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January 28, 2020

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Colorado River Basin Region
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Subject: Revised Topock IM-3 Combined Fourth Quarter 2019 Monitoring, Semiannual July – December 2019 and Annual January - December 2019 Operation and Maintenance Report
PG&E Topock Compressor Station, Needles, California
Interim Measure No. 3 Groundwater Treatment System
(Document ID: PGE20200123)

Dear Ms. Innis and Mr. Stormo:

Enclosed is the Revised Fourth Quarter 2019 Monitoring, Semiannual July – December 2019 and Annual January – December 2019 Operation and Maintenance Report (Revised 4Q2019 Report) for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Interim Measure No. 3 (IM-3) Groundwater Treatment System.

This Revised 4Q2019 Report is being issued due to the inadvertent omission of Reverse Osmosis Concentrate (RO Concentrate) flow data in the Fourth Quarter 2019 Monitoring, Semiannual July – December 2019 and Annual January – December 2019 Operation and Maintenance Report submitted January 15, 2020. The omission of the RO concentrate data was discovered after we sent the report on January 15, 2020, and this revised report is being issued with corrected volume data.

RO Concentrate is a by-product of the IM-3 treatment process and is shipped off-site by tanker truck as non-hazardous waste. Due to Final Groundwater Remedy construction activities at the MW-20 Bench adjacent to the IM-3 RO Concentrate storage tank, the RO Concentrate is temporarily being stored and shipped from the RO Concentrate process collection tank. Since the flowmeter is located between the RO Concentrate process collection tank and the RO Concentrate storage tank, the RO Concentrate flow from the process collection tank was not recorded by the flowmeter. The additional RO Concentrate flow data in this Revised 4Q2019 Report is from Liquid Environmental Solutions non-hazardous waste manifests (provided in Appendix B).

From July 2005 through September 2011 PG&E was operating the IM-3 groundwater treatment system as authorized by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) Order No. R7-2004-0103 (issued October 13, 2004); Order No. R7-2006-0060 (issued September 20,

2006); and the revised Monitoring and Reporting Program under Order No. R7-2006-0060 (issued August 28, 2008). Order No. R7-2006-0060 expired on September 20, 2011.

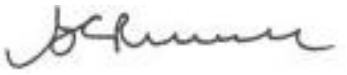
PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs) as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Regional Water Board to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board. Quarterly monitoring reports are required to be submitted by the fifteenth day of the month following the end of the quarter.

The IM-3 groundwater extraction and treatment system has extracted and treated approximately 959,679,229 gallons of water and removed approximately 7,850 pounds of total chromium from August 1, 2005 through December 31, 2019.

The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program.

If you have any questions regarding this report, please call me at (760) 791-5884.

Sincerely,



Curt Russell
Topock Site Manager

Enclosures:

Revised Topock IM-3 Combined Fourth Quarter 2019 Monitoring, Semiannual July - December 2019, and Annual January - December 2019 Operation and Maintenance Report

cc: Thomas Vandenberg, Colorado River Basin Regional Water Board
Aaron Yue, California Department of Toxic Substances Control

Topock Project Executive Abstract

Document Title: *Revised Topock IM-3 Fourth Quarter 2019 Monitoring, Semiannual July - December 2019 and Annual January – December 2019 Operation and Maintenance Report* Submitting Agency/Authored by: U.S. Department of the Interior and Regional Water Quality Control Board Final Document? X Yes __ No Is this time critical? __ Yes X No	Date of Document: January 28, 2020 Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E Document ID Number: PGE20200123
Priority Status: __ HIGH __ MED X LOW	Is this time critical? __ Yes X No
Type of Document: __ Draft X Report __ Letter __ Memo __ Other / Explain:	Action Required: X Information Only __ Review and Input __ Other / Explain:
What does this information pertain to? __ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA) __ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment) __ Corrective Measures Study (CMS)/Feasibility Study (FS) __ Corrective Measures Implementation (CMI)/ Remedial Action (RA) __ California Environmental Quality Act (CEQA)/ Environmental Impact Report (EIR) X Interim Measures __ Other / Explain:	Is this a Regulatory Requirement? X Yes __ No If no, why is the document needed?
What is the consequence of NOT doing this item? What is the consequence of DOING this item? Submittal of this report is a compliance requirement of the ARARs for waste discharge as documented in Attachment A to the Letter Agreement issued July 26, 2011.	Other Justification/s: __ Permit __ Other / Explain:
Brief Summary of attached document: This report covers the Interim Measure No. 3 (IM-3) groundwater treatment system monitoring activities during the Fourth Quarter 2019 period, and the operation and maintenance activities during the July 1, 2019 to December 31, 2019 semiannual and the January 1, 2019 to December 31, 2019 annual periods. The groundwater monitoring results for wells OW 1S/M/D, OW 2S/M/D, OW 5S/M/D, CW 1M/D, CW 2M/D, CW 3M/D, and CW 4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program. Written by: Pacific Gas and Electric Company	
Recommendations: This report is for your information only.	
How is this information related to the Final Remedy or Regulatory Requirements? The Topock IM-3 Fourth Quarter 2019 Monitoring, Semiannual July - December 2019 and Annual January – December 2019 Operation and Maintenance Report is related to the Interim Measure. PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs) as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board.	
Other requirements of this information? None.	

JACOBS

Revised Combined Fourth Quarter 2019 Monitoring, Semiannual July – December 2019 and Annual January – December 2019 Operation and Maintenance Report Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Document ID: PGE20200123

January 28, 2020

Prepared for

Colorado River Basin Regional Water Quality Control Board
and
United States Department of the Interior
on behalf of
Pacific Gas and Electric Company

Revised Combined Fourth Quarter 2019 Monitoring, Semiannual July – December 2019, and Annual January – December 2019 Operation and Maintenance Report for Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Prepared for

United States Department of the Interior
and
Colorado River Basin Regional Water Quality Control Board

on behalf of

Pacific Gas and Electric Company

January 28, 2020

This report was prepared under the supervision of a
California Certified Professional Engineer

_____

John Porcella, P.E.
Project Engineer

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Acronyms and Abbreviations

ARARs	Applicable or Relevant and Appropriate Requirements
ASSET	ASSET Laboratories
DOI	United States Department of the Interior
gpm	gallons per minute
HMI	human-machine interface
IM	Interim Measure
IM-3	Interim Measure No. 3
IW	injection well
MRP	Monitoring and Reporting Program
O&M	operation and maintenance
PG&E	Pacific Gas and Electric Company
PLC	programmable logic controller
PST	Pacific Standard Time
RCRA	Resource Conservations and Recovery Act
Regional Water Board	Colorado River Basin Regional Water Quality Control Board
RO	reverse osmosis
Truesdail	Truesdail Laboratories, Inc.
WDR	Waste Discharge Requirements

1. Introduction

Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The IM consists of groundwater extraction for hydraulic control of the plume boundaries in the Colorado River floodplain, treatment of extracted groundwater, and treated groundwater injection into injection wells located on San Bernardino County Assessor's Parcel No. 650-151-06. The groundwater extraction, treatment, and injection systems collectively are referred to as Interim Measure No. 3 (IM-3). Figure 1 provides a map of the project area. All figures are located at the end of this report.

From July 2005 through September 2011 PG&E was operating the IM-3 groundwater treatment system as authorized by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) Order No. R7-2004-0103 (issued October 13, 2004), Order No. R7-2006-0060 (issued September 20, 2006), and the revised Monitoring and Reporting Program (MRP) under Order No. R7-2006-0060 (issued August 28, 2008). Order No. R7-2006-0060 expired September 20, 2011.

PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs) as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Regional Water Board to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board. Quarterly monitoring reports are required to be submitted by the fifteenth day of the month following the end of the quarter.

This report covers monitoring activities related to operation of the IM-3 groundwater treatment system during the Fourth Quarter 2019, as well as the operation and maintenance (O&M) activities during the July 1, 2019 to December 31, 2019 semiannual period and the January 1, 2019 to December 31, 2019 annual period. The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program.

2. Sampling Station Locations

Table 1 lists the locations of sampling stations (all tables are located at the end of this report.) Sampling station locations are shown on the process and instrumentation diagrams (Figures TP-PR-10-10-04, PR-10-03, PR-10-04, and TP-PR-10-10-06) provided at the end of this report.

3. Description of Activities

The treatment system was initially operated between July 25 and July 28, 2005 for the Waste Discharge Requirement (WDR)-mandated startup phase. Discharge to the injection wells was initiated July 31, 2005 after successfully completing the startup phase in accordance with Order No. R7-2004-0103. Full-time operation of the treatment system commenced in August 2005.

As previously noted, this report describes Fourth Quarter 2019 monitoring activities and the July 1, 2019 through December 31, 2019 (Third and Fourth Quarters) O&M activities related to the IM-3 groundwater treatment system. It also serves as the Annual January – December 2019 O&M Report for IM-3. IM-3 monitoring activities from January 1, 2019 through September 30, 2019 (First, Second and Third Quarters) were presented in the following monitoring and O&M reports:

- Topock IM-3 First Quarter 2019 Monitoring Report, submitted to the DOI and Regional Water Board April 15, 2019
- Topock IM-3 Second Quarter 2019 Monitoring and Semi-annual January 1, 2019 through June 30, 2019 Operation and Maintenance Report, submitted to the DOI and Regional Water Board July 15, 2019
- Topock IM-3 Third Quarter 2019 Monitoring Report, submitted to the DOI and Regional Water Board October 15, 2019

3.1 Groundwater Treatment System

The treatment system was initially operated between July 25 and July 28, 2005 for the WDR-mandated startup phase. Discharge to the injection wells was initiated July 31, 2005 after successfully completing the startup phase in accordance with Order R7-2004-0103. Full-time operation of the treatment system commenced in August 2005.

Influent to the treatment facility, as listed in Attachment A, Waste Discharge ARARs, to the Letter Agreement issued July 26, 2011, includes the following:

- Groundwater from extraction wells TW-2S, TW-2D, TW-3D, and PE-1
- Purged groundwater and water generated from rinsing field equipment during monitoring events
- Groundwater generated during well installation, well development, and aquifer testing

Operation of the groundwater treatment system results in the following three effluent streams:

- **Treated Effluent:** Treated water that is discharged to the injection well(s)
- **Reverse Osmosis (RO) Concentrate (brine):** Treatment byproduct that is transported and disposed of offsite at a permitted facility
- **Sludge:** Treatment byproduct that is transported offsite for disposal at a permitted facility, which occurs either when a sludge waste storage bin reaches capacity, or within 90 days of the start date for accumulation in the storage container, whichever occurs first

3.2 Groundwater Treatment System Flow Rates for Fourth Quarter 2019

Downtime is defined as any periods when all extraction wells are not operating so that no groundwater is being extracted and piped into IM-3 as influent. Periods of planned and unplanned extraction system downtime (that together resulted in approximately 3.1 percent downtime during Fourth Quarter 2019) are summarized in the Semiannual Operations and Maintenance Log provided in Appendix A. The times shown are in Pacific Standard Time to be consistent with other data collected (e.g., water level data) at the site. Periods of planned and unplanned extraction system downtime during the months July 2019 through September 2019 were originally reported in the *Third Quarter 2019 Monitoring Report for Interim*

Measure No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, CA, published October 15, 2019, and are also included in Appendix A of this report.

Data regarding daily volumes of groundwater treated and discharged are provided in Appendix B. The IM-3 groundwater treatment system flowmeter calibration records are included in Appendix C.

3.2.1 Treatment System Influent

During the Fourth Quarter 2019, extraction well TW-3D operated with a target pumping rate of 135 gallons per minute (gpm), excluding periods of planned and unplanned downtime. Extraction wells PE-01 and TW-2D were only operated to collect a sample. TW-2S was not operated during Fourth Quarter 2019. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 98.5 percent during October 2019
- 96.3 percent during November 2019
- 95.9 percent during December 2019

The Fourth Quarter 2019 treatment system monthly average flow rates (influent, effluent, and RO concentrate) are presented in Table 2. The system influent flow rate was measured by flowmeters at groundwater extraction wells TW-2S, TW-2D, TW-3D, and PE-1 (Figure TP-PR-10-10-03).

The IM-3 facility treated approximately 17,157,730 gallons of extracted groundwater during Fourth Quarter 2019.

In addition to extracted groundwater, during Fourth Quarter 2019 the IM-3 facility treated 40,000 gallons of Final Groundwater Remedy waste water, 3,500 gallons of water generated from the groundwater monitoring program and 1,050 gallons of injection well development water.

3.2.2 Effluent Streams

The treatment system effluent flow rate was measured by flowmeters in the piping leading to injection wells IW-2 and IW-3 (Figure TP-PR-10-10-11) and in the piping running from the treated water tank T-700 to the injection wells (Figure TP-PR-10-10-04). The IM-3 facility injected 17,198,006 gallons of treatment system effluent during Fourth Quarter 2019. The monthly average flow rate to injection wells is shown in Table 2.

The RO concentrate flow rate is measured by a flowmeter at the piping carrying water from RO concentrate tank T-701 to the truck load-out station (Figure PR-10-04) or from Liquid Environmental Solutions non-hazardous waste manifests (provided in Appendix B). Due to Final Groundwater Remedy construction activities at the MW-20 Bench adjacent to the IM-3 RO concentrate storage tank, the RO concentrate is temporarily being stored and shipped from the RO concentrate process collection tank. Since the flowmeter is located between the RO Concentrate process collection tank and the RO Concentrate storage tank, the RO Concentrate flow from the process collection tank was not recorded by the flowmeter.

The IM-3 facility generated an estimated 9,000 gallons of RO concentrate during Fourth Quarter 2019. The monthly average RO concentrate flow rate is shown in Table 2.

The sludge flow rate is measured by the size and weight of containers shipped offsite. Four sludge containers were shipped offsite from the IM-3 facility during Fourth Quarter 2019. The shipment dates and approximate weights are provided in Section 5.3.

3.3 Sampling and Analytical Procedures

With the exception of pH, samples were collected at the designated sampling locations and placed directly into containers provided by Truesdail Laboratories, Inc. (Truesdail) or ASSET Laboratories (ASSET). Sample containers were labeled and packaged according to standard sampling procedures.

The samples were stored in a sealed container chilled with ice and transported to Truesdail or ASSET via courier under chain-of-custody documentation. The laboratories confirmed the samples were received in chilled condition upon arrival. Truesdail is certified by the California Department of Health Services (Certification No. 1237) under the State of California's Environmental Laboratory Accreditation Program. ASSET is certified by the California Department of Health Services (Certification No. 2676) under the State of California's Environmental Laboratory Accreditation Program. California-certified laboratory analyses were performed in accordance with the latest edition of the *Guidelines Establishing Test Procedures for Analysis of Pollutants* (40 Code of Federal Regulations Part 136), promulgated by the U.S. Environmental Protection Agency.

Analysis of pH was conducted by field method pursuant to the Regional Water Board letter dated October 16, 2007 (subject: Clarification of Monitoring and Reporting Program Requirements) authorizing pH measurements to be conducted in the field. The field method pH samples were collected at the designated sampling locations and field tested within 15 minutes of sampling.

As required by the MRP, the analytical method selected for total chromium has a method detection limit of 1 part per billion, and the analytical method selected for hexavalent chromium has a method detection limit of 0.2 part per billion.

Influent, effluent, RO concentrate, and sludge sampling frequency were in accordance with the MRP. The Fourth Quarter 2019 sample collection schedule is shown in Table 3.

Groundwater quality is being monitored in observation and compliance wells according to Attachment A, Waste Discharge ARARs, to the Letter Agreement issued July 26, 2011, and the procedures and schedules approved in the *Groundwater Compliance Monitoring Plan for Interim Measure No. 3 Injection Area* submitted to the Regional Water Board on June 17, 2005. Quarterly groundwater monitoring analytical results for the injection area (wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D) are reported in a separate document, in conjunction with groundwater level maps of the same monitoring wells.

4. Analytical Results

The analytical results and laboratory reports for the IM-3 groundwater treatment system monitoring program were previously reported for the First, Second and Third Quarters of 2019:

- The January 1, 2019 through March 31, 2019 results were included in the First Quarter 2019 Monitoring Report submitted to the DOI and Regional Water Board on April 15, 2019.
- The April 1, 2019 through June 30, 2019 results were included in the Second Quarter 2019 Monitoring Report submitted to the DOI and Regional Water Board on July 15, 2019.
- The July 1, 2019 through September 30, 2019 results were included in the Third Quarter 2019 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2019.

Laboratory reports for samples collected in Fourth Quarter 2019 were prepared by certified analytical laboratories, and are presented in Appendix D. The Fourth Quarter 2019 analytical results are presented in Tables 4, 5, 6, and 7:

- Influent analytical results are presented in Table 4.
- Effluent analytical results are presented in Table 5. There were no exceedances of effluent limitations during the reporting period.
- RO concentrate analytical results are presented in Table 6.
- Sludge analytical results are presented in Table 7.

The sludge is required to have an aquatic bioassay test annually. The most recent aquatic bioassay test was conducted in the third quarter 2019, and the results were presented in the Third Quarter 2019 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2019.

Table 8 identifies the following information for each analysis:

- Sample location
- Sample identification number
- Sampler name
- Sample date
- Sample time
- Laboratory performing analysis
- Analysis method
- Analysis date
- Laboratory technician

5. Semiannual Operation and Maintenance

This section includes the Semiannual Operation and Maintenance Report for the IM-3 groundwater treatment system for the period July 1, 2019 through December 31, 2019.

All O&M records are maintained at the facility, including site inspection forms, process monitoring records, hazardous waste generator records (i.e., waste manifests), and self-monitoring reports. These records will be maintained onsite for a period of at least 5 years. Operational programmable logic controller data (flow rates, system alarms, process monitoring data, etc.) are maintained electronically via data historian software. O&M records are also archived using maintenance software. The subsections below summarize the O&M activities during this semiannual reporting period.

5.1 Flowmeter Calibration Records

The IM-3 groundwater treatment system flowmeter calibration records are included in Appendix C. Flowmeter calibrations are performed in a timely manner consistent with the use, flow, material, and manufacturer recommendations. The following flowmeters are used at the facility to measure groundwater flow:

Location	Location ID Where Flowmeter is Installed	Current Flowmeter Serial No.	Date of Calibration	Date of Installation
Extraction well PE-1	FIT-103	6A022016000	12/5/2018	5/1/2019
Extraction well TW-3D	FIT-102	N6005016000	6/13/2018	5/1/2019
Extraction well TW-2D	FIT-101	6A021F16000	12/5/2018	12/4/2019
Extraction well TW-2S	FIT-100	6A022016000	12/5/2018	12/4/2019
Injection well IW-03	FIT-1203	N6004E16000	6/13/2018	5/1/2019
Injection well IW-02	FIT-1202	7700F216000	5/4/2017	8/8/2017
Combined IW-02 and IW-03	FIT-700	7700F316000	10/28/2016	10/19/2018
Reverse osmosis concentrate	FIT-701	N6004F16000	6/13/2018	11/17/2018

5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between July 1, 2019 and December 31, 2019 are provided in Appendix B. The daily volumes of groundwater treated from January 1, 2019 through June 30, 2019 were reported in the Second Quarter 2019 Monitoring Report and Semiannual January 1- June 30, 2019 Operation and Maintenance Report submitted on July 15, 2019.

Approximately 33,130,820 gallons of groundwater were extracted and treated between July 1, 2019 and December 31, 2019. Treatment of this water at the IM-3 facility is being performed in accordance with the conditions of ARARs.

Additionally, approximately treated 78,300 gallons of Final Groundwater Remedy waste water, 3,950 gallons of well purge water (generated during monitoring well sampling), as well as 26,150 gallons of injection well re-development water, were treated at the IM-3 facility during the July 1, 2019 through December 31, 2019 semiannual period.

A total of approximately 33,284,341 gallons of treated groundwater were injected back into the Alluvial Aquifer between July 1, 2019 and December 31, 2019. This is greater than the metered influent, but is within the accuracy of the flow meters.

5.3 Residual Solids Generated (Sludge)

During the July 1, 2019 through December 31, 2019 reporting period, twelve containers of sludge were shipped offsite for disposal. The sludge was shipped to U.S. Ecology in Beatty, Nevada, for disposal. A listing of each shipment during the July 1, 2019 through December 31, 2019 reporting period is provided below.

Date Sludge Bin Removed from Site	Approximate Quantity from Waste Manifests (cubic yards)	Type of Shipment
7/17/2019	8	Non-RCRA hazardous waste
7/17/2019	8	Non-RCRA hazardous waste
7/18/2019	8	Non-RCRA hazardous waste
9/11/2019	8	Non-RCRA hazardous waste
9/11/2019	8	Non-RCRA hazardous waste
9/12/2019	8	Non-RCRA hazardous waste
9/25/2019	8	Non-RCRA hazardous waste
9/25/2019	8	Non-RCRA hazardous waste
10/23/2019	8	Non-RCRA hazardous waste
10/23/2019	8	Non-RCRA hazardous waste
12/4/2019	8	Non-RCRA hazardous waste
12/4/2019	8	Non-RCRA hazardous waste

Note:

RCRA = Resource Conservation and Recovery Act

5.4 Reverse Osmosis Concentrate Generated

Data regarding daily volumes of RO concentrate generated are provided in Appendix B, as measured by flowmeter FIT-701 (Figures PR-10-03 and PR-10-04).

This Revised 4Q2019 Report is being issued due to the inadvertent omission of RO concentrate flow data in the Fourth Quarter 2019 Monitoring, Semiannual July – December 2019 and Annual January – December 2019 Operation and Maintenance Report submitted January 15, 2020. The omission of the RO concentrate data was discovered after we sent the report on January 15, 2020, and this revised report is being issued with corrected volume data.

RO concentrate is a by-product of the IM-3 treatment process and is shipped off-site by tanker truck as non-hazardous waste. Due to Final Groundwater Remedy construction activities at the MW-20 Bench adjacent to the IM-3 RO concentrate storage tank, the RO concentrate is temporarily being stored and shipped from the RO concentrate process collection tank. Since the flowmeter is located between the RO concentrate process collection tank and the RO concentrate storage tank, the RO concentrate flow from the process collection tank was not recorded by the flowmeter. The additional RO concentrate flow data in this Revised 4Q2019 Report is from Liquid Environmental Solutions non-hazardous waste manifests (provided in Appendix B).

From July 1, 2019 through December 31, 2019, approximately 424 gallons of RO concentrate was measured at the flowmeter between the RO concentrate process collection tank and the RO concentrate storage tank. Additionally, approximately 13,850 gallons of RO concentrate were transported to Liquid

Environmental Solutions in Phoenix, Arizona for disposal according to the non-hazardous waste manifests provided in Appendix B.

5.5 Summary of ARARs Compliance

No ARAR violations were identified during the July 1, 2019 through December 31, 2019 semiannual reporting period.

5.6 Operation and Maintenance – Required Shutdowns

Records of routine maintenance are kept onsite.

Appendix A contains a summary of the operation or maintenance issues that required the groundwater extraction system to be shut down during the July 1, 2019 through December 31, 2019 semiannual reporting period.

Activities during the Third and Fourth Quarters 2019 included one extended shutdown:

- **August 12-16, 2019 (planned):** The extraction well system was offline from 5:52 a.m. on August 12, 2019 to 8:40 a.m. on August 15, 2019; from 10:02 a.m. to 12:44 p.m. August 15, 2019; and from 1:58 p.m. on August 15, 2019 to 2:44 p.m. on August 16, 2019 for the semiannual scheduled maintenance. Extraction system downtime was 4 days 6 hours 16 minutes.

5.7 Treatment Facility Modifications

No modifications were made to the IM-3 treatment facility that resulted in a material change in the quality or quantity of wastewater treated or discharged, nor resulted in a material change in the location of discharge, during the July 1, 2019 through December 31, 2019 semiannual period.

6. Conclusions

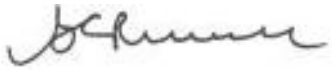
There were no exceedances of effluent limitations during the reporting period.

In addition, no incidents of non-compliance were identified during the reporting period. No events that caused an immediate or potential threat to human health or the environment, and no new releases of hazardous waste or hazardous waste constituents, or new solid waste management units, were identified during the reporting period.

7. Certification

Certification Statement:

I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Signature: 

Name: Curt Russell

Company: Pacific Gas and Electric Company

Title: Topock Site Manager

Date: January 28, 2020

Tables

Table 1. Sampling Station Descriptions

Fourth Quarter 2019 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Sample Station	Sample ID[a]	Location
Sampling Station A: Groundwater Treatment System Influent	SC-100B-WDR-###	Sample collected from tap on pipe into T-100 (refer to Figure TP-RP-10-10-04).
Sampling Station B: Groundwater Treatment System Effluent	SC-700B-WDR-###	Sample collected from tap on pipe downstream from T-700 (refer to Figure TP-RP-10-10-04).
Sampling Station D: Groundwater Treatment System Reverse Osmosis Concentrate	SC-701-WDR-###	Sample collected from tap on pipe into T-701 (refer to Figures PR-10-03 and PR-10-04).
Sampling Station E: Groundwater Treatment System Sludge	SC-SLUDGE-WDR-###	Sample collected from sludge accumulated in the phase separator used this quarter (refer to Figure TP-RP-10-10-06).

Notes:

= Sequential sample identification number at each sample station

[a] The sample event number is included at the end of the sample ID (e.g., SC-100B-WDR-015).

Table 2. Flow Monitoring Results

Fourth Quarter 2019 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	System Influent[a,b] (gpm)	System Effluent[b] (gpm)	Reverse Osmosis Concentrate[b,c] (gpm)
October 2019 Average Monthly Flowrate	131.9	132.2	0
November 2019 Average Monthly Flowrate	129.8	129.9	0
December 2019 Average Monthly Flowrate	126.9	127.4	0

Notes:

gpm: gallons per minute

[a] Extraction well TW-3D was operated during the Fourth Quarter 2019. Extraction wells PE-01 and TW-2D were only operated to collect a sample. TW-2S was not operated during Fourth Quarter 2019.

[b] The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Fourth Quarter 2019 is approximately -0.23 percent.

[c] Due to Final Groundwater Remedy construction activities at the MW-20 bench, brine (RO) concentrate was no longer sent to the brine tanks since May 8, 2019. The total gallons removed from IM-3 since that date are an estimate from the Liquid Environmental Systems non-hazardous waste manifests. On December 12, 2019, it is estimated that 5,000 gallons were removed, and again on December 16, 2019, it is estimated that 4,000 gallons of RO concentrate were removed. Using these estimates, that would make the RO Concentration be 0.2 gpm for December 2019.

Table 3. Sample Collection Dates

Fourth Quarter 2019 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	Sample Collection Dates	Results
Influent	October 1, 2019 November 5, 2019 December 3, 2019	Refer to Table 4
Effluent	October 1, 2019 November 5, 2019 December 3, 2019	Refer to Table 5
Reverse Osmosis Concentrate	October 1, 2019	Refer to Table 6
Sludge[a]	Composite sample sent to lab October 1, 2019	Refer to Table 7

Note:

[a] Sludge samples analysis is required quarterly by composite.

Table 4. Influent Monitoring Results [a]

Fourth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Analytes		TDS	Turbidity	Specific Conductance	Field [c] pH	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)	Sulfate	Iron	Zinc
Units [b]		mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
MDL		50.0	0.100	0.100	---	0.650	3.30	40.0	0.0200	0.160	0.0810	0.150	0.0740	0.550	0.0480	0.130	0.260	0.210	0.260	0.160	2.00	18.0	2.30
Sampling Frequency		Monthly						Quarterly															
Sample ID	Date																						
SC-100B-WDR-594	10/1/2019	**4200**	**0.300**	**7200**	**7.4**	**960**	**920**	**ND (50.0)**	**0.0400 J**	**ND (0.500)**	**3.20**	**35.0**	**1.00**	**ND (1.00)**	**3.10**	**ND (1.00)**	**ND (0.500)**	**24.0**	**7.50**	**4.10**	**480**	**ND (20.0)**	**15.0**
RL		50.0	0.100	0.100	---	25.0	20.0	50.0	0.100	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0
SC-100B-WDR-595	11/5/2019	**4100**	**0.220**	**6900**	**7.3**	**400**	**410**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**ND (0.500)**	**---**	**---**	**---**	**---**	**ND (20.0)**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	20.0	---
SC-100B-WDR-596	12/3/2019	**4400**	**0.230**	**7500**	**7.2**	**430**	**460**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**ND (0.500)**	**---**	**---**	**---**	**---**	**ND (100)**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	100	---

Notes:

(---) = not required by the ARARs Monitoring and Reporting Program
J = concentration or reporting limits estimated by laboratory or validation
MDL = method detection limit
mg/L = milligrams per liter
N = nitrogen
ND = parameter not detected at the listed value
NTU = nephelometric turbidity units
RL = project reporting limit
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

[a] Sampling Location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&ID TP-PR-10-10-04).

[b] Units reported in this table are those units required in the ARARs.

[c] Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

Table 5. Effluent Monitoring Results [a]

Fourth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Analytes		TDS	Turbidity	Specific Conductance	Field pH [e]	Chromium	Hexavalent Chromium	Aluminiur	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)		Sulfate	Iron	Zinc
Units [c]		mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L		mg/L	µg/L	µg/L
MDL [d]		50.0	0.100	0.100	---	0.130	0.0330	200	0.0200	0.160	0.0810	0.150	0.0740	0.550	0.0480	0.130	0.260	0.210	0.260	0.160		2.00	18.0	2.30
Effluent Limits [b]	Ave. Monthly	NA	NA	NA	6.5-8.4	25	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Max Daily	NA	NA	NA	6.5-8.4	50	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Frequency		**Monthly**																						
Sample ID	**Date**																							
SC-700B-WDR-594	**10/1/2019**	**4000**	**0.220**	**7000**	**7.1**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**0.0300 J**	**ND (0.500)**	**0.130**	**17.0**	**0.930**	**ND (1.00)**	**3.00**	**ND (1.00)**	**ND (0.500)**	**24.0**	**1.30**	**3.10**		**460**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.100	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250		25.0	20.0	10.0
SC-700B-WDR-595	**11/5/2019**	**3900**	**0.260**	**7000**	**7.3**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**0.140 J**	**ND (0.500)**	**ND (0.100)**	**20.0**	**0.990**	**ND (1.00)**	**2.80**	**ND (1.00)**	**ND (0.500)**	**21.0**	**2.40**	**2.90**		**480**	**55.0**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.100	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250		25.0	20.0	10.0
SC-700B-WDR-596	**12/3/2019**	**4600**	**0.140**	**7500**	**7.0**	**ND (1.00)**	**ND (0.200)**	**ND (250)**	**0.180**	**ND (0.500)**	**ND (0.100)**	**23.0**	**1.40**	**ND (1.00)**	**2.50**	**ND (1.00)**	**ND (0.500)**	**21.0**	**1.90**	**2.70**		**500**	**ND (100)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	250	0.100	0.500	0.100	1.00	0.500	1.00	0.500	1.00	0.500	0.500	1.00	0.250		25.0	100	10.0

Notes:

(---) = not required by the ARARs Monitoring and Reporting Program
J = concentration or reporting limits estimated by laboratory or validation
MDL = method detection limit
mg/L = milligrams per liter
N = nitrogen
NA = not applicable
ND = parameter not detected at the listed value
NTU = nephelometric turbidity units
RL = project reporting limit
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

[a] Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection wells (see attached P&ID TP-PR-10-10-04).

[b] In addition to the listed effluent limits, the ARARs state that the effluent shall not contain heavy metals, chemicals, pesticides or other constituents in concentrations toxic to human health.

[c] Units reported in this table are those units required in the ARARs.

[d] MDL listed is the target MDL by analysis method; however, the MDL may change for each sample analysis due to the dilution required by the matrix to meet the method QC requirements. The target MDL for each method/analyte combination is calculated annually.

