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January 15, 2019

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Subject: Topock IM-3 Combined Fourth Quarter 2018 Monitoring, Semiannual July – December 2018 and Annual January - December 2018 Operation and Maintenance Report PG&E Topock Compressor Station, Needles, California Interim Measure No. 3 Groundwater Treatment System (Document ID: PGE20190115A)

Dear Ms. Innis and Mr. Stormo:

Enclosed is the Fourth Quarter 2018 Monitoring, Semiannual July – December 2018 and Annual January – December 2018 Operation and Maintenance Report for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Interim Measure No. 3 (IM-3) Groundwater Treatment System.

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 893,036,457 gallons of water and removed approximately 7,570 pounds of total chromium from August 1, 2005 through December 31, 2018.

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:

Topock IM-3 Combined Fourth Quarter 2018 Monitoring, Semiannual July - December 2018, and Annual January - December 2018 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: Topock IM-3 Fourth Quarter 2018 Monitoring, Semiannual July - December 2018 and Annual January – December 2018 Operation and Maintenance Report Submitting Agency/Authored by: U.S. Department of the Interior and Regional Water Quality Control Board Final Document? ☒ Yes ☐ No	Date of Document: January 15, 2019 Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E Document ID Number: PGE20190115A
Priority Status: ☐ HIGH ☐ MED ☒ LOW Is this time critical? ☐ Yes ☒ No Type of Document: ☐ Draft ☒ Report ☐ Letter ☐ Memo ☐ Other / Explain:	Action Required: ☒ Information Only ☐ Review & Comment Return to: _____ By Date:_____ ☐ 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 ☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR) ☒ Interim Measures ☐ Other / Explain:	Is this a Regulatory Requirement? ☒ 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 2018 period, and the operation and maintenance activities during the July 1, 2018 to December 31, 2018 semiannual and the January 1, 2018 to December 31, 2018 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: PG&E

Recommendations:
This report is for your information only.

How is this information related to the Final Remedy or Regulatory Requirements?

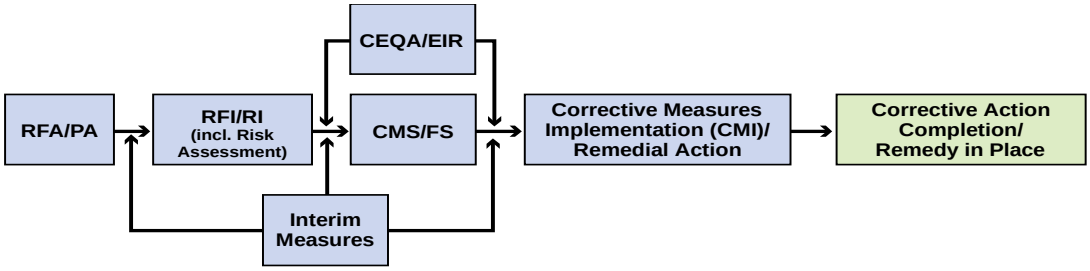
The Topock IM-3 Fourth Quarter 2018 Monitoring, Semiannual July - December 2018 and Annual January – December 2018 Operation and Maintenance Report is related to the Interim Measure. PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (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.

Related Reports and Documents:

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



Legend

RFA/PA – RCRA Facility Assessment/Preliminary Assessment

RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)

CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

CEQA/EIR – California Environmental Quality Act/Environmental Impact Report

Version 9

Combined Fourth Quarter 2018 Monitoring, Semiannual July – December 2018 and Annual January – December 2018 Operation and Maintenance Report Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Document ID: PGE20190115A

January 15, 2019

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

Combined Fourth Quarter 2018 Monitoring, Semiannual July – December 2018, and Annual January – December 2018 Operation and Maintenance Report for Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Prepared for

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and
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on behalf of

Pacific Gas and Electric Company

January 15, 2019

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

Dennis Fink, P.E.
Project Engineer

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B Daily Volumes of Groundwater Treated
C Flowmeter Calibration Records
D Fourth Quarter 2018 Laboratory Analytical Reports

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 2018 and the operation and maintenance (O&M) activities during the July 1, 2018 to December 31, 2018 semiannual period and the January 1, 2018 to December 31, 2018 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 2018 monitoring activities and the July 1, 2018 through December 31, 2018 (Third and Fourth Quarters) O&M activities related to the IM-3 groundwater treatment system. It also serves as the Annual January – December 2018 O&M Report for IM-3. IM-3 monitoring activities from January 1, 2018 through September 30, 2018 (First, Second and Third Quarters) were presented in the following monitoring and O&M reports:

- Topock IM-3 First Quarter 2018 Monitoring Report, submitted to the DOI and Regional Water Board April 15, 2018
- Topock IM-3 Second Quarter 2018 Monitoring and Semi-annual January 1, 2018 through June 30, 2018 Operation and Maintenance Report, submitted to the DOI and Regional Water Board July 15, 2018
- Topock IM-3 Third Quarter 2018 Monitoring Report, submitted to the DOI and Regional Water Board October 15, 2018

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 2018

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 1.5 percent downtime during Fourth Quarter 2018) 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 2018 through September 2018 were originally reported in the *Third Quarter 2018 Monitoring Report for Interim*

Measure No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, CA, published October 15, 2018, 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 2018, 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 2018. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 97.6 percent during October 2018
- 98.5 percent during November 2018
- 97.2 percent during December 2018

The Fourth Quarter 2018 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 17,463,281 gallons of extracted groundwater during Fourth Quarter 2018.

In addition to extracted groundwater, during Fourth Quarter 2018 the IM-3 facility treated 5,885 gallons of water generated from the groundwater monitoring program and 30,000 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 17,570,488 gallons of treatment system effluent during Fourth Quarter 2018. The monthly average flow rate to injection wells is shown in Table 2.

The RO concentrate flow rate was 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). The IM-3 facility generated 55,440 gallons of RO concentrate during Fourth Quarter 2018. 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. Two sludge containers were shipped offsite from the IM-3 facility during Fourth Quarter 2018. 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 2018 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 2018:

- The January 1, 2018 through March 31, 2018 results were included in the First Quarter 2018 Monitoring Report submitted to the DOI and Regional Water Board on April 15, 2018.
- The April 1, 2018 through June 30, 2018 results were included in the Second Quarter 2018 Monitoring Report submitted to the DOI and Regional Water Board on July 15, 2018.
- The July 1, 2018 through September 30, 2018 results were included in the Third Quarter 2018 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2018.

Laboratory reports for samples collected in Fourth Quarter 2018 were prepared by certified analytical laboratories, and are presented in Appendix D. The Fourth Quarter 2018 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 2018, and the results were presented in the Third Quarter 2018 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2018.

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, 2018 through December 31, 2018.

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	6A021F16000	9/16/2015	1/6/2016
Extraction well TW-3D	FIT-102	6C037116000	9/17/2015	1/6/2016
Extraction well TW-2D	FIT-101	6C036F16000	1/15/2016	6/1/2016
Extraction well TW-2S	FIT-100	6A022116000	9/20/2013	7/8/2015
Injection well IW-03	FIT-1203	6C037316000	1/15/2016	3/1/2016
Injection well IW-02	FIT-1202	7700F216000	5/4/2017	8/8/2017
Combined IW-02 and IW-03	FIT-700	L200EO16000	2/5/2016	10/6/2016
Reverse osmosis concentrate	FIT-701	6C037216000	5/6/2016	8/8/2017

5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between July 1, 2018 and December 31, 2018 are provided in Appendix B. The daily volumes of groundwater treated from January 1, 2018 through June 30, 2018 were reported in the Second Quarter 2018 Monitoring Report and Semiannual January 1- June 30, 2018 Operation and Maintenance Report submitted on July 15, 2018.

Approximately 33,390,148 gallons of groundwater were extracted and treated between July 1, 2018 and December 31, 2018. Treatment of this water at the IM-3 facility is being performed in accordance with the conditions of ARARs.

Additionally, approximately 6,585 gallons of well purge water (generated during monitoring well sampling), as well as 30,000 gallons of injection well re-development water, were treated at the IM-3 facility during the July 1, 2018 through December 31, 2018 semiannual period.

A total of approximately 33,475,094 gallons of treated groundwater were injected back into the Alluvial Aquifer between July 1, 2018 and December 31, 2018. 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, 2018 through December 31, 2018 reporting period, four 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, 2018 through December 31, 2018 reporting period is provided below.

Date Sludge Bin Removed from Site	Approximate Quantity from Waste Manifests (cubic yards)	Type of Shipment
8/7/2018	8	Non-RCRA hazardous waste
8/7/2018	8	Non-RCRA hazardous waste
10/24/18	8	Non-RCRA hazardous waste
10/24/18	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). From July 1, 2018 through December 31, 2018, approximately 133,666 gallons of RO concentrate were transported to Liquid Environmental Solutions in Phoenix, Arizona for disposal.

5.5 Summary of ARARs Compliance

No ARAR violations were identified during the July 1, 2018 through December 31, 2018 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, 2018 through December 31, 2018 semiannual reporting period.

Activities during the Third and Fourth Quarters 2018 included one extended shutdown:

- **August 6-10, 2018 (planned):** The extraction well system was offline from 6:18 a.m. August 6, 2018 to 6:52 a.m. August 10, 2018 for the semiannual scheduled maintenance. Also, the extraction well system was offline from 9:32 a.m. to 11:26 a.m., from 12:04 p.m. to 4:18 p.m., from 4:40 p.m. to 5:48 p.m., from 6:06 p.m. to 10:32 p.m., and from 10:44 p.m. to 11:52 p.m. on August 10, 2018 as part of the semiannual scheduled maintenance. Plant operators were filling tanks and testing the water before moving on to the next step. Extraction system downtime was 4 days 13 hours 24 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, 2018 through December 31, 2018 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 15, 2019

Tables

Table 1. Sampling Station Descriptions

Fourth Quarter 2018 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 (see 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 (see 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 (see 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 (see 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 2018 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	System Influent[a,b] (gpm)	System Effluent[b] (gpm)	Reverse Osmosis Concentrate[b] (gpm)
October 2018 Average Monthly Flowrate	131.7	132.0	0.6
November 2018 Average Monthly Flowrate	133.1	133.0	0.5
December 2018 Average Monthly Flowrate	131.5[C]	132.9	0.2

Notes:

gpm: gallons per minute

[a] Extraction well TW-3D was operated during the Fourth Quarter 2018. Extraction wells PE-01 and TW-2D were only operated to collect a sample. TW-2S was not operated during Fourth Quarter 2018.

[b] The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Fourth Quarter 2018 is approximately 0.92 percent without the adjusted rate in December (see note c below); with the adjusted rate, it is 0.71 percent.

[c] The larger than normal amount of purge water and well development water during December 2018 (>35,000 gallons) was included in the system influent value shown.

Table 3. Sample Collection Dates

Fourth Quarter 2018 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	Sample Collection Dates	Results
Influent	October 2, 2018 November 6, 2018 December 4, 2018	See Table 4
Effluent	October 2, 2018 November 6, 2018 December 4, 2018	See Table 5
Reverse Osmosis Concentrate	October 2, 2018	See Table 6
Sludge[a]	Composite sample sent to lab October 2, 2018	See Table 7

Note:

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

Table 4. Influent Monitoring Results [a]

Fourth Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Monthly						Quarterly															
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	0.0500	0.160	0.0810	0.150	0.0740	0.550	0.0320	0.130	0.260	0.210	0.260	0.160	1.10	18.0	2.30
Sample ID	Date																						
SC-100B-WDR-579	**10/2/2018**	**4200**	**0.220**	**7900**	**7.5**	**460**	**470**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**2.90**	**28.0**	**1.00 J**	**ND (1.00)**	**2.30**	**ND (1.00)**	**7.50**	**21.0**	**ND (1.00)**	**2.60 J**	**500**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	5.00	20.0	50.0	0.200	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-580	**11/6/2018**	**4600**	**0.210**	**7400**	**7.8**	**520**	**490**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**7.70**	**---**	**---**	**---**	**---**	**---**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---
SC-100B-WDR-581	**12/4/2018**	**4400**	**0.200**	**7500**	**7.2**	**490**	**490**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**7.00**	**---**	**---**	**---**	**---**	**---**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---

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 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sample ID	Date	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
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
	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
Sampling Frequency		Monthly																					
Analytes		TDS	Turbidity	Specific Conductance	Field pH	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	40.0	0.0500	0.160	0.0810	0.150	0.0740	0.550	0.0320	0.130	0.260	0.210	0.260	0.160	1.10	18.0	2.30
SC-700B-WDR-579	**10/2/2018**	**4200**	**0.300**	**7800**	**7.1**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**0.110**	**23.0**	**1.00**	**ND (1.00)**	**2.20**	**ND (1.00)**	**22.0**	**21.0**	**2.60**	**2.80**	**490**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	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-580	**11/6/2018**	**3900**	**0.210**	**7600**	**7.6**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**ND (0.100)**	**13.0**	**1.10 J**	**ND (1.00)J**	**2.20**	**ND (1.00)**	**1.90**	**24.0**	**ND (1.00)**	**2.70**	**490**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	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-581	**12/4/2018**	**4300**	**0.400**	**7500**	**7.0**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**ND (0.100)**	**14.0**	**1.10**	**ND (1.00)J**	**2.40**	**ND (1.00)**	**9.00**	**23.0**	**ND (1.00)**	**2.40**	**500**	**ND (20.0)**	**ND (10.0)J**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	1.00	25.0	20.0	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]

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Sampling Frequency		Quarterly																					
Analytes		TDS	Specific Conductance	pH	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	0.100	0.00065	0.00083	0.00078	0.00041	0.00075	0.0011	0.00026	0.00021	0.0027	0.130	0.0032	0.0011	0.00013	0.0013	0.0018	0.0012	0.0048	0.00028	0.0110
Sample ID	Date																						
SC-701-WDR-579	**10/2/2018**	**43000**	**64000**	**7.9**	**ND (0.0050)**	**ND (0.0050)**	**ND (0.0025)**	**0.00240**	**0.160**	**ND (0.0120)**	**ND (0.0025)**	**ND (0.0025)**	**ND (0.0050)**	**19.0**	**ND (0.0250)**	**0.230**	**ND (0.00020)**	**0.0110**	**0.0490**	**ND (0.0025)**	**ND (0.0120)**	**0.00340**	**ND (0.0500)**
RL		500	0.100	0.1	0.0050	0.0050	0.0025	0.00050	0.0050	0.0120	0.0025	0.0025	0.0050	2.00	0.0250	0.0025	0.00020	0.0050	0.0025	0.0025	0.0120	0.0010	0.0500

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.