[e] Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

Table 6. Reverse Osmosis Concentrate Monitoring Results[a]

Fourth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Analytes	TDS	Specific Conductance	Field pH [c]	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units [b]	mg/L	µmhos/cm	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL	500	0.100	---	0.00013	0.00017	0.00078	0.000081	0.00075	0.0011	0.00026	0.000042	0.00055	0.190	0.0032	0.0011	0.00013	0.00026	0.00036	0.0012	0.0048	0.00028	0.0023
Sampling Frequency	**Quarterly**																					
Sample ID **Date**																						
SC-701-WDR-594 **10/1/2019**	**28000**	**38000**	**7.9**	**0.00200**	**ND (0.0010)**	**ND (0.0025)**	**0.00510**	**0.100**	**ND (0.0120)**	**ND (0.0025)**	**0.000650**	**0.00230**	**18.0**	**ND (0.0250)**	**0.190**	**ND (0.00020)**	**0.0150**	**0.0310**	**ND (0.0025)**	**ND (0.0120)**	**0.00680**	**ND (0.0100)**
RL	500	0.100	---	0.0010	0.0010	0.0025	0.00010	0.0050	0.0120	0.0025	0.00050	0.0010	2.00	0.0250	0.0025	0.00020	0.0010	0.00050	0.0025	0.0120	0.0010	0.0100

Notes:
(---) = not required by the ARARs Monitoring and Reporting Program
MDL = method detection limit
mg/L = milligrams per liter
ND = parameter not detected at the listed value
RL = project reporting limit
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

[a] Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&ID PR-10-04).

[b] Units reported in this table are those units required in the ARARs.

[c] Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

Table 7. Sludge Monitoring Results[a]

Third Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Analytes		Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units[b]		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL		0.660	0.590	0.670	1.10	0.630	0.440	0.540	0.580	1.80	0.280	0.600	0.610	0.0540	0.690	1.20	1.30	0.720	0.450	0.610
Sampling Frequency		**Quarterly**																		
Sample ID	**Date**																			
Phase Separator-594-Sludge	**10/1/2019**	**1900**	**53.0**	**9.00**	**13.0**	**80.0**	**ND (2.00)**	**ND (2.00)**	**4.00**	**160 J**	**25.0**	**ND (2.00)**	**14.0**	**ND (0.200)**	**30.0**	**ND (2.00)J**	**ND (2.00)**	**ND (4.10)**	**38.0**	**480**
RL		2.00	2.00	4.10	2.00	2.00	2.00	2.00	2.00	4.10	4.10	2.00	2.00	0.200	2.00	2.00	2.00	4.10	2.00	2.00

Notes:

(---) = not required by the ARARs Monitoring and Reporting Program
J = concentration or reporting limits estimated by laboratory or validation
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MDL = method detection limit
ND = parameter not detected at the listed reporting limit
RL = project reporting limit

[a] Sampling location for all sludge samples is the sludge collection bin (see attached P&ID TP-PR-10-10-06).

[b] Units reported in this table are those units required in the ARARs.

[c] Sludge samples analysis is required quarterly by composite; sludge samples were collected from each container prior to shipment off-site, and combined for the composite sample of the preceding quarter.

Table 8. Monitoring Information

Fouth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-594	Ryan Phelps	10/1/2019	11:25:00 AM	ASSET	EPA 120.1	SC	10/2/2019	Lilia Ramit
					ASSET	EPA 200.7	AL	10/4/2019	Diane Jetajobe
					ASSET	EPA 200.7	B	10/4/2019	Diane Jetajobe
					ASSET	EPA 200.7	FE	10/7/2019	Diane Jetajobe
					ASSET	EPA 200.8	AS	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	BA	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CR	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CU	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MO	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	NI	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	PB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	SB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/7/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/4/2019	Hanah Glodoviza
					ASSET	EPA 300.0	FL	10/7/2019	Ria Abes
					ASSET	EPA 300.0	SO4	10/8/2019	Ria Abes
					ASSET	SM 2540C	TDS	10/2/2019	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/12/2019	Marlon Cartin
					ASSET	SM2130B	TRB	10/2/2019	Lilia Ramit
					CTBERK	SM4500NH3D	NH3N	10/8/2019	
				11:25:00 PM	Field	HACH	PH	10/1/2019	Ryan Phelps
SC-100B	SC-100B-WDR-595	Ryan Phelps	11/5/2019	9:20:00 AM	ASSET	EPA 120.1	SC	11/6/2019	Lilia Ramit
					ASSET	EPA 200.7	FE	11/7/2019	Ria Abes
					ASSET	EPA 200.8	CR	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	11/7/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/6/2019	Ria Abes
					Field	HACH	PH	11/5/2019	Ryan Phelps
					ASSET	SM 2540C	TDS	11/11/2019	Lilia Ramit
					ASSET	SM2130B	TRB	11/6/2019	Lilia Ramit
SC-100B	SC-100B-WDR-596	Ryan Phelps	12/3/2019	10:20:00 AM	ASSET	EPA 120.1	SC	12/4/2019	Lilia Ramit
					ASSET	EPA 200.7	FE	12/9/2019	Diane Jetajobe
					ASSET	EPA 200.8	CR	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	12/9/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/4/2019	Ria Abes
					Field	HACH	PH	12/3/2019	Ryan Phelps
					ASSET	SM 2540C	TDS	12/5/2019	Lilia Ramit
					ASSET	SM2130B	TRB	12/4/2019	Lilia Ramit

Table 8. Monitoring Information

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-594	Ryan Phelps	10/1/2019	11:20:00 AM	ASSET	EPA 120.1	SC	10/2/2019	Lilia Ramit
					ASSET	EPA 200.7	AL	10/4/2019	Diane Jetajobe
					ASSET	EPA 200.7	B	10/4/2019	Diane Jetajobe
					ASSET	EPA 200.7	FE	10/7/2019	Diane Jetajobe
					ASSET	EPA 200.8	AS	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	BA	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CR	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CU	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MO	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	NI	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	PB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	SB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/7/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/3/2019	Hanah Glodoviza
					ASSET	EPA 300.0	FL	10/7/2019	Ria Abes
					ASSET	EPA 300.0	SO4	10/8/2019	Ria Abes
					ASSET	SM 2540C	TDS	10/2/2019	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/12/2019	Marlon Cartin
					ASSET	SM2130B	TRB	10/2/2019	Lilia Ramit
					CTBERK	SM4500NH3D	NH3N	10/8/2019	
				11:20:00 PM	Field	HACH	PH	10/1/2019	Ryan Phelps
SC-700B	SC-700B-WDR-595	Ryan Phelps	11/5/2019	9:25:00 AM	ASSET	EPA 120.1	SC	11/6/2019	Lilia Ramit
					ASSET	EPA 200.7	AL	11/7/2019	Ria Abes
					ASSET	EPA 200.7	B	11/7/2019	Ria Abes
					ASSET	EPA 200.7	FE	11/7/2019	Ria Abes
					ASSET	EPA 200.8	AS	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	BA	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CR	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CU	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MO	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	NI	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	PB	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	SB	11/7/2019	Claire Ignacio
					ASSET	EPA 200.8	ZN	11/7/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/6/2019	Ria Abes
					ASSET	EPA 300.0	FL	11/11/2019	Ria Abes

Table 8. Monitoring Information

Fouth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-595	Ryan Phelps	11/5/2019	9:25:00 AM	ASSET	EPA 300.0	SO4	11/12/2019	Ria Abes
					Field	HACH	PH	11/5/2019	Ryan Phelps
					ASSET	SM 2540C	TDS	11/11/2019	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	11/14/2019	Ria Abes
					ASSET	SM2130B	TRB	11/6/2019	Lilia Ramit
					CTBERK	SM4500NH3D	NH3N	11/18/2019	
SC-700B	SC-700B-WDR-596	Ryan Phelps	12/3/2019	10:25:00 AM	ASSET	EPA 120.1	SC	12/4/2019	Lilia Ramit
					ASSET	EPA 200.7	AL	12/9/2019	Diane Jetajobe
					ASSET	EPA 200.7	B	12/9/2019	Diane Jetajobe
					ASSET	EPA 200.7	FE	12/9/2019	Diane Jetajobe
					ASSET	EPA 200.8	AS	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	BA	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	CR	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	CU	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	MO	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	NI	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	PB	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	SB	12/9/2019	Claire Ignacio
					ASSET	EPA 200.8	ZN	12/9/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/4/2019	Ria Abes
					ASSET	EPA 300.0	FL	12/10/2019	Ria Abes
					ASSET	EPA 300.0	SO4	12/10/2019	Ria Abes
					Field	HACH	PH	12/3/2019	Ryan Phelps
					ASSET	SM 2540C	TDS	12/5/2019	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	12/11/2019	Ria Abes
					ASSET	SM2130B	TRB	12/4/2019	Lilia Ramit
					CTBERK	SM4500NH3D	NH3N	12/10/2019	
SC-701	SC-701-WDR-594	Ryan Phelps	10/1/2019	11:35:00 AM	ASSET	EPA 120.1	SC	10/2/2019	Lilia Ramit
					ASSET	EPA 200.8	AG	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	AS	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	BA	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	BE	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CD	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CO	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CR	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	CU	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	MN	10/7/2019	Claire Ignacio

Table 8. Monitoring Information

Fouth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-701	SC-701-WDR-594	Ryan Phelps	10/1/2019	11:35:00 AM	ASSET	EPA 200.8	MO	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	NI	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	PB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	SB	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	SE	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	TL	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	V	10/7/2019	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/7/2019	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/3/2019	Hanah Glodoviza
					ASSET	EPA 245.1	HG	10/3/2019	Diane Jetajobe
					ASSET	EPA 300.0	FL	10/7/2019	Ria Abes
					ASSET	SM 2540C	TDS	10/2/2019	Lilia Ramit
				11:35:00 PM	Field	HACH	PH	10/1/2019	Ryan Phelps
Phase Separator	Phase Separator-594-Sludge		10/1/2019	11:00:00 AM	ASSET	EPA 300.0	FL	10/9/2019	Ria Abes
					ASSET	EPA 6010B	AG	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	AS	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	BA	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	BE	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	CD	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	CO	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	CR	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	CU	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	MN	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	MO	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	NI	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	PB	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	SB	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	SE	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	TL	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	V	10/8/2019	Diane Jetajobe
					ASSET	EPA 6010B	ZN	10/8/2019	Diane Jetajobe
					ASSET	EPA 7471A	HG	10/2/2019	Diane Jetajobe
					ASSET	SW 7199	CR6	10/9/2019	Ria Abes

Table 8. Monitoring Information

Fouth Quarter 2019 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Notes:

SC-700B = Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection well IW-2 (see attached P&ID TP-PR-10-10-04).

SC-100B = Sampling location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&ID TP-PR-10-10-04).

SC-701 = Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&ID PR-10-04).

Prior to April 11, 2007 the analytical methods listed in the 40 CFR Part 136 for pH and TDS were E150.1 and E160.1, respectively. Per EPA and Department of Health Services guidelines, the analytical methods listed in the current 40 CFR Part 136 have changed to SM4500-H B and SM2540C as shown on the table.

ALKB =	alkalinity, bicarb as CaCO3	MO =	molybdenum
ALKC =	alkalinity, carb as CaCO3	MOIST =	moisture
AL =	aluminum	NH3N =	ammonia (as N)
Ag =	silver	NI =	nickel
AS =	arsenic	NO3NO2N =	nitrate/nitrite (as N)
B =	boron	PB =	lead
BA =	barium	PH =	pH
BE =	beryllium	SB =	antimony
CD =	cadmium	SC =	specific conductance
CO =	cobalt	SE =	selenium
CR =	chromium	SO4 =	sulfate
CR6 =	hexavalent chromium	TDS =	total dissolved solids
CU =	copper	TL =	thallium
FE =	iron	TRB =	turbidity
FETD =	iron, dissolved	V =	vanadium
FL =	fluoride	ZN =	zinc
HG =	mercury		
MN =	manganese		
MND =	manganese, dissolved		

Figures

Parcel No. 650-151-06
Fort Mojave Indian Tribe
(Formerly owned by PG&E)

BLM

East Mesa
Injection Area

CW-4
CW-3
CW-2
CW-1
IW-1
IW-2
IW-3

IM-3
Treatment
Plant

BAT CAVE WASH

Park Moabi Rd./National Trails Highway

Colorado River

MW-20
Bench

TW-02S
TW-03D
TW-02D
MW-20-130
PE-01

BN&SF RAILROAD

600

INTERSTATE 40

LEGEND

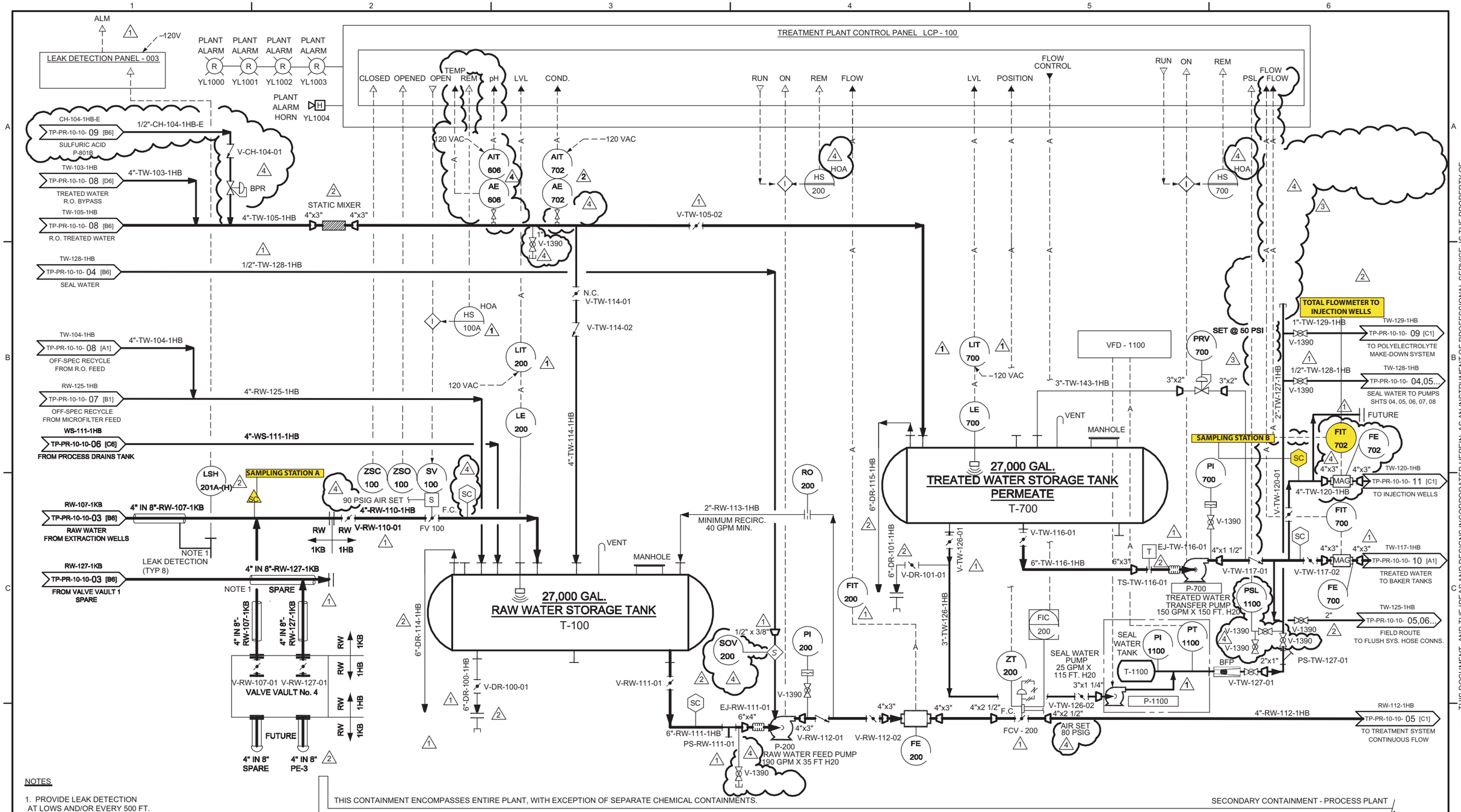
- IM-3 Injection Well
- Observation Well Cluster
- Compliance Monitoring Well Cluster
- Exploratory Boring
- Groundwater Monitoring Well
- IM Extraction Well
- IM-3 Treatment Facility Pipelines
- IM-3 Effluent Pipeline
- Parcel Boundary

N

0 170 340 680 Feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 1
IM-3 PROJECT SITE FEATURES
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA



NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL		REV 4	DATE 09/21/05	PRINT DISTRIBUTION
0	07/28/04	FOR INTERNAL REVIEW	EFC	AJ	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL		STATUS
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL		REV.
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL		CLIENT
3	02/14/05	ADDED RECIRC. LINE AND PRV VALVE TO T-700 - APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL		FIELD
4	09/21/05	REVISED PER AS-BUILT CONDITIONS	EFC	AJ	PIPING		GEN. ARRANG.		INTRA CO.

RESPONSIBLE ENGINEER: Kenneth L. Martins Exp. 6-30-05 CH4876 PE #

STATUS	REV	DATE	SDE	PEM
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	4	/ /		

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
PROJ NO. 315994

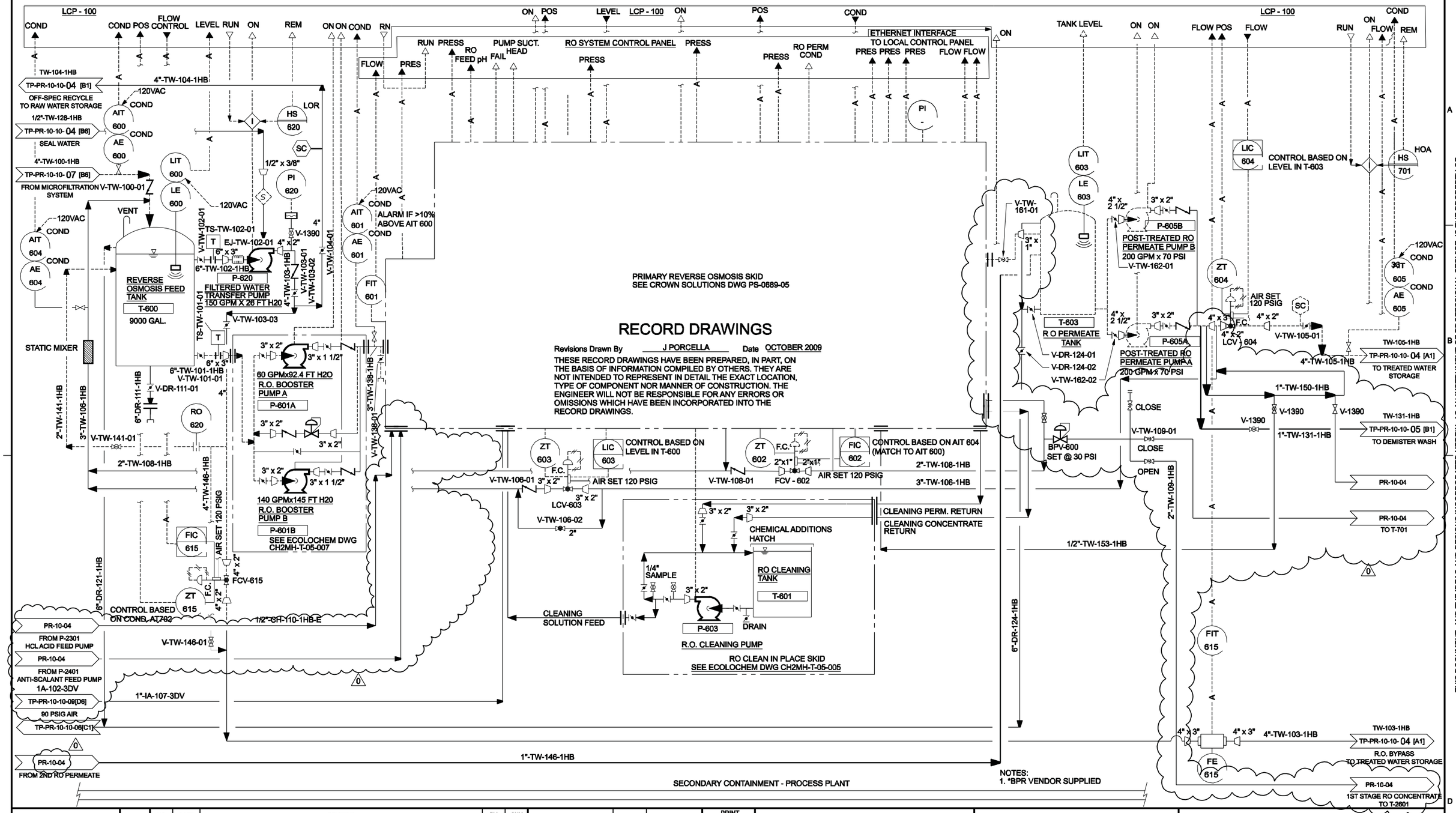
CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 04
STORAGE AREA

DWG. NO. TP-PR-10-10-04 REV. 4

BAR IS ONE INCH ON ORIGINAL DRAWING

FILENAME: tppr101004.dwg PLOT DATE: 21-SEP-2005 PLOT TIME:



**
ORIGINALLY STAMPED AND SIGNED BY:
JOHN PORCELLA
CALIFORNIA PE NO. C70145
ON 04-01-2009
**

RESPONSIBLE ENGINEER: John Porcella C70145 Exp. 9-30-10
PE#

NO.	DATE	REVISION	BY	CHK
A	2/12/09	INTERNAL REVIEW		
B	2/12/09	CLIENT REVIEW		
C	4/01/09	FOR REVIEW AND APPROVAL	JR	JP
0	11/17/09	FINAL RECORD ISSUE	JR	JP

REVISION APPROVAL				REV 0	DATE 10/02/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE	
CIVIL	SJ	ELECTRICAL	FH	STATUS	
STRUCTURAL		INST & CONTROL	JG	REV.	
MECHANICAL	SJ	ARCHITECTURAL		CLIENT	
PROCESS	DF	ENVIRONMENTAL		FIELD	
PIPING	SJ	GEN. ARRANG.	SJ	INTRA CO.	

PRINT DISTRIBUTION

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY	A	2/12/09	JP	JP
FOR REVIEW AND APPROVAL	C	4/01/09	JP	JP
APPROVED FOR CONSTRUCTION				
REVISED & APPROVED FOR CONSTRUCTION	0	10/02/09	JP	JP

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
PLANT PERFORMANCE IMPROVEMENTS

PROJ NO. 362032

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
REVERSE OSMOSIS SYSTEM
SHEET ONE OF TWO

DWG. NO. PR-10-03 REV. 0

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: PR-10-03.dgn PLOT DATE: 11/19/2009 PLOT TIME: 10:27:54 AM

COND LVL RUN ON FLOW

PR-10-03 — TO SEAL WATER TRUNK LINE

HOA HS 701

1 1/2" TW-154-1HB

PR-10-03 TO PRIMARY RO FROM P-2301 HCl ACID PUMP

LOCATED IN CHEMICAL STORAGE AREA

1/2" CH-112-1HB

HCl ACID TOTE

HYDRO-CHLORIC ACID (HCl) PUMP SKID SEE CROWN DWG PS-0689-03

FROM P-2302 3/8" CH-113-1HB

LOCATED NEAR EXISTING RO

1/2" CH-114-1HB

SECONDARY RO ANTI-SCALANT CHEMICAL DRUM

ANTISCALANT FEED PUMP SKID SEE CROWN DWG PS-0689-04

PRIMARY RO ANTI-SCALANT CHEMICAL DRUM

1/4" CH-115-1HB FROM P-2402

V-1390 NC

PR-10-03 TO PRIMARY RO FROM P-2401 ANTI-SCALANT FEED PUMP

1A-102-3DV TP-PR-10-10-09[06] 90 PSIG AIR

1"-1A-108-3DV

120VAC

AIT 701 COND

AE 701 COND

1 1/2" TW-152-1HB RECYCLE

1ST STAGE RO CONCENTATE PR-10-03

1 1/2"-TW-148-1HB

2"x1 1/2"

V-1390 NO

2" TW-109-1HB

V-1390 NC

T-2601 SECONDARY RO FEED TANK SEE CROWN DWG PS-0689-06

1 1/2" TW-149-1HB

V-1390 NC

P-2701 SECONDARY RO FEED PUMP SEE CROWN DWG PS-0689-07

1 1/2" TW-151-1HB

SECONDARY REVERSE OSMOSIS SKID SEE CROWN SOLUTION DWG: PS-0689-08 (NOTE 3)

1" TW-146-1HB

PERMEATE PR-10-03 TO T-603 TANK

V-1390

LIT 701

LE 701

120VAC

VENT

PI 701

SAMPLING STATION D

SC

PR-10-03 FROM PRIMARY RO

CLOSE

2"x1"

OPEN V-1390

V-DR-112-01

SEAL WATER

RO CONCENTRATE STORAGE TANK 7,200 GAL.

T-701 8000 GAL.

TS-TW-111-01

FIT 701

RD CONCENTRATE FLOWMETER

FE 701

V-1390

SOV 701

S

SEAL WATER TP-PR-10-10-08 [B6]

1/2"x3/8"

6"-DR-112-1HB

V-TW-111-01

T 6"x1 1/2"

EJ-TW-111-01

6"-TW-111-1HB P-107

3"x1" 3"x1" MAG 3"x2"

V-TW-112-01 V-TW-112-03

RO CONCENTRATE TRANSFER PUMP 80 GPM X 85 FT H20

TO TRENCH DRAIN

1" TW-147-1HB

TW-112-1RB TP-PR-10-10 [C1] RO CONCENTRATE

RECORD DRAWINGS

Revisions Drawn By J PORCELLA Date OCTOBER 2009

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

** ORIGINALLY STAMPED AND SIGNED BY: JOHN PORCELLA CALIFORNIA PE NO. C70145 ON 04-01-2009 **

RESPONSIBLE ENGINEER: John Porcella Exp. 9-30-10 C70145 PE #

NO.	DATE	REVISION	BY	CHK
A	2/12/09	INTERNAL REVIEW		
B	2/12/09	CLIENT REVIEW		
C	4/01/09	FOR REVIEW AND APPROVAL	JR	JP
0	11/17/09	FINAL RECORD ISSUE	JR	JP

REVISION APPROVAL		REV 0	DATE 10/02/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	SJ	ELECTRICAL	FH
STRUCTURAL		INST & CONTROL	JG
MECHANICAL	SJ	ARCHITECTURAL	
PROCESS	DF	ENVIRONMENTAL	
PIPING	SJ	GEN. ARRANG.	SJ

PRINT DISTRIBUTION	
DATE	
STATUS	
REV.	
CLIENT	
FIELD	
INTRA CO.	

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY	A	2/12/09	JP	JP
FOR REVIEW AND APPROVAL	C	4/01/09	JP	JP
APPROVED FOR CONSTRUCTION				
REVISED & APPROVED FOR CONSTRUCTION	0	10/02/09	JP	JP

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
PLANT PERFORMANCE IMPROVEMENTS

PROJ NO. 362032

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
REVERSE OSMOSIS SYSTEM
SHEET TWO OF TWO

DWG. NO. PR-10-04 REV. 0

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

FILENAME: PR-10-04.dgn PLOT DATE: 11/19/2009 PLOT TIME: 10:28:26 AM

CONTROL PANEL

PLC

REM ON RUN REM ON RUN HI TORQUE REM ON RUN CLOSE OPEN REM REM OPEN OPEN LAH TURB OPEN REM RUN LVL ON REM REM LT ON RUNOPEN LAH RM OPEN REM LAH LAH

HS 400A LOR · HS 400B LOR · HS 400C LOR · HS 401 HOA · HS 402 LOR · HS 404 HOA

CH-109-1HB-E
TP-PR-10-10- 09 [C6]
POLYELECTROLYTE FEED CH-108-1HB-E
1/2"-CH-109-1HB-E
V-CH-109-01

TP-PR-10-10- 09 [C6]
POLYELECTROLYTE FEED
1/2"-CH-108-1HB-E
V-CH-108-01

RW-121-1HB
TP-PR-10-10- 05 [C6]
FROM CHEM REDUCTION AND COAGULATION SYSTEM IA-104-3DV
4"-RW-121-1HB

TP-PR-10-10- 09 [D6]
90 PSIG AIR
1"-IA-104-3DV

M-400-A · M-400-B · M-400-C · CL-400 CLARIFIER · NSH 400 TORQUE · HS 400 HOA · HS 410 HOA · AIT 400 120VAC TURB · SV 400 · ZSC 400 · ZSO 400 · AIR SET 120 PSIG · F. C. · FV - 400 · AE 400 TURB · SV 401 · 120 PSIG AIR SET · PI 401 · PE 401 · LE 402 · M-402 · 4"-WS-102-1HB

ZSC 410 · ZSO 410 · AIR SET 120 PSIG · SV 410 · F. C. · FV - 410 · V-WS-104-01 · 4"-WS-100-1HB

SEE PARKSON DRAWING 10066701-01

6"-DR-107-1HB

1/4" / 1" SLOPE TO PRE-TREATED WATER TANK

6"-RW-122-1HB
RW-122-1HB
TP-PR-10-10- 07 [B1]
MICROFILTRATION SYSTEM

120VAC LIT 402 · SV 404 · 120 PSIG AIR SET · HS 403 HOA · SV 403 · PI 404 · PE 404 · 1/2" · 2" x 1" · V-WS-103-01 · V-WS-103-02 · WS-103-1HB
TP-PR-10-10- 05 [B1]
SLUDGE RECYCLE

4" x 1" · P-404 SLUDGE RECYCLE PUMP 20 GPM X 30 FT. H2O · 2"-WS-103-1HB · V-WS-109-01 · 2"-WS-109-1HB

2"-WS-101-1HB · 2" x 1" · V-WS-101-01 · 4" x 2" · P-401 SLUDGE WITHDRAWAL PUMP 20 GPM X 30 FT. H2O · 6" x 4"

SLUDGE HOLDING TANK 6000 GAL · T-402 · VENT · DECANT · 3% - 5% SOLIDS · 2"-WS-105-1HB · V-WS-105-01 · 2"-WS-107-1HB · V-WS-107-01 · V-WS-108-01 · 4"-WS-108-1HB · P-403 SEPARATOR FEED PUMP 20 GPM X 30 FT. H2O · V-WS-110-01

2" x 1" · 2" x 1" · 2"-WS-106-1HB · V-WS-106-01 · 4"-WS-110-1HB · TRUCK FILL FOR OFF-SITE DISPOSAL

2" V-1790 (TYP 5) · 4" (TYP 5) AIR/SIGHT GAP · 4" · PI 403 · PE 403

TRENCH
TP-PR-10-10- 08 [D6]
R.O. GRAVITY DRAINS

DR-109-1HB
TP-PR-10-10- 07 [C6]
FROM M.F. SYSTEM GRAVITY DRAIN
3"-DR-109-1HB

TRENCH
TP-PR-10-10- 07 [D6]
FROM M.F. SYSTEM PRETREATED WATER TANK

4"-WS-104-1HB

DR-110-1HB
TP-PR-10-10- 07 [C6]
FILTER BACKWASH FROM MICROFILTRATION SYSTEM
4"-DR-110-1HB

TRENCH
TP-PR-10-10- 05 [D6]
GRAVITY DRAIN

TW-128-1HB
TP-PR-10-10- 04 [B6]
SEAL WATER
1/2"-TW-128-1HB

120VAC LIT 900 · LE 900 · 1/2" x 3/8" · VENT · PROCESS DRAIN TANK 5,000 GAL. T-900 · P-900 PROCESS DRAIN PUMP · V-DR-113-01 · 6"-DR-113-1HB · VERTICAL WET PIT 175 GPM x 37 FT. H2O · LSH 900

V-WS-111-02 · V-WS-111-03 · 4"-WS-111-1HB · V-WS-111-01 · PS-WS-111-01 · V-1390 · 1"-DR-106-1HB · V-WS-113-01 · 2"-WS-113-1HB · 4" x 2"

WS-111-1HB
TP-PR-10-10- 04 [B1]
TO RAW WATER STORAGE TANK

LSH 405B · FH-WS-106-01 · LSH 405A · SAMPLING STATION E

UNIT 2 CAKE CAKE · UNIT 1 CAKE CAKE · FH-WS-112-02 · 2"-WS-112-1HB · FH-WS-112-01

LSHH 405 · 480 VAC · LCP - 405 · P-405 PHASE SEPARATOR SUMP PUMP PACKAGE 25 GPM x 25 FT. H2O · PUMPOUT VAULT · PS-405 PHASE SEPARATORS ALTERNATING DURING OPERATION

SECONDARY CONTAINMENT - PROCESS PLANT

T-900A PROCESS SUMP

NOTES:

1. USE PORTABLE SUMP PUMP (OPERATIONS SUPPLIED) FOR PUMP OUT

NO.	DATE	REVISION	BY	CHK
0	07/28/04	FOR INTERNAL REVIEW	EFC	AJ
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ

REVISION APPROVAL — REV 2 — DATE 01/23/05

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
CIVIL		ELECTRICAL		STATUS
STRUCTURAL		INST & CONTROL		REV.
MECHANICAL		ARCHITECTURAL		CLIENT
PROCESS		ENVIRONMENTAL		FIELD
PIPING		GEN. ARRANG.		INTRA CO.