Table 7. Sludge Monitoring Results[a]

Fourth Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																		
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		0.620	0.560	0.630	1.00	0.600	0.410	0.510	0.550	1.70	0.270	0.570	0.570	0.0510	0.650	1.10	1.20	0.680	0.430	0.570
Sample ID	Date																			
Phase Separator-579-Sludge	**10/2/2018**	**2800**	**53.0 J**	**18.0**	**19.0**	**64.0**	**ND (1.90)**	**ND (1.90)**	**3.80**	**140**	**22.0**	**ND (1.90)**	**4.60**	**ND (0.190)**	**26.0**	**ND (1.90)**	**ND (1.90)**	**6.80**	**43.0**	**34.0**
RL		1.90	1.90	3.80	1.90	1.90	1.90	1.90	1.90	3.80	3.80	1.90	1.90	0.190	1.90	1.90	1.90	3.80	1.90	1.90

Notes:

(---) = not required by the ARARs Monitoring and Reporting Program
J = concentration or reporting limits estimated by laboratory or validation
mg/kg = milligrams per killogram
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

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-579	Ron Phelps	10/2/2018	9:00:00 AM	ASSET	EPA 120.1	SC	10/3/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	10/11/2018	Quennie Manimtim
					ASSET	EPA 200.7	B	10/15/2018	Quennie Manimtim
					ASSET	EPA 200.7	FE	10/11/2018	Quennie Manimtim
					ASSET	EPA 200.8	AS	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/8/2018	Ria Abes
					ASSET	EPA 300.0	FL	10/9/2018	Ria Abes
					ASSET	EPA 300.0	SO4	10/10/2018	Ria Abes
					ASSET	SM 2540C	TDS	10/3/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/8/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	10/3/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	10/11/2018	JMH
				9:08:00 AM	Field	HACH	PH	10/2/2018	Ron Phelps
SC-100B	SC-100B-WDR-580	Ryan Phelps	11/6/2018	5:00:00 PM	ASSET	EPA 120.1	SC	11/7/2018	Lilia Ramit
					ASSET	EPA 200.8	CR	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	11/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/8/2018	Ria Abes
					ASSET	SM 2540C	TDS	11/7/2018	Lilia Ramit
					ASSET	SM2130B	TRB	11/7/2018	Lilia Ramit
				5:12:00 PM	Field	HACH	PH	11/6/2018	Ryan Phelps
SC-100B	SC-100B-WDR-581	Ryan Phelps	12/4/2018	4:45:00 PM	ASSET	EPA 120.1	SC	12/5/2018	Lilia Ramit
					ASSET	EPA 200.8	CR	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	12/5/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/5/2018	Ria Abes
					ASSET	SM 2540C	TDS	12/5/2018	Lilia Ramit
					ASSET	SM2130B	TRB	12/5/2018	Lilia Ramit
				5:00:00 PM	Field	HACH	PH	12/4/2018	Ryan Phelps
SC-700B	SC-700B-WDR-579	Ron Phelps	10/2/2018	9:02:00 AM	ASSET	EPA 120.1	SC	10/3/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	10/11/2018	Quennie Manimtim

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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-579	Ron Phelps	10/2/2018	9:02:00 AM	ASSET	EPA 200.7	B	10/15/2018	Quennie Manimtim
					ASSET	EPA 200.7	FE	10/11/2018	Quennie Manimtim
					ASSET	EPA 200.8	AS	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/8/2018	Ria Abes
					ASSET	EPA 300.0	FL	10/9/2018	Ria Abes
					ASSET	EPA 300.0	SO4	10/10/2018	Ria Abes
					ASSET	SM 2540C	TDS	10/3/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/8/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	10/3/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	10/11/2018	JMH
				9:10:00 AM	Field	HACH	PH	10/2/2018	Ron Phelps
SC-700B	SC-700B-WDR-580	Ryan Phelps	11/6/2018	5:03:00 PM	ASSET	EPA 120.1	SC	11/7/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	11/20/2018	Claire Ignacio
					ASSET	EPA 200.7	B	11/20/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	11/20/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	11/16/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	11/15/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	11/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/8/2018	Ria Abes
					ASSET	EPA 300.0	FL	11/7/2018	Ria Abes
					ASSET	EPA 300.0	SO4	11/7/2018	Ria Abes
					ASSET	SM 2540C	TDS	11/7/2018	Lilia Ramit

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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-580	Ryan Phelps	11/6/2018	5:03:00 PM	ASSET	SM 4500-NO3F	NO3NO2N	11/9/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	11/7/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	11/15/2018	JMH
				5:11:00 PM	Field	HACH	PH	11/6/2018	Ryan Phelps
SC-700B	SC-700B-WDR-581	Ryan Phelps	12/4/2018	4:45:00 PM	ASSET	EPA 120.1	SC	12/5/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	12/6/2018	Claire Ignacio
					ASSET	EPA 200.7	B	12/6/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	12/6/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	12/7/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	12/5/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	12/5/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/5/2018	Ria Abes
					ASSET	EPA 300.0	FL	12/5/2018	Ria Abes
					ASSET	EPA 300.0	SO4	12/6/2018	Ria Abes
					ASSET	SM 2540C	TDS	12/5/2018	Lilia Ramit
					ASSET	SM2130B	TRB	12/5/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	12/13/2018	JMH
					CEL	SM4500NO3-E	NO3NO2N	12/8/2018	
				4:59:00 PM	Field	HACH	PH	12/4/2018	Ryan Phelps
SC-701	SC-701-WDR-579	Ron Phelps	10/2/2018	9:04:00 AM	ASSET	EPA 120.1	SC	10/3/2018	Lilia Ramit
					ASSET	EPA 200.8	AG	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BE	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CD	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CO	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	10/15/2018	Claire Ignacio

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-701	SC-701-WDR-579	Ron Phelps	10/2/2018	9:04:00 AM	ASSET	EPA 200.8	PB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SE	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	TL	10/15/2018	Claire Ignacio
					ASSET	EPA 200.8	V	10/17/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/8/2018	Ria Abes
					ASSET	EPA 245.1	HG	10/5/2018	Mark Gesmundo
					ASSET	EPA 300.0	FL	10/9/2018	Ria Abes
					ASSET	SM 2540C	TDS	10/3/2018	Lilia Ramit
					ASSET	SM4500-HB	PH	1/14/2019	LR
Phase Separator	Phase Separator-579-Sludge	Ryan Phelps	10/2/2018	7:30:00 AM	ASSET	EPA 300.0	FL	10/8/2018	Ria Abes
					ASSET	EPA 6010B	AG	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	AS	10/4/2018	Claire Ignacio
					ASSET	EPA 6010B	BA	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	BE	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CD	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CO	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CR	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CU	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	MN	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	MO	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	NI	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	PB	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	SB	10/5/2018	Claire Ignacio
					ASSET	EPA 6010B	SE	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	TL	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	V	10/3/2018	Claire Ignacio
					ASSET	EPA 6010B	ZN	10/3/2018	Claire Ignacio
					ASSET	EPA 7471A	HG	10/3/2018	Mark Gesmundo
					ASSET	SW 7199	CR6	10/4/2018	Ria Abes

Table 8. Monitoring Information

Fourth Quarter 2018 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	TLI =	Truesdail Laboratories, Inc.
FETD =	iron, dissolved	TRB =	turbidity
FL =	fluoride	V =	vanadium
HG =	mercury	ZN =	zinc
MN =	manganese		
MND =	manganese, dissolved		

Figures

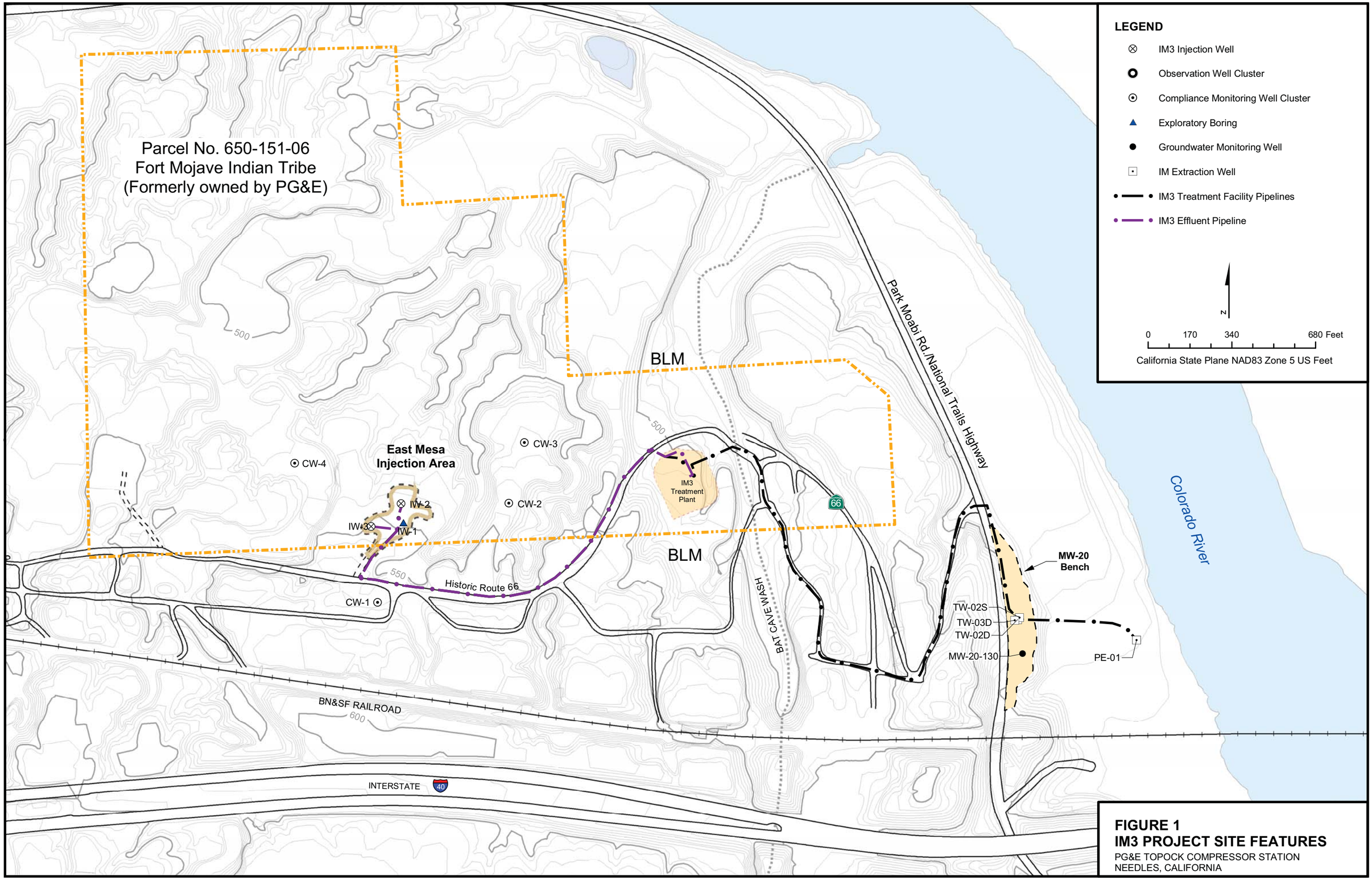
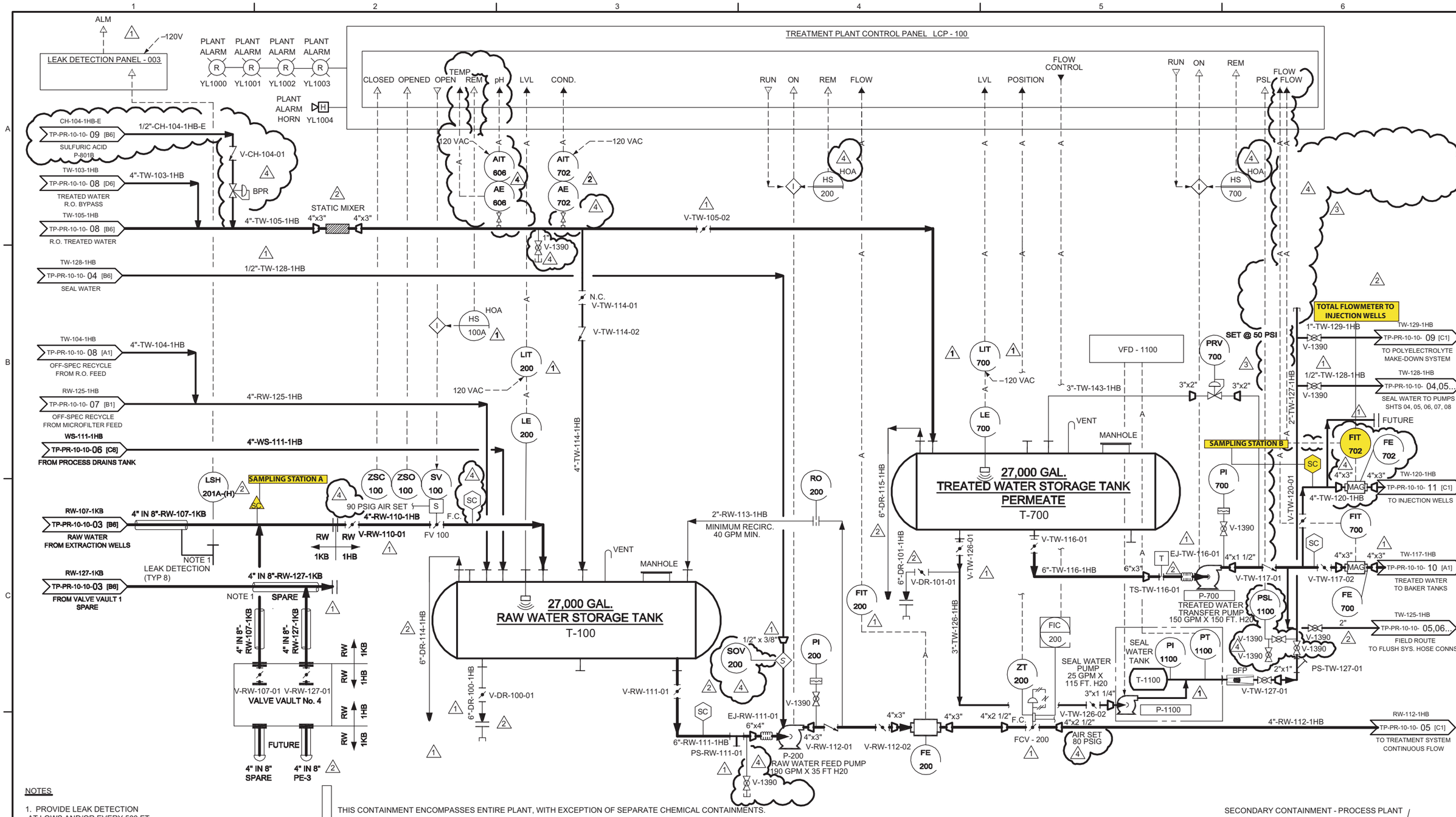


FIGURE 1
IM3 PROJECT SITE FEATURES
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MAPFILES\2010\IM3\IM3_PROJECT_AREA_APRIL10.MXD JLAMANTI 10/8/2010 12:12:30



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NO.	DATE	REVISION	BY	CHK
D	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
3	02/14/05	ADDED RECIRC. LINE AND PRV VALVE TO T-700 - APPROVED FOR CONSTRUCTION	EFC	AJ
4	09/21/05	REVISED PER AS-BUILT CONDITIONS	EFC	AJ

REVISION APPROVAL		REV 4	DATE 09/21/05	PRINT DISTRIBUTION
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
CIVIL		ELECTRICAL		STATUS
STRUCTURAL		INST & CONTROL		REV.
MECHANICAL		ARCHITECTURAL		CLIENT
PROCESS		ENVIRONMENTAL		FIELD
PIPING		GEN. ARRANG.		INTRA CO.