PRINT DISTRIBUTION

RESPONSIBLE ENGINEER: Kenneth L. Martins Exp. 6-30-05 PE # CH4876

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	2	01/23/05		

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
PROJ NO. 315994

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 06
CLARIFICATION AND SLUDGE REMOVAL

DWG. NO. TP-PR-10-10-06 REV. 2

FILENAME: tppr101006.dwg PLOT DATE: 23-JAN-2005 PLOT TIME:

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

CONTROL PANEL LCP-100

WELL TW-3D CONTROL

WELL TW-2S CONTROL

WELL TW-2D CONTROL

WELL PE-1 CONTROL

LEAK DETECTION PANEL - 003

ALM

120V

LSH LVL RUN ON RM PRESS FLOW

LSH LSHH

HOA

HS 102

HS 100

HS 101

HS 103

HOLD

LSH 002

LSHH 002

4" IN 8"-RW-141-1KB

FUTURE

4"-RW-140-1HB

V-RW-140-01

NOTE 1

VALVE VAULT No. 2

4" IN 8"-RW-142-1KB

FUTURE

4"-RW-139-1HB

V-RW-139-01

NOTE 1

3"-RW-138-1HB

V-RW-138-01

3" IN 6"-RW-137-1KB

4"-RW-105-1HB

V-RW-105-05

4" IN 8"-FUTURE

4" IN 8"-RW-135-1KB

LSH 102A

NOTE 1

FI 102

LSH 001

LSHH 001

Well TW-2S Flowmeter

FE 100

FIT 100

PIT 100

PE 100

LT 100

VENT

3"x2"

V-RW-105-02

MAG

3"-RW-105-1HB THROTTLING

V-RW-105-01

V-1390

VALVE VAULT No. 1

LSH 100A

3" IN 6"-RW-104-1KB

NOTE 1

1" V-1390

4" x 3" 4"-RW-105-1HB

EJ-RW-105-01

Well TW-2D Flowmeter

FE 101

FIT 101

PIT 101

PE 101

LT 101

V-RW-102-02

3"-RW-102-1HB THROTTLING

V-RW-102-01

LSH 101A

3" IN 6"-RW-101-1KB

NOTE 1

4" IN 8" RW-127-1KB SPARE

4" IN 8" RW-127-1KB

TP-PR-10-10-04 [C1]

SPARE TO VALVE VAULT 4

NOTES 1 & 2

V-RW-105-06 THROTTLING

V-RW-105-03

V-RW-105-04

4" IN 8" RW-107-1KB

TP-PR-10-10-04 [C1]

TO RAW WATER STORAGE

V-RW-108-02 THROTTLING

Well PE-1 Flowmeter

FE 103

FIT 103

PIT 103

PE 103

LT 103

VENT

3"x2"

MAG

3"-RW-108-1HB

V-RW-130-02

V-RW-130-01

4"-RW-130-1HB

V-RW-108-01

V-1390

LSH

NOTE 1

4" IN 8"-RW-131-1KB

TO BAKER TANKS V-RW-131-01

LSH 103A

4" IN 8"-RW-133-1KB

NOTE 1

4"x3"

V-RW-132-02

PRV 103

PI 103

SET AT 120 PSI

V-1390

3"-RW-132-1HB

3"x2"

V-RW-132-01

WELL VAULT No. 3

LSH 103

LE 103

P-103

EXTRACTION WELL PE-1

40 GPM x 235 FT. H20

Well TW-3D Flowmeter

VENT

LT 102

PI 102

PIT 102

PE 102

FIT 102

FE 102

PRV 102

SET AT 120 PSI

V-1390

3"x2"

3"-RW-134-1HB

V-RW-134-01

MAG

4"x3"

V-RW-134-02

WELL VAULT No. 4

LSH 102

LE 102

P-102

EXTRACTION WELL TW-3D

135 GPM x 248 FT. H20

PI 100

V-1390

3"-RW-103-1HB

V-RW-103-01

V-RW-103-02

WELL VAULT No. 2

LSH 100

LE 100

P-100

EXTRACTION WELL TW-2S

40 GPM x 180 FT. H20

PRV 101

PI 101

SET AT 120 PSI

V-1390

3"-RW-100-1HB

V-RW-100-01

V-RW-100-02

WELL VAULT No. 1

LSH 101

LE 101

P-101

EXTRACTION WELL TW-2D

90 GPM x 245 FT. H20

NOTES

1. PROVIDE LEAK DETECTION AT LOWS AND/OR EVERY 500 FT.
2. INSTALL AIR RELEASE VALVES AT HIGH POINTS.

NO.	DATE	REVISION	BY	CHK
8	12/07/05	REMOVED PE-1 HOLDS	JBW	SDH
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
3	03/16/05	DELETED NOTES. APPROVED FOR CONSTRUCTION	EFC	AJ
4	07/20/05	RELIEF VALVE SETTINGS. WELL PE-1 LINE TAGS. HOLDS REMOVED. APPROVED FOR CONSTRUCTION	EFC	AJ
5	09/27/05	FINAL RECORD ISSUE	EFC	AJ
6	10/06/05	REVISED FINAL RECORD – ADDED TW-3D	EFC	AJ
7	10/19/05	REVISED AS NOTED	EFC	AJ

REVISION APPROVAL		REV 8 DATE 12/06/05	
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	—	ELECTRICAL	—
STRUCTURAL	—	INST & CONTROL	—
MECHANICAL	AJ	ARCHITECTURAL	—
PROCESS	—	ENVIRONMENTAL	—
PIPING	SDH	GEN. ARRANG.	—

PRINT DISTRIBUTION: DATE / STATUS / REV. / CLIENT / FIELD / INTRA CO.

STATUS	REV	DATE	SDE	PEM
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	7	12/9/05	AJ for KLM	AJ

SCALE NONE

RESPONSIBLE ENGINEER: Kenneth L. Martins CH4876 Exp. 6-30-06

REGISTERED PROFESSIONAL ENGINEER KENNETH L. MARTINS No. CH4876 CIVIL STATE OF CALIFORNIA

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
PROJ NO. 315994

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 03
EXTRACTION WELLS
PE-1, TW-2D, TW-2S AND TW-3D

DWG. NO. TP-PR-10-10-03 REV. 8

BAR IS ONE INCH
tppr101003.dwg 12/07/2005 01:06:58 PM

FILENAME: tppr101003.dwg PLOT DATE: 19-OCT-2005 PLOT TIME:

FIBER OPTIC ETHERNET LINK TO TREATMENT PLANT CONTROL PANEL LCP-100

INJECTION WELL CONTROL PANEL

PLC | LAH | FLOW | PRESS | CLOSE | OPEN | CLOSED | OPENED | LAH | FLOW | LVL | PRESS | CLOSE | OPEN | CLOSED | OPENED | LVL

SOLAR VOLTAIC POWER SUPPLY

Well IW-02 Flowmeter

FIT 1202 | PIT 1202 | FE 1202 | ZSC 1202 | ZSO 1202 | SV 1202 | S | PI 1202 | LIT 1202

V-1390 | V-1390 | V-1390

4"-TW-142-1HB | V-TW-142-01 | 4" x 2" | MAG | UG | AG | 1KA | 1HB

V-TW-142-02 | 3" x 2" | 1HB | 3DA | 3"-TW-145-3DA | V-TW-145-01 | 3" | V-AHP-101-01 | 1/2"-AHP-101-3DA | FLANGED WELL HEAD

FV-1202 SHUT-OFF VALVE CLA-VAL (Or Equivalent) | THROTTLING | NOTE 1

VAC / PRESSURE GAUGE

AIR / VACUUM RELEASE | PI 1202A | V-1910 | 1/2" | V-AHP-103-02 | V-AHP-103-01 | V-1301 | V-1301 | 1"-AHP-103-2CA

INJECTION WELL IW-02

LSH 1202 | LE 1202

4"-TW-123-1KA

Well IW-03 Flowmeter

3"-TW-133-1KA SPARE

AIR RELEASE VALVE | V-1911 | 3/4" | V-1100

FUTURE | 4"

TW-120-1HB | TP-PR-10-10-04 [C6] | R.O. PERMEATE FROM TREATED WATER STORAGE

4"-TW-120-1HB | 4"-TW-121-1KA | 4"-TW-122-1PV | AG | UG | 1HB | 1KA | 1PV

FE 1203 | FIT 1203 | PIT 1203 | ZSC 1203 | ZSO 1203 | SV 1203 | S | PI 1203 | LIT 1203

V-1390 | V-1390 | V-1390

4"-TW-135-1HB | V-TW-135-01 | 4" x 2" | MAG | UG | AG | 1KA | 1HB

V-TW-135-02 | 3" x 2" | 1HB | 3DA | 3"-TW-144-3DA | V-TW-144-01 | 3" | V-AHP-100-01 | 1/2"-AHP-100-3DA | FLANGED WELL HEAD

FV-1203 SHUT-OFF VALVE CLA-VAL (Or Equivalent) | THROTTLING | NOTE 1

VAC / PRESSURE GAUGE

AIR / VACUUM RELEASE | PI 1203A | V-1910 | 1/2" | V-AHP-102-02 | V-AHP-102-01 | V-1301 | V-1301 | 1"-AHP-102-2CA

INJECTION WELL IW-03

LSH 1203 | LE 1203

NOTES:
1. FLANGE REQUIRES PORT FOR MANUAL WATER LEVEL GAUGING ON WELLHEAD FLANGE.
2. ALL VALVES AND INSTRUMENTATION INSTALLED IN SUBSURFACE, LOW PROFILE VAULT.

NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL		REV 4	DATE 03/10/05		PRINT DISTRIBUTION	
A	07/28/04	FOR INTERNAL REVIEW	EFC	AJ	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED		DATE	
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL			STATUS	
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL			REV.	
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL			CLIENT	
3	02/14/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL			FIELD	
4	03/10/05	REMOVED HOLD AND APPROVED FOR CONSTRUCTION	EFC	AJ	PIPING		GEN. ARRANG.			INTRA CO.	

RESPONSIBLE ENGINEER: Kenneth L. Martins CH4876 Exp. 6-30-05 PE #

STATUS				
ISSUED	REV	DATE	SDE	PEM
PRELIMINARY				
FOR REVIEW AND APPROVAL	A	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	4	/ /		

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION
AND TREATMENT SYSTEM
PROJ NO. 315994

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 11
INJECTION WELLS

DWG. NO. TP-PR-10-10-11 REV. 4

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

FILENAME: tppr101011.dwg PLOT DATE: 10-MAR-2005 PLOT TIME:

Appendix A
Semiannual Operations and Maintenance Log, July 1, 2019 through December 31, 2019

Appendix A:
Semiannual Operations and Maintenance Log, July 1, 2019 through December 31, 2019

Downtime is defined as any periods when all extraction wells are not operating, so that no groundwater is being extracted and piped into IM-3 as influent. Periods of planned and unplanned extraction system downtime are summarized here. The times shown are in Pacific Standard Time (PST) to be consistent with other data collected at the site.

July 2019

During July 2019, extraction well TW-3D operated at a target pump rate of 135 gallons per minute (gpm) excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during July 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 92.3 percent during the July 2019 reporting period.

The IM-3 facility treated approximately 5,506,761 gallons of extracted groundwater during July 2019. The IM-3 facility treated 0 gallons of purge water and 13,500 gallons of groundwater from injection well backwashing/re-development during July 2019. Three containers of solids from the IM-3 facility were transported offsite during July 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 7.7 percent downtime during July 2019) are summarized as follows.

- **July 1, 2019 (unplanned):** The extraction well system was offline from 3:44 p.m. to 5:22 p.m. because of a high level in T-100 due to backwashing of the injection wells. Extraction system downtime was 1 hour 38 minutes.
- **July 3, 2019 (planned):** The extraction well system was offline from 10:26 a.m. to 11:48 a.m. due to replacing microfilter modules and testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 22 minutes.
- **July 10, 2019 (unplanned):** The extraction well system was offline from 3:00 p.m. to 3:52 p.m. due to air compressor failure. The air compressor overheated due to extremely high weather temperatures and shutdown. Shading was placed in front of the compressor unit to block direct afternoon sunlight and the unit was returned to service. Extraction system downtime was 52 minutes.
- **July 10, 2019 (unplanned):** The extraction well system was offline from 9:36 p.m. to 10:50 p.m. due to a high-water level in Raw Water Storage Tank (T-100). The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 1 hour 14 minutes.
- **July 11-12, 2019 (unplanned):** The extraction well system was offline from 5:38 a.m. to 7:26 a.m. on July 11, 2019 and from 7:54 a.m. on July 11, 2019 to 1:46 p.m. on July 12, 2019 due to leaking microfilter modules and a failed air pressure regulator. The facility was down until a replacement regulator arrived and was installed. While the facility was down, a leak was fixed on the Feed Tank on the microfilter skid 4 (T-501). Extraction system downtime was 1 day, 7 hours 40 minutes.
- **July 12, 2019 (unplanned):** The extraction well system was offline from 4:20 p.m. to 5:42 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain. Extraction system downtime was 1 hour 22 minutes.
- **July 13, 2019 (unplanned):** The extraction well system was offline from 12:20 p.m. to 12:30 p.m., from 12:54 p.m. to 7:36 p.m., and from 8:00 p.m. to 10:00 p.m. due to RO system problems. Incoming power from the City of Needles was adversely affecting the Primary RO system. The Plant Manager

advised the plant operator to keep the facility down until the power became stable and/or temperatures dropped. Extraction system downtime was 8 hours 52 minutes.

- **July 14, 2019 (unplanned):** The extraction well system was offline from 7:56 a.m. to 8:00 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 4 minutes.
- **July 14, 2019 (unplanned):** The extraction well system was offline from 1:42 p.m. to 1:46 p.m.; from 1:48 p.m. to 1:52 p.m.; from 1:54 p.m. to 1:56 p.m.; from 1:58 p.m. to 2:18 p.m.; from 2:20 p.m. to 2:22 p.m.; from 2:24 p.m. to 2:42 p.m.; and from 2:44 p.m. to 2:52 p.m. because of a high level in T-100 due to backwashing of the injection wells. Extraction system downtime was 58 minutes.
- **July 14, 2019 (unplanned):** The extraction well system was offline from 2:54 p.m. to 3:04 p.m. and from 3:06 p.m. to 3:10 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 14 minutes.
- **July 15, 2019 (unplanned):** The extraction well system was offline from 8:44 a.m. to 9:34 a.m. due to City of Needles Utility Services being onsite to fix incoming voltage. Extraction system downtime was 50 minutes.
- **July 18, 2019 (unplanned):** The extraction well system was offline from 1:52 p.m. to 2:40 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 48 minutes.
- **July 18, 2019 (unplanned):** The extraction well system was offline from 8:30 p.m. to 10:06 p.m. due to high weather temperatures causing a blower to shut down. A portable cooling unit was placed in front of the blower unit to help with temperatures. The blower unit was reset and returned to service. Extraction system downtime was 1 hour 36 minutes.
- **July 18, 2019 (unplanned):** The extraction well system was offline from 10:26 p.m. to 10:48 p.m. due to a low-flow ferrous chloride rate alarm. An adjustment was made to the backflow pressure valve and the facility was returned to service. Extraction system downtime was 22 minutes.
- **July 20, 2019 (unplanned):** The extraction well system was offline from 10:16 a.m. to 10:30 a.m. due to a high-water level in T-100 caused by rinsing the microfilter modules before the chemical cleaning. Extraction system downtime was 14 minutes.
- **July 21, 2019 (unplanned):** The extraction well system was offline from 5:08 a.m. to 6:18 a.m. to change out the microfilter modules. Extraction system downtime was 1 hour 10 minutes.
- **July 23, 2019 (unplanned):** The extraction well system was offline from 8:18 p.m. to 9:16 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 58 minutes.
- **July 26, 2019 (unplanned):** The extraction well system was offline from 4:10 a.m. to 4:50 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 40 minutes.
- **July 28, 2019 (unplanned):** The extraction well system was offline from 11:00 a.m. to 12:20 p.m. due to backwashing of the injection wells. Extraction system downtime was 1 hour 20 minutes.
- **July 30, 2019 (unplanned):** The extraction well system was offline from 6:46 p.m. to 7:26 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 40 minutes.
- **July 31, 2019 (unplanned):** The extraction well system was offline from 6:14 p.m. to 6:58 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high level alarm setpoint. Extraction system downtime was 44 minutes.

August 2019

During August 2019, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during August 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 83.6 percent during the August 2019 reporting period.

The IM-3 facility treated approximately 4,940,564 gallons of extracted groundwater during August 2019. The IM-3 facility also treated 38,350 gallons of Groundwater Remedy wastewater and sampling purge water from well construction activities, pursuant to the approved Groundwater Remedy Construction/Remedial Action Work Plan (C/RAWP) and the IM-3 ARARs. The IM-3 facility also treated 11,600 gallons of groundwater from injection well backwashing/re-development during August 2019. No containers of solids from the IM-3 facility were transported offsite during August 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 16.4 percent downtime during August 2019) are summarized as follows.

- **August 2, 2019 (unplanned):** The extraction well system was offline from 10:40 a.m. to 12:06 p.m. and from 4:26 p.m. to 4:50 p.m. because of a high level in Raw Water Storage Tank (T-100) due to backwashing of the injection wells. Extraction system downtime was 1 hour 50 minutes.
- **August 2-3, 2019 (unplanned):** The extraction well system was offline from 11:36 p.m. on August 2, 2019 to 12:22 a.m. on August 3, 2019 due to a high-water level in T-100. The facility was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 46 minutes.
- **August 4, 2019 (unplanned):** The extraction well system was offline from 5:40 p.m. to 5:56 p.m. due to a blower failure. The blower overheated due to severe temperatures and shut down. A cooling unit was placed in front of the blower to lower the internal blower temperature and the unit was returned to service. Extraction system downtime was 16 minutes.
- **August 5, 2019 (unplanned):** The extraction well system was offline from 4:30 a.m. to 5:32 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 2 minutes.
- **August 7, 2019 (unplanned):** The extraction well system was offline from 12:18 a.m. to 1:16 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 58 minutes.
- **August 8, 2019 (unplanned):** The extraction well system was offline from 5:16 p.m. to 5:22 p.m. due to a City of Needles power outage. Extraction system downtime was 6 minutes.
- **August 8, 2019 (unplanned):** The extraction well system was offline from 7:08 p.m. to 7:52 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 44 minutes.
- **August 9, 2019 (unplanned):** The extraction well system was offline from 6:36 a.m. to 8:00 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 24 minutes.
- **August 10, 2019 (unplanned):** The extraction well system was offline from 4:10 a.m. to 4:42 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 32 minutes.
- **August 10, 2019 (planned):** The extraction well system was offline from 8:06 a.m. to 8:40 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 34 minutes.
- **August 12-16, 2019 (planned):** The extraction well system was offline from 5:52 a.m. on August 12, 2019 to 8:40 a.m. on August 15, 2019; from 10:02 a.m. to 12:44 p.m. August 15, 2019; and from 1:58

p.m. on August 15, 2019 to 2:44 p.m. on August 16, 2019 for the semiannual scheduled maintenance. Extraction system downtime was 4 days 6 hours 16 minutes.

- **August 17, 2019 (unplanned):** The extraction well system was offline from 9:56 a.m. to 10:28 a.m. and from 6:54 p.m. to 7:28 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 22 minutes.
- **August 18, 2019 (unplanned):** The extraction well system was offline from 10:10 p.m. to 10:58 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 48 minutes.
- **August 20, 2019 (unplanned):** The extraction well system was offline from 3:16 p.m. to 4:38 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 22 minutes.
- **August 22, 2019 (unplanned):** The extraction well system was offline from 7:18 a.m. to 7:24 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 6 minutes.
- **August 22-23, 2019 (unplanned):** The extraction well system was offline from 9:20 a.m. to 11:14 a.m. and from 11:26 a.m. to 12:02 p.m. on August 22, 2019; and from 6:00 a.m. to 8:04 a.m. and from 9:56 a.m. to 10:30 a.m. August 23, 2019. Pursuant to the approved Groundwater Remedy C/RAWP and the IM-3 ARARs, the facility treated remedy wastewater generated from well construction activities. The additional water caused high-water levels in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 5 hours 8 minutes.
- **August 29, 2019 (unplanned):** The extraction well system was offline from 4:42 a.m. to 5:18 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 36 minutes.
- **August 30, 2019 (unplanned):** The extraction well system was offline from 5:18 a.m. to 7:22 a.m. due to replacing microfilter modules. Extraction system downtime was 2 hours 4 minutes.
- **August 30, 2019 (unplanned):** The extraction well system was offline from 7:24 a.m. to 7:34 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 10 minutes.

September 2019

During September 2019, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during September 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 96.5 percent during the September 2019 reporting period.

The IM-3 facility treated approximately 5,525,766 gallons of extracted groundwater during September 2019. The IM-3 facility also treated no gallons of Final Groundwater Remedy wastewater, 400 gallons of sampling purge water, and no groundwater from injection well backwashing/re-development during September 2019. Five containers of solids from the IM-3 facility were transported offsite during September 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 3.5 percent downtime during September 2019) are summarized as follows.

- **September 1, 2019 (unplanned):** The extraction well system was offline from 9:46 p.m. to 11:24 p.m. due to a City of Needles power outage. Extraction system downtime was 1 hour 38 minutes.
- **September 3, 2019 (unplanned):** The extraction well system was offline from 5:18 p.m. to 5:20 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.

- **September 3, 2019 (unplanned):** The extraction well system was offline from 6:42 p.m. to 7:32 p.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 50 minutes.
- **September 4, 2019 (unplanned):** The extraction well system was offline from 7:54 p.m. to 8:14 p.m. to switch the facility to generator power due to storms and lightning in the area. Extraction system downtime was 20 minutes.
- **September 5, 2019 (unplanned):** The extraction well system was offline from 12:20 a.m. to 12:28 a.m. to switch the facility back to power from the City of Needles. Extraction system downtime was 8 minutes.
- **September 5, 2019 (unplanned):** The extraction well system was offline from 1:10 a.m. to 1:50 a.m. due to a high-water level in T-100. The extraction wells were shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 40 minutes.
- **September 7, 2019 (unplanned):** The extraction well system was offline from 7:08 a.m. to 7:16 a.m. and from 7:18 a.m. to 7:20 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 10 minutes.
- **September 7, 2019 (unplanned):** The extraction well system was offline from 7:22 a.m. to 8:56 a.m. due to replacing the microfilter modules. Extraction system downtime was 1 hour 34 minutes.
- **September 10, 2019 (unplanned):** The extraction well system was offline from 7:54 p.m. to 8:22 p.m. due to replacing the RO system filter. Extraction system downtime was 28 minutes.
- **September 17, 2019 (planned):** The extraction well system was offline from 8:08 a.m. to 2:04 p.m. to remove sludge from the clarifier. Extraction system downtime was 5 hours 56 minutes.
- **September 18, 2019 (planned):** The extraction well system was offline from 4:10 a.m. to 2:34 p.m. to remove the failed clarifier rake. During that downtime the Process Drain Pump (P-900) was replaced due to age and likelihood of impending failure. Extraction system downtime was 10 hours 24 minutes.
- **September 19, 2019 (unplanned):** The extraction well system was offline from 3:34 a.m. to 3:44 a.m., from 3:46 a.m. to 4:00 a.m., and from 4:06 a.m. to 4:32 a.m. due to a City of Needles power outage. The facility operator had difficulty getting the RO system to start, which caused several brief outages. Extraction system downtime was 50 minutes.
- **September 23, 2019 (unplanned):** The extraction well system was offline from 9:10 a.m. to 10:16 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 6 minutes.
- **September 25, 2019 (unplanned):** The extraction well system was offline from 12:20 p.m. to 12:22 p.m., from 4:52 p.m. to 4:58 p.m., and from 5:06 p.m. to 5:12 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 14 minutes.
- **September 25, 2019 (unplanned):** The extraction well system was offline from 5:16 p.m. to 5:50 p.m. due to switching the facility to generator power due to storms and lightning in the area. Extraction system downtime was 34 minutes.
- **September 25, 2019 (unplanned):** The extraction well system was offline from 8:48 p.m. to 8:54 p.m. due to switching the facility back to power from the City of Needles. Extraction system downtime was 6 minutes.

October 2019

During October 2019, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during October 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 98.5 percent during the October 2019 reporting period.

The IM-3 facility treated approximately 5,885,977 gallons of extracted groundwater during October 2019. The IM-3 facility also treated 40,000 gallons of Final Groundwater Remedy waste water, no sampling purge water and no groundwater from injection well backwashing/re-development during October 2019. Two containers of solids from the IM-3 facility were transported offsite during October 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 1.5 percent downtime during October 2019) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **October 1-2, 2019 (planned):** The extraction well system was offline from 7:00 a.m. to 7:54 a.m. on October 1, 2019; and from 6:24 a.m. to 8:24 a.m. October 2, 2019 to process remedy wastewater generated from remedy well construction activities. Extraction system downtime was 2 hours 54 minutes.
- **October 7, 2019 (unplanned):** The extraction well system was offline from 8:50 a.m. to 10:02 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 12 minutes.
- **October 8, 2019 (unplanned):** The extraction well system was offline from 3:48 a.m. to 4:22 a.m. due to a high water level in Raw Water Storage Tank (T-100). The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 34 minutes.
- **October 9, 2019 (unplanned):** The extraction well system was offline from 10:10 a.m. to 11:10 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour.
- **October 18, 2019 (unplanned):** The extraction well system was offline from 9:42 a.m. to 10:48 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 6 minutes.
- **October 24, 2019 (unplanned):** The extraction well system was offline from 7:16 p.m. to 7:50 p.m. due to replacing microfilter modules. Extraction system downtime was 34 minutes.
- **October 28, 2019 (unplanned):** The extraction well system was offline from 2:30 a.m. to 2:36 p.m., from 3:38 a.m. to 3:46 a.m.; from 4:04 a.m. to 4:10 a.m.; and from 9:42 a.m. to 12:38 p.m. due to lower ambient temperatures causing condensation to form in the tanks and on the level sensors, which was shutting down pumps and ultimately causing tank level issues in the Clarifier Feed Pump (P-400) and the Iron Oxidation Reactor #3 (T-301C). Extraction system downtime was 3 hours 16 minutes.
- **October 30, 2019 (unplanned):** The extraction well system was offline from 8:12 a.m. to 8:26 a.m. and from 8:54 a.m. to 8:58 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 18 minutes.

November 2019

During November 2019, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during November 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 96.3 percent during the November 2019 reporting period.

The IM-3 facility treated approximately 5,605,590 gallons of extracted groundwater during November 2019. The IM-3 facility also treated no Final Groundwater Remedy waste water, 1,050 gallons of sampling purge water and no groundwater from injection well backwashing/re-development during November 2019. Zero containers of solids from the IM-3 facility were transported offsite during November 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 3.7 percent downtime during November 2019) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **November 4, 2019 (unplanned):** The extraction well system was offline from 8:22 a.m. to 9:12 a.m. due to the City of Needles needing to adjust the incoming power at the electrical transformer (also known as a voltage tap adjustment). Extraction system downtime was 50 minutes.
- **November 4, 2019 (unplanned):** The extraction well system was offline from 9:14 a.m. to 9:20 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 6 minutes.
- **November 5, 2019 (unplanned):** The extraction well system was offline from 10:00 a.m. to 1:32 p.m. due to replacing microfilter modules. Extraction system downtime was 3 hours 32 minutes.
- **November 11-12, 2019 (unplanned):** The extraction well system was offline from 5:12 p.m. on November 11, 2019 to 12:02 a.m. November 12, 2019 due to Microfilter Feed Pump P-501 failing. The pump was replaced, and the extraction system returned to service. Extraction system downtime was 6 hours 50 minutes.
- **November 12, 2019 (unplanned):** The extraction well system was offline from 10:32 a.m. to 11:50 a.m. due to replacing microfilter modules and repairing a flow meter on the microfilter that was giving inaccurate flow readings. Extraction system downtime was 1 hour 18 minutes.
- **November 15-17, 2019 (unplanned):** The extraction well system was offline from 9:22 a.m. to 10:08 a.m. on November 15, 2019; from 4:50 a.m. to 5:30 a.m. November 16, 2019; and from 10:24 a.m. to 10:46 a.m. November 17, 2019 due to a high water level in Raw Water Storage Tank (T-100). The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 48 minutes.
- **November 18, 2019 (unplanned):** The extraction well system was offline from 11:10 a.m. to 12:14 p.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 4 minutes.
- **November 18-21, 2019 (unplanned):** The extraction well system was offline from 11:18 p.m. on November 18, 2019 to 12:02 a.m. November 19, 2019; from 1:34 a.m. to 2:30 a.m. November 20, 2019; and from 2:36 a.m. to 3:26 a.m. November 21, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 30 minutes.
- **November 21, 2019 (unplanned):** The extraction well system was offline from 11:50 a.m. to 12:14 p.m. due to replacing plugged prefilters in the reverse osmosis system. Extraction system downtime was 24 minutes.
- **November 22, 2019 (unplanned):** The extraction well system was offline from 7:04 p.m. to 8:18 p.m. due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 14 minutes.
- **November 23, 2019 (unplanned):** The extraction well system was offline from 8:10 a.m. to 9:12 p.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 2 minutes.
- **November 24-25, 2019 (unplanned):** The extraction well system was offline from 1:02 a.m. to 1:50 a.m., and from 9:16 p.m. to 10:10 p.m. November 24, 2019, and from 6:30 p.m. to 7:20 p.m. November 25, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 32 minutes.
- **November 26, 2019 (unplanned):** The extraction well system was offline from 7:02 p.m. to 7:46 p.m. due to replacing microfilter modules. Extraction system downtime was 44 minutes.
- **November 27, 2019 (planned):** The extraction well system was offline from 11:06 a.m. to 12:48 p.m. due testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 42 minutes.

- **November 30, 2019 (unplanned):** The extraction well system was offline from 9:54 p.m. to 10:40 p.m. due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 46 minutes.

December 2019

During December 2019, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during December 2019. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 95.9 percent during the December 2019 reporting period.