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

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	4	/ /		

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

PROJ NO. 315994

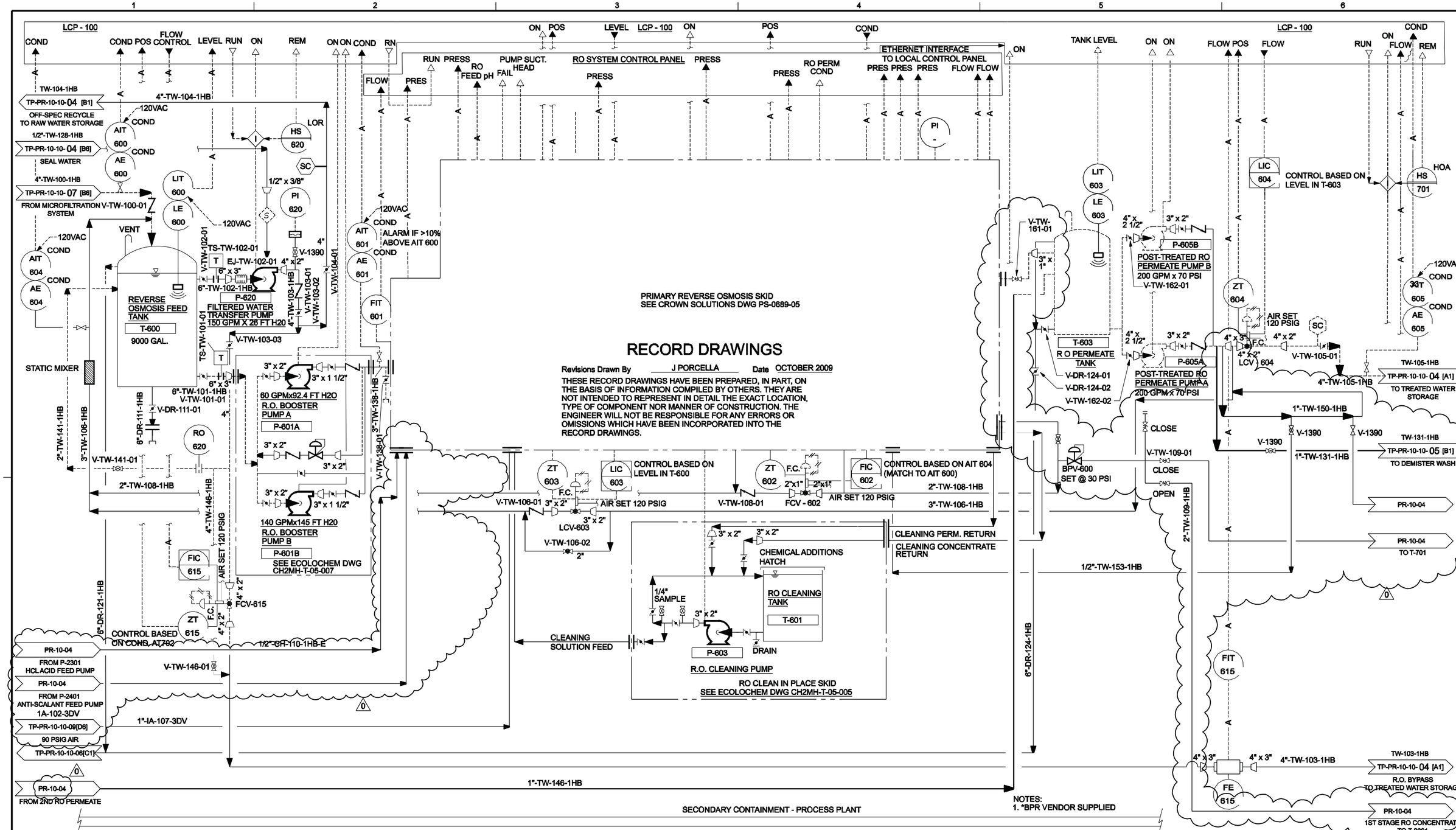
CH2MHILL

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:



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REUSE OF DOCUMENTS:

**
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
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				
ISSUED	REV	DATE	SDE	PEM
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.
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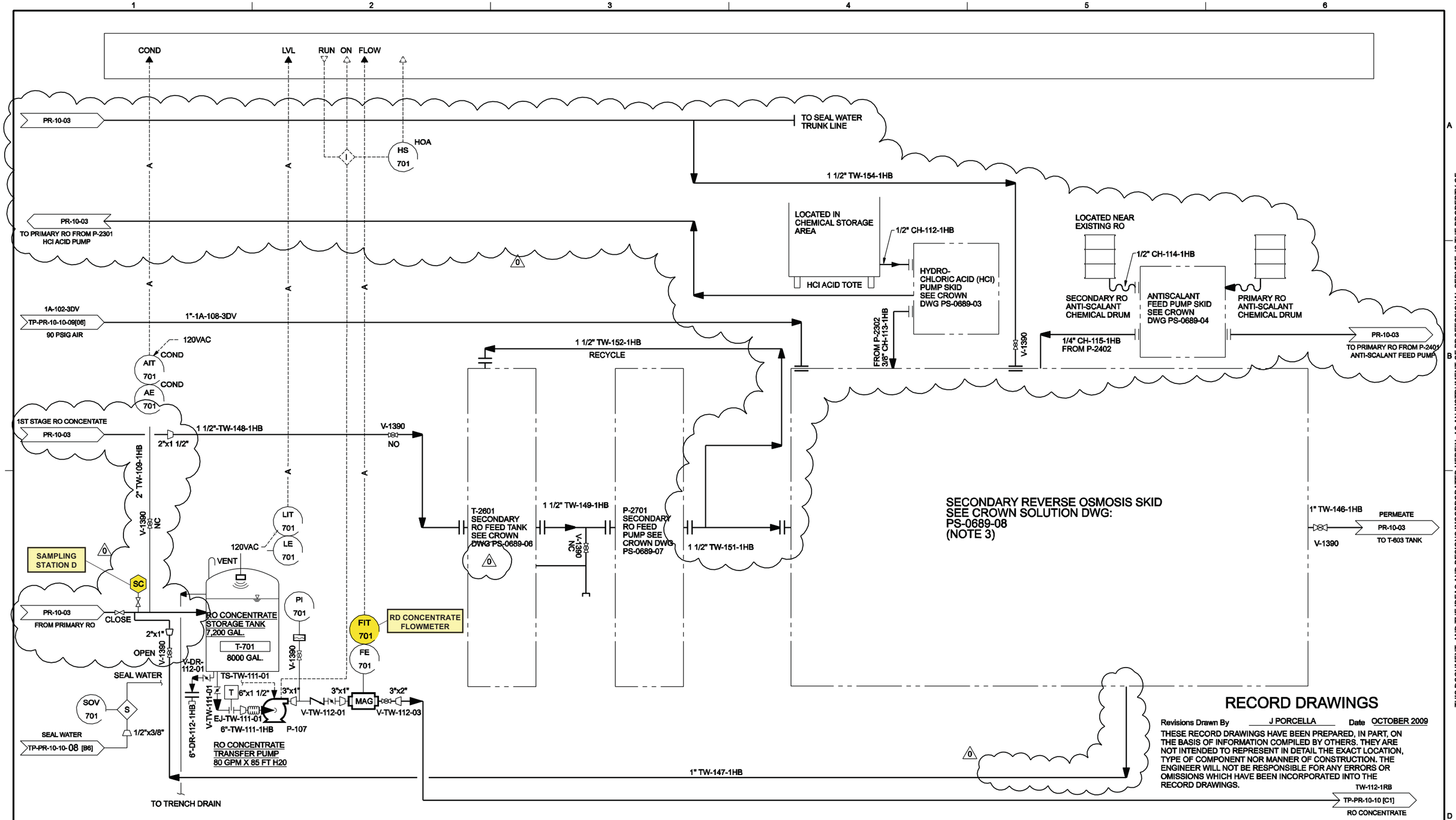

RECORD DRAWINGS

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.

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** 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		
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				
ISSUED	REV	DATE	SDE	PEM
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

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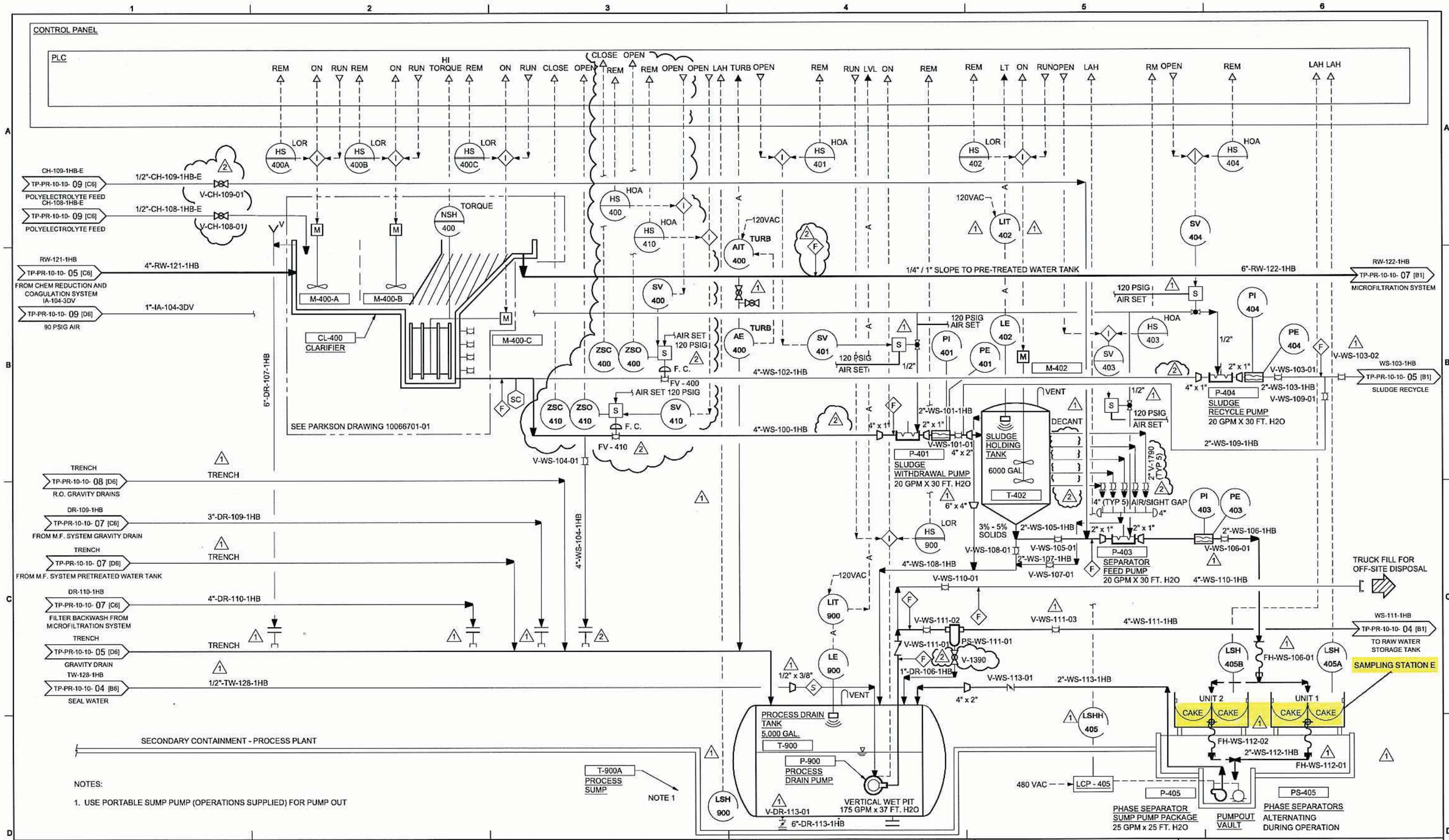

NOTES:

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
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONTROL	
MECHANICAL		ARCHITECTURAL	
PROCESS		ENVIRONMENTAL	
PIPING		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	2	01/23/05		

SCALE NONE

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

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

PROJ NO. 315994

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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"

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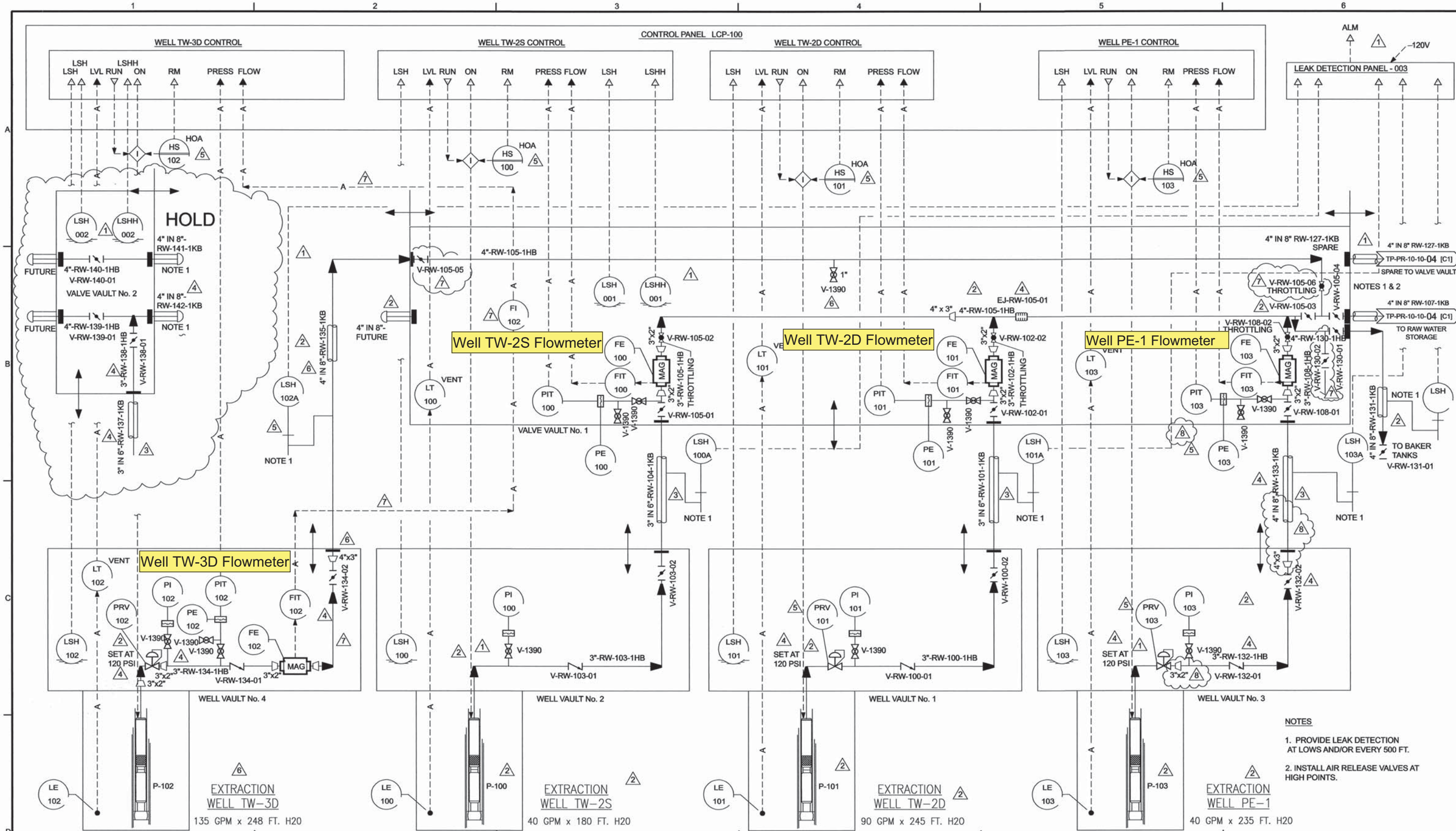

NOTES

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

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REGISTERED PROFESSIONAL ENGINEER — KENNETH L. MARTINS — No. CH4876 — Exp. 6-30-06 — CIVIL — STATE OF CALIFORNIA

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

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				
ISSUED	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	12/19/05	AJ for KLM	AJ

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 03
EXTRACTION WELLS
PE-1, TW-2D, TW-2S AND TW-3D