The IM-3 facility treated approximately 5,666,163 gallons of extracted groundwater during December 2019. The IM-3 facility also treated no gallons of Final Groundwater Remedy waste water, 3,500 gallons of sampling purge water and no groundwater from injection well backwashing/re-development during December 2019. Two containers of solids from the IM-3 facility were transported offsite during December 2019.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 4.1 percent downtime during December 2019) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **December 2-4, 2019 (unplanned):** The extraction well system was offline from 2:44 p.m. to 4:34 p.m. on December 2, 2019; and from 12:06 a.m. to 1:18 a.m. December 4, 2019 due to a high water level in Raw Water Storage Tank (T-100). The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 3 hours 2 minutes.
- **December 4, 2019 (unplanned):** The extraction well system was offline from 8:04 a.m. to 1:00 p.m. due to replacing microfilter modules. The Pretreated Water Transfer Pump (P-500) failed to start back up and was replaced. Extraction system downtime was 4 hours 56 minutes.
- **December 4, 2019 (unplanned):** The extraction well system was offline from 2:50 p.m. to 3:02 p.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 12 minutes.
- **December 5, 2019 (unplanned):** The extraction well system was offline from 2:16 p.m. to 2:26 p.m. because operators tried to disconnect the PE-1 signal wire for remedy construction to be able to do work on the MW-20 bench. The signal wire was tied to the PermAlert system (leak detection on the extraction pipeline) and gave a false alarm when disconnected. When the PermAlert system alarms it automatically shuts down the extraction system. Extraction system downtime was 10 minutes.
- **December 6-8, 2019 (unplanned):** The extraction well system was offline from 9:00 p.m. to 10:06 p.m. on December 6, 2019; and from 1:14 p.m. to 2:26 p.m. December 8, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 18 minutes.
- **December 9, 2019 (unplanned):** The extraction well system was offline from 8:12 a.m. to 12:42 p.m. to replace Clarifier Feed Pump (P-400), which had been having difficulty keeping up with the flow. Also, removed sludge from Iron Oxidation Reactor 3 (T-301C). Extraction system downtime was 4 hours 30 minutes.
- **December 10, 2019 (unplanned):** The extraction well system was offline from 9:04 a.m. to 12:16 p.m. due to a failed level sensor, high pressure, and overflowed tank. The microfilter strainer received a high pressure alert and shut down the microfilter, which also shut down P-500. With P-500 off, the Pre-treated Water Tank (T-500) overflowed to the plant drains. All plant drains flow to the Process Drain Tank (T-900). T-900 at that time had a bad level sensor and was being operated manually by the operator verifying the level and starting or stopping the pump. With P-900 being off

and having a failed level sensor, the operator did not know until he went to manually check the level (approximately every 2-2.5 hrs) that T-900 was overflowing into the T-900 vault. The plant was shut down, water was removed from the T-900 vault, the strainer was cleaned, and the plant was returned to service. Extraction system downtime was 3 hours 12 minutes.

- **December 10, 2019 (unplanned):** The extraction well system was offline from 2:18 p.m. to 4:18 p.m. due to precautionary measures due to abnormal turbidity process control readings at Treated Water Tank (T-700). After the microfilter shutdown earlier in the day, the initial blast of water from the microfilter into the empty Reverse Osmosis Feed Tank (T-600) caused scaled solids to break loose and flow to the Treated Water Storage Tank (T-700). Routine monitoring by the operator showed higher than normal turbidity of 2.72 NTU. Operators emptied T-700 for reprocessing. Extraction was shut down to lower water levels in T-100. Extraction system downtime was 2 hours.
- **December 15, 2019 (unplanned):** The extraction well system was offline from 8:06 a.m. to 10:00 a.m. due to working on the microfilter. A leak was found in one of the module concentrate lines. The extraction system was shut down to fix it and then returned to service. Extraction system downtime was 1 hour 54 minutes.
- **December 17, 2019 (unplanned):** The extraction well system was offline from 10:52 a.m. to 11:14 a.m. due to a plugged microfilter strainer that caused P-500 to shut off. The strainer was cleaned, and extraction was turned back on. Extraction system downtime was 22 minutes.
- **December 17, 2019 (unplanned):** The extraction well system was offline from 1:14 p.m. to 2:20 p.m. to replace the level sense in T-301C. Extraction system downtime was 1 hour 6 minutes.
- **December 20, 2019 (unplanned):** The extraction well system was offline from 1:00 a.m. to 1:56 a.m. due to a high-water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 56 minutes.
- **December 20, 2019 (unplanned):** The extraction well system was offline from 12:10 p.m. to 3:18 p.m. due to replacing microfilter modules, cleaning the Raw Water Storage Tank (T-100) strainers, and replacing the inline mixer at the discharge of P-400 where polymer is injected. The mixer was removed to inspect for scaling and replaced with a clean one. Extraction system downtime was 3 hours 8 minutes.
- **December 27, 2019 (unplanned):** The extraction well system was offline from 5:16 p.m. to 6:24 p.m. due to a high-water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 8 minutes.
- **December 30, 2019 (unplanned):** The extraction well system was offline from 9:12 a.m. to 10:50 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 38 minutes.

Appendix B
Daily Volumes of Groundwater Treated

Revised 4Q2019 Report, January 28, 2020
July 2019 Operational Data
IM-3 Groundwater Extraction and Treatment System
PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
July	1	2019	--	--	177,334	0	177,334	186,186	0	186,186	0
July	2	2019	--	--	190,465	0	190,465	192,595	0	192,595	0
July	3	2019	--	--	179,443	0	179,443	174,940	0	174,940	0
July	4	2019	--	--	190,106	0	190,106	192,694	0	192,694	0
July	5	2019	--	--	189,912	0	189,912	187,617	0	187,617	0
July	6	2019	--	--	189,877	0	189,877	184,757	0	184,757	104
July	7	2019	--	--	189,979	0	189,979	187,667	0	187,667	0
July	8	2019	--	--	189,943	0	189,943	190,221	0	190,221	0
July	9	2019	--	--	189,684	0	189,684	183,475	0	183,475	0
July	10	2019	--	--	172,769	0	172,769	173,655	0	173,655	0
July	11	2019	--	--	48,225	0	48,225	48,370	0	48,370	0
July	12	2019	--	--	69,489	0	69,489	71,252	0	71,252	0
July	13	2019	--	--	120,854	0	120,854	117,536	0	117,536	0
July	14	2019	--	--	185,389	0	185,389	194,809	0	194,809	0
July	15	2019	--	--	189,975	0	189,975	96,017	87,201	183,218	0
July	16	2019	--	--	196,194	0	196,194	0	196,899	196,899	0
July	17	2019	--	--	196,078	0	196,078	0	195,818	195,818	0
July	18	2019	--	--	173,125	0	173,125	0	174,806	174,806	200
July	19	2019	--	--	195,931	0	195,931	0	191,110	191,110	0
July	20	2019	--	--	192,228	0	192,228	0	190,193	190,193	0
July	21	2019	--	--	183,827	0	183,827	0	177,672	177,672	0
July	22	2019	--	--	193,569	0	193,569	0	190,832	190,832	0
July	23	2019	--	--	185,525	0	185,525	0	196,309	196,309	0
July	24	2019	--	--	193,359	261	193,620	0	190,963	190,963	0
July	25	2019	--	--	193,375	0	193,375	0	183,995	183,995	0
July	26	2019	--	--	187,615	0	187,615	0	192,164	192,164	0
July	27	2019	--	--	192,836	0	192,836	0	187,168	187,168	0
July	28	2019	--	--	182,199	0	182,199	0	195,662	195,662	120
July	29	2019	--	--	192,977	0	192,977	0	189,790	189,790	0
July	30	2019	--	--	187,417	0	187,417	0	183,342	183,342	0
July	31	2019	--	--	186,801	0	186,801	0	186,899	186,899	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,506,500**	**261**	**5,506,761**	**2,381,792**	**3,110,823**	**5,492,615**	**424**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**123.4**	**0.0**	**123.4**	**53.4**	**69.7**	**123.0**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during July 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during July 2019.

b. Effluent was discharged into injection wells IW-02 and IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during July 2019 is approximately 0.25 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

d. Due to Final Groundwater Remedy construction activities at the MW-20 bench, brine (RO concentrate) was no longer sent to the brine tanks since May 8, 2019. The total gallons removed from IM-3 since that date are an estimate from Liquid Environmental Solutions non-hazardous waste manifests. On July 24, 2019, it is estimated that 4,850 gallons of RO concentrate were removed.

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August 2019 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
August	1	2019	--	--	192,563	0	192,563	0	191,711	191,711	0
August	2	2019	--	--	174,297	0	174,297	0	191,704	191,704	0
August	3	2019	--	--	189,248	0	189,248	0	187,109	187,109	0
August	4	2019	--	--	189,827	0	189,827	0	184,756	184,756	0
August	5	2019	--	--	183,796	0	183,796	0	186,719	186,719	0
August	6	2019	--	--	192,234	0	192,234	0	187,396	187,396	0
August	7	2019	--	--	184,401	202	184,603	0	187,623	187,623	0
August	8	2019	--	--	185,416	0	185,416	0	187,564	187,564	0
August	9	2019	--	--	180,834	0	180,834	0	174,905	174,905	0
August	10	2019	--	--	182,761	0	182,761	0	191,534	191,534	0
August	11	2019	--	--	191,552	0	191,552	0	191,012	191,012	0
August	12	2019	--	--	46,906	0	46,906	0	58,234	58,234	0
August	13	2019	--	--	0	0	0	0	0	0	0
August	14	2019	--	--	0	0	0	0	0	0	0
August	15	2019	--	--	20,416	0	20,416	0	0	0	0
August	16	2019	--	--	73,798	0	73,798	0	82,809	82,809	0
August	17	2019	--	--	180,534	0	180,534	0	185,440	185,440	0
August	18	2019	--	--	185,070	0	185,070	0	186,089	186,089	0
August	19	2019	--	--	191,605	0	191,605	0	186,489	186,489	0
August	20	2019	--	--	180,368	0	180,368	0	186,811	186,811	0
August	21	2019	--	--	189,558	0	189,558	0	187,642	187,642	0
August	22	2019	--	--	167,802	155	167,957	0	198,288	198,288	0
August	23	2019	--	--	168,563	0	168,563	0	187,832	187,832	0
August	24	2019	--	--	190,314	0	190,314	0	192,726	192,726	0
August	25	2019	--	--	190,644	0	190,644	0	191,649	191,649	0
August	26	2019	--	--	190,390	0	190,390	0	185,751	185,751	0
August	27	2019	--	--	187,899	0	187,899	0	189,696	189,696	0
August	28	2019	--	--	188,624	0	188,624	0	193,808	193,808	0
August	29	2019	--	--	183,204	0	183,204	0	189,201	189,201	0
August	30	2019	--	--	169,910	0	169,910	0	172,446	172,446	0
August	31	2019	--	--	187,673	0	187,673	0	188,527	188,527	0
Total Monthly Volumes (gallons)			**0**	**0**	**4,940,207**	**357**	**4,940,564**	**0**	**5,025,473**	**5,025,473**	**0**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**110.7**	**0.0**	**110.7**	**0.0**	**112.6**	**112.6**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during August 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during August 2019.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during August 2019 is approximately 1.72 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

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September 2019 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
September	1	2019	--	--	174,901	0	174,901	0	186,266	186,266	0
September	2	2019	--	--	191,607	0	191,607	0	185,183	185,183	0
September	3	2019	--	--	185,017	0	185,017	0	193,613	193,613	0
September	4	2019	--	--	189,258	206	189,464	0	186,560	186,560	0
September	5	2019	--	--	184,734	0	184,734	0	190,909	190,909	0
September	6	2019	--	--	191,265	0	191,265	0	186,993	186,993	0
September	7	2019	--	--	176,876	0	176,876	0	185,299	185,299	0
September	8	2019	--	--	191,030	0	191,030	0	192,447	192,447	0
September	9	2019	--	--	191,063	0	191,063	0	193,111	193,111	0
September	10	2019	--	--	186,846	0	186,846	0	187,675	187,675	0
September	11	2019	--	--	190,265	0	190,265	0	190,424	190,424	0
September	12	2019	--	--	190,054	0	190,054	0	191,618	191,618	0
September	13	2019	--	--	189,703	0	189,703	0	194,485	194,485	0
September	14	2019	--	--	189,496	0	189,496	0	193,084	193,084	0
September	15	2019	--	--	189,310	0	189,310	0	189,605	189,605	0
September	16	2019	--	--	188,355	0	188,355	0	189,806	189,806	0
September	17	2019	--	--	143,302	0	143,302	0	145,637	145,637	0
September	18	2019	--	--	108,639	0	108,639	0	111,485	111,485	0
September	19	2019	--	--	185,250	0	185,250	0	189,175	189,175	0
September	20	2019	--	--	191,907	0	191,907	0	190,731	190,731	0
September	21	2019	--	--	191,727	0	191,727	0	190,867	190,867	0
September	22	2019	--	--	191,732	0	191,732	0	194,375	194,375	0
September	23	2019	--	--	182,873	0	182,873	0	177,288	177,288	0
September	24	2019	--	--	191,169	0	191,169	0	188,876	188,876	0
September	25	2019	--	--	184,409	0	184,409	0	182,888	182,888	0
September	26	2019	--	--	191,197	0	191,197	0	197,252	197,252	0
September	27	2019	--	--	190,996	0	190,996	0	190,450	190,450	0
September	28	2019	--	--	190,889	0	190,889	0	193,102	193,102	0
September	29	2019	--	--	190,929	0	190,929	0	187,949	187,949	0
September	30	2019	--	--	190,761	0	190,761	0	191,095	191,095	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,525,561**	**206**	**5,525,766**	**0**	**5,568,247**	**5,568,247**	**0**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**127.9**	**0.0**	**127.9**	**0.0**	**128.9**	**128.9**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during September 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during September 2019.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during September 2019 is approximately 0.77 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

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October 2019 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
October	1	2019	--	--	179,604	0	179,604	0	189,890	189,890	0
October	2	2019	--	--	175,429	0	175,429	0	194,642	194,642	0
October	3	2019	--	56	194,424	497	194,977	0	188,582	188,582	0
October	4	2019	--	--	194,549	0	194,549	0	195,466	195,466	0
October	5	2019	--	--	194,570	0	194,570	0	198,408	198,408	0
October	6	2019	--	--	194,526	0	194,526	0	193,328	193,328	0
October	7	2019	--	--	184,785	0	184,785	0	178,128	178,128	0
October	8	2019	--	--	189,780	0	189,780	0	191,135	191,135	0
October	9	2019	--	--	186,140	0	186,140	0	182,183	182,183	0
October	10	2019	--	--	194,228	0	194,228	0	191,966	191,966	0
October	11	2019	--	--	194,056	0	194,056	0	195,029	195,029	0
October	12	2019	--	--	193,741	0	193,741	0	189,167	189,167	0
October	13	2019	--	--	193,461	0	193,461	0	195,540	195,540	0
October	14	2019	--	--	193,390	0	193,390	0	195,261	195,261	0
October	15	2019	--	--	193,048	0	193,048	0	187,557	187,557	0
October	16	2019	--	--	192,917	0	192,917	0	193,720	193,720	0
October	17	2019	--	--	192,754	0	192,754	0	193,621	193,621	0
October	18	2019	--	--	183,692	0	183,692	0	181,062	181,062	0
October	19	2019	--	--	192,783	0	192,783	0	192,430	192,430	0
October	20	2019	--	--	192,714	0	192,714	0	193,894	193,894	0
October	21	2019	--	--	192,635	0	192,635	0	189,223	189,223	0
October	22	2019	--	--	192,559	0	192,559	0	194,970	194,970	0
October	23	2019	--	--	192,587	0	192,587	0	190,086	190,086	0
October	24	2019	--	--	187,929	0	187,929	0	190,556	190,556	0
October	25	2019	--	--	192,516	0	192,516	0	192,650	192,650	0
October	26	2019	--	--	191,797	0	191,797	0	192,406	192,406	0
October	27	2019	--	--	189,179	0	189,179	0	193,916	193,916	0
October	28	2019	--	--	166,131	0	166,131	0	164,716	164,716	0
October	29	2019	--	--	192,255	0	192,255	0	194,767	194,767	0
October	30	2019	--	--	187,452	0	187,452	0	190,028	190,028	0
October	31	2019	--	--	189,796	0	189,796	0	185,880	185,880	0
Total Monthly Volumes (gallons)			**0**	**56**	**5,885,424**	**497**	**5,885,977**	**0**	**5,900,208**	**5,900,208**	**0**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**131.8**	**0.0**	**131.9**	**0.0**	**132.2**	**132.2**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction well TW-3D was operated during October 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells PE-01 and TW-2D were only operated to collect a sample. Extraction well TW-2S was not operated during October 2019.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during October 2019 is approximately 0.24 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

Revised 4Q2019 Report, January 28, 2020

November 2019 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
November	1	2019	--	--	192,503	0	192,503	0	197,466	197,466	0
November	2	2019	--	--	192,617	0	192,617	0	195,452	195,452	0
November	3	2019	--	--	192,488	0	192,488	0	193,092	193,092	0
November	4	2019	--	--	186,738	0	186,738	0	189,020	189,020	0
November	5	2019	--	--	167,730	0	167,730	0	172,173	172,173	0
November	6	2019	--	--	196,493	0	196,493	0	191,218	191,218	0
November	7	2019	--	--	194,859	712	195,571	0	191,728	191,728	0
November	8	2019	--	--	194,551	0	194,551	0	193,576	193,576	0
November	9	2019	--	--	194,492	0	194,492	0	194,630	194,630	0
November	10	2019	--	--	194,514	0	194,514	0	195,073	195,073	0
November	11	2019	--	--	139,402	0	139,402	0	149,212	149,212	0
November	12	2019	--	--	183,702	0	183,702	0	170,602	170,602	0
November	13	2019	--	--	194,506	0	194,506	0	193,732	193,732	0
November	14	2019	--	--	194,309	0	194,309	0	190,679	190,679	0
November	15	2019	--	--	187,977	0	187,977	0	190,436	190,436	0
November	16	2019	--	--	188,678	0	188,678	0	194,841	194,841	0
November	17	2019	--	--	191,178	0	191,178	0	186,646	186,646	0
November	18	2019	--	--	179,650	0	179,650	0	177,542	177,542	0
November	19	2019	--	--	194,130	0	194,130	0	190,404	190,404	0
November	20	2019	--	--	186,357	0	186,357	0	190,271	190,271	0
November	21	2019	--	--	183,824	0	183,824	0	185,128	185,128	0
November	22	2019	--	--	183,770	0	183,770	0	187,422	187,422	0
November	23	2019	--	--	185,322	0	185,322	0	177,993	177,993	0
November	24	2019	--	--	179,690	0	179,690	0	187,103	187,103	0
November	25	2019	--	--	186,480	0	186,480	0	182,866	182,866	0
November	26	2019	--	--	187,275	0	187,275	0	178,366	178,366	0
November	27	2019	--	--	179,299	0	179,299	0	192,687	192,687	0
November	28	2019	--	--	193,442	0	193,442	0	189,225	189,225	0
November	29	2019	--	--	186,485	0	186,485	0	190,739	190,739	0
November	30	2019	--	--	192,417	0	192,417	0	191,015	191,015	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,604,878**	**712**	**5,605,590**	**0**	**5,610,337**	**5,610,337**	**0**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**129.7**	**0.0**	**129.8**	**0.0**	**129.9**	**129.9**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during November 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during November 2019.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during November 2019 is approximately 0.08 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

Revised 4Q2019 Report, January 28, 2020

December 2019 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
December	1	2019	--	--	192,179	0	192,179	0	188,761	188,761	0
December	2	2019	--	--	177,327	0	177,327	0	186,394	186,394	0
December	3	2019	--	--	192,150	0	192,150	0	186,814	186,814	0
December	4	2019	--	--	141,026	262	141,287	0	144,451	144,451	0
December	5	2019	--	--	190,486	0	190,486	0	190,832	190,832	0
December	6	2019	--	--	182,831	0	182,831	0	187,339	187,339	0
December	7	2019	--	--	191,576	0	191,576	0	186,917	186,917	0
December	8	2019	--	--	181,797	0	181,797	0	188,857	188,857	0
December	9	2019	--	--	155,399	0	155,399	0	157,749	157,749	0
December	10	2019	--	--	149,704	0	149,704	0	152,874	152,874	0
December	11	2019	--	--	191,169	0	191,169	0	184,918	184,918	0
December	12	2019	--	--	191,045	0	191,045	0	189,443	189,443	0
December	13	2019	--	--	190,927	0	190,927	0	195,594	195,594	0
December	14	2019	--	--	190,926	0	190,926	0	193,826	193,826	0
December	15	2019	--	--	175,862	0	175,862	0	173,497	173,497	0
December	16	2019	--	--	190,879	0	190,879	0	188,315	188,315	0
December	17	2019	--	--	178,948	0	178,948	0	178,829	178,829	0
December	18	2019	--	--	190,684	0	190,684	0	183,589	183,589	0
December	19	2019	--	--	190,464	0	190,464	0	197,712	197,712	0
December	20	2019	--	--	157,991	0	157,991	0	163,573	163,573	0
December	21	2019	--	--	190,207	0	190,207	0	185,057	185,057	0
December	22	2019	--	--	189,730	0	189,730	0	185,616	185,616	0
December	23	2019	--	--	189,185	0	189,185	0	188,093	188,093	0
December	24	2019	--	--	189,250	0	189,250	0	191,350	191,350	0
December	25	2019	--	--	188,886	0	188,886	0	187,249	187,249	0
December	26	2019	--	--	188,710	0	188,710	0	187,675	187,675	0
December	27	2019	--	--	179,633	0	179,633	0	187,503	187,503	0
December	28	2019	--	--	189,274	0	189,274	0	194,159	194,159	0
December	29	2019	--	--	189,876	0	189,876	0	190,538	190,538	0
December	30	2019	--	--	177,170	0	177,170	0	174,634	174,634	0
December	31	2019	--	--	190,610	0	190,610	0	195,303	195,303	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,665,901**	**262**	**5,666,162**	**0**	**5,687,462**	**5,687,462**	**0**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**126.9**	**0.0**	**126.9**	**0.0**	**127.4**	**127.4**	**0.0**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction well TW-3D was operated during December 2019 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well PE-01 was only operated to collect a sample. Extraction wells TW-2S and TW-2D were not operated during December 2019.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during December 2019 is approximately 0.38 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

d. Due to Final Groundwater Remedy construction activities at the MW-20 bench, brine (RO concentrate) was no longer sent to the brine tanks since May 8, 2019. The total gallons removed from IM-3 since that date are an estimate from Liquid Environmental Solutions non-hazardous waste manifests. On December 12, 2019, it is estimated that 5,000 gallons were removed, and again on December 16, 2019, it is estimated that 4,000 gallons of RO concentrate were removed.

LIQUID ENVIRONMENTAL SOLUTIONS

P 5448

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	Ryan Phelps	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck # 750		**Tank#** 3346		**Inspection Paperwork Verified By:** RP	
Waste Removed (Gallons)	4850	**Totalizer Readings (Gallons)**	**Start** 5817 / **Finish** 967	**Date** 7-24-19	**Time** 08:?1

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)	Chad Turner	**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

LIQUID ENVIRONMENTAL SOLUTIONS

P 5449

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	CHRIS LENTZ	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck #		**Tank#**		**Inspection Paperwork Verified By:**	
Waste Removed (Gallons)	500	**Totalizer Readings (Gallons)**	**Start** / **Finish**	**Date**	**Time**
				10/14/19	

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)		**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

LIQUID ENVIRONMENTAL SOLUTIONS

P 5451

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	Ryan Phelps	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck # 750		**Tank#** 3346		**Inspection Paperwork Verified By:** RDP	
Waste Removed (Gallons)	4,000	**Totalizer Readings (Gallons)**	**Start** NA	**Finish** NA	**Date** 12-14-19 / **Time** 8:00

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)	Manuel Ayala	**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

LIQUID ENVIRONMENTAL SOLUTIONS

P 5448

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	Ryan Phelps	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck # 750		**Tank#** 3346		**Inspection Paperwork Verified By:** RP	
Waste Removed (Gallons)	4850	**Totalizer Readings (Gallons)**	**Start** 5817 / **Finish** 967	**Date** 7-24-19	**Time** 08:?1

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)	Chad Turner	**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

LIQUID ENVIRONMENTAL SOLUTIONS

P 5449

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	CHRIS LENTZ	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck #		**Tank#**		**Inspection Paperwork Verified By:**	
Waste Removed (Gallons)	500	**Totalizer Readings (Gallons)**	**Start** / **Finish**	**Date**	**Time**
				10/14/19	

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)		**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

LIQUID ENVIRONMENTAL SOLUTIONS

P 5451

NON-HAZARDOUS WASTE MANIFEST

Profile Number
15713

Generator Name	PG&E Topock Groundwater Extraction Site Phone: (760) 326-3326 Emergency: (800) 833-7602	**Generator Address**	15 Mi Southwest of Needles Hwy I40 & Park Moabi Rd. Needles, CA 92363 EPA ID#: CAR000151118
Waste Type	Non Hazardous Waste, Liquid (Brine Water)		

I certify that the waste material removed from the above premises does not contain any radioactive, flammable, explosive, toxic or hazardous material ("Excluded Waste"). The term "hazardous material" is defined as any one or more pollutant, toxic substance, hazardous substance, solvent or oil as defined in or pusuant to the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Compensation and Liability Act, the Federal Clean Water Act, or any other federal, state or local environmental law, regulation, ordinance, or rule, whether existing as of the date of this agreement or subsequently enacted. I also acknowledge that the Generator shall be responsible for any costs incurred by the Transporter or Disposal Facility in handling or proper disposal of any hazardous waste and that the Generator expressly agrees to defend, indemnify and hold harmless the Transporter from and against any and all damages, costs, fines and liabilities resulting from or arising out of any such hazardous waste.

Generator Rep. Name (please print)	Ryan Phelps	**Generator Rep. Signature**	
Transporter Name	MP Environmental Services	**Transporter Address**	3045 S. 51st Ave. Phoenix, AZ 85043

Vehicle Information

Truck # 750		**Tank#** 3346		**Inspection Paperwork Verified By:** RDP	
Waste Removed (Gallons)	4,000	**Totalizer Readings (Gallons)**	**Start** NA	**Finish** NA	**Date** 12-14-19 / **Time** 8:00

I certify that the information above is accurate, and that only the waste certified for removal by the Generator is contained in the servicing vehicle. I am aware that falsification of this manifest may result in prosecution.

Driver must comply with proper PPE requirements. Including; gloves, safety vest, hard hat, steel toes shoes & safety glasses

Driver Name (please print)	Manuel Ayala	**Driver Signature**	

Disposal Facility	Liquid Environmental Solutions of Arizona	**Address**	5159 West Van Buren Street Phoenix, AZ 85043	
Waste Received (Gallons)		**Date**		**Time**
Facility Rep. Name (please print)		**Facility Rep. Signature**		

WHITE - Transporter YELLOW - Second Generator GOLDENROD - Disposal Facility PINK - Generator

Appendix C
Flowmeter Calibration Records

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

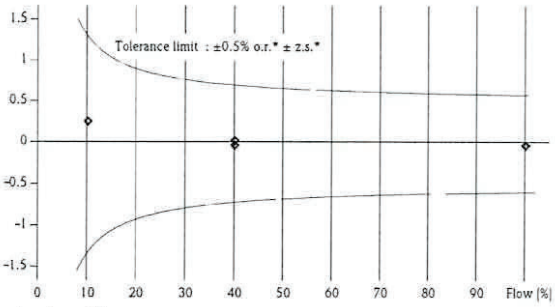
92018013-1275191

WWRA7737 Purchase order number	FCP-7.1.6 US Calibration rig
US-3601544787-200 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1RA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9176 Calibration factor
6A022016000 Serial N°	0 Zero point
FIT-101 Tag N°	70.4 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.0	15.602	60.2	15.653	15.694	0.26	5.61
40.0	62.169	60.2	62.373	62.355	-0.03	10.39
40.0	62.168	60.2	62.373	62.394	0.03	10.39
99.9	155.518	60.2	156.029	155.981	-0.03	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading
**Calculated value (4 - 20 mA)

Measured error % o.r.



*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

John Davis

12-05-2018
Date of calibration

John Davis
Operator

Endress+Hauser Inc.
2350 Endress Place
Greenwood, IN 46143

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

30437063-4458242

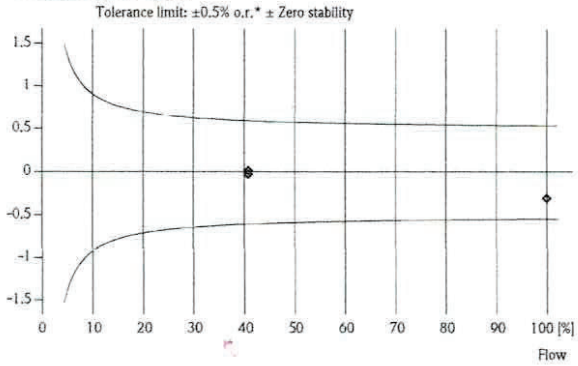
3800382048 Purchase order number	FCP-8.B Calibration rig
US-3005992023-10 / Endress+Hauser Flowtec Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
5P2B50-79W4/0 Order code	Service interface Calibrated output
Promag P 200 2" Sensor/Transmitter	0.93864 Calibration factor
N6005016000 Serial N°	11 Zero point
- Tag N°	76.1 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
40.5	63.018	65.0	68.315	68.302	-0.02	10.48
40.5	63.034	65.0	68.331	68.344	0.02	10.48
99.8	155.341	65.0	168.393	167.890	-0.30	19.92
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading

**Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

Robert J Kizzee

06-13-2018

Date of calibration

Joe Kizzee

Operator

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

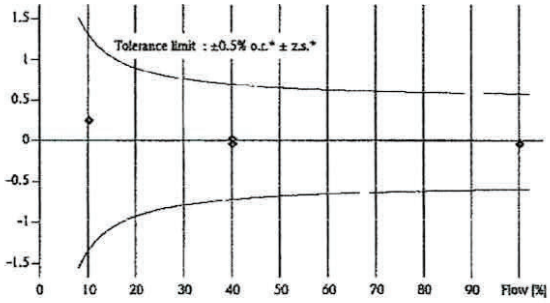
92018013-1275191

WWRA7737	FCP-7.1.6 US
Purchase order number	Calibration rig
US-3601544787-200 / Endress+Hauser Inc.	155.6102 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P50-AL1A1RA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 2"	0.9176
Transmitter/Sensor	Calibration factor
6A022016000	0
Serial N°	Zero point
FIT-~~101~~ TW2S	70.4 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.0	15.602	60.2	15.653	15.694	0.26	5.61
40.0	62.169	60.2	62.373	62.355	-0.03	10.39
40.0	62.168	60.2	62.373	62.394	0.03	10.39
99.9	155.518	60.2	156.029	155.981	-0.03	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading
**Calculated value (4 - 20 mA)

Measured error % o.r.



*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

John Davis

12-05-2018
Date of calibration

John Davis
Operator

Endress+Hauser Inc.
2350 Endress Place
Greenwood, IN 46143

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

92018011-1275190

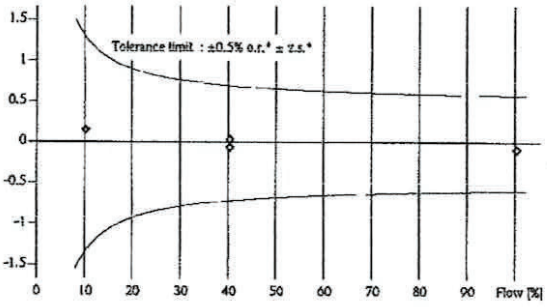
WWRA7737 Purchase order number	FCP-7.1.6 US Calibration rig
US-3601544787-100 / Endress+Hauser Inc. Order N°/Manufacturer	155 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1RA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9035 Calibration factor
6A021F16000 Serial N°	-17 Zero point
FIT-~~100~~ TW2D Tag N°	70.6 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.0	15.541	60.2	15.592	15.618	0.16	5.61
40.2	62.279	60.2	62.481	62.510	0.05	10.43
40.2	62.297	60.2	62.511	62.477	-0.05	10.43
100.2	155.312	60.2	155.827	155.705	-0.08	20.02
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading

**Calculated value (4 - 20 mA)

Measured error % o.r.