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

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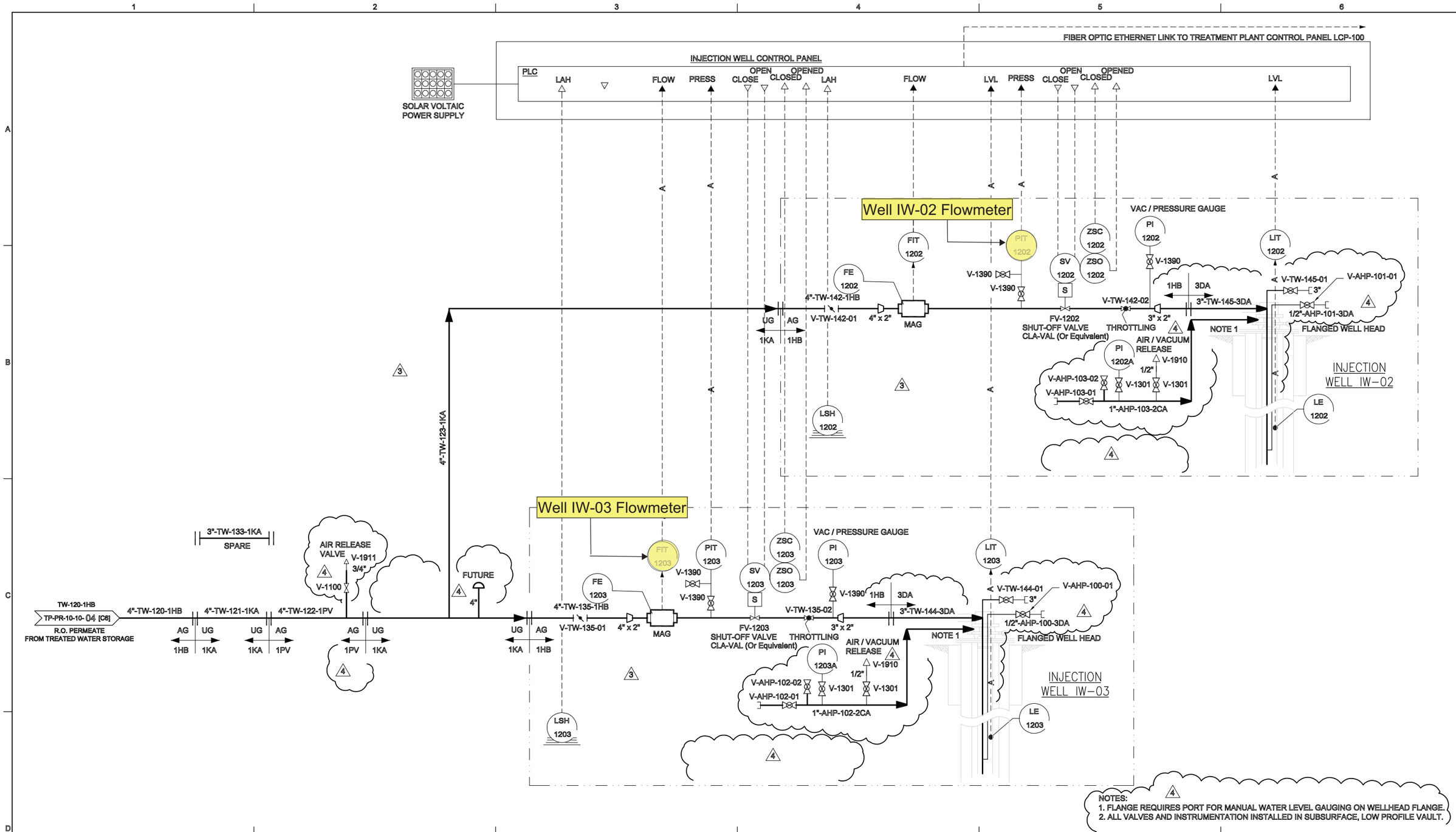
FILENAME: tppr101003.dwg PLOT DATE: 19-OCT-2005 PLOT TIME:



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

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

NO.	DATE	REVISION	BY	CHK
A	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
3	02/14/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
4	03/10/05	REMOVED HOLD AND APPROVED FOR CONSTRUCTION	EFC	AJ

REVISION APPROVAL		REV 4	DATE 03/10/05	PRINT DISTRIBUTION	
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE	
CIVIL		ELECTRICAL		STATUS	
STRUCTURAL		INST & CONTROL		REV.	
MECHANICAL		ARCHITECTURAL		CLIENT	
PROCESS		ENVIRONMENTAL		FIELD	
PIPING		GEN. ARRANG.		INTRA CO.	

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

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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:

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Appendix A
Semiannual Operations and Maintenance Log, July 1, 2017 through December 31, 2018

APPENDIX A

Semiannual Operations and Maintenance Log, July 1, 2018 through December 31, 2018

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 2018

During July 2018, 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 2018. 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 87.9 percent during the July 2018 reporting period.

The IM-3 facility treated approximately 5,314,668 gallons of extracted groundwater during July 2018. The IM-3 facility did not treat purge water during July 2018. No containers of solids from the IM-3 facility were transported offsite during July 2018.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 12.1 percent downtime during July 2018) are summarized below.

- **July 1 - 2, 2018 (unplanned):** The extraction well system was offline from 11:56 p.m. July 1, 2018 to 8:10 a.m. July 2, 2018 because the starter failed to the Raw Water Feed Pump (P-200). Extraction system downtime was 8 hours 14 minutes.
- **July 3, 2018 (unplanned):** The extraction well system was offline from 10:38 a.m. to 12:02 p.m. to change out the microfilter modules in the east bank. Extraction system downtime was 1 hour 24 minutes.
- **July 5, 2018 (unplanned):** The extraction well system was offline from 12:16 p.m. to 1:06 p.m. to lower levels at Iron Oxidation Reactor #3 (T-301C) and Raw Water Storage Tank (T-100). Extraction system downtime was 50 minutes.
- **July 9, 2018 (unplanned):** The extraction well system was offline from 9:12 p.m. to 9:20 p.m. The plant operator switched from Needles Power to the generator power because there was a thunderstorm. Extraction system downtime was 8 minutes.
- **July 10, 2018 (unplanned):** The extraction well system was offline from 2:42 p.m. to 2:48 p.m. The plant operator switched back to Needles Power from generator power because the thunderstorm ended. Extraction system downtime was 6 minutes.
- **July 11, 2018 (planned):** The extraction well system was offline from 9:38 a.m. to 11:36 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 58 minutes.
- **July 13, 2018 (unplanned):** The extraction well system was offline from 7:30 a.m. to 8:22 a.m. to maintain appropriate water levels in T-100. There was a high level in T-100 because of the heavy rinse needed to clean the extremely dirty modules. The rinse water went from Process Drain Tank (T-900), which is the normal process. Extraction system downtime was 52 minutes.
- **July 14, 2018 (unplanned):** The extraction well system was offline from 4:56 a.m. to 7:24 a.m. to change out the microfilter modules. Extraction system downtime was 2 hours 28 minutes.

- **July 16, 2018 (unplanned):** The extraction well system was offline from 5:40 a.m. to 7:42 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 2 hours 2 minutes.
- **July 16-17, 2018 (unplanned):** The extraction well system was offline from 12:32 p.m. July 16, 2018 to 6:46 p.m. July 17, 2018 because one of the airline ports on the header of the microfilter cracked. The microfilter cannot run without the airline functioning properly so the operators had to drive to Riverside, California for the repair. Extraction system downtime was 1 day 6 hours 14 minutes.
- **July 18, 2018 (planned):** The extraction well system was offline from 6:56 a.m. to 1:10 p.m. to replace the Pre-Treated Water Transfer Pump (P-500) and valve #5 (valve that controls flow on the microfilter). Extraction system downtime was 6 hours 14 minutes.
- **July 19, 2018 (unplanned):** The extraction well system was offline from 11:22 a.m. to 2:50 p.m. to clean the hand-operated valve on the discharge of P-500. Extraction system downtime was 3 hours 28 minutes.
- **July 20-21, 2018 (unplanned):** The extraction well system was offline from 7:04 a.m. to 8:32 a.m. on July 20, 2018, and from 5:24 a.m. to 7:06 a.m. and from 6:12 p.m. to 7:46 p.m. on July 21, 2018 to maintain appropriate water levels in T-100. Extraction system downtime was 4 hours 44 minutes.
- **July 21, 2018 (unplanned):** The extraction well system was offline from 8:18 a.m. to 8:30 a.m., from 9:02 a.m. 9:10 a.m., and from 2:12 p.m. to 2:30 p.m. due to Needles Power loss, switching to generator power, and switching back to Needles Power. Extraction system downtime was 38 minutes.
- **July 22-23, 2018 (unplanned):** The extraction well system was offline from 3:30 p.m. to 4:22 p.m. on July 22, 2018 and from 4:28 a.m. to 5:30 a.m. on July 23, 2018 to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 54 minutes.
- **July 23, 2018 (unplanned):** The extraction well system was offline from 9:50 a.m. to 11:18 a.m. to change out the microfilter modules. Extraction system downtime was 1 hour 28 minutes.
- **July 24, 2018 (unplanned):** The extraction well system was offline from 3:18 a.m. to 3:36 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 18 minutes.
- **July 24, 2018 (unplanned):** The extraction well system was offline from 4:24 a.m. to 5:56 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 32 minutes.
- **July 25, 2018 (unplanned):** The extraction well system was offline from 11:30 a.m. to 12:52 p.m. due to a pipe blockage at the top of the chemical loop. Plant was shut down to clean the blockage. Extraction system downtime was 1 hour 22 minutes.
- **July 25, 2018 (unplanned):** The extraction well system was offline from 4:06 p.m. to 5:26 p.m. due to a blockage in the pipeline on the discharge of P-500, which feeds the microfilter. This was causing flow problems throughout the plant. Operators had to drain Pretreated Water Tank (T-500), which filled Process Drain Tank (T-900) and T-100. Plant was shut down to clean the blockage. Extraction system downtime was 1 hour 20 minutes.
- **July 26, 2018 (unplanned):** The extraction well system was offline from 10:36 p.m. to 10:54 p.m. due to extraction well TW-3D shutting off automatically because of high levels at T-100. Extraction system downtime was 18 minutes.
- **July 27, 2018 (unplanned):** The extraction well system was offline from 4:48 a.m. to 5:08 a.m. and from 10:20 a.m. to 10:46 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 46 minutes.
- **July 27-28, 2018 (unplanned):** The extraction well system was offline from 10:48 a.m. to 11:50 a.m. on July 27, 2018 and from 4:58 a.m. to 5:54 a.m. on July 28, 2018 to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 58 minutes.

- **July 28-29, 2018 (unplanned):** The extraction well system was offline from 9:26 p.m. to 9:38 p.m. on July 28, 2018 and from 0:16 a.m. to 0:30 a.m. on July 29, 2018 due to a PLC and HMI connectivity issue. Extraction system downtime was 26 minutes.
- **July 29, 2018 (unplanned):** The extraction well system was offline from 5:58 a.m. to 9:12 a.m., from 9:50 a.m. to 10:14 a.m., and from 10:20 a.m. to 10:46 a.m. due a microfilter air valve not working. An air controller on the microfilter faulted and needed to be reset and reprogrammed. Extraction system downtime was 4 hour 4 minutes.
- **July 29-31, 2018 (unplanned):** The extraction well system was offline from 1:14 a.m. to 2:38 a.m. and from 7:44 p.m. to 9:34 p.m. on July 29, 2018, and from 1:48 a.m. to 2:58 a.m. on July 31, 2018 to maintain appropriate water levels in T-100. Extraction system downtime was 4 hours 24 minutes.
- **July 31, 2018 (unplanned):** The extraction well system was offline from 8:08 a.m. to 9:50 a.m. and from 10:02 a.m. to 3:04 p.m. due to the Clarifier Feed Pump (P-400) shutting down which caused high levels in all the oxidation tanks at the front of the plant. Extraction system downtime was 6 hours 44 minutes.

August 2018

During August 2018, 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 2018. 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 79.8 percent during the August 2018 reporting period.

The IM-3 facility treated approximately 4,840,351 gallons of extracted groundwater during August 2018. The IM-3 facility did not treat purge water during August 2018. Two containers of solids from the IM-3 facility were transported offsite during August 2018.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 20.2 percent downtime during August 2018) are summarized below.

- **August 1 - 2, 2018 (unplanned):** The extraction well system was offline from 12:08 p.m. to 1:02 p.m. and from 7:46 p.m. to 9:06 p.m. on August 1, 2018, and from 11:30 a.m. to 12:16 p.m. on August 2, 2018 to maintain appropriate water levels in Raw Water Storage Tank (T-100). There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 3 hours.
- **August 3 - 4, 2018 (unplanned):** The extraction well system was offline from 3:26 a.m. to 5:46 a.m. on August 3, 2018, and from 1:26 a.m. to 2:24 a.m. and from 2:40 a.m. to 5:30 a.m. on August 4, 2018 to maintain appropriate water levels in T-100. A high level in Raw Water Storage Tank (T-500) caused the Clarifier Feed Pump (P-400) to shut down, which caused the high level in T-100. Extraction system downtime was 6 hours 8 minutes.
- **August 4, 2018 (unplanned):** The extraction well system was offline from 11:38 p.m. to 11:50 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 12 minutes.
- **August 5, 2018 (unplanned):** The extraction well system was offline from 4:58 a.m. to 6:30 a.m. to maintain appropriate water levels in Raw Water Storage Tank (T-100). There was a blockage in the microfilters that cause the water levels to be high in T-100. The plant was shut down to clean the blockage. Extraction system downtime was 1 hour 32 minutes.
- **August 5, 2018 (unplanned):** The extraction well system was offline from 2:44 p.m. to 3:58 p.m. because the air compressor overheated and shut down due to extreme weather temperatures. Extraction system downtime was 1 hour 14 minutes.

- **August 6, 2018 (planned):** The extraction well system was offline from 2:54 a.m. to 4:06 a.m. to lower the level in T-100 in preparation for the semiannual scheduled maintenance. Extraction system downtime was 1 hour 12 minutes.
- **August 6-10, 2018 (planned):** The extraction well system was offline from 6:18 a.m. August 6, 2018 to 6:52 a.m. August 10, 2018 for the semiannual scheduled maintenance. Extraction system downtime was 4 days 34 minutes.
- **August 10, 2018 (planned):** The extraction well system was offline from 9:32 a.m. to 11:26 a.m., from 12:04 p.m. to 4:18 p.m., from 4:40 p.m. to 5:48 p.m., from 6:06 p.m. to 10:32 p.m., and from 10:44 p.m. to 11:52 p.m. as part of the semiannual scheduled maintenance. Plant operators were filling tanks and testing the water before moving on to the next step. Extraction system downtime was 12 hours 50 minutes.
- **August 11 - 13, 2018 (unplanned):** The extraction well system was offline from 11:32 p.m. August 11, 2018 to 1:18 a.m. August 12, 2018 and from 10:54 p.m. August 12, 2018 to 12:26 a.m. August 13, 2018 to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. The plant was shut down to clean the blockage. Extraction system downtime was 3 hours 18 minutes.
- **August 14, 2018 (unplanned):** The extraction well system was offline from 12:02 p.m. to 1:04 p.m. to change out the microfilter modules. Extraction system downtime was 1 hour 2 minutes.
- **August 14, 2018 (unplanned):** The extraction well system was offline from 5:48 p.m. to 6:10 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 22 minutes.
- **August 14, 2018 (unplanned):** The extraction well system was offline from 7:00 p.m. to 8:20 p.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 1 hour 20 minutes.
- **August 15, 2018 (unplanned):** The extraction well system was offline from 12:06 a.m. to 3:24 a.m. because the plant was put in recirculation. Extraction system downtime was 3 hours 18 minutes.
- **August 16, 2018 (unplanned):** The extraction well system was offline from 5:42 p.m. to 6:00 p.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 18 minutes.
- **August 17, 2018 (unplanned):** The extraction well system was offline from 12:08 a.m. to 12:20 a.m. and from 5:06 a.m. to 6:08 a.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. The plant was shut down to clean the blockage. Extraction system downtime was 1 hour 14 minutes.
- **August 18, 2018 (unplanned):** The extraction well system was offline from 8:16 a.m. to 9:00 a.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 44 minutes.
- **August 19, 2018 (unplanned):** The extraction well system was offline from 12:02 a.m. to 12:22 a.m. and from 4:56 a.m. to 6:16 a.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 1 hour 40 minutes.
- **August 20, 2018 (unplanned):** The extraction well system was offline from 12:08 p.m. to 1:38 p.m. because the pH probes in Iron Oxidation Reactor No. 2 (T-301B) were not reading properly. The plant was shut down to repair the probes. Extraction system downtime was 1 hour 30 minutes.
- **August 21 - 22, 2018 (unplanned):** The extraction well system was offline from 4:06 p.m. August 21, 2018 to 5:34 p.m. August 21, 2018 and from 10:02 p.m. August 22, 2018 to 11:32 p.m. August 22, 2018 to maintain appropriate water levels in T-100. There was a blockage in the microfilters that

caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 2 hours 58 minutes.

- **August 23, 2018 (unplanned):** The extraction well system was offline from 8:48 p.m. to 9:24 p.m. to maintain appropriate water levels in T-100. The Raw Water Feed Pump (P-200) shut down for an unknown reason and caused a high level in T-100. Extraction system downtime was 36 minutes.
- **August 23, 2018 (unplanned):** The extraction well system was offline from 10:42 p.m. to 10:54 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 12 minutes.
- **August 24, 2018 (unplanned):** The extraction well system was offline from 10:12 a.m. to 12:00 p.m. to maintain appropriate water levels in T-100. There was a blockage in the microfilters that caused the water levels to be high in T-100. Plant was shut down to clean the blockage. Extraction system downtime was 1 hour 48 minutes.
- **August 31, 2018 (unplanned):** The extraction well system was offline from 5:26 a.m. to 12:20 p.m. because the air blower failed and needed to be replaced. Extraction system downtime was 6 hours 54 minutes.

September 2018

During September 2018, 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 2018. 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 99.1 percent during the September 2018 reporting period.

The IM-3 facility treated approximately 5,771,849 gallons of extracted groundwater during September 2018. The IM-3 facility treated 700 gallons of purge water during September 2018. No containers of solids from the IM-3 facility were transported offsite during September 2018.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 0.9 percent downtime during September 2018) are summarized below.

- **September 6, 2018 (unplanned):** The extraction well system was offline from 6:56 a.m. to 6:58 a.m., from 9:46 a.m. to 10:16 a.m., and from 10:20 a.m. to 10:22 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **September 15, 2018 (unplanned):** The extraction well system was offline from 8:40 a.m. to 10:04 a.m. to change out the microfilter modules. Extraction system downtime was 1 hour 24 minutes.
- **September 22, 2018 (unplanned):** The extraction well system was offline from 5:40 a.m. to 7:50 a.m. because the supplier ran out of hydrochloric acid, which caused a late acid delivery. The plant was shut down while the acid was in transit. Extraction system downtime was 2 hours 10 minutes.
- **September 23, 2018 (unplanned):** The extraction well system was offline from 3:20 p.m. to 4:24 p.m. to change out the microfilter modules. Extraction system downtime was 1 hour 4 minutes.
- **September 29, 2018 (unplanned):** The extraction well system was offline from 5:26 a.m. to 6:24 a.m. to change out the microfilter modules. Extraction system downtime was 58 minutes.

October 2018

During October 2018, 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 2018. 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 97.6 percent during the October 2018 reporting period.

The IM-3 facility treated approximately 5,878,114 gallons of extracted groundwater during October 2018. The IM-3 facility did not treat purge water during October 2018. Two containers of solids from the IM-3 facility were transported offsite during October 2018.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 2.4 percent downtime during October 2018) are summarized below.

- **October 1, 2018 (unplanned):** The extraction well system was offline from 8:10 a.m. to 8:52 a.m. due to testing of the pipeline critical alarms and leak detection system and also to change out 4 microfilter modules. Extraction system downtime was 42 minutes.
- **October 1, 2018 (unplanned):** The extraction well system was offline from 8:54 a.m. to 8:56 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **October 1, 2018 (unplanned):** The extraction well system was offline from 8:58 a.m. to 9:00 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **October 3, 2018 (unplanned):** The extraction well system was offline from 6:30 a.m. to 2:14 p.m. to remove sludge from the clarifier that plugged the pipelines in between the waste and recycle pumps and associated valves. Extraction system downtime was 7 hours 44 minutes.
- **October 6, 2018 (unplanned):** The extraction well system was offline from 1:26 a.m. to 2:56 a.m. due to a plugged feed line from Raw Water Storage Tank (T-100) to the Raw Water Feed Pump (P-200). The plug was removed (strainer changed) and the plant returned to service. Extraction system downtime was 1 hours 30 minutes.
- **October 12, 2018 (unplanned):** The extraction well system was offline from 9:52 a.m. to 10:44 a.m. to change out the microfilter modules. Extraction system downtime was 52 minutes.
- **October 14, 2018 (unplanned):** The extraction well system was offline from 5:20 a.m. to 11:26 a.m. due to low pH in the plant. A backflow pressure device failed at the hydrochloric acid injection point in the chemical loop, which caused the low pH. The device was replaced and the plant was in recirculation until the pH returned to normal. Extraction system downtime was 6 hours 6 minutes.
- **October 15, 2018 (unplanned):** The extraction well system was offline from 1:02 p.m. to 1:06 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 4 minutes.
- **October 22, 2018 (unplanned):** The extraction well system was offline from 11:44 a.m. to 12:40 p.m. due to low ferrous flow. A low level in the ferrous feed tote caused prime loss in the pump. The tote was changed out, the pump re-primed, and the plant returned to service. Extraction system downtime was 56 minutes.
- **October 31, 2018 (unplanned):** The extraction well system was offline from 3:34 p.m. to 3:38 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 4 minutes.

November 2018

During November 2018, 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 2018. 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 November 2018 reporting period.

The IM-3 facility treated approximately 5,750,023 gallons of extracted groundwater during November 2018. The IM-3 facility did not treat purge water during November 2018. No containers of solids from the IM-3 facility were transported offsite during November 2018.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 1.5 percent downtime during November 2018) are summarized below.

- **November 1, 2018 (unplanned):** The extraction well system was offline from 7:18 a.m. to 8:08 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 50 minutes.
- **November 1, 2018 (unplanned):** The extraction well system was offline from 8:36 a.m. to 8:54 a.m. due to work on the HMI. Extraction system downtime was 18 minutes.
- **November 11, 2018 (unplanned):** The extraction well system was offline from 3:22 a.m. to 4:32 a.m. due the failure of the air valve controller on the microfilter. The controller was reset and the plant returned to service. Extraction system downtime was 1 hour 10 minutes.
- **November 16, 2018 (unplanned):** The extraction well system was offline from 8:18 a.m. to 9:36 a.m. to change out the microfilter modules. Extraction system downtime was 1 hour 18 minutes.
- **November 23, 2018 (unplanned):** The extraction well system was offline from 1:30 a.m. to 6:24 a.m. due the failure of the air valve controller on the microfilter. The controller was replaced and the plant returned to service. Extraction system downtime was 4 hours 54 minutes.
- **November 26, 2018 (unplanned):** The extraction well system was offline from 9:06 a.m. to 11:08 a.m. to change out the microfilter modules. Extraction system downtime was 2 hours 2 minutes.

December 2018

During December 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during December 2018. Extraction wells TW-2D and PE-01 were only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 97.2 percent during the December 2018 reporting period.

The IM-3 facility treated approximately 5,835,144 gallons of extracted groundwater during December 2018. Also, the IM-3 facility treated 5,885 gallons of purge water and 30,000 gallons of water from injection well backwashing/re-development from Groundwater Partners. No containers of solids from the IM-3 facility were transported offsite during December 2018.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 2.8 percent downtime during December 2018) are summarized below.

- **December 5, 2018 (unplanned):** The extraction well system was offline from 12:06 p.m. to 12:24 p.m. and from 12:32 p.m. to 12:34 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 20 minutes.
- **December 6, 2018 (unplanned):** The extraction well system was offline from 1:10 p.m. to 1:30 p.m. because the electric voltage coming into the plant was too high (higher voltage can damage the equipment). Needles Power had to lower the incoming electric voltage, which required a shutdown. Extraction system downtime was 20 minutes.
- **December 7, 2018 (unplanned):** The extraction well system was offline from 10:00 a.m. to 10:46 a.m. to change out the microfilter modules. Extraction system downtime was 46 minutes.

- **December 8, 2018 (unplanned):** The extraction well system was offline from 10:20 p.m. to 11:56 p.m. to change out the microfilter modules. Extraction system downtime was 1 hour 36 minutes.
- **December 14, 2018 (unplanned):** The extraction well system was offline from 8:40 a.m. to 8:54 a.m. because Groundwater Partners needed to measure the static water level from the wells. Extraction system downtime was 14 minutes.
- **December 17, 2018 (unplanned):** The extraction well system was offline from 2:34 a.m. to 6:10 a.m. and from 6:36 a.m. to 1:40 p.m. due to a clarifier upset. The polymer batch was weak and caused a bad floc. The plant operators had to work through the issue until the floc was normal. Extraction system downtime was 10 hours 40 minutes.
- **December 19, 2018 (unplanned):** The extraction well system was offline from 9:34 a.m. to 10:56 a.m. due to the same clarifier issue as on December 17, 2018. Extraction system downtime was 1 hour 22 minutes.
- **December 21, 2018 (unplanned):** The extraction well system was offline from 6:32 a.m. to 7:02 a.m. because of a high level in the Raw Water Storage Tank (T-100) due to the Clean in Place (CIP) flushing of the microfilter modules. The high level was caused by an extra-long flushing cycle because of the extremely dirty or plugged modules. Extraction system downtime was 30 minutes.
- **December 28, 2018 (unplanned):** The extraction well system was offline from 9:02 a.m. to 10:08 a.m. because of a high level in T-100 due to backwashing of the injection wells. Extraction system downtime was 1 hour 6 minutes.
- **December 29, 2018 (unplanned):** The extraction well system was offline from 6:40 a.m. to 7:50 a.m. because of a high level in T-100 due to backwashing of the injection wells. Extraction system downtime was 1 hour 10 minutes.
- **December 29, 2018 (unplanned):** The extraction well system was offline from 11:06 a.m. to 11:52 a.m. because Groundwater Partners need to measure static water levels in the extraction wells. Extraction system downtime was 46 minutes.
- **December 30, 2018 (unplanned):** The extraction well system was offline from 7:32 a.m. to 9:32 a.m. due to the Process Drain Pump (P-900) being down. The level sensor was malfunctioning due to the cold temperatures. Extraction system downtime was 2 hours.

Appendix B
Daily Volumes of Groundwater Treated

July 2018 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	2018	--	--	194,009	0	194,009	0	190,478	190,478	0
July	2	2018	--	--	128,310	0	128,310	0	137,755	137,755	0
July	3	2018	--	--	183,029	198	183,227	0	184,431	184,431	3,894
July	4	2018	--	--	194,267	0	194,267	0	193,000	193,000	0
July	5	2018	--	--	187,317	0	187,317	0	190,155	190,155	0
July	6	2018	--	--	194,114	0	194,114	0	190,049	190,049	0
July	7	2018	--	--	193,990	0	193,990	0	190,831	190,831	0
July	8	2018	--	--	194,050	0	194,050	0	193,485	193,485	0
July	9	2018	--	--	193,153	0	193,153	0	196,725	196,725	0
July	10	2018	--	--	193,304	0	193,304	0	197,108	197,108	0
July	11	2018	--	--	178,669	0	178,669	0	197,373	197,373	0
July	12	2018	--	--	195,174	0	195,174	0	186,214	186,214	3,940
July	13	2018	--	--	187,838	0	187,838	0	190,630	190,630	0
July	14	2018	--	--	175,433	0	175,433	0	184,249	184,249	0
July	15	2018	--	--	194,896	0	194,896	0	188,066	188,066	0
July	16	2018	--	--	85,272	0	85,272	0	93,077	93,077	0
July	17	2018	--	--	42,655	0	42,655	0	41,871	41,871	0
July	18	2018	--	--	145,047	0	145,047	0	141,047	141,047	0
July	19	2018	--	--	167,369	0	167,369	0	156,659	156,659	0
July	20	2018	--	--	183,501	0	183,501	0	171,382	171,382	3,708
July	21	2018	--	--	163,941	0	163,941	0	151,377	151,377	0
July	22	2018	--	--	188,719	0	188,719	0	184,644	184,644	0
July	23	2018	--	--	175,268	0	175,268	0	171,019	171,019	0
July	24	2018	--	--	180,481	0	180,481	0	175,607	175,607	0
July	25	2018	--	--	173,327	0	173,327	0	162,228	162,228	0
July	26	2018	--	--	192,839	0	192,839	0	188,928	188,928	3,816
July	27	2018	--	--	180,657	0	180,657	0	178,569	178,569	0
July	28	2018	--	--	185,810	0	185,810	0	175,662	175,662	0
July	29	2018	--	--	134,218	0	134,218	0	141,116	141,116	0
July	30	2018	--	--	195,945	0	195,945	0	187,389	187,389	3,897
July	31	2018	--	--	131,868	0	131,868	0	119,459	119,459	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,314,470**	**198**	**5,314,668**	**0**	**5,250,583**	**5,250,583**	**19,253**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**119.1**	**0.0**	**119.1**	**0.0**	**117.6**	**117.6**	**0.4**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during July 2018 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 2018.

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 July 2018 is approximately 0.84 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.

August 2018 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	2018	--	--	176,854	367	177,220	0	183,932	183,932	0
August	2	2018	--	--	188,792	0	188,792	0	188,103	188,103	3,017
August	3	2018	--	--	175,898	0	175,898	0	174,474	174,474	0
August	4	2018	--	--	161,889	0	161,889	0	155,752	155,752	3,945
August	5	2018	--	--	172,147	0	172,147	0	177,811	177,811	0
August	6	2018	--	--	41,449	0	41,449	0	53,215	53,215	0
August	7	2018	--	--	0	0	0	0	0	0	0
August	8	2018	--	--	0	0	0	0	0	0	0
August	9	2018	--	--	0	0	0	0	0	0	0
August	10	2018	--	--	34,845	0	34,845	0	16,989	16,989	0
August	11	2018	--	--	191,713	0	191,713	0	185,752	185,752	0
August	12	2018	--	--	175,966	0	175,966	0	190,198	190,198	590
August	13	2018	--	--	192,081	0	192,081	0	184,575	184,575	0
August	14	2018	--	--	173,416	0	173,416	0	169,514	169,514	3,812
August	15	2018	--	--	168,988	0	168,988	0	179,394	179,394	0
August	16	2018	--	--	193,461	0	193,461	0	183,459	183,459	3,817
August	17	2018	--	--	185,650	0	185,650	0	190,529	190,529	0
August	18	2018	--	--	189,651	0	189,651	0	190,981	190,981	0
August	19	2018	--	--	182,158	0	182,158	0	190,546	190,546	3,880
August	20	2018	--	--	183,786	0	183,786	0	188,476	188,476	0
August	21	2018	--	--	184,059	0	184,059	0	181,459	181,459	3,663
August	22	2018	--	--	183,594	0	183,594	0	190,284	190,284	0
August	23	2018	--	--	189,063	0	189,063	0	183,292	183,292	3,784
August	24	2018	--	--	181,048	0	181,048	0	184,091	184,091	0
August	25	2018	--	--	195,564	0	195,564	0	195,584	195,584	0
August	26	2018	--	--	195,885	0	195,885	0	199,227	199,227	3,944
August	27	2018	--	--	196,251	0	196,251	0	196,137	196,137	0
August	28	2018	--	--	196,218	0	196,218	0	196,247	196,247	0
August	29	2018	--	--	196,187	0	196,187	0	196,385	196,385	0
August	30	2018	--	--	194,968	0	194,968	0	195,610	195,610	0
August	31	2018	--	--	138,400	0	138,400	0	139,626	139,626	0
Total Monthly Volumes (gallons)			**0**	**0**	**4,839,984**	**367**	**4,840,351**	**0**	**4,861,644**	**4,861,644**	**30,452**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**108.4**	**0.0**	**108.4**	**0.0**	**108.9**	**108.9**	**0.7**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during August 2018 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 2018.

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 2018 is approximately 1.07 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.