*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

John Davis

12-05-2018
Date of calibration

John Davis
Operator

Endress+Hauser Inc.
2350 Endress Place
Greenwood, IN 46143

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

30437052-4458240

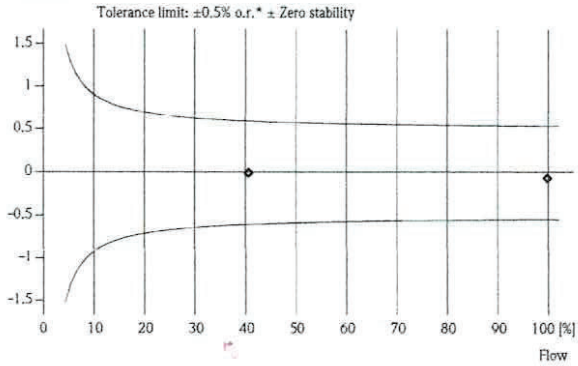
3800382048	FCP-8.B
Purchase order number	Calibration rig
US-3005992023-10 / Endress+Hauser Flowtec	155.6102 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
5P2B50-79W4/0	Service interface
Order code	Calibrated output
Promag P 200 2"	0.92223
Sensor/Transmitter	Calibration factor
N6004E16000	3
Serial N°	Zero point
-	75.9 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
40.3	62.762	65.0	68.035	68.036	0.00	10.45
40.3	62.776	65.0	68.051	68.049	0.00	10.45
99.7	155.211	65.0	168.253	168.149	-0.06	19.95
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading

**Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

Robert J Kizzee

06-13-2018

Date of calibration

Joe Kizzee

Operator

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

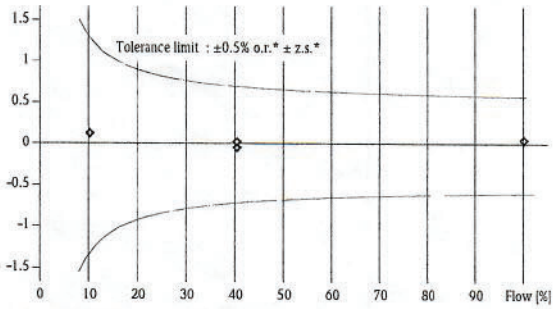
92013941-1385272

WWRA1095	FCP-7.1.6 US
Purchase order number	Calibration rig
US-3601538697-100 / Endress+Hauser Inc.	156 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P50-AL1A1AA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 2"	0.9270
Transmitter/Sensor	Calibration factor
7700F216000	0
Serial N°	Zero point
-	71.3 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.1	15.725	60.2	15.778	15.800	0.14	5.62
40.3	62.822	60.2	63.033	63.055	0.04	10.45
40.3	62.848	60.2	63.063	63.041	-0.04	10.44
100.0	155.916	60.2	156.426	156.516	0.06	20.00
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of rate
**Calculated value (4 - 20 mA)

Measured error % o.r.



*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).

John Davis

05-04-2017
Date of calibration

John Davis
Operator

Endress+Hauser Inc.
2350 Endress Place
Greenwood, IN 46143

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

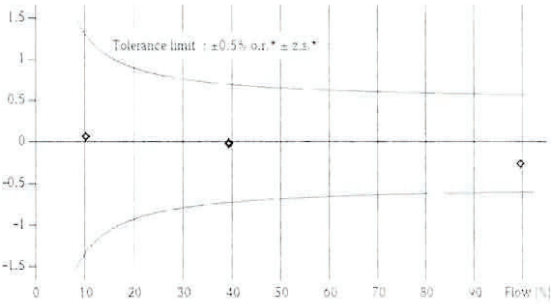
92012624-1385273

WWRA019463F	FCP-7.1.6 US
Purchase order number	Calibration rig
US-3601536867-100 / Endress+Hauser Inc.	400 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P80-AL1A1AA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 3"	1.1715
Transmitter/Sensor	Calibration factor
7700F316000	-18
Serial N°	Zero point
-	70.1 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal./min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.0	39.861	60.2	39.998	40.030	0.08	5.60
39.2	156.592	60.2	157.110	157.121	0.01	10.26
39.2	156.760	60.2	157.298	157.277	-0.01	10.27
99.4	397.471	60.2	398.771	397.796	-0.24	19.86
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of rate
**Calculated value (4 - 20 mA)

Measured error % o.r.



*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

John Davis

10-28-2016
Date of calibration

John Davis
Operator

Endress+Hauser Inc.
2350 Endress Place
Greenwood, IN 46143

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

30437059-4458241

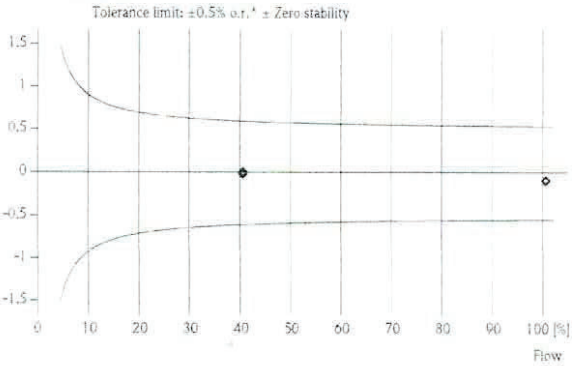
3800382048 Purchase order number	FCP-8.B Calibration rig
US-3005992023-10 / Endress+Hauser Flowtec Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
5P2B50-79W4/0 Order code	Service interface Calibrated output
Promag P 200 2" Sensor/Transmitter	0.92113 Calibration factor
N6004F16000 Serial N°	-4 Zero point
- Tag N°	76 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
40.3	62.745	65.0	68.025	68.031	0.01	10.45
40.3	62.739	65.0	68.013	68.006	-0.01	10.45
100.5	156.427	65.0	169.573	169.427	-0.09	20.07
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading

**Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

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Robert J Kizzee

06-13-2018

Date of calibration

Joe Kizzee

Operator

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Appendix D
Fourth Quarter 2019
Laboratory Analytical Reports

October 17, 2019

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N037718

RE: PG&E Topock, 680375CH.04.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 01, 2019 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Liburdi for

Puri Romualdo
Laboratory Director

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to Enthalpy Analytical- Berkeley, CA.

Analytical Comments for EPA 200.8:

Dilution was necessary on some analytes for sample N037718-003 due to associated internal standard not meeting method criteria possibly due to matrix interference. Sample was analyzed with dilution and internal standard met method criteria. Affected analytes for this failed internal standard were reported at dilution that meets internal standard recovery limit.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N037759-001A-MS and N037759-001A-MSD possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 218.6:

Dilution was necessary for sample N037718-003 due to matrix. Sample has color.

ASSET Laboratories

Date: *17-Oct-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N037718
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N037718-001A	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-001B	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-001C	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-001D	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-001E	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-001F	SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	10/1/2019	10/17/2019
N037718-002A	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-002B	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-002C	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-002D	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-002E	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-002F	SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	10/1/2019	10/17/2019
N037718-003A	SC-701-WDR-594	Water	10/1/2019 11:35:00 AM	10/1/2019	10/17/2019
N037718-003B	SC-701-WDR-594	Water	10/1/2019 11:35:00 AM	10/1/2019	10/17/2019
N037718-003C	SC-701-WDR-594	Water	10/1/2019 11:35:00 AM	10/1/2019	10/17/2019
N037718-003D	SC-701-WDR-594	Water	10/1/2019 11:35:00 AM	10/1/2019	10/17/2019

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191002C**	QC Batch: **R136731**			PrepDate:			Analyst: **LR**
Specific Conductance	7200	0.10	0.10		umhos/cm	1	10/2/2019 02:10 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191002C**	QC Batch: **R136731**			PrepDate:			Analyst: **LR**
Specific Conductance	7000	0.10	0.10		umhos/cm	1	10/2/2019 02:10 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:35:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191002C**	QC Batch: **R136731**			PrepDate:			Analyst: **LR**
Specific Conductance	38000	0.10	0.10		umhos/cm	1	10/2/2019 02:10 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID	N037718-003ADUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	136731
Client ID:	ZZZZZZ	Batch ID:	R136731	TestNo:	EPA 120.1			Analysis Date:	10/2/2019	SeqNo:	3524286

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	37400.000	0.10						37500	0.267	2	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191002G**	QC Batch: **75537**			PrepDate:	**10/2/2019**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	10/2/2019 01:18 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191002G**	QC Batch: **75537**			PrepDate:	**10/2/2019**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4000	50	50		mg/L	1	10/2/2019 01:18 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:35:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191002G**	QC Batch: **75537**			PrepDate:	**10/2/2019**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	28000	500	500		mg/L	1	10/2/2019 01:18 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	LCS-75537	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/2/2019	RunNo:	136757
Client ID:	LCSW	Batch ID:	75537	TestNo:	SM2540C			Analysis Date:	10/2/2019	SeqNo:	3525817

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	946.000	10	1000	0	94.6	80	120				

Sample ID	MB-75537	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/2/2019	RunNo:	136757
Client ID:	PBW	Batch ID:	75537	TestNo:	SM2540C			Analysis Date:	10/2/2019	SeqNo:	3525818

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	ND	10									

Sample ID	N037718-003ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/2/2019	RunNo:	136757
Client ID:	ZZZZZZ	Batch ID:	75537	TestNo:	SM2540C			Analysis Date:	10/2/2019	SeqNo:	3525823

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	27900.000	500						28300	1.42	5	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191004B**	QC Batch: **75559**			PrepDate:	**10/4/2019**		Analyst: **DJ**
Aluminum	ND	40	50		µg/L	1	10/4/2019 08:23 PM
Boron	1000	74	100		µg/L	1	10/4/2019 08:23 PM
Iron	ND	18	20		µg/L	1	10/7/2019 05:44 PM

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191004B**	QC Batch: **75559**			PrepDate:	**10/4/2019**		Analyst: **DJ**
Aluminum	ND	40	50		µg/L	1	10/4/2019 08:28 PM
Boron	930	74	100		µg/L	1	10/4/2019 08:28 PM
Iron	ND	18	20		µg/L	1	10/7/2019 05:49 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	**MB-75559**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136789**
Client ID:	**PBW**	Batch ID: **75559**	TestNo: **EPA 200.7**		Analysis Date: **10/4/2019**	SeqNo: **3527240**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									
Boron	ND	100									

Sample ID	**LCS1-75559**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136789**
Client ID:	**LCSW**	Batch ID: **75559**	TestNo: **EPA 200.7**		Analysis Date: **10/4/2019**	SeqNo: **3527241**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10028.218	50	10000	0	100	85	115				
Boron	4902.611	100	5000	0	98.1	85	115				

Sample ID	**N037759-001A-MS1**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136789**
Client ID:	**ZZZZZZ**	Batch ID: **75559**	TestNo: **EPA 200.7**		Analysis Date: **10/4/2019**	SeqNo: **3527249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9423.331	50	10000	71.71	93.5	75	125				
Boron	5306.692	100	5000	552.3	95.1	75	125				

Sample ID	**N037759-001A-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136789**
Client ID:	**ZZZZZZ**	Batch ID: **75559**	TestNo: **EPA 200.7**		Analysis Date: **10/4/2019**	SeqNo: **3527250**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9409.863	50	10000	71.71	93.4	75	125	9423	0.143	20	
Boron	5301.930	100	5000	552.3	95.0	75	125	5307	0.0898	20	

Sample ID	**MB-75559**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136819**
Client ID:	**PBW**	Batch ID: **75559**	TestNo: **EPA 200.7**		Analysis Date: **10/7/2019**	SeqNo: **3529283**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	MB-75559	SampType:	MBLK	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136819
Client ID:	PBW	Batch ID:	75559	TestNo:	EPA 200.7			Analysis Date:	10/7/2019	SeqNo:	3529283

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	ND	20									

Sample ID	LCS1-75559	SampType:	LCS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136819
Client ID:	LCSW	Batch ID:	75559	TestNo:	EPA 200.7			Analysis Date:	10/7/2019	SeqNo:	3529284

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	103.198	20	100.0	0	103	85	115				

Sample ID	N037759-001A-MS1	SampType:	MS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136819
Client ID:	ZZZZZZ	Batch ID:	75559	TestNo:	EPA 200.7			Analysis Date:	10/7/2019	SeqNo:	3529290

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	121.485	20	100.0	35.74	85.7	75	125				

Sample ID	N037759-001A-MSD	SampType:	MSD	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136819
Client ID:	ZZZZZZ	Batch ID:	75559	TestNo:	EPA 200.7			Analysis Date:	10/7/2019	SeqNo:	3529291

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	120.682	20	100.0	35.74	84.9	75	125	121.5	0.663	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

Calculations are based on raw values

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191007B**	QC Batch: **75558**				PrepDate:	**10/4/2019**	Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	10/7/2019 01:19 PM
Arsenic	3.2	0.081	0.10		µg/L	1	10/7/2019 01:19 PM
Barium	35	0.15	1.0		µg/L	1	10/7/2019 01:19 PM
Copper	ND	0.55	1.0		µg/L	1	10/7/2019 07:38 PM
Lead	ND	0.13	1.0		µg/L	1	10/7/2019 01:19 PM
Manganese	ND	0.26	0.50		µg/L	1	10/7/2019 07:38 PM
Molybdenum	24	0.21	0.50		µg/L	1	10/7/2019 01:19 PM
Nickel	7.5	0.26	1.0		µg/L	1	10/7/2019 01:19 PM
Zinc	15	2.3	10		µg/L	1	10/7/2019 01:19 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191007B**	QC Batch: **75558**				PrepDate:	**10/4/2019**	Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	10/7/2019 01:29 PM
Arsenic	0.13	0.081	0.10		µg/L	1	10/7/2019 01:29 PM
Barium	17	0.15	1.0		µg/L	1	10/7/2019 01:29 PM
Copper	ND	0.55	1.0		µg/L	1	10/7/2019 07:47 PM
Lead	ND	0.13	1.0		µg/L	1	10/7/2019 01:29 PM
Manganese	ND	0.26	0.50		µg/L	1	10/7/2019 07:47 PM
Molybdenum	24	0.21	0.50		µg/L	1	10/7/2019 01:29 PM
Nickel	1.3	0.26	1.0		µg/L	1	10/7/2019 01:29 PM
Zinc	ND	2.3	10		µg/L	1	10/7/2019 01:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Lab Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab ID: N037718-003

Client Sample ID: SC-701-WDR-594
Collection Date: 10/1/2019 11:35:00 AM
Matrix: WATER

TOTAL METALS BY ICPMS

EPA 200.8

RunID: **NV00922-ICP7_191007B** QC Batch: **75558** PrepDate: **10/4/2019** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	ND	0.78	2.5		µg/L	5	10/7/2019 01:44 PM
Arsenic	5.1	0.081	0.10		µg/L	1	10/7/2019 01:39 PM
Barium	100	0.75	5.0		µg/L	5	10/7/2019 01:44 PM
Beryllium	ND	1.1	12		µg/L	25	10/7/2019 02:46 PM
Cadmium	ND	0.26	2.5		µg/L	5	10/7/2019 01:44 PM
Cobalt	0.65	0.042	0.50		µg/L	1	10/7/2019 01:39 PM
Copper	2.3	0.55	1.0		µg/L	1	10/7/2019 07:57 PM
Lead	ND	3.2	25		µg/L	25	10/7/2019 02:46 PM
Manganese	100	0.26	0.50		µg/L	1	10/7/2019 07:57 PM
Molybdenum	190	1.1	2.5		µg/L	5	10/7/2019 01:44 PM
Nickel	15	0.26	1.0		µg/L	1	10/7/2019 01:39 PM
Selenium	31	0.36	0.50		µg/L	1	10/7/2019 07:57 PM
Silver	ND	1.2	2.5		µg/L	5	10/7/2019 01:44 PM
Thallium	ND	4.8	12		µg/L	25	10/7/2019 02:46 PM
Vanadium	6.8	0.28	1.0		µg/L	1	10/7/2019 01:39 PM
Zinc	ND	2.3	10		µg/L	1	10/7/2019 01:39 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified
DO	Surrogate Diluted Out

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-75558**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136811**
Client ID: **PBW**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528716**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Beryllium	ND	0.50									
Cadmium	ND	0.50									
Cobalt	ND	0.50									
Lead	ND	1.0									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Silver	ND	0.50									
Thallium	ND	0.50									
Vanadium	0.464	1.0									
Zinc	ND	10									

Sample ID **LCS-75558**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136811**
Client ID: **LCSW**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528717**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.699	0.50	10.00	0	107	85	115				
Arsenic	10.646	0.10	10.00	0	106	85	115				
Barium	10.631	1.0	10.00	0	106	85	115				
Beryllium	10.121	0.50	10.00	0	101	85	115				
Cadmium	10.410	0.50	10.00	0	104	85	115				
Cobalt	10.144	0.50	10.00	0	101	85	115				
Lead	10.326	1.0	10.00	0	103	85	115				
Molybdenum	10.465	0.50	10.00	0	105	85	115				
Nickel	10.260	1.0	10.00	0	103	85	115				
Silver	10.034	0.50	10.00	0	100	85	115				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-75558	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136811
Client ID:	LCSW	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3528717

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium	10.084	0.50	10.00	0	101	85	115				
Vanadium	11.083	1.0	10.00	0	111	85	115				
Zinc	10.392	10	10.00	0	104	85	115				

Sample ID	N037759-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136811
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3528721

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.961	0.50	10.00	0.4777	105	75	125				
Arsenic	11.349	0.10	10.00	1.148	102	75	125				
Barium	89.479	1.0	10.00	82.16	73.2	75	125				S
Beryllium	12.067	0.50	10.00	0	121	75	125				
Cadmium	10.288	0.50	10.00	0	103	75	125				
Cobalt	9.546	0.50	10.00	0.5057	90.4	75	125				
Lead	10.001	1.0	10.00	0	100	75	125				
Molybdenum	50.815	0.50	10.00	41.86	89.5	75	125				
Nickel	8.919	1.0	10.00	0	89.2	75	125				
Silver	10.089	0.50	10.00	0	101	75	125				
Thallium	10.044	0.50	10.00	0	100	75	125				
Vanadium	19.710	1.0	10.00	10.32	93.9	75	125				
Zinc	7.887	10	10.00	0	78.9	75	125				

Sample ID	N037759-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136811
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3528722

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	11.096	0.50	10.00	0.4777	106	75	125	10.96	1.22	20	
Arsenic	11.573	0.10	10.00	1.148	104	75	125	11.35	1.96	20	
Barium	89.364	1.0	10.00	82.16	72.0	75	125	89.48	0.129	20	S
Beryllium	12.304	0.50	10.00	0	123	75	125	12.07	1.95	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N037759-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136811
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3528722

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	10.184	0.50	10.00	0	102	75	125	10.29	1.01	20	
Cobalt	9.476	0.50	10.00	0.5057	89.7	75	125	9.546	0.728	20	
Lead	9.922	1.0	10.00	0	99.2	75	125	10.00	0.796	20	
Molybdenum	50.787	0.50	10.00	41.86	89.3	75	125	50.81	0.0545	20	
Nickel	9.055	1.0	10.00	0	90.5	75	125	8.919	1.52	20	
Silver	9.980	0.50	10.00	0	99.8	75	125	10.09	1.09	20	
Thallium	10.061	0.50	10.00	0	101	75	125	10.04	0.172	20	
Vanadium	19.458	1.0	10.00	10.32	91.4	75	125	19.71	1.28	20	
Zinc	8.141	10	10.00	0	81.4	75	125	7.887	0	20	

Sample ID	MB-75558	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136822
Client ID:	PBW	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3529595

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	1.0									
Manganese	ND	0.50									
Selenium	ND	0.50									

Sample ID	LCS-75558	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136822
Client ID:	LCSW	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3529596

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	9.969	1.0	10.00	0	99.7	85	115				
Manganese	107.204	0.50	100.0	0	107	85	115				
Selenium	11.030	0.50	10.00	0	110	85	115				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N037759-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136822
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3529600

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	7.167	1.0	10.00	0	71.7	75	125				S
Manganese	81.035	0.50	100.0	0	81.0	75	125				
Selenium	11.409	0.50	10.00	1.167	102	75	125				

Sample ID	N037759-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/4/2019	RunNo:	136822
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3529601

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	7.049	1.0	10.00	0	70.5	75	125	7.167	1.66	20	S
Manganese	81.832	0.50	100.0	0	81.8	75	125	81.04	0.978	20	
Selenium	10.178	0.50	10.00	1.167	90.1	75	125	11.41	11.4	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out
- Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N037759-001A-PS	SampType:	PS	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	136811
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3528725

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	11.035	0.50	10.00	0.4777	106	80	120				
Arsenic	11.437	0.10	10.00	1.148	103	80	120				
Barium	89.394	1.0	10.00	82.16	72.3	80	120				S
Beryllium	11.517	0.50	10.00	0	115	80	120				
Cadmium	10.274	0.50	10.00	0	103	80	120				
Cobalt	9.623	0.50	10.00	0.5057	91.2	80	120				
Lead	10.001	1.0	10.00	0	100	80	120				
Molybdenum	51.151	0.50	10.00	41.86	92.9	80	120				
Nickel	9.307	1.0	10.00	0	93.1	80	120				
Silver	9.954	0.50	10.00	0	99.5	80	120				
Thallium	10.078	0.50	10.00	0	101	80	120				
Vanadium	19.591	1.0	10.00	10.32	92.7	80	120				
Zinc	8.128	10	10.00	0	81.3	80	120				

Sample ID	N037759-001A-PS	SampType:	PS	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	136822
Client ID:	ZZZZZZ	Batch ID:	75558	TestNo:	EPA 200.8			Analysis Date:	10/7/2019	SeqNo:	3529599

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	6.839	1.0	10.00	0	68.4	80	120				S
Manganese	86.452	0.50	100.0	0	86.5	80	120				
Selenium	10.356	0.50	10.00	1.167	91.9	80	120				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191004A**	QC Batch: **R136795**			PrepDate:			Analyst: **HG**
Hexavalent Chromium	920	3.3	20		µg/L	100	10/4/2019 11:25 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191007A**	QC Batch: **75558**			PrepDate:	**10/4/2019**		Analyst: **CEI**
Chromium	960	3.2	25		µg/L	25	10/7/2019 02:35 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified
DO	Surrogate Diluted Out

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191003A**	QC Batch: **R136776**			PrepDate:			Analyst: **HG**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	10/3/2019 06:10 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191007A**	QC Batch: **75558**			PrepDate:	**10/4/2019**		Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	10/7/2019 01:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified
DO	Surrogate Diluted Out

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:35:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191003A**	QC Batch: **R136776**			PrepDate:			Analyst: **HG**
Hexavalent Chromium	ND	0.17	1.0		µg/L	5	10/3/2019 06:48 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191007A**	QC Batch: **75558**			PrepDate:	**10/4/2019**		Analyst: **CEI**
Chromium	2.0	0.13	1.0		µg/L	1	10/7/2019 01:39 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified
DO	Surrogate Diluted Out

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**MB-75558**	SampType: **MBLK**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136810**
Client ID:	**PBW**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528636**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	**LCS-75558**	SampType: **LCS**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136810**
Client ID:	**LCSW**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528637**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.500	1.0	10.00	0	105	85	115				

Sample ID	**N037759-001A-MS**	SampType: **MS**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136810**
Client ID:	**ZZZZZZ**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528641**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	17.381	1.0	10.00	8.261	91.2	75	125				

Sample ID	**N037759-001A-MSD**	SampType: **MSD**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **10/4/2019**	RunNo: **136810**
Client ID:	**ZZZZZZ**	Batch ID: **75558**	TestNo: **EPA 200.8**		Analysis Date: **10/7/2019**	SeqNo: **3528642**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	17.127	1.0	10.00	8.261	88.7	75	125	17.38	1.47	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R136776	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776		
Client ID:	PBW	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526540		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		ND	0.20										

Sample ID	LCS-R136776	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776		
Client ID:	LCSW	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526541		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		4.934	0.20	5.000	0	98.7	90	110					

Sample ID	N037721-001BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776		
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526542		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		5577.300	100	2500	3100	99.1	90	110					

Sample ID	N037722-002AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776		
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526546		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1.966	0.20	1.000	0.9687	99.7	90	110					

Sample ID	N037721-001BMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776		
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526548		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		5598.200	100	2500	3100	99.9	90	110	5577	0.374	20		

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N037722-002ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526549

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.957	0.20						0.9687	1.20	20	

Sample ID	N037718-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526565

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.077	0.20	1.000	0	108	90	110				

Sample ID	N037718-003BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136776
Client ID:	ZZZZZZ	Batch ID:	R136776	TestNo:	EPA 218.6			Analysis Date:	10/3/2019	SeqNo:	3526569

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.605	1.0	5.000	0	92.1	90	110				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R136795	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136795		
Client ID:	PBW	Batch ID:	R136795	TestNo:	EPA 218.6			Analysis Date:	10/4/2019	SeqNo:	3527653		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		ND	0.20										

Sample ID	LCS-R136795	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136795		
Client ID:	LCSW	Batch ID:	R136795	TestNo:	EPA 218.6			Analysis Date:	10/4/2019	SeqNo:	3527654		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		5.009	0.20	5.000	0	100	90	110					

Sample ID	N037718-001CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136795		
Client ID:	ZZZZZZ	Batch ID:	R136795	TestNo:	EPA 218.6			Analysis Date:	10/4/2019	SeqNo:	3527657		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1457.190	20	500.0	917.7	108	90	110					

Sample ID	N037718-001CMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136795		
Client ID:	ZZZZZZ	Batch ID:	R136795	TestNo:	EPA 218.6			Analysis Date:	10/4/2019	SeqNo:	3527658		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1439.840	20	500.0	917.7	104	90	110	1457	1.20	20		

Sample ID	N037759-001BDUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	136795		
Client ID:	ZZZZZZ	Batch ID:	R136795	TestNo:	EPA 218.6			Analysis Date:	10/4/2019	SeqNo:	3527660		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		8.180	0.20						8.186	0.0745	20		

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N037759-001BMS**	SampType: **MS**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:					RunNo: **136795**			
Client ID: **ZZZZZZ**	Batch ID: **R136795**	TestNo: **EPA 218.6**		Analysis Date: **10/4/2019**					SeqNo: **3527661**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium	13.141	0.20	5.000	8.186	99.1	90	110					

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191002D**	QC Batch: **R136733**			PrepDate:			Analyst: **LR**
Turbidity	0.30	0.10	0.10		NTU	1	10/2/2019 03:05 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191002D**	QC Batch: **R136733**			PrepDate:			Analyst: **LR**
Turbidity	0.22	0.10	0.10		NTU	1	10/2/2019 03:05 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	**MB-R136733**	SampType:	**MBLK**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**136733**
Client ID:	**PBW**	Batch ID:	**R136733**	TestNo:	**SM 2130B**			Analysis Date:	**10/2/2019**	SeqNo:	**3524305**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	**N037722-002DDUP**	SampType:	**DUP**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**136733**
Client ID:	**ZZZZZZ**	Batch ID:	**R136733**	TestNo:	**SM 2130B**			Analysis Date:	**10/2/2019**	SeqNo:	**3524310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	52.400	0.10						52.20	0.382	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:35:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 245.1							
RunID: **NV00922-AA2_191003C** QC Batch: **75542**				PrepDate:	**10/2/2019**		Analyst: **DJ**
Mercury	ND	0.13	0.20		µg/L	1	10/3/2019 12:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID	**MB-75542**	SampType: **MBLK**	TestCode: **245.1_W**	Units: **µg/L**	Prep Date: **10/2/2019**	RunNo: **136760**
Client ID:	**PBW**	Batch ID: **75542**	TestNo: **EPA 245.1**		Analysis Date: **10/3/2019**	SeqNo: **3525915**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.20									

Sample ID	**LCS-75542**	SampType: **LCS**	TestCode: **245.1_W**	Units: **µg/L**	Prep Date: **10/2/2019**	RunNo: **136760**
Client ID:	**LCSW**	Batch ID: **75542**	TestNo: **EPA 245.1**		Analysis Date: **10/3/2019**	SeqNo: **3525917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.900	0.20	5.000	0	98.0	85	115				

Sample ID	**N037718-003C-MS**	SampType: **MS**	TestCode: **245.1_W**	Units: **µg/L**	Prep Date: **10/2/2019**	RunNo: **136760**
Client ID:	**ZZZZZZ**	Batch ID: **75542**	TestNo: **EPA 245.1**		Analysis Date: **10/3/2019**	SeqNo: **3525918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.740	0.20	5.000	0	94.8	75	125				

Sample ID	**N037718-003C-MSD**	SampType: **MSD**	TestCode: **245.1_W**	Units: **µg/L**	Prep Date: **10/2/2019**	RunNo: **136760**
Client ID:	**ZZZZZZ**	Batch ID: **75542**	TestNo: **EPA 245.1**		Analysis Date: **10/3/2019**	SeqNo: **3525919**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.830	0.20	5.000	0	96.6	75	125	4.740	1.88	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191007A**	QC Batch: **R136816**			PrepDate:			Analyst: **RAB**
Fluoride	3.1	0.048	0.50		mg/L	5	10/7/2019 11:02 AM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191008A**	QC Batch: **R136839**			PrepDate:			Analyst: **RAB**
Sulfate	480	2.0	25		mg/L	50	10/8/2019 10:00 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191007A**	QC Batch: **R136816**			PrepDate:			Analyst: **RAB**
Fluoride	3.0	0.048	0.50		mg/L	5	10/7/2019 11:18 AM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191008A**	QC Batch: **R136839**			PrepDate:			Analyst: **RAB**
Sulfate	460	2.0	25		mg/L	50	10/8/2019 10:15 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:35:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191007A**	QC Batch: **R136816**			PrepDate:			Analyst: **RAB**
Fluoride	18	0.19	2.0		mg/L	20	10/7/2019 11:34 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**MB-R136816_F**	SampType: **MBLK**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **136816**
Client ID:	**PBW**	Batch ID: **R136816**	TestNo: **EPA 300.0**		Analysis Date:	**10/7/2019**	SeqNo: **3529060**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID	**LCS-R136816_F**	SampType: **LCS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **136816**
Client ID:	**LCSW**	Batch ID: **R136816**	TestNo: **EPA 300.0**		Analysis Date:	**10/7/2019**	SeqNo: **3529061**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.291	0.10	1.250	0	103	90	110				

Sample ID	**N037736-001DMS**	SampType: **MS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **136816**
Client ID:	**ZZZZZZ**	Batch ID: **R136816**	TestNo: **EPA 300.0**		Analysis Date:	**10/7/2019**	SeqNo: **3529076**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	9.268	0.50	6.250	2.967	101	80	120				

Sample ID	**N037736-001DMSD**	SampType: **MSD**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **136816**
Client ID:	**ZZZZZZ**	Batch ID: **R136816**	TestNo: **EPA 300.0**		Analysis Date:	**10/7/2019**	SeqNo: **3529077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	9.263	0.50	6.250	2.967	101	80	120	9.268	0.0594	20	

Sample ID	**N037722-001DMS**	SampType: **MS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **136816**
Client ID:	**ZZZZZZ**	Batch ID: **R136816**	TestNo: **EPA 300.0**		Analysis Date:	**10/7/2019**	SeqNo: **3529078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	9.749	0.50	6.250	3.267	104	80	120				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	N037718-001BDUP	SampType:	DUP	TestCode:	300_W_FPGE	Units:	mg/L	Prep Date:		RunNo:	136816
Client ID:	ZZZZZZ	Batch ID:	R136816	TestNo:	EPA 300.0			Analysis Date:	10/7/2019	SeqNo:	3529079

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	3.015	0.50						3.125	3.57	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R136839_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	136839
Client ID:	PBW	Batch ID:	R136839	TestNo:	EPA 300.0			Analysis Date:	10/8/2019	SeqNo:	3530604

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	LCS-R136839_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	136839
Client ID:	LCSW	Batch ID:	R136839	TestNo:	EPA 300.0			Analysis Date:	10/8/2019	SeqNo:	3530605

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.056	0.50	4.000	0	101	90	110				

Sample ID	N037722-001DMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	136839
Client ID:	ZZZZZZ	Batch ID:	R136839	TestNo:	EPA 300.0			Analysis Date:	10/8/2019	SeqNo:	3530616

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	684.995	25	200.0	479.3	103	80	120				

Sample ID	N037736-004DMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	136839
Client ID:	ZZZZZZ	Batch ID:	R136839	TestNo:	EPA 300.0			Analysis Date:	10/8/2019	SeqNo:	3530618

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	661.330	25	200.0	463.0	99.2	80	120				

Sample ID	N037736-004DMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	136839
Client ID:	ZZZZZZ	Batch ID:	R136839	TestNo:	EPA 300.0			Analysis Date:	10/8/2019	SeqNo:	3530619

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	660.465	25	200.0	463.0	98.7	80	120	661.3	0.131	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **N037736-005DDUP**	SampType: **DUP**	TestCode: **300_W_SO4P**	Units: **mg/L**	Prep Date:			RunNo: **136839**				
Client ID: **ZZZZZZ**	Batch ID: **R136839**	TestNo: **EPA 300.0**		Analysis Date: **10/8/2019**			SeqNo: **3530623**				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	461.945	25						466.2	0.913	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_191012A**	QC Batch: **R136983**			PrepDate:			Analyst: **MBC**
Nitrate/Nitrite as N	4.1	0.16	0.25		mg/L	5	10/12/2019

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-594
Lab Order:	N037718	**Collection Date:**	10/1/2019 11:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N037718-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_191012A**	QC Batch: **R136983**			PrepDate:			Analyst: **MBC**
Nitrate/Nitrite as N	3.1	0.16	0.25		mg/L	5	10/12/2019

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037718
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID	**MB-R136983**	SampType:	**MBLK**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**136983**
Client ID:	**PBW**	Batch ID:	**R136983**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2019**	SeqNo:	**3536757**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	ND	0.050									

Sample ID	**LCS-R136983**	SampType:	**LCS**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**136983**
Client ID:	**LCSW**	Batch ID:	**R136983**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2019**	SeqNo:	**3536758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.496	0.050	0.5000	0	99.2	85	115				

Sample ID	**N037723-001CDUP**	SampType:	**DUP**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**136983**
Client ID:	**ZZZZZZ**	Batch ID:	**R136983**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2019**	SeqNo:	**3536807**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	ND	0.050						0.03870	0	20	

Sample ID	**N037679-006BMS**	SampType:	**MS**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**136983**
Client ID:	**ZZZZZZ**	Batch ID:	**R136983**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2019**	SeqNo:	**3536809**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	25.814	1.0	10.00	15.25	106	75	125				

Sample ID	**N037679-006BMSD**	SampType:	**MSD**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**136983**
Client ID:	**ZZZZZZ**	Batch ID:	**R136983**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2019**	SeqNo:	**3536810**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	26.802	1.0	10.00	15.25	116	75	125	25.81	3.76	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CH2MHILL **CHAIN OF CUSTODY RECORD** Page 1 OF 1

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375CH.04.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-594
Turnaround Time 10 Days
Shipping Date:
COC Number: 594

	Container:	1 Liter Poly	1 Liter Poly	1 Liter Poly	1 Liter Poly	250 ml Poly	1 Liter Poly	1 Liter Poly	500 ml Poly	500 ml Poly	500 ml Poly	1 Liter Poly			
	Preservatives:	4°C Lab H2SO4	4°C	4°C	4°C	4°C	4°C Lab H2SO4	4°C	4°C	4°C	4°C	4°C			
	Filtered:	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	Holding Time:	28	7	7	7	1	28	7	180	180	180	7			
		AMMONIA (SM4500NH3D)	Anions (E300.0) Fl & SO4	Anions (E300.0) Flouride	CONDUCTIVITY (E120.1)	E218.6 Lab Filtered	Nitrate/Nitrite (SM4500NO3-E)	TDS (SM2540C)	Total Metals (E200.8 Mn)	Total Metals(E200.7 and E200.8)	Total Title22Metals	Turbidity (SM2130)		Number of Containers	COMMENTS
SC-100B-WDR-594	10-1-19 11:25 Water	X	X		X	X	X	X		X		X	N037718-01	4	pH = 7.86
SC-700B-WDR-594	10-1-19 11:20 Water	X	X		X	X	X	X		X		X	-02	4	pH = 7.09
SC-701-WDR-594	10-1-19 11:35 Water			X	X	X		X	X		X		-03	3	pH = 7.89
													TOTAL NUMBER OF CONTAINERS	11	

Signatures	Date/Time
Approved by	10-1-19 08:00
Sampled by	10-1-19 11:35
Relinquished by	10-1-19 15:35
Received by JULIA BUNDALIAN	10-1-19 1535
Relinquished by JULIA BUNDALIAN	10/1/19 1939
Received by JULIA BUNDALIAN	10/1/19 1939

Shipping Details
Method of Shipment: ~~FedEx~~ CS 95507
On Ice: (yes) / no 4.1°C Temp #7
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody and Marlon Cartin

Special Instructions:

Report Copy to
Doug Scott
(970) 731-0636

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	10/1/2019	Workorder:	N037718
Rep sample Temp (Deg C):	4.1	IR Gun ID:	1
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	NA	Packing Material Used:	None
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Cr 6+ were lab filtered and then preserved with Ammonium buffer.
Samples for Total Metals were lab preserved with HNO3 and for Ammonia/NO3- with H2SO4.

Checklist Completed By: YR YRJ 10/2/2019

Reviewed By: LG 100919

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

03-Oct-19

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N037718-001A / SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	32OZP	1		
N037718-002A / SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N37718A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 546410382

		Date/Time		Date/Time
Relinquished by:	YRJ	10/3/2019 17:00	**Received by:**	
Relinquished by:			**Received by:**	

List of Analysts

ASSET Laboratories Work Order: N037718

NAME	TEST METHOD
Claire Ignacio	EPA 200.8
Marlon Cartin	SM 4500-NO3F
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B
Ria Abes	EPA 300.0
Hanah Glodoviza	EPA 218.6
Diane Jetajobe	EPA 200.7, EPA 245.1

Enthalpy Analytical
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900

enthalpy.com

Lab Job Number: 314598
Report Level: IV
Report Date: 10/18/2019

Wet Chemistry

Analytical Report *prepared for:*

Andrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Authorized for release by:

Patrick McCarthy, Project Manager
(510) 204-2236 ext 13115
patrick.mccarthy@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 2896, NELAP# 4044-001

ENTHALPY ANALYTICAL

Sample Summary

Andrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Lab Job Number: 314598
Date Received: 10/04/19

Sample ID	Lab ID	Collected	Matrix
N037718-001A / SC-100B-WDR-594	314598-001	10/01/19 11:25	Water
N037718-002A / SC-700B-WDR-594	314598-002	10/01/19 11:20	Water

Case Narrative

WET CHEMISTRY (SM4500NH3-D)

ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118
Andrea Gallardo

Lab Job Number: 314598
Date Received: 10/04/19

This data package contains sample and QC results for two water samples, requested for the above referenced project on 10/04/19. See attached cooler receipt form for any sample receipt problems or discrepancies.

Ammonia Nitrogen (SM4500NH3-D):
No analytical problems were encountered.

314598

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

03-Oct-19

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N037718-001A / SC-100B-WDR-594	Water	10/1/2019 11:25:00 AM	32OZP	1		
N037718-002A / SC-700B-WDR-594	Water	10/1/2019 11:20:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N37718A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 546410382

		Date/Time			Date/Time
Relinquished by:	YRJ	10/3/2019 17:00	**Received by:**		10/4/19 10:15
Relinquished by:			**Received by:**		

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 314598 Client: Assest Laboratories

Date Received: 10/4/19 Project: _____

Section 2: Shipping info (if applicable) 544437956 GIO

Are custody seals present? ☑ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: _____ How many _____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☐ N/A

Samples received in a cooler? ☑ Yes, how many? 1 ☐ No (**skip Section 3 below**)

If no cooler Sample Temp (°C): _____ using IR Gun # ☑ B, or ☐ C

☐ Samples received on ice directly from the field. Cooling process had begun

If in cooler: Date Opened 10/4/19 By (print) A (sign) _____

Section 3: ***Important*: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) _____

☐ Bubble Wrap, ☐ Foam blocks, ☑ Bags, ☐ None, ☐ Cloth material, ☐ Cardboard, ☐ Styrofoam, ☐ Paper towels

☐ Samples received on ice directly from the field. Cooling process had begun

Type of ice used : ☑ Wet, ☐ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☑ No

Temperature measured using ☐ Thermometer ID: _____, or IR Gun # ☑ B ☐ C

Cooler Temp (°C): #1: 1.4, #2: _____, #3: _____, #4: _____, #5: _____, #6: _____, #7: _____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	—		
Were Method 5035 sampling containers present?		—	
If YES, what time were they transferred to freezer? _____			
Did all bottles arrive unbroken/unopened?	—		
Are there any missing / extra samples?		—	
Are samples in the appropriate containers for indicated tests?	—		
Are sample labels present, in good condition and complete?	—		
Does the container count match the COC?	—		
Do the sample labels agree with custody papers?	—		
Was sufficient amount of sample sent for tests requested?	—		
Did you change the hold time in LIMS for unpreserved VOAs?			—
Did you change the hold time in LIMS for preserved terracores?			—
Are bubbles > 6mm present in VOA samples?			—
Was the client contacted concerning this sample delivery?		—	
If YES, who was called? _____ By _____ Date: _____			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (if N/A, skip the rest of section 5)	—		
Did you check preservatives for all bottles for each sample?	—		
Did you document your preservative check?	—		

pH strip lot# SUKD+12891 pH strip lot# _____, pH strip lot# _____

Preservative added:

☐ H2SO4 lot# _____ added to samples _____ on/at _____

☐ HCL lot# _____ added to samples _____ on/at _____

☐ HNO3 lot# _____ added to samples _____ on/at _____

☐ NaOH lot# _____ added to samples _____ on/at _____

Section 6:

Explanations/Comments: _____

Date Logged in 10/4/19 **By (print)** R **(sign)** _____

Date Labeled 10/4/19 **By (print)** AC **(sign)** _____

ENTHALPY ANALYTICAL

Ammonia Nitrogen

Lab #: 314598 **Project#:** STANDARD

Client: ASSET LABS **Location:**

Field ID:	N037718-001A / SC-100B-WDR-594	**Diln Fac:**	1.000	**Prepared:**	10/08/19 10:42
Type:	SAMPLE	**Batch#:**	274885	**Analyzed:**	10/08/19 15:05
Lab ID:	314598-001	**Sampled:**	10/01/19 11:25	**Prep:**	SM4500NH3-B
Matrix:	Water	**Received:**	10/04/19	**Analysis:**	SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	**0.040 J**	0.10	0.020	mg/L

Field ID:	N037718-002A / SC-700B-WDR-594	**Diln Fac:**	1.000	**Prepared:**	10/08/19 10:42
Type:	SAMPLE	**Batch#:**	274885	**Analyzed:**	10/08/19 15:05
Lab ID:	314598-002	**Sampled:**	10/01/19 11:20	**Prep:**	SM4500NH3-B
Matrix:	Water	**Received:**	10/04/19	**Analysis:**	SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	**0.030 J**	0.10	0.020	mg/L

Type:	BLANK	**Diln Fac:**	1.000	**Analyzed:**	10/08/19 12:50
Lab ID:	QC994111	**Batch#:**	274885	**Prep:**	SM4500NH3-B
Matrix:	Water	**Prepared:**	10/08/19 10:42	**Analysis:**	SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	ND	0.10	0.020	mg/L

Legend

J: Estimated value
MDL: Method Detection Limit
ND: Not Detected at or above MDL
RL: Reporting Limit

ENTHALPY ANALYTICAL

Ammonia Nitrogen: Batch QC

Lab #: 314598 **Project#:** STANDARD

Client: ASSET LABS **Location:**

Type: LCS **DilnFac:** 1.000 **Analyzed:** 10/08/19 12:50

Lab ID: QC994112 **Batch#:** 274885 **Prep:** SM4500NH3-B

Matrix: Water **Prepared:** 10/08/19 10:42 **Analysis:** SM4500NH3-D

Analyte	Spiked	Result	%REC	Limits	Units
Ammonia-N	5.000	4.100	82	80-120	mg/L

Field ID: N037736-003B / CW-02D-LF-Q419 **DilnFac:** 1.000 **Analyzed:** 10/08/19 12:50

Type: MS **Batch#:** 274885 **Prep:** SM4500NH3-B

MSS Lab ID: 314595-003 **Sampled:** 10/02/19 11:50 **Analysis:** SM4500NH3-D

Lab ID: QC994113 **Received:** 10/04/19

Matrix: Water **Prepared:** 10/08/19 10:42

Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
Ammonia-N	0.06000	5.000	4.000	80	28-120	mg/L

Field ID: N037736-003B / CW-02D-LF-Q419 **DilnFac:** 1.000 **Analyzed:** 10/08/19 12:50

Type: MSD **Batch#:** 274885 **Prep:** SM4500NH3-B

MSS Lab ID: 314595-003 **Sampled:** 10/02/19 11:50 **Analysis:** SM4500NH3-D

Lab ID: QC994114 **Received:** 10/04/19

Matrix: Water **Prepared:** 10/08/19 10:42

Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
Ammonia-N	5.000	4.300	86	28-120	mg/L	7	30

Legend

RPD: Relative Percent Difference

October 17, 2019

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N037719

RE: PG&E Topock, 680375CH.04.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 01, 2019 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Sitterson for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N037719

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

Analytical Comments for EPA 6010B:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N037719-001B-MS1 and N037719-001B-MSD1 possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Chromium in QC samples N037719-001B-MS1 and N037719-001B-MSD1 since the analyte concentration in the sample is disproportionate to the spike level. Post Spike (PS) passed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N037719
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N037719-001A	Phase Separator-594-Sludge	Soil	10/1/2019 11:00:00 AM	10/1/2019	10/17/2019
N037719-001B	Phase Separator-594-Sludge	Soil	10/1/2019 11:00:00 AM	10/1/2019	10/17/2019

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-594-Sludge
Lab Order:	N037719	**Collection Date:**	10/1/2019 11:00:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N037719-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191009A**	QC Batch: **R136861**			PrepDate:			Analyst: **RAB**
Fluoride	25	0.28	4.1		mg/Kg-dry	2	10/9/2019 03:53 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID	MB-R136861	SampType:	MBLK	TestCode:	300_S	Units:	mg/Kg	Prep Date:		RunNo:	136861
Client ID:	PBS	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531814

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	1.0									

Sample ID	LCS-R136861	SampType:	LCS	TestCode:	300_S	Units:	mg/Kg	Prep Date:		RunNo:	136861
Client ID:	LCSS	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531815

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	12.784	1.0	12.50	0	102	90	110				

Sample ID	N037719-001ADUP	SampType:	DUP	TestCode:	300_S	Units:	mg/Kg-dry	Prep Date:		RunNo:	136861
Client ID:	ZZZZZZ	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531817

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	25.005	4.1						24.51	2.00	20	

Sample ID	N037719-001AMS	SampType:	MS	TestCode:	300_S	Units:	mg/Kg-dry	Prep Date:		RunNo:	136861
Client ID:	ZZZZZZ	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531818

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	52.726	4.1	25.56	24.51	110	80	120				

Sample ID	N037719-001AMSD	SampType:	MSD	TestCode:	300_S	Units:	mg/Kg-dry	Prep Date:		RunNo:	136861
Client ID:	ZZZZZZ	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531819

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	52.562	4.1	25.56	24.51	110	80	120	52.73	0.311	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID	N037719-001APS	SampType:	MS	TestCode:	300_S	Units:	mg/Kg-dry	Prep Date:		RunNo:	136861
Client ID:	ZZZZZZ	Batch ID:	R136861	TestNo:	EPA 300.0			Analysis Date:	10/9/2019	SeqNo:	3531820

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	83.722	4.1	51.11	24.51	116	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Lab Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab ID: N037719-001

Client Sample ID: Phase Separator-594-Sludge
Collection Date: 10/1/2019 11:00:00 AM
Matrix: SOIL

TOTAL METALS BY ICP

EPA 3050B **EPA 6010B**

RunID: **NV00922-ICP2_191008B** QC Batch: **75576** PrepDate: **10/7/2019** Analyst: **DJ**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	9.0	0.67	4.1		mg/Kg-dry	1	10/8/2019 12:45 PM
Arsenic	13	1.1	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Barium	80	0.63	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Beryllium	ND	0.44	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Cadmium	ND	0.54	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Chromium	1900	0.66	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Cobalt	4.0	0.58	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Copper	160	1.8	4.1		mg/Kg-dry	1	10/8/2019 12:45 PM
Lead	ND	0.60	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Manganese	520	1.0	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Molybdenum	14	0.61	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Nickel	30	0.69	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Selenium	ND	1.2	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Silver	ND	1.3	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Thallium	ND	0.72	4.1		mg/Kg-dry	1	10/8/2019 12:45 PM
Vanadium	38	0.45	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM
Zinc	480	0.61	2.0		mg/Kg-dry	1	10/8/2019 12:45 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified
DO	Surrogate Diluted Out

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **MB-75576**	SampType: **MBLK**	TestCode: **6010_SPGE**	Units: **mg/Kg**	Prep Date: **10/7/2019**	RunNo: **136832**
Client ID: **PBS**	Batch ID: **75576**	TestNo: **EPA 6010B**	**EPA 3050B**	Analysis Date: **10/8/2019**	SeqNo: **3530277**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	ND	1.0									
Chromium	ND	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	ND	1.0									
Manganese	ND	1.0									
Molybdenum	ND	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	ND	1.0									
Thallium	ND	2.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID **LCS1-75576**	SampType: **LCS**	TestCode: **6010_SPGE**	Units: **mg/Kg**	Prep Date: **10/7/2019**	RunNo: **136832**
Client ID: **LCSS**	Batch ID: **75576**	TestNo: **EPA 6010B**	**EPA 3050B**	Analysis Date: **10/8/2019**	SeqNo: **3530278**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.049	2.0	25.00	0	100	85	115				
Arsenic	24.636	1.0	25.00	0	98.5	85	115				
Barium	25.549	1.0	25.00	0	102	85	115				
Beryllium	25.122	1.0	25.00	0	100	85	115				
Cadmium	24.868	1.0	25.00	0	99.5	85	115				
Chromium	25.266	1.0	25.00	0	101	85	115				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	LCS1-75576	SampType:	LCS	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/7/2019	RunNo:	136832
Client ID:	LCSS	Batch ID:	75576	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/8/2019	SeqNo:	3530278

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	25.038	1.0	25.00	0	100	85	115				
Copper	25.389	2.0	25.00	0	102	85	115				
Lead	24.844	1.0	25.00	0	99.4	85	115				
Manganese	49.871	1.0	50.00	0	99.7	85	115				
Molybdenum	24.684	1.0	25.00	0	98.7	85	115				
Nickel	25.124	1.0	25.00	0	100	85	115				
Selenium	24.725	1.0	25.00	0	98.9	85	115				
Silver	25.724	1.0	25.00	0	103	85	115				
Thallium	25.074	2.0	25.00	0	100	85	115				
Vanadium	25.395	1.0	25.00	0	102	85	115				
Zinc	25.710	1.0	25.00	0	103	85	115				

Sample ID	N037719-001B-MS1	SampType:	MS	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/7/2019	RunNo:	136832
Client ID:	ZZZZZZ	Batch ID:	75576	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/8/2019	SeqNo:	3530282

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	55.912	4.1	51.14	9.028	91.7	75	125				
Arsenic	66.644	2.0	51.14	13.46	104	75	125				
Barium	118.053	2.0	51.14	79.72	75.0	75	125				S
Beryllium	47.285	2.0	51.14	0	92.5	75	125				
Cadmium	46.422	2.0	51.14	2.004	86.9	75	125				
Chromium	2000.005	2.0	51.14	1929	140	75	125				S
Cobalt	50.214	2.0	51.14	4.042	90.3	75	125				
Copper	194.789	4.1	51.14	161.5	65.1	75	125				S
Lead	44.293	2.0	51.14	1.710	83.3	75	125				
Manganese	544.523	2.0	102.3	517.6	26.3	75	125				S
Molybdenum	54.105	2.0	51.14	14.43	77.6	75	125				
Nickel	78.138	2.0	51.14	30.41	93.3	75	125				
Selenium	34.457	2.0	51.14	0	67.4	75	125				S
Silver	43.073	2.0	51.14	0	84.2	75	125				

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	N037719-001B-MS1	SampType:	MS	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/7/2019	RunNo:	136832
Client ID:	ZZZZZZ	Batch ID:	75576	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/8/2019	SeqNo:	3530282

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium	42.157	4.1	51.14	1.592	79.3	75	125				
Vanadium	82.264	2.0	51.14	38.47	85.6	75	125				
Zinc	428.288	2.0	51.14	481.0	-103	75	125				S

Sample ID	N037719-001B-MSD	SampType:	MSD	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/7/2019	RunNo:	136832
Client ID:	ZZZZZZ	Batch ID:	75576	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/8/2019	SeqNo:	3530283

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	57.727	4.1	51.32	9.028	94.9	75	125	55.91	3.19	20	
Arsenic	67.249	2.1	51.32	13.46	105	75	125	66.64	0.903	20	
Barium	129.628	2.1	51.32	79.72	97.2	75	125	118.1	9.35	20	
Beryllium	47.967	2.1	51.32	0	93.5	75	125	47.29	1.43	20	
Cadmium	46.633	2.1	51.32	2.004	87.0	75	125	46.42	0.453	20	
Chromium	2060.199	2.1	51.32	1929	256	75	125	2000	2.97	20	S
Cobalt	50.800	2.1	51.32	4.042	91.1	75	125	50.21	1.16	20	
Copper	206.108	4.1	51.32	161.5	86.9	75	125	194.8	5.65	20	
Lead	45.195	2.1	51.32	1.710	84.7	75	125	44.29	2.02	20	
Manganese	615.845	2.1	102.6	517.6	95.7	75	125	544.5	12.3	20	
Molybdenum	56.944	2.1	51.32	14.43	82.8	75	125	54.10	5.11	20	
Nickel	79.624	2.1	51.32	30.41	95.9	75	125	78.14	1.88	20	
Selenium	34.376	2.1	51.32	0	67.0	75	125	34.46	0.238	20	S
Silver	44.145	2.1	51.32	0	86.0	75	125	43.07	2.46	20	
Thallium	42.629	4.1	51.32	1.592	80.0	75	125	42.16	1.11	20	
Vanadium	85.345	2.1	51.32	38.47	91.3	75	125	82.26	3.68	20	
Zinc	505.376	2.1	51.32	481.0	47.5	75	125	428.3	16.5	20	S

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	**N037719-001B-PS**	SampType: **PS**	TestCode: **6010_SPGE**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **136832**
Client ID:	**ZZZZZZ**	Batch ID: **75576**	TestNo: **EPA 6010B**	**EPA 3050B**	Analysis Date: **10/8/2019**	SeqNo: **3530281**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	66.255	4.1	50.89	9.028	112	80	120				
Arsenic	70.402	2.0	50.89	13.46	112	80	120				
Barium	130.364	2.0	50.89	79.72	99.5	80	120				
Beryllium	53.060	2.0	50.89	0	104	80	120				
Cadmium	49.416	2.0	50.89	2.004	93.2	80	120				
Chromium	1973.642	2.0	50.89	1929	88.5	80	120				
Cobalt	54.871	2.0	50.89	4.042	99.9	80	120				
Copper	219.595	4.1	50.89	161.5	114	80	120				
Lead	49.309	2.0	50.89	1.710	93.5	80	120				
Manganese	618.223	2.0	101.8	517.6	98.8	80	120				
Molybdenum	64.841	2.0	50.89	14.43	99.1	80	120				
Nickel	82.621	2.0	50.89	30.41	103	80	120				
Selenium	38.391	2.0	50.89	0	75.4	80	120				S
Silver	45.280	2.0	50.89	0	89.0	80	120				
Thallium	45.458	4.1	50.89	1.592	86.2	80	120				
Vanadium	91.580	2.0	50.89	38.47	104	80	120				
Zinc	523.214	2.0	50.89	481.0	83.0	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-594-Sludge
Lab Order:	N037719	**Collection Date:**	10/1/2019 11:00:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N037719-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 3060A			**EPA 7199**				
RunID: **NV00922-IC6_191009A**	QC Batch: **75591**			PrepDate: **10/8/2019**			Analyst: **RAB**
Hexavalent Chromium	53	0.59	2.0		mg/Kg-dry	5	10/9/2019 02:59 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	**MB-75591**	SampType: **MBLK**	TestCode: **7199_S_PGE**	Units: **mg/Kg**	Prep Date: **10/8/2019**	RunNo: **136958**
Client ID:	**PBS**	Batch ID: **75591**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/9/2019**	SeqNo: **3536070**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	ND	0.20									

Sample ID	**LCS-75591**	SampType: **LCS**	TestCode: **7199_S_PGE**	Units: **mg/Kg**	Prep Date: **10/8/2019**	RunNo: **136958**
Client ID:	**LCSS**	Batch ID: **75591**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/9/2019**	SeqNo: **3536071**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	3.833	0.20	3.997	0	95.9	80	120				

Sample ID	**N037786-001C-REP**	SampType: **DUP**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/8/2019**	RunNo: **136958**
Client ID:	**ZZZZZZ**	Batch ID: **75591**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/9/2019**	SeqNo: **3536073**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	ND	0.26						0	0	20	

Sample ID	**N037786-001C-DUP**	SampType: **DUP**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/8/2019**	RunNo: **136958**
Client ID:	**ZZZZZZ**	Batch ID: **75591**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/9/2019**	SeqNo: **3536074**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	ND	0.26						0	0	20	

Sample ID	**N037786-001C-MS**	SampType: **MS**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/8/2019**	RunNo: **136958**
Client ID:	**ZZZZZZ**	Batch ID: **75591**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/9/2019**	SeqNo: **3536075**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.779	0.26	5.145	0	92.9	75	125				

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	N037786-001C-MSD	SampType:	MSD	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536076

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.783	0.26	5.149	0	92.9	75	125	4.779	0.0756	20	

Sample ID	N037786-001C-MS I	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536077

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	853.714	13	883.9	0	96.6	75	125				

Sample ID	N037785-001C-REP	SampType:	DUP	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536079

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.311	0.36						0.3171	0	20	

Sample ID	N037719-001A-REP	SampType:	DUP	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536083

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	53.182	2.0						53.26	0.150	20	

Sample ID	N037772-001B-REP	SampType:	DUP	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536085

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.027	0.21						1.033	0.619	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	N037787-001C-REP	SampType:	DUP	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/8/2019	RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536087

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	ND	0.27						0	0	20	

Sample ID	N037786-001C-PS	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:		RunNo:	136958
Client ID:	ZZZZZZ	Batch ID:	75591	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/9/2019	SeqNo:	3536088

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.088	0.26	5.131	0	99.2	75	125				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-594-Sludge
Lab Order:	N037719	**Collection Date:**	10/1/2019 11:00:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N037719-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
			EPA 7471A				
RunID: **NV00922-AA2_191002A**	QC Batch: **75535**			PrepDate:	**10/2/2019**		Analyst: **DJ**
Mercury	ND	0.054	0.20		mg/Kg-dry	1	10/2/2019 12:07 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S_PGE

Sample ID	**MB-75535**	SampType: **MBLK**	TestCode: **7471_S_PGE**	Units: **mg/Kg**	Prep Date: **10/2/2019**	RunNo: **136729**
Client ID:	**PBS**	Batch ID: **75535**	TestNo: **EPA 7471A**		Analysis Date: **10/2/2019**	SeqNo: **3524254**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID	**LCS-75535**	SampType: **LCS**	TestCode: **7471_S_PGE**	Units: **mg/Kg**	Prep Date: **10/2/2019**	RunNo: **136729**
Client ID:	**LCSS**	Batch ID: **75535**	TestNo: **EPA 7471A**		Analysis Date: **10/2/2019**	SeqNo: **3524255**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.481	0.10	0.4167	0	115	75	125				

Sample ID	**N037719-001B-MS**	SampType: **MS**	TestCode: **7471_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/2/2019**	RunNo: **136729**
Client ID:	**ZZZZZZ**	Batch ID: **75535**	TestNo: **EPA 7471A**		Analysis Date: **10/2/2019**	SeqNo: **3524256**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.072	0.20	0.8534	0.1219	111	75	125				

Sample ID	**N037719-001B-MSD**	SampType: **MSD**	TestCode: **7471_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/2/2019**	RunNo: **136729**
Client ID:	**ZZZZZZ**	Batch ID: **75535**	TestNo: **EPA 7471A**		Analysis Date: **10/2/2019**	SeqNo: **3524257**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.127	0.21	0.8548	0.1219	118	75	125	1.072	4.98	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-594-Sludge
Lab Order:	N037719	**Collection Date:**	10/1/2019 11:00:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N037719-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE							
			D2216				
RunID: **NV00922-WC_191002B**	QC Batch: **R136730**			PrepDate:			Analyst: **LR**
Percent Moisture	51.09	0.1000	0.1000		wt%	1	10/2/2019 10:30 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N037719
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: PMOIST

Sample ID	**MB-R136730**	SampType:	**MBLK**	TestCode:	**PMOIST**	Units:	**wt%**	Prep Date:		RunNo:	**136730**
Client ID:	**PBS**	Batch ID:	**R136730**	TestNo:	**D2216**			Analysis Date:	**10/2/2019**	SeqNo:	**3524279**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	ND	0.1000									

Sample ID	**N037719-001BDUP**	SampType:	**DUP**	TestCode:	**PMOIST**	Units:	**wt%**	Prep Date:		RunNo:	**136730**
Client ID:	**ZZZZZZ**	Batch ID:	**R136730**	TestNo:	**D2216**			Analysis Date:	**10/2/2019**	SeqNo:	**3524282**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	51.115	0.1000						51.09	0.0476	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CH2MHILL **CHAIN OF CUSTODY RECORD** Page 1 OF 1

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375CH.04.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-594-SLUDGE
Turnaround Time 10 Days
Shipping Date:
COC Number: 594-s

				Container:	Glass Jar(8 oz)	Glass Jar(8 oz)	4 oz jar			
				Preservatives:	none	none	4°C			
				Filtered:	NA	NA	NA			
				Holding Time:	NA	NA	180			
	DATE	TIME	Matrix		Anions (E300_Soil) FI	Metals (6010B_Soil) Title 22, Mercury, Mn	Metals (7199)		Number of Containers	COMMENTS
Phase Separator-594-Sludge	10-1-19	11:00	Soil		X	X	X	N037719-01	3	
								TOTAL NUMBER OF CONTAINERS	3	

Signatures	Date/Time
Approved by	10-1-19 08:00
Sampled by	10-1-19 11:00
Relinquished by	10-1-19 1535
Received by JULIA BUNDALIAN	10-1-19 1535
Relinquished by JULIA BUNDALIAN	10/1/19 1939
Received by JULIA BUNDALIAN	10/1/19 1939

Shipping Details
Method of Shipment: ~~FedEx~~ asset C9
On Ice: (yes) / no
Airbill No: 4.1°C JB#1
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:

Report Copy to
Doug Scott
(970) 731-0636

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	10/1/2019	Workorder:	N037719
Rep sample Temp (Deg C):	4.1	IR Gun ID:	1

Temp Blank: ☑ Yes ☐ No

Carrier name: ASSET

Last 4 digits of Tracking No.: NA Packing Material Used: None

Cooling process: ☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☐	NA ☑
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☐	No ☐	NA ☑
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments:

Checklist Completed By: YR YRJ 10/2/2019

Reviewed By: LG 100919

List of Analysts

ASSET Laboratories Work Order: N037719

NAME	TEST METHOD
Lilia Ramit	ASTM D2216
Ria Abes	EPA 300.0, EPA 7199
Diane Jetajobe	EPA 6010B, EPA 7471A

November 19, 2019

Shawn P. Duffy
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (530) 229-3303
FAX: (530) 339-3303

Workorder No.: N038162

RE: PG&E Topock, 680375CH.04.IM.OP.00

Attention: Shawn P. Duffy

Enclosed are the results for sample(s) received on November 05, 2019 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Libucao for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N038162

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to Enthalpy Analytical- Berkeley, CA.

Analytical Comments for EPA 200.7:

Matrix Spike (MS) is outside recovery criteria for Iron in QC sample N038160-001A-MS possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 200.8:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N038160-001A-MS and N038160-001A-MSD possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 300.0:

Sample N038162-02 required dilution due to high concentration of target analytes.