September 2018 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	2018	--	--	194,532	0	194,532	0	196,275	196,275	4,132
September	2	2018	--	--	194,399	0	194,399	0	196,612	196,612	0
September	3	2018	--	--	194,605	0	194,605	0	196,242	196,242	0
September	4	2018	--	--	194,594	0	194,594	0	191,924	191,924	0
September	5	2018	--	--	194,451	0	194,451	0	194,600	194,600	0
September	6	2018	--	--	188,451	382	188,833	0	194,051	194,051	4,091
September	7	2018	--	--	194,304	0	194,304	0	194,623	194,623	0
September	8	2018	--	--	194,149	0	194,149	0	194,547	194,547	0
September	9	2018	--	--	194,312	0	194,312	0	194,581	194,581	0
September	10	2018	--	--	194,492	0	194,492	0	194,603	194,603	4,081
September	11	2018	--	--	194,503	0	194,503	0	194,448	194,448	0
September	12	2018	--	--	194,413	0	194,413	0	194,182	194,182	0
September	13	2018	--	--	194,367	0	194,367	0	193,877	193,877	0
September	14	2018	--	--	194,159	0	194,159	0	192,347	192,347	4,430
September	15	2018	--	--	182,740	0	182,740	0	184,778	184,778	0
September	16	2018	--	--	194,248	0	194,248	0	186,252	186,252	0
September	17	2018	--	--	194,349	0	194,349	0	194,724	194,724	0
September	18	2018	--	--	194,317	0	194,317	0	196,973	196,973	3,817
September	19	2018	--	--	194,206	0	194,206	0	196,813	196,813	0
September	20	2018	--	--	193,923	0	193,923	0	195,826	195,826	0
September	21	2018	--	--	193,678	0	193,678	0	196,213	196,213	0
September	22	2018	--	--	176,194	0	176,194	0	178,657	178,657	0
September	23	2018	--	--	185,180	0	185,180	0	186,636	186,636	3,855
September	24	2018	--	--	193,821	0	193,821	0	191,856	191,856	0
September	25	2018	--	--	193,727	0	193,727	0	191,195	191,195	0
September	26	2018	--	--	193,680	0	193,680	0	192,479	192,479	0
September	27	2018	--	--	193,596	0	193,596	0	198,449	198,449	4,115
September	28	2018	--	--	193,249	0	193,249	0	198,136	198,136	0
September	29	2018	--	--	185,341	0	185,341	0	186,894	186,894	0
September	30	2018	--	--	193,484	0	193,484	0	193,627	193,627	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,771,467**	**382**	**5,771,849**	**0**	**5,792,419**	**5,792,419**	**28,521**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**133.6**	**0.0**	**133.6**	**0.0**	**134.1**	**134.1**	**0.7**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during September 2018 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 2018.

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 2018 is approximately 0.85 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.

October 2018 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	2018	--	--	187,334	0	187,334	0	180,081	180,081	0
October	2	2018	--	--	193,395	368	193,763	0	195,281	195,281	4,119
October	3	2018	--	--	131,373	0	131,373	0	132,504	132,504	0
October	4	2018	--	--	194,113	0	194,113	0	194,216	194,216	0
October	5	2018	--	--	193,957	0	193,957	0	194,431	194,431	0
October	6	2018	--	--	181,901	0	181,901	0	184,896	184,896	3,816
October	7	2018	--	--	193,989	0	193,989	0	196,897	196,897	0
October	8	2018	--	--	193,925	0	193,925	0	196,342	196,342	0
October	9	2018	--	--	193,654	0	193,654	0	195,213	195,213	0
October	10	2018	--	--	193,324	0	193,324	0	189,802	189,802	0
October	11	2018	--	--	193,194	0	193,194	0	194,649	194,649	3,788
October	12	2018	--	--	186,005	0	186,005	0	187,618	187,618	0
October	13	2018	--	--	193,178	0	193,178	0	189,553	189,553	0
October	14	2018	--	--	144,596	0	144,596	0	150,398	150,398	0
October	15	2018	--	--	194,245	0	194,245	0	195,862	195,862	3,913
October	16	2018	--	--	195,357	0	195,357	0	193,709	193,709	0
October	17	2018	--	--	195,039	0	195,039	0	193,645	193,645	129
October	18	2018	--	--	194,931	0	194,931	0	194,632	194,632	0
October	19	2018	--	--	195,124	0	195,124	0	194,274	194,274	0
October	20	2018	--	--	195,208	0	195,208	0	194,630	194,630	3,808
October	21	2018	--	--	195,288	0	195,288	0	195,728	195,728	0
October	22	2018	--	--	187,764	0	187,764	0	190,695	190,695	0
October	23	2018	--	--	195,544	0	195,544	0	199,061	199,061	0
October	24	2018	--	--	195,468	0	195,468	0	198,835	198,835	3,770
October	25	2018	--	--	195,209	0	195,209	0	191,585	191,585	0
October	26	2018	--	--	194,848	0	194,848	0	192,397	192,397	0
October	27	2018	--	--	194,528	0	194,528	0	192,558	192,558	0
October	28	2018	--	--	194,345	0	194,345	0	196,592	196,592	0
October	29	2018	--	--	194,078	0	194,078	0	196,383	196,383	3,666
October	30	2018	--	--	193,786	0	193,786	0	196,261	196,261	0
October	31	2018	--	--	193,047	0	193,047	0	194,342	194,342	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,877,747**	**368**	**5,878,114**	**0**	**5,893,070**	**5,893,070**	**27,010**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**131.7**	**0.0**	**131.7**	**0.0**	**132.0**	**132.0**	**0.6**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during October 2018 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 2018.

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 2018 is approximately 0.71 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.

November 2018 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	2018	--	--	184,482	0	184,482	0	187,348	187,348	0
November	2	2018	--	--	194,038	0	194,038	0	193,684	193,684	0
November	3	2018	--	--	193,888	0	193,888	0	196,336	196,336	3,667
November	4	2018	--	--	193,859	0	193,859	0	196,156	196,156	0
November	5	2018	--	--	193,558	0	193,558	0	189,675	189,675	0
November	6	2018	--	--	193,256	0	193,256	0	191,307	191,307	0
November	7	2018	--	--	194,914	138	195,052	0	193,478	193,478	0
November	8	2018	--	--	196,334	0	196,334	0	193,506	193,506	3,808
November	9	2018	--	--	196,424	0	196,424	0	193,083	193,083	0
November	10	2018	--	--	196,424	0	196,424	0	197,493	197,493	0
November	11	2018	--	--	186,813	0	186,813	0	189,255	189,255	0
November	12	2018	--	--	196,274	0	196,274	0	199,571	199,571	0
November	13	2018	--	--	196,078	0	196,078	0	194,377	194,377	0
November	14	2018	--	--	195,900	0	195,900	0	194,205	194,205	3,844
November	15	2018	--	--	194,120	0	194,120	0	194,340	194,340	0
November	16	2018	--	--	182,755	0	182,755	0	182,915	182,915	0
November	17	2018	--	--	194,442	0	194,442	0	193,864	193,864	0
November	18	2018	--	--	194,418	0	194,418	0	194,044	194,044	0
November	19	2018	--	--	194,171	0	194,171	0	194,232	194,232	3,991
November	20	2018	--	--	194,004	0	194,004	0	194,107	194,107	0
November	21	2018	--	--	193,797	0	193,797	0	198,361	198,361	0
November	22	2018	--	--	193,609	0	193,609	0	198,924	198,924	0
November	23	2018	--	--	154,112	0	154,112	0	151,013	151,013	0
November	24	2018	--	--	193,524	0	193,524	0	192,512	192,512	0
November	25	2018	--	--	193,942	0	193,942	0	192,450	192,450	3,849
November	26	2018	--	--	177,428	0	177,428	0	176,448	176,448	0
November	27	2018	--	--	194,292	0	194,292	0	193,030	193,030	2,358
November	28	2018	--	--	194,267	0	194,267	0	193,017	193,017	0
November	29	2018	--	--	194,432	0	194,432	0	193,018	193,018	0
November	30	2018	--	--	194,332	0	194,332	0	193,075	193,075	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,749,885**	**138**	**5,750,023**	**0**	**5,744,825**	**5,744,825**	**21,519**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**133.1**	**0.0**	**133.1**	**0.0**	**133.0**	**133.0**	**0.5**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during November 2018 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 2018.

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 2018 is approximately 0.28 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.

December 2018 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	2018	--	--	194,107	0	194,107	0	197,700	197,700	1,368
December	2	2018	--	--	193,926	0	193,926	0	198,910	198,910	0
December	3	2018	--	--	193,690	0	193,690	0	195,036	195,036	0
December	4	2018	--	141	193,499	418	194,058	0	195,465	195,465	0
December	5	2018	--	--	191,304	0	191,304	0	183,497	183,497	0
December	6	2018	--	--	191,453	0	191,453	0	188,930	188,930	0
December	7	2018	--	--	187,681	0	187,681	0	190,420	190,420	0
December	8	2018	--	--	180,717	0	180,717	0	188,039	188,039	0
December	9	2018	--	--	193,724	0	193,724	0	190,382	190,382	0
December	10	2018	--	--	193,619	0	193,619	0	195,065	195,065	0
December	11	2018	--	--	193,604	0	193,604	0	194,925	194,925	150
December	12	2018	--	--	193,410	0	193,410	0	194,818	194,818	0
December	13	2018	--	--	193,218	0	193,218	0	194,360	194,360	0
December	14	2018	--	--	190,772	0	190,772	120,743	75,622	196,365	294
December	15	2018	--	--	192,767	0	192,767	199,019	0	199,019	0
December	16	2018	--	--	192,653	0	192,653	199,286	0	199,286	0
December	17	2018	--	--	107,166	0	107,166	106,055	0	106,055	296
December	18	2018	--	--	192,957	0	192,957	196,314	0	196,314	0
December	19	2018	--	--	181,769	0	181,769	183,410	0	183,410	2,469
December	20	2018	--	--	193,457	0	193,457	193,657	0	193,657	2,335
December	21	2018	--	--	189,990	0	189,990	194,387	0	194,387	0
December	22	2018	--	--	194,162	0	194,162	194,873	0	194,873	0
December	23	2018	--	--	194,231	0	194,231	199,624	0	199,624	0
December	24	2018	--	--	194,151	0	194,151	199,140	0	199,140	0
December	25	2018	--	--	193,866	0	193,866	198,766	0	198,766	0
December	26	2018	--	--	193,589	0	193,589	197,556	0	197,556	0
December	27	2018	--	--	193,684	0	193,684	183,170	7,941	191,111	0
December	28	2018	--	--	184,880	0	184,880	127,130	72,482	199,612	0
December	29	2018	--	--	178,250	0	178,250	0	198,487	198,487	0
December	30	2018	--	--	178,059	0	178,059	0	183,216	183,216	0
December	31	2018	--	--	194,233	0	194,233	0	194,129	194,129	0
Total Monthly Volumes (gallons)			**0**	**141**	**5,834,585**	**418**	**5,835,144**	**2,693,129**	**3,239,423**	**5,932,553**	**6,912**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**130.7**	**0.0**	**130.7**	**60.3**	**72.6**	**132.9**	**0.2**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during December 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during December 2018.

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 December 2018 is approximately 1.79 percent. During December 2018, a larger than normal amount of well purge/development water was treated at IM3. When this amount (35,885 gallons) is included in the difference calculation, the % difference is 1.17%. 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.

Appendix C
Flowmeter Calibration Records

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

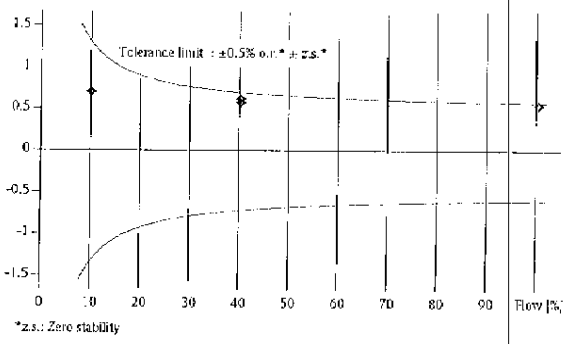
92009494-1275190

WWRA017112F Purchase order number	FCP-8.2 US Calibration rig
US-3601532757-100 / 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	0.9159 Calibration factor
6A021F16000 Serial N°	-17 Zero point
FIT-100 Tag N°	76.5 °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	15.496	60.0	15.507	15.616	0.70	5.61
40.1	62.217	60.1	62.277	62.664	0.62	10.46
40.2	62.237	60.0	62.285	62.643	0.58	10.46
100.4	155.557	60.0	155.665	156.522	0.55	20.15
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of rate
**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.
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).

09-16-2015
Date of calibration

Calvin Williams
Operator

Endress+Hauser Inc.
10057 Porter Road
La Porte, Texas 77571

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

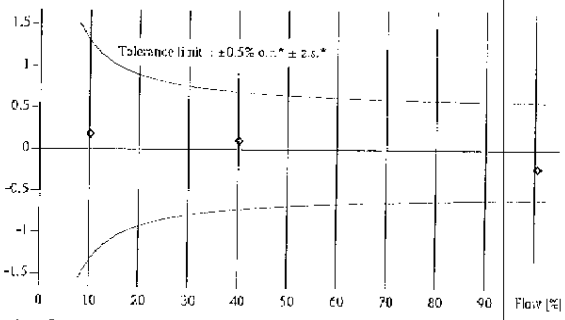
92009500-1304797

WWRA017112F Purchase order number	FCP-8.2 US Calibration rig
US-3601532757-200 / Endress+Hauser Inc. Order N°/Manufacturer	156 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9164 Calibration factor
6C037116000 Serial N°	5 Zero point
– Tag N°	77 °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	15.575	60.1	15.590	15.620	0.19	5.60
40.0	62.448	60.1	62.513	62.585	0.11	10.41
40.0	62.468	60.0	62.512	62.583	0.11	10.41
100.4	156.636	60.1	156.798	156.474	-0.21	20.03
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–

*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).

09-17-2015
Date of calibration

Calvin Williams
Operator

Endress+Hauser Inc.
10057 Porter Road
La Porte, Texas 77571

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

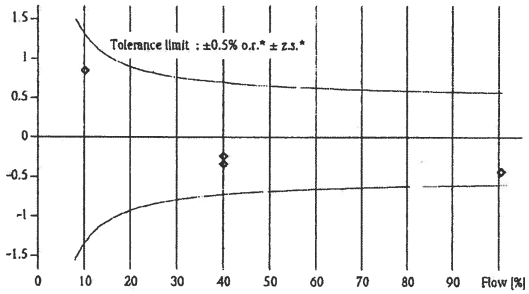
92010359-1304705

WWRA-017895-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601533868-100 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9101 Calibration factor
6C036F16000 Serial N°	-34 Zero point
FIT-1201 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]
9.9	15.450	60.2	15.502	15.635	0.85	5.60
39.9	62.130	60.2	62.334	62.134	-0.32	10.37
39.9	62.139	60.2	62.352	62.214	-0.22	10.38
100.4	156.155	60.2	156.670	156.016	-0.42	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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

01-15-2016
Date of calibration

John Davis
Operator

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

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

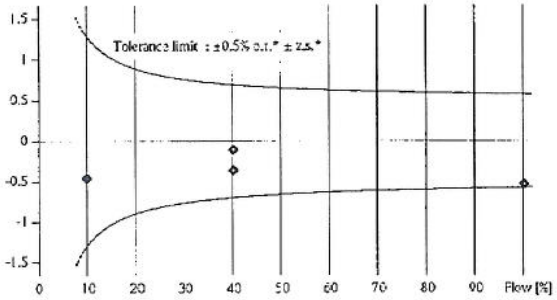
92004350-1275192

4017515743	FCP-8.2 US
Purchase order number	Calibration rig
US-3601525789-100 / Endress+Hauser Inc.	156 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P50-AL1A1RA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 2"	0.9082
Transmitter/Sensor	Calibration factor
6A022116000	0
Serial N°	Zero point
FIT-102	72.3 °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]
10.0	15.643	60.0	15.654	15.582	-0.46	5.60
40.1	62.618	60.0	62.665	62.440	-0.36	10.40
40.2	62.628	60.0	62.673	62.607	-0.11	10.42
100.3	156.535	60.0	156.646	155.804	-0.54	19.97
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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).

Wesley Watkins

09-20-2013
Date of calibration

W. Watkins
Operator

Endress+Hauser Inc.
10057 Porter Road
La Porte, Texas 77571

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

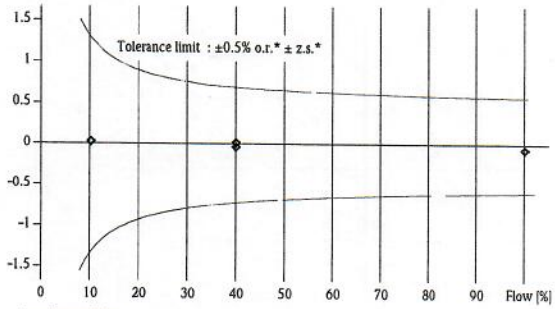
92010358-1304709

WWRA-017895-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601533868-200 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9189 Calibration factor
6C037316000 Serial N°	0 Zero point
FIT-1205 Tag N°	70.5 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.1	15.712	60.2	15.764	15.770	0.04	5.62
39.9	62.125	60.2	62.338	62.323	-0.02	10.39
39.9	62.118	60.2	62.330	62.347	0.03	10.39
100.0	155.573	60.2	156.107	156.027	-0.05	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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

01-15-2016
Date of calibration

John Davis
Operator

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

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

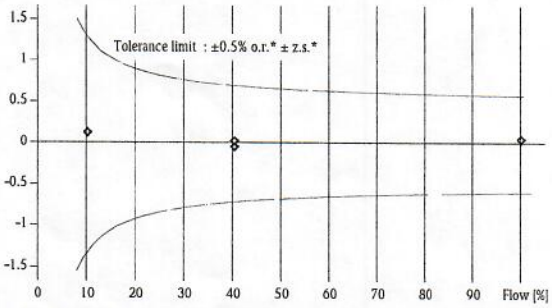
92013941-1385272

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

30361270-3757980

3800196517	FCP-8.B
Purchase order number	Calibration rig
US-3005497039-10 / Endress+Hauser Flowtec	398.3621 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
5P2B80-1CX9/0	Service interface
Order code	Calibrated output
Promag P 200 3"	1.1823
Sensor/Transmitter	Calibration factor
L200E016000	-5
Serial N°	Zero point
-	80.3 °F
Tag N°	Water temperature

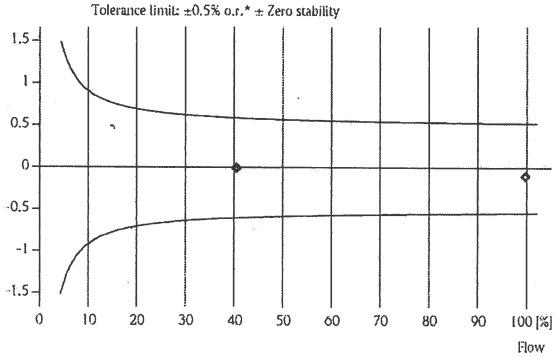
Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
40.2	160.154	65.1	173.658	173.655	0.00	10.43
40.2	160.198	65.1	173.705	173.717	0.01	10.43
99.6	396.900	65.1	430.394	430.000	-0.09	19.93
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of reading

**Calculated value (4 - 20 mA)

Measured error % o.r.

Tolerance limit: ±0.5% o.r.* ± Zero stability



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) and Suzhou (CN).

02-05-2016
Date of calibration

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

Travis Burdette
Operator

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

Endress+Hauser

People for Process Automation

Flow Calibration without Adjustment

92011344-1304708

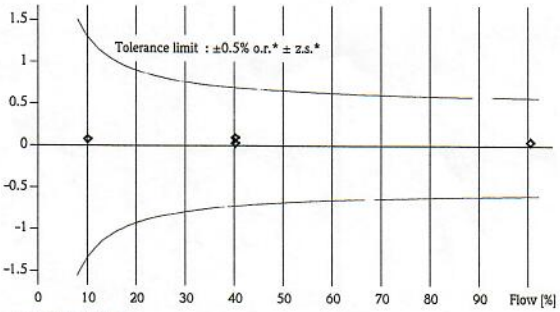
WWRA-018498-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601535048-200 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9227 Calibration factor
6C037216000 Serial N°	20 Zero point
FIT-1204 Tag N°	72.6 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
9.9	15.455	60.2	15.507	15.520	0.09	5.59
40.0	62.288	60.2	62.491	62.557	0.11	10.41
40.1	62.343	60.2	62.550	62.578	0.04	10.41
100.3	156.108	60.2	156.637	156.728	0.06	20.06
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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

05-06-2016
Date of calibration

John Davis
Operator

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

Appendix D
Fourth Quarter 2018
Laboratory Analytical Reports

Date of Report: 10/15/2018

Marlon Cartin

ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Client Project:	N032326
BCL Project:	Level IV
BCL Work Order:	1831281
Invoice ID:	B319163

Enclosed are the results of analyses for samples received by the laboratory on 10/4/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval
Client Service Rep

Stuart Buttram
Technical Director

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

RUSH! CHAIN-OF-CUSTODY RECORD

Page 1 of 1

QC Level: Level IV

Subcontractor: 18-31281
BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

03-Oct-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: SM4500-NH3D		
N032326-001A / SC-100B-WDR-579 -1	Water	10/2/2018 9:00:00 AM	32OZP	1		
N032326-002A / SC-700B-WDR-579 -2	Water	10/2/2018 9:02:00 AM	32OZP	1		

CHK BY: GO
DISTRIBUTION: MAIL OR FAX
SUB-OUT

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N32326A 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 #: 542281605

		Date/Time			Date/Time
Relinquished by:	YKJ	10/3/2018 17:00	Received by:	NYG	10-4-18 0815
Relinquished by:			Received by:		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Chain of Custody and Cooler Receipt Form for 1831281 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 18-3128\

SHIPPING INFORMATION
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐
BC Lab Field Service ☐ Other ☒ (Specify) GSO

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)

FREE LIQUID
YES ☐ NO ☐
W / S

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received
☒ YES ☐ NO

Emissivity: 0.97 Container: PE Thermometer ID: 274 Date/Time 10-4-18 0815
Temperature: (A) 2.4 °C / (C) 2.1 °C Analyst Init: KJJ

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
EPNITROGEN FORMS 32oz	A	A								
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:
Sample Numbering Completed By: EMC Date/Time: 10-4-18 2229 Rev 21 05/23/2016
A = Actual / C = Corrected
[S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 20]

ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1831281-01	**COC Number:**	---	**Receive Date:**	10/04/2018 08:15
	Project Number:	---	**Sampling Date:**	10/02/2018 09:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	N032326-001A / SC-100B-WDR-579	**Lab Matrix:**	Water
	Sampled By:	Client	**Sample Type:**	Water
1831281-02	**COC Number:**	---	**Receive Date:**	10/04/2018 08:15
	Project Number:	---	**Sampling Date:**	10/02/2018 09:02
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	N032326-002A / SC-700B-WDR-579	**Lab Matrix:**	Water
	Sampled By:	Client	**Sample Type:**	Water

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ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

BCL Sample ID: 1831281-01 | **Client Sample Name:** N032326-001A / SC-100B-WDR-579, 10/2/2018 9:00:00AM, Client

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	SM-4500-NH3G	10/10/18 13:22	10/11/18 15:01	JMH	SC-1	1	B026928

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ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

BCL Sample ID: 1831281-02 | **Client Sample Name:** N032326-002A / SC-700B-WDR-579, 10/2/2018 9:02:00AM, Client

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	SM-4500-NH3G	10/10/18 13:22	10/11/18 15:02	JMH	SC-1	1	B026928

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
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ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B026928						
Ammonia as N (Distilled)	B026928-BLK1	ND	mg/L	0.20		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B026928										
Ammonia as N (Distilled)	B026928-BS1	LCS	1.0711	1.0000	mg/L	107		85 - 115		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
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ASSET Laboratories- Las Vegas
3151-3153 W. Post Rd
Las Vegas, NV 89118

Reported: 10/15/2018 19:22
Project: Level IV
Project Number: N032326
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B026928	Used client sample: N										
Ammonia as N (Distilled)	DUP	1830244-14	0.24290	0.24060		mg/L	1.0		20		
	MS	1830244-14	0.24290	1.4054	1.1111	mg/L		105		80 - 120	
	MSD	1830244-14	0.24290	1.4298	1.1111	mg/L	1.7	107	20	80 - 120	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

October 24, 2018

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612
TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N032326

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 02, 2018 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,

Quennie Manimtim
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.

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 BC Labs- Bakersfield,CA.

Analytical Comments for EPA 200.7:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Boron in QC samples N032326-001E-MS1 and N032326-001E-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 200.8:

Dilution was necessary on most analytes for sample N032326-003 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 meet internal standard recovery limit.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Nickel in QC samples N032329-001D-MS and N032329-001D-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 218.6:

Dilution was necessary for sample N032326-003 due to matrix interference. Sample was analyzed at lower dilution however matrix spike recovery and retention time criteria were not met indicating

possible matrix interference. Sample was reported at dilution that meet matrix spike recovery limit and the detected peak within retention time window.

Analytical Comments for EPA 300.0:

Dilution was necessary for samples N032326-001 and-002 due to precipitation upon the addition of eluent.

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N032326
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N032326-001A	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-001B	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-001C	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-001D	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-001E	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-001F	SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	10/2/2018	10/24/2018
N032326-002A	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-002B	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-002C	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-002D	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-002E	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-002F	SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	10/2/2018	10/24/2018
N032326-003A	SC-701-WDR-579	Water	10/2/2018 9:04:00 AM	10/2/2018	10/24/2018
N032326-003B	SC-701-WDR-579	Water	10/2/2018 9:04:00 AM	10/2/2018	10/24/2018
N032326-003C	SC-701-WDR-579	Water	10/2/2018 9:04:00 AM	10/2/2018	10/24/2018
N032326-003D	SC-701-WDR-579	Water	10/2/2018 9:04:00 AM	10/2/2018	10/24/2018

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_181003D** QC Batch: **R128996** PrepDate Analyst: **LR**							
Specific Conductance	7900	0.10	0.10		umhos/cm	1	10/3/2018 02:05 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_181003D** QC Batch: **R128996** PrepDate Analyst: **LR**							
Specific Conductance	7800	0.10	0.10		umhos/cm	1	10/3/2018 02:05 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_181003D** QC Batch: **R128996** PrepDate							Analyst: **LR**
Specific Conductance	64000	0.10	0.10		umhos/cm	1	10/3/2018 02:05 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N032326-003ADUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **128996**
Client ID: **ZZZZZZ** Batch ID: **R128996** TestNo: **EPA 120.1** Analysis Date: **10/3/2018** SeqNo: **3161443**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	64300.000	0.10						63900	0.624	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_181003H** QC Batch: **70874** PrepDate **10/3/2018** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	10/3/2018 01:14 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_181003H** QC Batch: **70874** PrepDate **10/3/2018** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	10/3/2018 01:14 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_181003H** QC Batch: **70874** PrepDate **10/3/2018** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	43000	500	500		mg/L	1	10/3/2018 01:14 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **LCS-70874** SampType: **LCS** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **10/3/2018** RunNo: **129005**
Client ID: **LCSW** Batch ID: **70874** TestNo: **SM2540C** Analysis Date: **10/3/2018** SeqNo: **3161513**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	950.000	10	1000	0	95.0	80	120				

Sample ID **MB-70874** SampType: **MBLK** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **10/3/2018** RunNo: **129005**
Client ID: **PBW** Batch ID: **70874** TestNo: **SM2540C** Analysis Date: **10/3/2018** SeqNo: **3161514**

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 **N032326-003ADUP** SampType: **DUP** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **10/3/2018** RunNo: **129005**
Client ID: **ZZZZZZ** Batch ID: **70874** TestNo: **SM2540C** Analysis Date: **10/3/2018** SeqNo: **3161523**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	44900.000	500						42750	4.91	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_181011A** QC Batch: **70949**				PrepDate	**10/9/2018**		Analyst: **CEI**
Aluminum	ND	40	50		µg/L	1	10/11/2018 03:02 PM
Boron	1000	74	100		µg/L	1	10/15/2018 01:14 PM
Iron	ND	18	20		µg/L	1	10/11/2018 03:02 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_181011A** QC Batch: **70949** PrepDate **10/9/2018** Analyst: **CEI**							
Aluminum	ND	40	50		µg/L	1	10/11/2018 03:45 PM
Boron	1000	74	100		µg/L	1	10/15/2018 01:48 PM
Iron	ND	18	20		µg/L	1	10/11/2018 03:45 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-70949** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129210**
Client ID: **PBW** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/11/2018** SeqNo: **3170645**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									
Iron	ND	20									

Sample ID **LCS1-70949** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129210**
Client ID: **LCSW** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/11/2018** SeqNo: **3170646**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5413.876	50	5000	0	108	85	115				
Iron	111.140	20	100.0	0	111	85	115				

Sample ID **N032326-001E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129210**
Client ID: **ZZZZZZ** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/11/2018** SeqNo: **3170650**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5384.220	50	5000	0	108	75	125				
Iron	111.404	20	100.0	0	111	75	125				

Sample ID **N032326-001E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129210**
Client ID: **ZZZZZZ** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/11/2018** SeqNo: **3170651**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5357.544	50	5000	0	107	75	125	5384	0.497	20	
Iron	110.454	20	100.0	0	110	75	125	111.4	0.856	20	

Sample ID **MB-70949** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129268**
Client ID: **PBW** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/15/2018** SeqNo: **3173764**

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	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-70949** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129268**
Client ID: **PBW** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/15/2018** SeqNo: **3173764**

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

Sample ID **LCS1-70949** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129268**
Client ID: **LCSW** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/15/2018** SeqNo: **3173765**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	917.303	100	1000	0	91.7	85	115				

Sample ID **N032326-001E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129268**
Client ID: **ZZZZZZ** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/15/2018** SeqNo: **3173769**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	2388.034	100	1000	1037	135	75	125				S

Sample ID **N032326-001E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/9/2018** RunNo: **129268**
Client ID: **ZZZZZZ** Batch ID: **70949** TestNo: **EPA 200.7** Analysis Date: **10/15/2018** SeqNo: **3173770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	2380.847	100	1000	1037	134	75	125	2388	0.301	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

Calculations are based on raw values

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181015A** QC Batch: **70934**				PrepDate	**10/8/2018**		Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	10/15/2018 07:04 PM
Arsenic	2.9	0.081	0.10		µg/L	1	10/15/2018 07:04 PM
Barium	28	0.15	1.0		µg/L	1	10/15/2018 07:04 PM
Copper	ND	0.55	1.0		µg/L	1	10/17/2018 12:13 AM
Lead	ND	0.13	1.0		µg/L	1	10/15/2018 07:04 PM
Manganese	7.5	0.26	0.50		µg/L	1	10/15/2018 07:04 PM
Molybdenum	21	0.21	0.50		µg/L	1	10/15/2018 07:04 PM
Nickel	ND	0.26	1.0		µg/L	1	10/15/2018 07:04 PM
Zinc	ND	2.3	10		µg/L	1	10/15/2018 07:04 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_181015A**	QC Batch: **70934**			PrepDate	**10/8/2018**		Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	10/15/2018 07:15 PM
Arsenic	0.11	0.081	0.10		µg/L	1	10/15/2018 07:15 PM
Barium	23	0.15	1.0		µg/L	1	10/15/2018 07:15 PM
Copper	ND	0.55	1.0		µg/L	1	10/17/2018 12:24 AM
Lead	ND	0.13	1.0		µg/L	1	10/15/2018 07:15 PM
Manganese	22	0.26	0.50		µg/L	1	10/15/2018 07:15 PM
Molybdenum	21	0.21	0.50		µg/L	1	10/15/2018 07:15 PM
Nickel	2.6	0.26	1.0		µg/L	1	10/15/2018 07:15 PM
Zinc	ND	2.3	10		µg/L	1	10/15/2018 07:15 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT: CH2M HILL
Lab Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00
Lab ID: N032326-003