ASSET Laboratories

Date: *19-Nov-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N038162
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N038162-001A	SC-100B-WDR-595	Water	11/5/2019 9:20:00 AM	11/5/2019	11/19/2019
N038162-001B	SC-100B-WDR-595	Water	11/5/2019 9:20:00 AM	11/5/2019	11/19/2019
N038162-001C	SC-100B-WDR-595	Water	11/5/2019 9:20:00 AM	11/5/2019	11/19/2019
N038162-001D	SC-100B-WDR-595	Water	11/5/2019 9:20:00 AM	11/5/2019	11/19/2019
N038162-002A	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019
N038162-002B	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019
N038162-002C	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019
N038162-002D	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019
N038162-002E	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019
N038162-002F	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/19/2019

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191106C**	QC Batch: **R137414**			PrepDate:			Analyst: **LR**
Specific Conductance	6900	0.10	0.10		umhos/cm	1	11/6/2019 11:35 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191106C**	QC Batch: **R137414**			PrepDate:			Analyst: **LR**
Specific Conductance	7000	0.10	0.10		umhos/cm	1	11/6/2019 11:35 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID	N038162-002BDUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	137414
Client ID:	ZZZZZZ	Batch ID:	R137414	TestNo:	EPA 120.1			Analysis Date:	11/6/2019	SeqNo:	3559403

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7010.000	0.10						6990	0.286	2	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191111B**	QC Batch: **75987**			PrepDate:	**11/11/2019**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4100	50	50		mg/L	1	11/11/2019 03:34 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191111B**	QC Batch: **75987**			PrepDate:	**11/11/2019**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	3900	50	50		mg/L	1	11/11/2019 03:34 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	LCS-75987	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	11/11/2019	RunNo:	137550
Client ID:	LCSW	Batch ID:	75987	TestNo:	SM2540C			Analysis Date:	11/11/2019	SeqNo:	3569819

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	941.000	10	1000	0	94.1	80	120				

Sample ID	MB-75987	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	11/11/2019	RunNo:	137550
Client ID:	PBW	Batch ID:	75987	TestNo:	SM2540C			Analysis Date:	11/11/2019	SeqNo:	3569820

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	ND	10									

Sample ID	N038162-001ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	11/11/2019	RunNo:	137550
Client ID:	ZZZZZZ	Batch ID:	75987	TestNo:	SM2540C			Analysis Date:	11/11/2019	SeqNo:	3569822

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	4145.000	50						4115	0.726	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191107B**	QC Batch: **75941**			PrepDate:	**11/7/2019**		Analyst: **DJ**
Iron	ND	18	20		µg/L	1	11/7/2019 06:35 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191107B**	QC Batch: **75941**			PrepDate:	**11/7/2019**		Analyst: **DJ**
Aluminum	ND	40	50		µg/L	1	11/7/2019 06:41 PM
Boron	990	74	100		µg/L	1	11/7/2019 06:41 PM
Iron	55	18	20		µg/L	1	11/7/2019 06:41 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-75941**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/7/2019**	RunNo: **137465**
Client ID: **PBW**	Batch ID: **75941**	TestNo: **EPA 200.7**		Analysis Date: **11/7/2019**	SeqNo: **3561917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									
Boron	ND	100									
Iron	ND	20									

Sample ID **LCS-75941**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/7/2019**	RunNo: **137465**
Client ID: **LCSW**	Batch ID: **75941**	TestNo: **EPA 200.7**		Analysis Date: **11/7/2019**	SeqNo: **3561918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9579.147	50	10000	0	95.8	85	115				
Boron	4683.381	100	5000	0	93.7	85	115				
Iron	97.343	20	100.0	0	97.3	85	115				

Sample ID **N038160-001A-MS**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/7/2019**	RunNo: **137465**
Client ID: **ZZZZZZ**	Batch ID: **75941**	TestNo: **EPA 200.7**		Analysis Date: **11/7/2019**	SeqNo: **3561924**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10234.508	50	10000	503.6	97.3	75	125				
Boron	5637.091	100	5000	855.3	95.6	75	125				
Iron	561.835	20	100.0	529.1	32.7	75	125				S

Sample ID **N038160-001A-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/7/2019**	RunNo: **137465**
Client ID: **ZZZZZZ**	Batch ID: **75941**	TestNo: **EPA 200.7**		Analysis Date: **11/7/2019**	SeqNo: **3561925**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10238.954	50	10000	503.6	97.4	75	125	10230	0.0434	20	
Boron	5596.713	100	5000	855.3	94.8	75	125	5637	0.719	20	
Iron	633.854	20	100.0	529.1	105	75	125	561.8	12.0	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	**N038160-001A-PS**	SampType: **PS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date:	RunNo: **137465**
Client ID:	**ZZZZZZ**	Batch ID: **75941**	TestNo: **EPA 200.7**		Analysis Date: **11/7/2019**	SeqNo: **3561923**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10174.501	50	10000	503.6	96.7	80	120				
Boron	5585.457	100	5000	855.3	94.6	80	120				
Iron	591.882	20	100.0	529.1	62.7	80	120				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191106A**	QC Batch: **75920**			PrepDate:	**11/6/2019**		Analyst: **CEI**
Manganese	ND	0.26	0.50		µg/L	1	11/7/2019 12:46 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191106A**	QC Batch: **75920**				PrepDate:	**11/6/2019**	Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	11/7/2019 12:56 AM
Arsenic	ND	0.081	0.10		µg/L	1	11/7/2019 12:56 AM
Barium	20	0.15	1.0		µg/L	1	11/7/2019 12:56 AM
Copper	ND	0.55	1.0		µg/L	1	11/7/2019 12:56 AM
Lead	ND	0.13	1.0		µg/L	1	11/7/2019 12:56 AM
Manganese	ND	0.26	0.50		µg/L	1	11/7/2019 12:56 AM
Molybdenum	21	0.21	0.50		µg/L	1	11/7/2019 12:56 AM
Nickel	2.4	0.26	1.0		µg/L	1	11/7/2019 12:56 AM
Zinc	ND	2.3	10		µg/L	1	11/7/2019 12:56 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-75920**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID: **PBW**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/6/2019**	SeqNo: **3560444**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	0.218	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **LCS-75920**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID: **LCSW**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/6/2019**	SeqNo: **3560445**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.738	0.50	10.00	0	107	85	115				
Arsenic	10.893	0.10	10.00	0	109	85	115				
Barium	10.843	1.0	10.00	0	108	85	115				
Copper	10.613	1.0	10.00	0	106	85	115				
Lead	10.954	1.0	10.00	0	110	85	115				
Manganese	109.706	0.50	100.0	0	110	85	115				
Molybdenum	10.795	0.50	10.00	0	108	85	115				
Nickel	11.001	1.0	10.00	0	110	85	115				
Zinc	10.830	10	10.00	0	108	85	115				

Sample ID **N038160-001A-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID: **ZZZZZZ**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/7/2019**	SeqNo: **3560454**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N038160-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/6/2019	RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560454

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.761	0.50	10.00	0.2846	105	75	125				
Arsenic	12.440	0.10	10.00	1.858	106	75	125				
Barium	121.207	1.0	10.00	115.7	55.2	75	125				S
Copper	6.037	1.0	10.00	0	60.4	75	125				S
Lead	10.392	1.0	10.00	0.1866	102	75	125				
Molybdenum	59.109	0.50	10.00	48.39	107	75	125				
Nickel	11.083	1.0	10.00	1.717	93.7	75	125				
Zinc	15.224	10	10.00	13.56	16.7	75	125				S

Sample ID	N038160-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/6/2019	RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560455

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	325.459	2.5	100.0	220.8	105	75	125				

Sample ID	N038160-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/6/2019	RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560456

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.719	0.50	10.00	0.2846	104	75	125	10.76	0.393	20	
Arsenic	12.475	0.10	10.00	1.858	106	75	125	12.44	0.284	20	
Barium	122.496	1.0	10.00	115.7	68.1	75	125	121.2	1.06	20	S
Copper	5.921	1.0	10.00	0	59.2	75	125	6.037	1.94	20	S
Lead	10.381	1.0	10.00	0.1866	102	75	125	10.39	0.102	20	
Molybdenum	59.540	0.50	10.00	48.39	111	75	125	59.11	0.726	20	
Nickel	10.983	1.0	10.00	1.717	92.7	75	125	11.08	0.908	20	
Zinc	14.728	10	10.00	13.56	11.7	75	125	15.22	3.31	20	S

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out
- Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N038160-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/6/2019	RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560457

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	325.593	2.5	100.0	220.8	105	75	125	325.5	0.0413	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N038160-001A-PS	SampType:	PS	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560450

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.673	0.50	10.00	0.2846	104	80	120				
Arsenic	12.361	0.10	10.00	1.858	105	80	120				
Barium	119.320	1.0	10.00	115.7	36.3	80	120				S
Copper	6.123	1.0	10.00	0	61.2	80	120				S
Lead	10.292	1.0	10.00	0.1866	101	80	120				
Molybdenum	58.253	0.50	10.00	48.39	98.6	80	120				
Nickel	11.260	1.0	10.00	1.717	95.4	80	120				
Zinc	17.887	10	10.00	13.56	43.3	80	120				S

Sample ID	N038160-001A-PS	SampType:	PS	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	137436
Client ID:	ZZZZZZ	Batch ID:	75920	TestNo:	EPA 200.8			Analysis Date:	11/7/2019	SeqNo:	3560451

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	324.325	2.5	100.0	220.8	104	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191106A**	QC Batch: **R137448**			PrepDate:			Analyst: **RAB**
Hexavalent Chromium	410	3.3	20		µg/L	100	11/6/2019 09:47 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191106A**	QC Batch: **75920**			PrepDate:	**11/6/2019**		Analyst: **CEI**
Chromium	400	0.65	5.0		µg/L	5	11/7/2019 12:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191106A**	QC Batch: **R137448**			PrepDate:			Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	11/6/2019 10:08 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191106A**	QC Batch: **75920**			PrepDate:	**11/6/2019**		Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	11/7/2019 12:56 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**MB-75920**	SampType: **MBLK**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID:	**PBW**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/6/2019**	SeqNo: **3560563**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	**LCS-75920**	SampType: **LCS**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID:	**LCSW**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/6/2019**	SeqNo: **3560564**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.293	1.0	10.00	0	103	85	115				

Sample ID	**N038160-001A-MS**	SampType: **MS**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID:	**ZZZZZZ**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/7/2019**	SeqNo: **3560573**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.176	1.0	10.00	0.8270	93.5	75	125				

Sample ID	**N038160-001A-MSD**	SampType: **MSD**	TestCode: **200.8_W_CR**	Units: **µg/L**	Prep Date: **11/6/2019**	RunNo: **137436**
Client ID:	**ZZZZZZ**	Batch ID: **75920**	TestNo: **EPA 200.8**		Analysis Date: **11/7/2019**	SeqNo: **3560575**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.070	1.0	10.00	0.8270	92.4	75	125	10.18	1.04	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R137448	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448		
Client ID:	PBW	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561416		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Hexavalent Chromium	ND	0.20											

Sample ID	LCS-R137448	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448		
Client ID:	LCSW	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561417		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Hexavalent Chromium	4.869	0.20	5.000	0	97.4	90	110						

Sample ID	N038162-001BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448		
Client ID:	ZZZZZZ	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561419		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Hexavalent Chromium	907.820	20	500.0	408.1	100	90	110						

Sample ID	N038162-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448		
Client ID:	ZZZZZZ	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561421		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Hexavalent Chromium	1.092	0.20	1.000	0	109	90	110						

Sample ID	N038164-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448		
Client ID:	ZZZZZZ	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561428		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Hexavalent Chromium	60.985	1.0	25.00	36.41	98.3	90	110						

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N038164-001AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448
Client ID:	ZZZZZZ	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561429

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	60.995	1.0	25.00	36.41	98.3	90	110	60.98	0.0156	20	

Sample ID	N038168-001ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	137448
Client ID:	ZZZZZZ	Batch ID:	R137448	TestNo:	EPA 218.6			Analysis Date:	11/6/2019	SeqNo:	3561433

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.942	0.20						0.9333	0.928	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191106E**	QC Batch: **R137416**			PrepDate:			Analyst: **LR**
Turbidity	0.22	0.10	0.10		NTU	1	11/6/2019 02:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191106E**	QC Batch: **R137416**			PrepDate:			Analyst: **LR**
Turbidity	0.26	0.10	0.10		NTU	1	11/6/2019 02:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	MB-R137416	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	137416
Client ID:	PBW	Batch ID:	R137416	TestNo:	SM 2130B			Analysis Date:	11/6/2019	SeqNo:	3559407

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	N038162-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	137416
Client ID:	ZZZZZZ	Batch ID:	R137416	TestNo:	SM 2130B			Analysis Date:	11/6/2019	SeqNo:	3559410

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.270	0.10						0.2600	3.77	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191111A**	QC Batch: **R137536**			PrepDate:			Analyst: **RAB**
Fluoride	2.8	0.048	0.50		mg/L	5	11/11/2019 12:45 PM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191112A**	QC Batch: **R137600**			PrepDate:			Analyst: **RAB**
Sulfate	480	2.0	25		mg/L	50	11/12/2019 06:34 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**MB-R137536_F**	SampType: **MBLK**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **137536**
Client ID:	**PBW**	Batch ID: **R137536**	TestNo: **EPA 300.0**		Analysis Date:	**11/11/2019**	SeqNo: **3568765**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID	**LCS-R137536_F**	SampType: **LCS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **137536**
Client ID:	**LCSW**	Batch ID: **R137536**	TestNo: **EPA 300.0**		Analysis Date:	**11/11/2019**	SeqNo: **3568766**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.224	0.10	1.250	0	97.9	90	110				

Sample ID	**N038176-001BDUP**	SampType: **DUP**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **137536**
Client ID:	**ZZZZZZ**	Batch ID: **R137536**	TestNo: **EPA 300.0**		Analysis Date:	**11/11/2019**	SeqNo: **3568769**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.139	0.50						2.096	2.01	20	

Sample ID	**N038176-001BMS**	SampType: **MS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **137536**
Client ID:	**ZZZZZZ**	Batch ID: **R137536**	TestNo: **EPA 300.0**		Analysis Date:	**11/11/2019**	SeqNo: **3568770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.269	0.50	6.250	2.096	98.8	80	120				

Sample ID	**N038176-001BMSD**	SampType: **MSD**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **137536**
Client ID:	**ZZZZZZ**	Batch ID: **R137536**	TestNo: **EPA 300.0**		Analysis Date:	**11/11/2019**	SeqNo: **3568771**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.377	0.50	6.250	2.096	100	80	120	8.268	1.30	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R137600_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	137600
Client ID:	PBW	Batch ID:	R137600	TestNo:	EPA 300.0			Analysis Date:	11/12/2019	SeqNo:	3571811

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	LCS-R137600_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	137600
Client ID:	LCSW	Batch ID:	R137600	TestNo:	EPA 300.0			Analysis Date:	11/12/2019	SeqNo:	3571812

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.929	0.50	4.000	0	98.2	90	110				

Sample ID	N038148-004CMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	137600
Client ID:	ZZZZZZ	Batch ID:	R137600	TestNo:	EPA 300.0			Analysis Date:	11/12/2019	SeqNo:	3571824

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	108.841	5.0	40.00	71.88	92.4	80	120				

Sample ID	N038148-004CMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	137600
Client ID:	ZZZZZZ	Batch ID:	R137600	TestNo:	EPA 300.0			Analysis Date:	11/12/2019	SeqNo:	3571825

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	109.311	5.0	40.00	71.88	93.6	80	120	108.8	0.431	20	

Sample ID	N038196-008CDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	137600
Client ID:	ZZZZZZ	Batch ID:	R137600	TestNo:	EPA 300.0			Analysis Date:	11/12/2019	SeqNo:	3571827

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	113.103	5.0						113.7	0.533	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **N038148-011CMS**	SampType: **MS**	TestCode: **300_W_SO4P**	Units: **mg/L**	Prep Date:				RunNo: **137600**			
Client ID: **ZZZZZZ**	Batch ID: **R137600**	TestNo: **EPA 300.0**		Analysis Date: **11/12/2019**				SeqNo: **3571828**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	60.085	2.5	20.00	40.30	98.9	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-595
Lab Order:	N038162	**Collection Date:**	11/5/2019 9:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038162-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_191114G**	QC Batch: **R137637**			PrepDate:			Analyst: **RAB**
Nitrate/Nitrite as N	2.9	0.16	0.25		mg/L	5	11/14/2019

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038162
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID	MB-R137637	SampType:	MBLK	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	137637		
Client ID:	PBW	Batch ID:	R137637	TestNo:	SM4500-NO3			Analysis Date:	11/14/2019	SeqNo:	3572744		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Nitrate/Nitrite as N	ND	0.050											

Sample ID	LCS-R137637	SampType:	LCS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	137637		
Client ID:	LCSW	Batch ID:	R137637	TestNo:	SM4500-NO3			Analysis Date:	11/14/2019	SeqNo:	3572745		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Nitrate/Nitrite as N	0.497	0.050	0.5000	0	99.3	90	110						

Sample ID	N038162-002DDUP	SampType:	DUP	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	137637		
Client ID:	ZZZZZZ	Batch ID:	R137637	TestNo:	SM4500-NO3			Analysis Date:	11/14/2019	SeqNo:	3572748		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Nitrate/Nitrite as N	2.946	0.25						2.881	2.23	10			

Sample ID	N038176-001CMS	SampType:	MS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	137637		
Client ID:	ZZZZZZ	Batch ID:	R137637	TestNo:	SM4500-NO3			Analysis Date:	11/14/2019	SeqNo:	3572750		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Nitrate/Nitrite as N	9.592	0.50	5.000	4.401	104	90	110						

Sample ID	N038176-001CMSD	SampType:	MSD	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	137637		
Client ID:	ZZZZZZ	Batch ID:	R137637	TestNo:	SM4500-NO3			Analysis Date:	11/14/2019	SeqNo:	3572751		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Nitrate/Nitrite as N	9.716	0.50	5.000	4.401	106	90	110	9.592	1.28	10			

Qualifiers:

B Analyte detected in the associated Method Blank
ND Not Detected at the Reporting Limit
DO Surrogate Diluted Out
E Value above quantitation range
R RPD outside accepted recovery limits
Calculations are based on raw values
H Holding times for preparation or analysis exceeded
S Spike/Surrogate outside of limits due to matrix interference

CH2MHILL **CHAIN OF CUSTODY RECORD** Page 1 OF 1

Project Name PG&E Topock
Location PG&E Topock
Project Number 880375CH.04.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-595
Turnaround Time 10 Days
Shipping Date: 11/3/2019
COC Number: 595

	Container:	1 Liter Poly	1 Liter Poly	1 Liter Poly	250 ml Poly	1 Liter Poly	1 Liter Poly	500 ml Poly	500 ml Poly	1 Liter Poly			
	Preservatives:	4°C Lab H2SO4	4°C	4°C	4°C	4°C Lab H2SO4	4°C	4°C	4°C	4°C			
	Filtered:	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	Holding Time:	28	7	7	1	28	7	180	180	7			
		AMMONIA (SM4500NH3D)	Anions (E300.0) Fl, SO4	CONDUCTIVITY (E120.1)	E218.6 Lab Filtered	Nitrate/Nitrite (SM4500NO3-E)	TDS (SM2540C)	Total Metals(E200.7 and E200.8)	Total Metals(E200.8) Cr, Mn, Fe	Turbidity (SM2130)		Number of Containers	COMMENTS
SC-100B-WDR-595	11-5-19 9:20 Water			X	X		X		X	X	N038162-01	1	
SC-700B-WDR-595	11-5-19 9:25 Water	X	X	X	X	X	X	X		X	-02	1	
											TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Approved by	Scott O'Donnell	11-5-19 9:30
Sampled by		11-5-19 9:40
Relinquished by		11-5-19 1605
Received by	JULIA BUNDALIAN	11/5/19 1605
Relinquished by	JULIA BUNDALIAN	11/5/19 18:47
Received by	JULIA BUNDALIAN	11/5/19 18:47

Shipping Details
Method of Shipment: ~~FedEx~~ ASSET JOB
On Ice: (yes) / no 4.7°C Jar #2
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:
SC-700B Total metals List:
Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn

Report Copy to
Shawn Duffy
(970) 731-0636

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	11/5/2019	Workorder:	N038162
Rep sample Temp (Deg C):	4.3	IR Gun ID:	2
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	NA	Packing Material Used:	None
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Cr 6+ were lab filtered and then preserved with Ammonium buffer.
Samples for Total Metals were lab preserved with HNO3 and for Ammonia/NO3- with H2SO4.

Checklist Completed By: YR YRJ 11/7/2019

Reviewed By: LG 111019

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

07-Nov-19

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N038162-002A / SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N38162A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Amonia by SM4500NH3D. EDD reqruirement Labspec7 edata.

GSO #: 546848611

		Date/Time			Date/Time
Relinquished by:	YRJ	11/7/2019 17:00	**Received by:**		
Relinquished by:			**Received by:**		

List of Analysts

ASSET Laboratories Work Order: N038162

NAME	TEST METHOD
Claire Ignacio	EPA 200.8
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B
Ria Abes	EPA 218.6, EPA 300.0, SM 4500-NO3F
Diane Jetajobe	EPA 200.7

Enthalpy Analytical
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900

enthalpy.com

Lab Job Number: 315694
Report Level: IV
Report Date: 11/20/2019

Wet Chemistry

Analytical Report *prepared for:*

Andrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Authorized for release by:

Patrick McCarthy, Project Manager
(510) 204-2236 ext 13115
patrick.mccarthy@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 2896, NELAP# 4044-001

ENTHALPY ANALYTICAL

Sample Summary

Andrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Lab Job Number: 315694
Date Received: 11/08/19

Sample ID	Lab ID	Collected	Matrix
N038162-002A / SC-700B-WDR-595	315694-001	11/05/19 09:25	Water

Case Narrative

WET CHEMISTRY (SM4500NH3-D)

ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118
Andrea Gallardo

Lab Job Number: 315694
Date Received: 11/08/19

This data package contains sample and QC results for one water sample, requested for the above referenced project on 11/08/19. See attached cooler receipt form for any sample receipt problems or discrepancies.

Ammonia Nitrogen (SM4500NH3-D):
No analytical problems were encountered.

315694

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

07-Nov-19

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N038162-002A / SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N38162A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Amonia by SM4500NH3D. EDD reqruirement Labspec7 edata.

GSO #: 546848611

		Date/Time			Date/Time
Relinquished by:	YRJ	11/7/2019 17:00	**Received by:**		11/8/19 1012
Relinquished by:			**Received by:**		

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 315694 Client: ASSET LABS

Date Received: 11/8/19 Project: _____

ENTHALPY

Section 2: Shipping info (if applicable) GSO #546841961

Are custody seals present? ☒ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: _____ How many _____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☒ N/A

Samples received in a cooler? ☒ Yes, how many? 1 ☐ No (**skip Section 3 below**)

If no cooler Sample Temp (°C): _____ using IR Gun # ☐ B, or ☐ C

☐ Samples received on ice directly from the field. Cooling process had begun

If in cooler: Date Opened 11/8/19 By (print) RV (sign) R

Section 3: ***Important*: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) _____

☐ Bubble Wrap, ☐ Foam blocks, ☒ Bags, ☐ None, ☐ Cloth material, ☐ Cardboard, ☐ Styrofoam, ☐ Paper towels

☐ Samples received on ice directly from the field. Cooling process had begun

Type of ice used : ☒ Wet, ☐ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☒ No

Temperature measured using ☐ Thermometer ID: _____, or IR Gun # ☐ B ☒ C

Cooler Temp (°C): #1: 1.2, #2: _____, #3: _____, #4: _____, #5: _____, #6: _____, #7: _____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	✓		
Were Method 5035 sampling containers present?		✓	
If YES, what time were they transferred to freezer? _____			
Did all bottles arrive unbroken/unopened?	✓		
Are there any missing / extra samples?		✓	
Are samples in the appropriate containers for indicated tests?	✓		
Are sample labels present, in good condition and complete?	✓		
Does the container count match the COC?	✓		
Do the sample labels agree with custody papers?	✓		
Was sufficient amount of sample sent for tests requested?	✓		
Did you change the hold time in LIMS for unpreserved VOAs?			✓
Did you change the hold time in LIMS for preserved terracores?			✓
Are bubbles > 6mm present in VOA samples?			✓
Was the client contacted concerning this sample delivery?		✓	
If YES, who was called? _____ By _____ Date: _____			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (if N/A, skip the rest of section 5)	✓		
Did you check preservatives for all bottles for each sample?	✓		
Did you document your preservative check?	✓		

pH strip lot# 80BDH2891, pH strip lot# _____, pH strip lot# _____

Preservative added:

☐ H2SO4 lot# _____ added to samples _____ on/at _____

☐ HCL lot# _____ added to samples _____ on/at _____

☐ HNO3 lot# _____ added to samples _____ on/at _____

☐ NaOH lot# _____ added to samples _____ on/at _____

Section 6:

Explanations/Comments: _____

Date Logged in 11/8/19 **By (print)** RV **(sign)** R

Date Labeled 11/8/19 **By (print)** RV **(sign)** R

ENTHALPY ANALYTICAL

Ammonia Nitrogen

Lab #: 315694 **Project#:** STANDARD

Client: ASSET LABS **Location:**

Field ID:	N038162-002A / SC-700B-WDR-595	**Diln Fac:**	1.000	**Prepared:**	11/18/19 10:25
Type:	SAMPLE	**Batch#:**	276169	**Analyzed:**	11/18/19 12:00
Lab ID:	315694-001	**Sampled:**	11/05/19 09:25	**Prep:**	SM4500NH3-B
Matrix:	Water	**Received:**	11/08/19	**Analysis:**	SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	**0.14**	0.10	0.020	mg/L

Type:	BLANK	**Diln Fac:**	1.000	**Analyzed:**	11/18/19 12:00
Lab ID:	QC999183	**Batch#:**	276169	**Prep:**	SM4500NH3-B
Matrix:	Water	**Prepared:**	11/18/19 10:25	**Analysis:**	SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	ND	0.10	0.020	mg/L

Legend

MDL: Method Detection Limit

ND: Not Detected at or above MDL

RL: Reporting Limit

ENTHALPY ANALYTICAL

Ammonia Nitrogen: Batch QC

Lab #: 315694 **Project#:** STANDARD

Client: ASSET LABS **Location:**

Type: LCS **Diln Fac:** 1.000 **Analyzed:** 11/18/19 12:00

Lab ID: QC999184 **Batch#:** 276169 **Prep:** SM4500NH3-B

Matrix: Water **Prepared:** 11/18/19 10:25 **Analysis:** SM4500NH3-D

Analyte	Spiked	Result	%REC	Limits	Units
Ammonia-N	5.000	4.200	84	80-120	mg/L

Field ID: N038162-002A / SC-700B-WDR-595 **Diln Fac:** 1.000 **Analyzed:** 11/18/19 12:00

Type: MS **Batch#:** 276169 **Prep:** SM4500NH3-B

MSS Lab ID: 315694-001 **Sampled:** 11/05/19 09:25 **Analysis:** SM4500NH3-D

Lab ID: QC999185 **Received:** 11/08/19

Matrix: Water **Prepared:** 11/18/19 10:25

Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
Ammonia-N	0.1400	5.000	4.400	85	28-120	mg/L

Field ID: N038162-002A / SC-700B-WDR-595 **Diln Fac:** 1.000 **Analyzed:** 11/18/19 12:00

Type: MSD **Batch#:** 276169 **Prep:** SM4500NH3-B

MSS Lab ID: 315694-001 **Sampled:** 11/05/19 09:25 **Analysis:** SM4500NH3-D

Lab ID: QC999186 **Received:** 11/08/19

Matrix: Water **Prepared:** 11/18/19 10:25

Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
Ammonia-N	5.000	4.500	87	28-120	mg/L	2	30

Legend

RPD: Relative Percent Difference

November 06, 2019

Shawn P. Duffy
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (530) 229-3303
FAX: (530) 339-3303

Workorder No.: N038163

RE: PG&E Topock, 680375CH.04.IM.OP.00

Attention: Shawn P. Duffy

Enclosed are the results for sample(s) received on November 05, 2019 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Liu for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N038163

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed past method holding time. pH testing is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N038163
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N038163-001A	SC-100B-WDR-595	Water	11/5/2019 9:20:00 AM	11/5/2019	11/6/2019
N038163-002A	SC-700B-WDR-595	Water	11/5/2019 9:25:00 AM	11/5/2019	11/6/2019

CLIENT: CH2M HILL
Lab Order: N038163
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab ID: N038163-001

Client Sample ID: SC-100B-WDR-595
Collection Date: 11/5/2019 9:20:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PH							
			SM4500-H+B				
RunID: **NV00922-WC_191106A**	QC Batch: **R137411**			PrepDate:			Analyst: **LR**
pH	7.3	0.10	0.10	H	pH Units	1	11/6/2019 09:40 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	1	11/6/2019 09:40 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Lab Order: N038163
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab ID: N038163-002

Client Sample ID: SC-700B-WDR-595
Collection Date: 11/5/2019 9:25:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PH							
			SM4500-H+B				
RunID: **NV00922-WC_191106A**	QC Batch: **R137411**			PrepDate:			Analyst: **LR**
pH	7.1	0.10	0.10	H	pH Units	1	11/6/2019 09:40 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	1	11/6/2019 09:40 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038163
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 150.1_4500H+B_W

Sample ID	**N038163-001ADUP**	SampType:	**DUP**	TestCode:	**150.1_4500H**	Units:	**pH Units**	Prep Date:		RunNo:	**137411**
Client ID:	**ZZZZZZ**	Batch ID:	**R137411**	TestNo:	**SM4500-H+B**			Analysis Date:	**11/6/2019**	SeqNo:	**3559255**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.270	0.10						7.260	0.138	10	H
Temp. at time of pH Analysis	25.000	0.10						25.00	0	10	H

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CH2MHILL **CHAIN OF CUSTODY RECORD** Page 1 OF 1

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375CH.04.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-595
Turnaround Time 1 Days
Shipping Date: 11/3/2019
COC Number: 595-IM3

Container: 250 ml Poly
Preservatives: 4°C
Filtered: NA
Holding Time: 5 minutes

	DATE	TIME	Matrix	pH		Number of Containers	COMMENTS
SC-100B-WDR-595	11-5-19	9:10	Water	X	N038163-01	1	7.28
SC-700B-WDR-595	11-5-19	9:25	Water	X	-02	1	7.26
					TOTAL NUMBER OF CONTAINERS	2	

Signatures		Date/Time
Approved by	Scott O'Donnell	11-5-19 9:30
Sampled by		11-5-19 9:40
Relinquished by		11-5-19 1605
Received by	JULIA BUNDALIAN	11/5/19 1605
Relinquished by	JULIA BUNDALIAN	11/5/19 18:47
Received by	JULIA BUNDALIAN	11/5/19 18:47

Shipping Details
Method of Shipment: ~~FedEx~~ AIRNET 028
On Ice: yes / no 4.7°C IR#2
Airbill No:
Lab Name: IM3-Plant
Lab Phone:

ATTN:
Sample Custody

Special Instructions:
SC-700B Total metals List:
Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn

Report Copy to
Shawn Duffy
(970) 731-0636

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	11/5/2019	Workorder:	N038163
Rep sample Temp (Deg C):	4.3	IR Gun ID:	2

Temp Blank: ☑ Yes ☐ No

Carrier name: ASSET

Last 4 digits of Tracking No.: NA Packing Material Used: None

Cooling process: ☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☐	No ☑	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☐	NA ☑
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments:

Checklist Completed By: YR YRJ 11/6/2019

Reviewed By: 11/6/2019

List of Analysts

ASSET Laboratories Work Order: N038163

NAME	TEST METHOD
Lilia Ramit	SM 4500-H+B

December 17, 2019

Shawn P. Duffy
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (530) 229-3303
FAX: (530) 339-3303

Workorder No.: N038600

RE: PG&E Topock, 680375CH.04.IM.OP.00

Attention: Shawn P. Duffy

Enclosed are the results for sample(s) received on December 03, 2019 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Liburdi for

Puri Romualdo
Laboratory Director

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to Enthalpy Analytical- Berkeley, CA.

Analytical Comments for EPA 200.7:

Dilution was necessary since plasma was extinguished when samples were analyzed at lower dilution.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Iron in QC samples N038637-001A-MS1 and N038637-001A-MSD1 possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

RPD for Matrix Spike (MS) and Matrix Spike Duplicate(MSD) is outside criteria for Iron ; however, the associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 200.8:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N038637-001A-MS and N038637-001A-MSD possibly due to matrix interference. Post Spike (PS) and Dilution Test (DT) were performed however, PS failed acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for SM 4500-NO3F:

RPD for Sample Duplicate N038580-012BDUP is outside criteria; however, the associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET Laboratories

Date: *17-Dec-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab Order: N038600
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N038600-001A	SC-100B-WDR-596	Water	12/3/2019 10:20:00 AM	12/3/2019	12/17/2019
N038600-001B	SC-100B-WDR-596	Water	12/3/2019 10:20:00 AM	12/3/2019	12/17/2019
N038600-001C	SC-100B-WDR-596	Water	12/3/2019 10:20:00 AM	12/3/2019	12/17/2019
N038600-001D	SC-100B-WDR-596	Water	12/3/2019 10:20:00 AM	12/3/2019	12/17/2019
N038600-002A	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019
N038600-002B	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019
N038600-002C	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019
N038600-002D	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019
N038600-002E	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019
N038600-002F	SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	12/3/2019	12/17/2019

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191204B**	QC Batch: **R138022**			PrepDate:			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	12/4/2019 04:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_191204B**	QC Batch: **R138022**			PrepDate:			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	12/4/2019 04:00 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID	**N038600-001ADUP**	SampType: **DUP**	TestCode: **120.1_WPGE**	Units: **umhos/cm**	Prep Date:	RunNo: **138022**
Client ID:	**ZZZZZZ**	Batch ID: **R138022**	TestNo: **EPA 120.1**		Analysis Date: **12/4/2019**	SeqNo: **3593660**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7500.000	0.10						7510	0.133	2	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191205P**	QC Batch: **76361**				PrepDate:	**12/5/2019**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4400	50	50		mg/L	1	12/5/2019 01:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_191205P**	QC Batch: **76361**				PrepDate:	**12/5/2019**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4600	50	50		mg/L	1	12/5/2019 01:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	LCS-76361	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/5/2019	RunNo:	138116
Client ID:	LCSW	Batch ID:	76361	TestNo:	SM2540C			Analysis Date:	12/5/2019	SeqNo:	3599199

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	979.000	10	1000	0	97.9	80	120				

Sample ID	MB-76361	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/5/2019	RunNo:	138116
Client ID:	PBW	Batch ID:	76361	TestNo:	SM2540C			Analysis Date:	12/5/2019	SeqNo:	3599200

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	ND	10									

Sample ID	N038580-012ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/5/2019	RunNo:	138116
Client ID:	ZZZZZZ	Batch ID:	76361	TestNo:	SM2540C			Analysis Date:	12/5/2019	SeqNo:	3599203

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	18100.000	200						17420	3.83	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191209A**	QC Batch: **76372**			PrepDate:	**12/6/2019**		Analyst: **DJ**
Iron	ND	89	100		µg/L	5	12/9/2019 04:38 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_191209A**	QC Batch: **76372**				PrepDate:	**12/6/2019**	Analyst: **DJ**
Aluminum	ND	200	250		µg/L	5	12/9/2019 05:03 PM
Boron	1400	370	500		µg/L	5	12/9/2019 05:03 PM
Iron	ND	89	100		µg/L	5	12/9/2019 05:03 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-76372**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/6/2019**	RunNo: **138172**
Client ID: **PBW**	Batch ID: **76372**	TestNo: **EPA 200.7**		Analysis Date: **12/9/2019**	SeqNo: **3601208**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									
Boron	ND	100									
Iron	ND	20									

Sample ID **LCS1-76372**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/6/2019**	RunNo: **138172**
Client ID: **LCSW**	Batch ID: **76372**	TestNo: **EPA 200.7**		Analysis Date: **12/9/2019**	SeqNo: **3601209**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10125.347	50	10000	0	101	85	115				
Boron	4756.792	100	5000	0	95.1	85	115				
Iron	95.744	20	100.0	0	95.7	85	115				

Sample ID **N038637-001A-MS1**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/6/2019**	RunNo: **138172**
Client ID: **ZZZZZZ**	Batch ID: **76372**	TestNo: **EPA 200.7**		Analysis Date: **12/9/2019**	SeqNo: **3601213**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10210.020	250	10000	0	102	75	125				
Boron	6783.204	500	5000	1672	102	75	125				
Iron	325.314	100	100.0	255.2	70.1	75	125				S

Sample ID **N038637-001A-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/6/2019**	RunNo: **138172**
Client ID: **ZZZZZZ**	Batch ID: **76372**	TestNo: **EPA 200.7**		Analysis Date: **12/9/2019**	SeqNo: **3601214**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10933.437	250	10000	0	109	75	125	10210	6.84	20	
Boron	7222.170	500	5000	1672	111	75	125	6783	6.27	20	
Iron	499.530	100	100.0	255.2	244	75	125	325.3	42.2	20	SR

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out
- Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	**N038637-001A-PS**	SampType: **PS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date:	RunNo: **138172**
Client ID:	**ZZZZZZ**	Batch ID: **76372**	TestNo: **EPA 200.7**		Analysis Date: **12/9/2019**	SeqNo: **3601212**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10268.411	250	10000	0	103	80	120				
Boron	6834.201	500	5000	1672	103	80	120				
Iron	310.763	100	100.0	255.2	55.6	80	120				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191209B**	QC Batch: **76374**			PrepDate:	**12/7/2019**		Analyst: **CEI**
Manganese	ND	0.26	0.50		µg/L	1	12/9/2019 06:38 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191209B**	QC Batch: **76374**				PrepDate:	**12/7/2019**	Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	12/9/2019 06:52 PM
Arsenic	ND	0.081	0.10		µg/L	1	12/9/2019 06:52 PM
Barium	23	0.15	1.0		µg/L	1	12/9/2019 06:52 PM
Copper	ND	0.55	1.0		µg/L	1	12/9/2019 06:52 PM
Lead	ND	0.13	1.0		µg/L	1	12/9/2019 06:52 PM
Manganese	ND	0.26	0.50		µg/L	1	12/9/2019 06:52 PM
Molybdenum	21	0.21	0.50		µg/L	1	12/9/2019 06:52 PM
Nickel	1.9	0.26	1.0		µg/L	1	12/9/2019 06:52 PM
Zinc	ND	2.3	10		µg/L	1	12/9/2019 06:52 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-76374**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/7/2019**	RunNo: **138163**
Client ID: **PBW**	Batch ID: **76374**	TestNo: **EPA 200.8**		Analysis Date: **12/9/2019**	SeqNo: **3600956**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **LCS-76374**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/7/2019**	RunNo: **138163**
Client ID: **LCSW**	Batch ID: **76374**	TestNo: **EPA 200.8**		Analysis Date: **12/9/2019**	SeqNo: **3600957**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.218	0.50	10.00	0	102	85	115				
Arsenic	10.450	0.10	10.00	0	104	85	115				
Barium	10.497	1.0	10.00	0	105	85	115				
Copper	9.170	1.0	10.00	0	91.7	85	115				
Lead	9.898	1.0	10.00	0	99.0	85	115				
Manganese	103.657	0.50	100.0	0	104	85	115				
Molybdenum	10.356	0.50	10.00	0	104	85	115				
Nickel	10.232	1.0	10.00	0	102	85	115				
Zinc	10.116	10	10.00	0	101	85	115				

Sample ID **N038637-001A-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/7/2019**	RunNo: **138163**
Client ID: **ZZZZZZ**	Batch ID: **76374**	TestNo: **EPA 200.8**		Analysis Date: **12/9/2019**	SeqNo: **3600969**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N038637-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3600969

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.528	0.50	10.00	0	105	75	125				
Arsenic	13.020	0.10	10.00	2.400	106	75	125				
Barium	142.144	1.0	10.00	132.1	100	75	125				
Copper	ND	1.0	10.00	0	0	75	125				S
Molybdenum	118.272	0.50	10.00	106.7	116	75	125				
Nickel	8.928	1.0	10.00	0	89.3	75	125				
Zinc	2.489	10	10.00	0	24.9	75	125				S

Sample ID	N038637-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3600970

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.025	0.50	10.00	0	100	75	125	10.53	4.90	20	
Arsenic	13.087	0.10	10.00	2.400	107	75	125	13.02	0.508	20	
Barium	143.964	1.0	10.00	132.1	119	75	125	142.1	1.27	20	
Copper	ND	1.0	10.00	0	0	75	125	0	0	20	S
Molybdenum	118.256	0.50	10.00	106.7	116	75	125	118.3	0.0142	20	
Nickel	8.813	1.0	10.00	0	88.1	75	125	8.928	1.30	20	
Zinc	2.783	10	10.00	0	27.8	75	125	2.489	0	20	S

Sample ID	N038637-001A-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3600976

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	11.564	5.0	10.00	0	116	75	125				
Manganese	218.189	2.5	100.0	118.3	99.9	75	125				

Qualifiers:

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S Spike/Surrogate outside of limits due to matrix interference
- DO Surrogate Diluted Out

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N038637-001A-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3601416

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	11.623	5.0	10.00	0	116	75	125	11.58	0.357	20	
Manganese	218.652	2.5	100.0	118.3	100	75	125	205.7	6.13	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	**N038637-001A-PS**	SampType: **PS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date:	RunNo: **138163**
Client ID:	**ZZZZZZ**	Batch ID: **76374**	TestNo: **EPA 200.8**		Analysis Date: **12/9/2019**	SeqNo: **3600968**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.923	0.50	10.00	0	109	80	120				
Arsenic	13.069	0.10	10.00	2.400	107	80	120				
Barium	142.267	1.0	10.00	132.1	102	80	120				
Copper	ND	1.0	10.00	0	0	80	120				S
Molybdenum	116.883	0.50	10.00	106.7	102	80	120				
Nickel	8.944	1.0	10.00	0	89.4	80	120				
Zinc	2.719	10	10.00	0	27.2	80	120				S

Sample ID	**N038637-001A-PS**	SampType: **PS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date:	RunNo: **138163**
Client ID:	**ZZZZZZ**	Batch ID: **76374**	TestNo: **EPA 200.8**		Analysis Date: **12/9/2019**	SeqNo: **3600972**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	11.234	5.0	10.00	0	112	80	120				
Manganese	217.146	2.5	100.0	118.3	98.9	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Lab Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00
Lab ID: N038600-001

Client Sample ID: SC-100B-WDR-596
Collection Date: 12/3/2019 10:20:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC				**EPA 218.6**			
RunID: **NV00922-IC7_191204A**	QC Batch: **R138015**			PrepDate:			Analyst: **RAB**
Hexavalent Chromium	460	3.3	20		µg/L	100	12/4/2019 06:38 PM
TOTAL METALS BY ICPMS				**EPA 200.8**			
RunID: **NV00922-ICP7_191209B**	QC Batch: **76374**			PrepDate:	**12/7/2019**		Analyst: **CEI**
Chromium	430	0.65	5.0		µg/L	5	12/9/2019 06:47 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_191204A**	QC Batch: **R138015**			PrepDate:			Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	12/4/2019 05:21 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_191209B**	QC Batch: **76374**			PrepDate:	**12/7/2019**		Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	12/9/2019 06:52 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	MB-76374	SampType:	MBLK	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	PBW	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3601635

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	LCS-76374	SampType:	LCS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	LCSW	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3601636

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.064	1.0	10.00	0	101	85	115				

Sample ID	N038637-001A-MS	SampType:	MS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3601648

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	8.989	1.0	10.00	0	89.9	75	125				

Sample ID	N038637-001A-MSD	SampType:	MSD	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	12/7/2019	RunNo:	138163
Client ID:	ZZZZZZ	Batch ID:	76374	TestNo:	EPA 200.8			Analysis Date:	12/9/2019	SeqNo:	3601649

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.014	1.0	10.00	0	90.1	75	125	8.989	0.280	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R138015	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015		
Client ID:	PBW	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595362		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		ND	0.20										

Sample ID	LCS-R138015	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015		
Client ID:	LCSW	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595363		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		5.177	0.20	5.000	0	104	90	110					

Sample ID	N038609-003AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015		
Client ID:	ZZZZZZ	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595365		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1156.930	20	500.0	654.3	101	90	110					

Sample ID	N038609-003AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015		
Client ID:	ZZZZZZ	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595366		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1162.110	20	500.0	654.3	102	90	110	1157	0.447	20		

Sample ID	N038607-002ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015		
Client ID:	ZZZZZZ	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595373		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		383.190	20						388.6	1.40	20		

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N038600-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015
Client ID:	ZZZZZZ	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595404

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.180	0.20	1.000	0.09390	109	90	110				

Sample ID	N038600-001BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	138015
Client ID:	ZZZZZZ	Batch ID:	R138015	TestNo:	EPA 218.6			Analysis Date:	12/4/2019	SeqNo:	3595406

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	955.390	20	500.0	461.7	98.7	90	110				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:20:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191204C**	QC Batch: **R138023**			PrepDate:			Analyst: **LR**
Turbidity	0.23	0.10	0.10		NTU	1	12/4/2019 04:25 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_191204C**	QC Batch: **R138023**			PrepDate:			Analyst: **LR**
Turbidity	0.14	0.10	0.10		NTU	1	12/4/2019 04:25 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	**MB-R138023**	SampType:	**MBLK**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**138023**
Client ID:	**PBW**	Batch ID:	**R138023**	TestNo:	**SM 2130B**			Analysis Date:	**12/4/2019**	SeqNo:	**3593675**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	**N038600-001ADUP**	SampType:	**DUP**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**138023**
Client ID:	**ZZZZZZ**	Batch ID:	**R138023**	TestNo:	**SM 2130B**			Analysis Date:	**12/4/2019**	SeqNo:	**3593677**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.230	0.10						0.2300	0	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191210A**	QC Batch: **R138222**			PrepDate:			Analyst: **RAB**
Fluoride	2.5	0.048	0.50		mg/L	5	12/10/2019 11:02 AM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_191210A**	QC Batch: **R138222**			PrepDate:			Analyst: **RAB**
Sulfate	500	2.0	25		mg/L	50	12/10/2019 10:46 AM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**MB-R138222_F**	SampType: **MBLK**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **138222**
Client ID:	**PBW**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date:	**12/10/2019**	SeqNo: **3605198**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID	**LCS-R138222_F**	SampType: **LCS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **138222**
Client ID:	**LCSW**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date:	**12/10/2019**	SeqNo: **3605199**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.217	0.10	1.250	0	97.3	90	110				

Sample ID	**N038580-008AMS**	SampType: **MS**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **138222**
Client ID:	**ZZZZZZ**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date:	**12/10/2019**	SeqNo: **3605212**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.906	0.50	6.250	3.042	93.8	80	120				

Sample ID	**N038580-008AMSD**	SampType: **MSD**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **138222**
Client ID:	**ZZZZZZ**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date:	**12/10/2019**	SeqNo: **3605213**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	9.061	0.50	6.250	3.042	96.3	80	120	8.906	1.73	20	

Sample ID	**N038580-008ADUP**	SampType: **DUP**	TestCode: **300_W_FPGE**	Units: **mg/L**	Prep Date:		RunNo: **138222**
Client ID:	**ZZZZZZ**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date:	**12/10/2019**	SeqNo: **3605216**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	3.089	0.50						3.042	1.55	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R138222_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	138222
Client ID:	PBW	Batch ID:	R138222	TestNo:	EPA 300.0			Analysis Date:	12/10/2019	SeqNo:	3605297

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	LCS-R138222_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	138222
Client ID:	LCSW	Batch ID:	R138222	TestNo:	EPA 300.0			Analysis Date:	12/10/2019	SeqNo:	3605298

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.950	0.50	4.000	0	98.8	90	110				

Sample ID	N038675-006CDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	138222
Client ID:	ZZZZZZ	Batch ID:	R138222	TestNo:	EPA 300.0			Analysis Date:	12/10/2019	SeqNo:	3605305

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	205.990	10						207.8	0.895	20	

Sample ID	N038675-006CMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	138222
Client ID:	ZZZZZZ	Batch ID:	R138222	TestNo:	EPA 300.0			Analysis Date:	12/10/2019	SeqNo:	3605306

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	287.130	10	80.00	207.8	99.1	80	120				

Sample ID	N038675-006CMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	138222
Client ID:	ZZZZZZ	Batch ID:	R138222	TestNo:	EPA 300.0			Analysis Date:	12/10/2019	SeqNo:	3605307

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	286.376	10	80.00	207.8	98.2	80	120	287.1	0.263	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **N038675-007CMS**	SampType: **MS**	TestCode: **300_W_SO4P**	Units: **mg/L**	Prep Date:				RunNo: **138222**			
Client ID: **ZZZZZZ**	Batch ID: **R138222**	TestNo: **EPA 300.0**		Analysis Date: **12/10/2019**				SeqNo: **3605311**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	289.198	10	80.00	207.5	102	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-596
Lab Order:	N038600	**Collection Date:**	12/3/2019 10:25:00 AM
Project:	PG&E Topock, 680375CH.04.IM.OP.00	**Matrix:**	WATER
Lab ID:	N038600-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_191211B**	QC Batch: **R138234**			PrepDate:			Analyst: **RAB**
Nitrate/Nitrite as N	2.7	0.16	0.25		mg/L	5	12/11/2019 07:58 PM

Qualifiers:

B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out
E	Value above quantitation range
ND	Not Detected at the Reporting Limit
	Results are wet unless otherwise specified

CLIENT: CH2M HILL
Work Order: N038600
Project: PG&E Topock, 680375CH.04.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R138234**	SampType: **MBLK**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:		RunNo: **138234**
Client ID: **PBW**	Batch ID: **R138234**	TestNo: **SM4500-NO3**		Analysis Date: **12/11/2019**		SeqNo: **3606303**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	ND	0.050									

Sample ID **LCS-R138234**	SampType: **LCS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:		RunNo: **138234**
Client ID: **LCSW**	Batch ID: **R138234**	TestNo: **SM4500-NO3**		Analysis Date: **12/11/2019**		SeqNo: **3606304**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.487	0.050	0.5000	0	97.4	85	115				

Sample ID **N038580-012BDUP**	SampType: **DUP**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:		RunNo: **138234**
Client ID: **ZZZZZZ**	Batch ID: **R138234**	TestNo: **SM4500-NO3**		Analysis Date: **12/11/2019**		SeqNo: **3606306**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.096	0.050						0.1193	21.6	20	R

Sample ID **N038610-005BMS**	SampType: **MS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:		RunNo: **138234**
Client ID: **ZZZZZZ**	Batch ID: **R138234**	TestNo: **SM4500-NO3**		Analysis Date: **12/11/2019**		SeqNo: **3606308**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	1.024	0.050	0.5000	0.5450	95.8	75	125				

Sample ID **N038610-005BMSD**	SampType: **MSD**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:		RunNo: **138234**
Client ID: **ZZZZZZ**	Batch ID: **R138234**	TestNo: **SM4500-NO3**		Analysis Date: **12/11/2019**		SeqNo: **3606309**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	1.135	0.050	0.5000	0.5450	118	75	125	1.024	10.3	20	

Qualifiers:

- B Analyte detected in the associated Method Blank
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375CH.04.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-596
Turnaround Time 10 Days
Shipping Date:
COC Number: 596

	Container:	1 Liter Poly	1 Liter Poly	1 Liter Poly	250 ml Poly	1 Liter Poly	1 Liter Poly	500 ml Poly	500 ml Poly	1 Liter Poly			
	Preservatives:	4°C Lab H2SO4	4°C	4°C	4°C	4°C Lab H2SO4	4°C	4°C	4°C	4°C			
	Filtered:	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	Holding Time:	28	7	7	1	28	7	180	180	7			
		AMMONIA (SM4500NH3D)	Anions (E300.0) Fl, SO4	CONDUCTIVITY (E120.1)	E218.6 Lab Filtered	Nitrate/Nitrite (SM4500NO3-E)	TDS (SM2540C)	Total Metals(E200.7 and E200.8)	Total Metals(E200.8) Cr, Mn, Fe	Turbidity (SM2130)		Number of Containers	COMMENTS
SC-100B-WDR-596	12-3-19 10:20 Water			X	X		X		X	X	N038600-01	3	PH 7.17
SC-700B-WDR-596	12-3-19 10:25 Water	X	X	X	X	X	X	X		X	-02	4	PH 6.97
											TOTAL NUMBER OF CONTAINERS	7	

Signatures		Date/Time
Approved by	Scott O'Donnell	12-3-19 1030
Sampled by		12-3-19 10:30
Relinquished by	Scott O'Donnell	12-3-19 1415
Received by	Mario Bundalian	12/3/19 1415
Relinquished by	Mario Bundalian	12/3/19 1844
Received by	Mario Bundalian	12/3/19 1844

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:
4.1°C
IR #2
ICE
Report Copy to
Shawn Duffy
(970) 731-0636

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 12/3/2019 Workorder: N038600

Rep sample Temp (Deg C): 4.1 IR Gun ID: 2

Temp Blank: ☑ Yes ☐ No

Carrier name: ASSET

Last 4 digits of Tracking No.: NA Packing Material Used: None

Cooling process: ☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Cr 6+ were lab filtered and then preserved with Ammonium buffer.
Samples for Total Metals were lab preserved with HNO3 and for Ammonia/NO3- with H2SO4.

Checklist Completed By: YR YRJ 12/10/2019 Reviewed By: MBC 12/12/2019

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

04-Dec-19

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N038600-002A / SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N38600A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD requirement Labspec7 edata.

GSO #: 547167562

	Date/Time		Date/Time
Relinquished by: YRJ	12/4/2019 17:00	Received by:	
Relinquished by:		Received by:	

List of Analysts

ASSET Laboratories Work Order: N038600

NAME	TEST METHOD
Claire Ignacio	EPA 200.8
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B
Ria Abes	EPA 218.6, EPA 300.0, SM 4500-NO3F
Diane Jetajobe	EPA 200.7

Enthalpy Analytical
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900

enthalpy.com

Lab Job Number: 316437
Report Level: IV
Report Date: 12/27/2019

Wet Chemistry

Analytical Report *prepared for:*

Anadrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Authorized for release by:

Patrick McCarthy, Project Manager
(510) 204-2236 ext 13115
patrick.mccarthy@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 2896, NELAP# 4044-001

ENTHALPY ANALYTICAL

Sample Summary

Anadrea Gallardo
ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118

Lab Job #: 316437
Date Received: 12/05/19

Sample ID	Lab ID	Collected	Matrix
N038600-002A/SC-700B-WDR-596	316437-001	12/03/19 10:25	Water

Case Narrative

WET CHEMISTRY (SM4500NH3-D)

ASSET LABS
3151-3153 W Post Road
Las Vegas, NV 89118
Anadrea Gallardo

Lab Job Number: 316437
Date Received: 12/05/19

This data package contains sample and QC results for one water sample, requested for the above referenced project on 12/07/19. See attached cooler receipt form for any sample receipt problems or discrepancies.

Ammonia Nitrogen (SM4500NH3-D):

Ammonia-N was detected between the MDL and the RL in the method blank for batch 276805; this analyte was not detected in the sample at or above the RL.

No other analytical problems were encountered.

316437

ASSET Laboratories
3151-3153 W Post Rd., Las Vegas, NV 89118
www.atl-labs.com
TEL: 7023072659 *FAX: 7023072691*

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Enthalpy Analytical
2323 5th St
Berkeley, CA 94710

TEL: (510) 486-0900
FAX:
Acct #:

Field Sampler: SIGNED

04-Dec-19

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N038600-002A / SC-700B-WDR-596	Water	12/3/2019 10:25:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM. Please cc andrea.gallardo@assetlaboratories.com

Please use PO#:N38600A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD requirement Labspec7 edata.

GSO #: 547167562

		Date/Time		Date/Time
Relinquished by:	YRJ	12/4/2019 17:00	**Received by:**	
Relinquished by:			**Received by:**	

SAMPLE RECEIPT CHECKLIST

Section 1: Login # 316437 Client: ASSET Labs

Date Received: 12-5 Project: _____

Section 2: Shipping info (if applicable) _____

Are custody seals present? ☒ No, or ☐ Yes. If yes, where? ☐ on cooler, ☐ on samples, ☐ on package

☐ Date: _____ How many _____ ☐ Signature, ☐ Initials, ☐ None

Were custody seals intact upon arrival? ☐ Yes ☐ No ☐ N/A

Samples received in a cooler? ☒ Yes, how many? 1 ☐ No (**skip Section 3 below**)

If no cooler Sample Temp (°C): _____ using IR Gun # ☐ B, or ☐ C

☐ Samples received on ice directly from the field. Cooling process had begun

If in cooler: Date Opened 12-5 By (print) JH (sign) _____

Section 3: ***Important*** **: Notify PM if temperature exceeds 6°C or arrive frozen.**

Packing in cooler: (if other, describe) _____

☐ Bubble Wrap, ☐ Foam blocks, ☒ Bags, ☐ None, ☐ Cloth material, ☐ Cardboard, ☐ Styrofoam, ☐ Paper towels

☐ Samples received on ice directly from the field. Cooling process had begun

Type of ice used : ☒ Wet, ☐ Blue/Gel, ☐ None Temperature blank(s) included? ☐ Yes, ☐ No

Temperature measured using ☐ Thermometer ID: _____, or IR Gun # ☒ B ☐ C

Cooler Temp (°C): #1: 3.6, #2: _____, #3: _____, #4: _____, #5: _____, #6: _____, #7: _____

Section 4:	YES	NO	N/A
Were custody papers dry, filled out properly, and the project identifiable	✓		
Were Method 5035 sampling containers present?		✓	
If YES, what time were they transferred to freezer? _____			
Did all bottles arrive unbroken/unopened?	✓		
Are there any missing / extra samples?		✓	
Are samples in the appropriate containers for indicated tests?	✓		
Are sample labels present, in good condition and complete?	✓		
Does the container count match the COC?			✓
Do the sample labels agree with custody papers?	✓		
Was sufficient amount of sample sent for tests requested?	✓		
Did you change the hold time in LIMS for unpreserved VOAs?			✓
Did you change the hold time in LIMS for preserved terracores?			✓
Are bubbles > 6mm present in VOA samples?			✓
Was the client contacted concerning this sample delivery?		✓	
If YES, who was called? _____ By _____ Date: _____			

Section 5:	YES	NO	N/A
Are the samples appropriately preserved? (if N/A, skip the rest of section 5)	✓		
Did you check preservatives for all bottles for each sample?	✓		
Did you document your preservative check?	✓		

pH strip lot# 80BDH289 pH strip lot# _____, pH strip lot# _____

Preservative added:

☐ H2SO4 lot# _____ added to samples _____ on/at _____

☐ HCL lot# _____ added to samples _____ on/at _____

☐ HNO3 lot# _____ added to samples _____ on/at _____

☐ NaOH lot# _____ added to samples _____ on/at _____

Section 6:

Explanations/Comments: _____

Date Logged in 12.7 **By (print)** BM **(sign)** BM

Date Labeled 12.7 **By (print)** BM **(sign)** BM

ENTHALPY ANALYTICAL

Ammonia Nitrogen

Lab #: 316437 **Project#:** STANDARD

Client: ASSET LABS **Location:**

Field ID: N038600-002A/SC-700B-WDR-596 **Diln Fac:** 1.000 **Prepared:** 12/10/19 10:55

Type: SAMPLE **Batch#:** 276805 **Analyzed:** 12/10/19 15:02

Lab ID: 316437-001 **Sampled:** 12/03/19 10:25 **Prep:** SM4500NH3-B

Matrix: Water **Received:** 12/05/19 **Analysis:** SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	**0.18**	0.10	0.020	mg/L

Type: BLANK **Diln Fac:** 1.000 **Analyzed:** 12/10/19 15:02

Lab ID: QC1001874 **Batch#:** 276805 **Prep:** SM4500NH3-B

Matrix: Water **Prepared:** 12/10/19 10:55 **Analysis:** SM4500NH3-D

Analyte	Result	RL	MDL	Units
Ammonia-N	**0.040 J**	0.10	0.020	mg/L

Legend

J: Estimated value

MDL: Method Detection Limit

RL: Reporting Limit

ENTHALPY ANALYTICAL

Ammonia Nitrogen: Batch QC

Lab #: - 17N- 4 **Project#:** STmHAmRA

Client: mSSET LmWS **Location:**

Type: LCS **Diln Fac:** 1.000 **Analyzed:** 1/ 8108 19 12:0/

Lab ID: 5 C1001Q42 **Batch#:** / 47Q02 **Prep:** SMN200H3 - BW

Matrix: a t er D **Prepared:** 1/ 8108 19 10:22 **Analysis:** SMN200H3 - BA

Analyte	Spiked	Result	%REC	Limits	Units
mo o ni g BH	2.000	N.- 00	Q7	Q0B1 / 0	o 68L

Field ID: H0- QN- 4B00/ F8Ma BCB1Q1B1119 **Diln Fac:** 1.000 **Analyzed:** 1/ 8108 19 12:0/

Type: MS **Batch#:** / 47Q02 **Prep:** SMN200H3 - BW

MSS Lab ID: - 17/ / 7B00/ **Sampled:** 118/ 1819 1- :/ Q **Analysis:** SMN200H3 - BA

Lab ID: 5 C1001Q47 **Received:** 118/ 2819

Matrix: a t er D **Prepared:** 1/ 8108 19 10:22

Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
mo o ni g BH	0.1700	2.000	N.- 00	Q-	/ QB1 / 0	o 68L

Field ID: H0- QN- 4B00/ F8Ma BCB1Q1B1119 **Diln Fac:** 1.000 **Analyzed:** 1/ 8108 19 12:0/

Type: MSA **Batch#:** / 47Q02 **Prep:** SMN200H3 - BW

MSS Lab ID: - 17/ / 7B00/ **Sampled:** 118/ 1819 1- :/ Q **Analysis:** SMN200H3 - BA

Lab ID: 5 C1001Q44 **Received:** 118/ 2819

Matrix: a t er D **Prepared:** 1/ 8108 19 10:22

Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
mo o ni g BH	2.000	N.700	Q9	/ QB1 / 0	o 68L	4	- 0

Lr6rid

RPD: RrIteyr PrDcrieAdjfrDicr

Analytical Bench Log Book

WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

	Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1	SC-100B-594	10-1-19	11:25	10-1-19	11:27	HQ440D	10-1-19	0000	-57.84		7.36
	Notes:										
2	~~SC-700~~ SC-700B-594	10-1-19	11:20	10-1-19	11:22	HQ440D	10-1-19	0000	-57.84		7.09
	Notes:										
3	SC-701-594	10-1-19	11:35	10-1-19	11:37	HQ440D	10-1-19	0000	-57.84		7.89
	Notes:										
4	SC-100B-595	11-5-19	9:20	11-5-19	9:22	HQ440D	11-5-19	0000	-54.98		7.29
	Notes:										
5	SC-700B-595	11-5-19	9:25	11-5-19	9:28	HQ440D	11-5-19	0000	-54.98		7.26
	Notes:										
6	FRONT GATE SWPPP #2	11-20-19	0245	11-20-19	0247	HQ440D	11-20-19	0149	-58.35		8.89
	Notes:										
7											
	Notes:										

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

Analytical Bench Log Book

WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

	Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1	SC-100B-596	12-3-19	10:20	12-3-19	10:27	HQ4400	12-3-19	0000	-57.82		7.17
	Notes:										
2	SC-700B-596	12-3-19	10:25	12-3-19	10:29	HQ4400	12-3-19	0000	-57.82		6.97
	Notes:										
3											
	Notes:										
4											
	Notes:										
5											
	Notes:										
6											
	Notes:										
7											
	Notes:										

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4