Client Sample ID: SC-701-WDR-579
Collection Date: 10/2/2018 9:04:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181015A** QC Batch: **70934** PrepDate **10/8/2018** Analyst: **CEI**							
Antimony	ND	0.78	2.5		µg/L	5	10/15/2018 07:33 PM
Arsenic	2.4	0.41	0.50		µg/L	5	10/15/2018 07:33 PM
Barium	160	0.75	5.0		µg/L	5	10/15/2018 07:33 PM
Beryllium	ND	1.1	12		µg/L	25	10/15/2018 07:38 PM
Cadmium	ND	0.26	2.5		µg/L	5	10/15/2018 07:33 PM
Cobalt	ND	0.21	2.5		µg/L	5	10/15/2018 07:33 PM
Copper	ND	2.7	5.0		µg/L	5	10/17/2018 12:41 AM
Lead	ND	3.2	25		µg/L	25	10/15/2018 07:38 PM
Manganese	37	1.3	2.5		µg/L	5	10/15/2018 07:33 PM
Molybdenum	230	1.1	2.5		µg/L	5	10/15/2018 07:33 PM
Nickel	11	1.3	5.0		µg/L	5	10/15/2018 07:33 PM
Selenium	49	1.8	2.5		µg/L	5	10/15/2018 07:33 PM
Silver	ND	1.2	2.5		µg/L	5	10/15/2018 07:33 PM
Thallium	ND	4.8	12		µg/L	25	10/15/2018 07:38 PM
Vanadium	3.4	0.28	1.0		µg/L	1	10/17/2018 12:35 AM
Zinc	ND	11	50		µg/L	5	10/15/2018 07:33 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-70934** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **PBW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175893**

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									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Selenium	ND	0.50									
Silver	ND	0.50									
Thallium	ND	0.50									
Zinc	ND	10									

Sample ID **LCS-70934** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **LCSW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175894**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.056	0.50	10.00	0	101	85	115				
Arsenic	9.735	0.10	10.00	0	97.4	85	115				
Barium	9.735	1.0	10.00	0	97.3	85	115				
Beryllium	9.855	0.50	10.00	0	98.6	85	115				
Cadmium	10.194	0.50	10.00	0	102	85	115				
Cobalt	9.462	0.50	10.00	0	94.6	85	115				
Lead	9.740	1.0	10.00	0	97.4	85	115				
Manganese	104.018	0.50	100.0	0	104	85	115				
Molybdenum	9.579	0.50	10.00	0	95.8	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **LCS-70934** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **LCSW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175894**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nickel	10.172	1.0	10.00	0	102	85	115				
Selenium	10.032	0.50	10.00	0	100	85	115				
Silver	10.914	0.50	10.00	0	109	85	115				
Thallium	10.156	0.50	10.00	0	102	85	115				
Zinc	200.980	10	200.0	0	100	85	115				

Sample ID **N032329-001D-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175909**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.941	0.50	10.00	0.1767	108	75	125				
Arsenic	12.248	0.10	10.00	1.843	104	75	125				
Barium	54.943	1.0	10.00	45.14	98.0	75	125				
Cadmium	9.637	0.50	10.00	0	96.4	75	125				
Cobalt	9.606	0.50	10.00	0.4891	91.2	75	125				
Lead	9.584	1.0	10.00	0	95.8	75	125				
Manganese	123.977	0.50	100.0	29.60	94.4	75	125				
Molybdenum	30.475	0.50	10.00	20.27	102	75	125				
Nickel	100.493	1.0	10.00	94.00	64.9	75	125				S
Selenium	10.359	0.50	10.00	0	104	75	125				
Silver	10.517	0.50	10.00	0	105	75	125				
Thallium	9.216	0.50	10.00	0	92.2	75	125				
Zinc	180.533	10	200.0	0	90.3	75	125				

Sample ID **N032329-001D-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	10.892	2.5	10.00	0	109	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N032329-001D-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175911**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.906	0.50	10.00	0.1767	107	75	125	10.94	0.321	20	
Arsenic	12.439	0.10	10.00	1.843	106	75	125	12.25	1.55	20	
Barium	55.978	1.0	10.00	45.14	108	75	125	54.94	1.87	20	
Cadmium	9.293	0.50	10.00	0	92.9	75	125	9.637	3.63	20	
Cobalt	9.460	0.50	10.00	0.4891	89.7	75	125	9.606	1.54	20	
Lead	9.610	1.0	10.00	0	96.1	75	125	9.584	0.272	20	
Manganese	123.150	0.50	100.0	29.60	93.6	75	125	124.0	0.670	20	
Molybdenum	30.950	0.50	10.00	20.27	107	75	125	30.47	1.55	20	
Nickel	98.290	1.0	10.00	94.00	42.9	75	125	100.5	2.22	20	S
Selenium	10.124	0.50	10.00	0	101	75	125	10.36	2.29	20	
Silver	10.474	0.50	10.00	0	105	75	125	10.52	0.416	20	
Thallium	9.259	0.50	10.00	0	92.6	75	125	9.216	0.462	20	
Zinc	179.361	10	200.0	0	89.7	75	125	180.5	0.651	20	

Sample ID **N032329-001D-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175912**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	11.052	2.5	10.00	0	111	75	125	10.89	1.46	20	

Sample ID **MB-70934** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129311**
Client ID: **PBW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/17/2018** SeqNo: **3176152**

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

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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **LCS-70934** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129311**
Client ID: **LCSW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/17/2018** SeqNo: **3176153**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	10.170	1.0	10.00	0	102	85	115				
Vanadium	10.209	1.0	10.00	0	102	85	115				

Sample ID **N032329-001D-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129311**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/17/2018** SeqNo: **3176168**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	19.398	1.0	10.00	11.01	83.9	75	125				
Vanadium	16.420	1.0	10.00	6.553	98.7	75	125				

Sample ID **N032329-001D-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129311**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/17/2018** SeqNo: **3176170**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	19.392	1.0	10.00	11.01	83.8	75	125	19.40	0.0279	20	
Vanadium	16.515	1.0	10.00	6.553	99.6	75	125	16.42	0.576	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181008A** QC Batch: **R129087** PrepDate							Analyst: **RAB**
Hexavalent Chromium	470	3.3	20		µg/L	100	10/8/2018 10:19 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181015A** QC Batch: **70934** PrepDate **10/8/2018**							Analyst: **CEI**
Chromium	460	0.65	5.0		µg/L	5	10/15/2018 07:10 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181008A** QC Batch: **R129087** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	10/8/2018 12:31 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181015A** QC Batch: **70934** PrepDate **10/8/2018**							Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	10/15/2018 07:15 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181008A** QC Batch: **R129087** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.83	5.0		µg/L	25	10/8/2018 12:12 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181015A** QC Batch: **70934** PrepDate **10/8/2018**							Analyst: **CEI**
Chromium	ND	0.65	5.0		µg/L	5	10/15/2018 07:33 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-70934** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **PBW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175810**

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

Sample ID **LCS-70934** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **LCSW** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175811**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.218	1.0	10.00	0	102	85	115				

Sample ID **N032329-001D-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175826**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	15.407	1.0	10.00	5.642	97.7	75	125				

Sample ID **N032329-001D-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/8/2018** RunNo: **129309**
Client ID: **ZZZZZZ** Batch ID: **70934** TestNo: **EPA 200.8** Analysis Date: **10/15/2018** SeqNo: **3175828**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	15.242	1.0	10.00	5.642	96.0	75	125	15.41	1.08	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
	Calculations are based on raw values				

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R129087** SampType: **MBLK** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **PBW** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167452**

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-R129087** SampType: **LCS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **LCSW** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167453**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.245	0.20	5.000	0	105	90	110				

Sample ID **N032326-001CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **ZZZZZZ** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167455**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	979.570	20	500.0	471.6	102	90	110				

Sample ID **N032326-001CMSD** SampType: **MSD** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **ZZZZZZ** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167456**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1012.960	20	500.0	471.6	108	90	110	979.6	3.35	20	

Sample ID **N032391-001ADUP** SampType: **DUP** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **ZZZZZZ** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167458**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	30.256	1.0						30.74	1.60	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N032326-003BMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **ZZZZZZ** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167463**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	25.670	5.0	25.00	0	103	90	110				

Sample ID **N032326-002CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129087**
Client ID: **ZZZZZZ** Batch ID: **R129087** TestNo: **EPA 218.6** Analysis Date: **10/8/2018** SeqNo: **3167465**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.952	0.20	1.000	0	95.2	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181003C**	QC Batch: **R128995**			PrepDate			Analyst: **LR**
Turbidity	0.22	0.10	0.10		NTU	1	10/3/2018 04:30 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181003C**	QC Batch: **R128995**			PrepDate			Analyst: **LR**
Turbidity	0.30	0.10	0.10		NTU	1	10/3/2018 04:30 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID **MB-R128995** SampType: **MBLK** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **128995**
Client ID: **PBW** Batch ID: **R128995** TestNo: **SM 2130B** Analysis Date: **10/3/2018** SeqNo: **3161435**

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

Sample ID **N032326-001BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **128995**
Client ID: **ZZZZZZ** Batch ID: **R128995** TestNo: **SM 2130B** Analysis Date: **10/3/2018** SeqNo: **3161437**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.240	0.10						0.2200	8.70	30	

Sample ID **N032326-002BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **128995**
Client ID: **ZZZZZZ** Batch ID: **R128995** TestNo: **SM 2130B** Analysis Date: **10/3/2018** SeqNo: **3161439**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.310	0.10						0.3000	3.28	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

Calculations are based on raw values

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 245.1							
RunID: **NV00922-AA1_181005A** QC Batch: **70898** PrepDate **10/5/2018** Analyst: **MG**							
Mercury	ND	0.13	0.20		µg/L	1	10/5/2018 01:08 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID **MB-70898** SampType: **MBLK** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2018** RunNo: **129038**
Client ID: **PBW** Batch ID: **70898** TestNo: **EPA 245.1** Analysis Date: **10/5/2018** SeqNo: **3163315**

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

Sample ID **LCS-70898** SampType: **LCS** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2018** RunNo: **129038**
Client ID: **LCSW** Batch ID: **70898** TestNo: **EPA 245.1** Analysis Date: **10/5/2018** SeqNo: **3163318**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.693	0.20	5.000	0	93.9	85	115				

Sample ID **N032326-003C-MS** SampType: **MS** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2018** RunNo: **129038**
Client ID: **ZZZZZZ** Batch ID: **70898** TestNo: **EPA 245.1** Analysis Date: **10/5/2018** SeqNo: **3163319**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.075	0.20	5.000	0.1431	78.6	75	125				

Sample ID **N032326-003C-MSD** SampType: **MSD** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2018** RunNo: **129038**
Client ID: **ZZZZZZ** Batch ID: **70898** TestNo: **EPA 245.1** Analysis Date: **10/5/2018** SeqNo: **3163320**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	3.933	0.20	5.000	0.1431	75.8	75	125	4.075	3.54	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

Calculations are based on raw values

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181009A** QC Batch: **R129169** PrepDate							Analyst: **RAB**
Fluoride	2.3	0.032	0.50		mg/L	5	10/9/2018 05:48 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181010A** QC Batch: **R129173** PrepDate							Analyst: **RAB**
Sulfate	500	1.1	25		mg/L	50	10/10/2018 05:54 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181009A** QC Batch: **R129169** PrepDate							Analyst: **RAB**
Fluoride	2.2	0.032	0.50		mg/L	5	10/9/2018 06:05 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181010A** QC Batch: **R129173** PrepDate							Analyst: **RAB**
Sulfate	490	1.1	25		mg/L	50	10/10/2018 06:10 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_181009A**	QC Batch: **R129169**			PrepDate			Analyst: **RAB**
Fluoride	19	0.13	2.0		mg/L	20	10/9/2018 06:21 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R129169_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129169**
Client ID: **PBW** Batch ID: **R129169** TestNo: **EPA 300.0** Analysis Date: **10/9/2018** SeqNo: **3168981**

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

Sample ID **LCS-R129169_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129169**
Client ID: **LCSW** Batch ID: **R129169** TestNo: **EPA 300.0** Analysis Date: **10/9/2018** SeqNo: **3168982**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.259	0.10	1.250	0	101	90	110				

Sample ID **N032326-001BDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129169**
Client ID: **ZZZZZZ** Batch ID: **R129169** TestNo: **EPA 300.0** Analysis Date: **10/9/2018** SeqNo: **3168993**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.231	0.50						2.277	2.04	20	

Sample ID **N032326-001BMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129169**
Client ID: **ZZZZZZ** Batch ID: **R129169** TestNo: **EPA 300.0** Analysis Date: **10/9/2018** SeqNo: **3168994**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.243	0.50	6.250	2.277	95.4	80	120				

Sample ID **N032326-001BMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129169**
Client ID: **ZZZZZZ** Batch ID: **R129169** TestNo: **EPA 300.0** Analysis Date: **10/9/2018** SeqNo: **3168995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.306	0.50	6.250	2.277	96.5	80	120	8.242	0.761	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
	Calculations are based on raw values				

CLIENT: CH2M HILL
Work Order: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **MB-R129173_SO4** SampType: **MBLK** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129173**
Client ID: **PBW** Batch ID: **R129173** TestNo: **EPA 300.0** Analysis Date: **10/10/2018** SeqNo: **3169327**

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

Sample ID **LCS-R129173_SO4** SampType: **LCS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129173**
Client ID: **LCSW** Batch ID: **R129173** TestNo: **EPA 300.0** Analysis Date: **10/10/2018** SeqNo: **3169328**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.974	0.50	4.000	0	99.4	90	110				

Sample ID **N032345-012BMS** SampType: **MS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129173**
Client ID: **ZZZZZZ** Batch ID: **R129173** TestNo: **EPA 300.0** Analysis Date: **10/10/2018** SeqNo: **3169332**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3197.880	100	800.0	2393	101	80	120				

Sample ID **N032345-012BMSD** SampType: **MSD** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129173**
Client ID: **ZZZZZZ** Batch ID: **R129173** TestNo: **EPA 300.0** Analysis Date: **10/10/2018** SeqNo: **3169333**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3200.220	100	800.0	2393	101	80	120	3198	0.0731	20	

Sample ID **N032345-012BDUP** SampType: **DUP** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129173**
Client ID: **ZZZZZZ** Batch ID: **R129173** TestNo: **EPA 300.0** Analysis Date: **10/10/2018** SeqNo: **3169334**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	2401.100	100						2393	0.358	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

Calculations are based on raw values

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:00:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_181008A** QC Batch: **R129094** PrepDate							Analyst: **QBM**
Nitrate/Nitrite as N	2.6	0.16	0.25		mg/L	5	10/8/2018

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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-579
Lab Order:	N032326	**Collection Date:**	10/2/2018 9:02:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032326-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_181008A** QC Batch: **R129094** PrepDate Analyst: **QBM**							
Nitrate/Nitrite as N	2.8	0.16	0.25		mg/L	5	10/8/2018

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: N032326
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R129094** SampType: **MBLK** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129094**
Client ID: **PBW** Batch ID: **R129094** TestNo: **SM4500-NO3** Analysis Date: **10/8/2018** SeqNo: **3165612**

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-R129094** SampType: **LCS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129094**
Client ID: **LCSW** Batch ID: **R129094** TestNo: **SM4500-NO3** Analysis Date: **10/8/2018** SeqNo: **3165613**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.983	0.050	1.000	0	98.3	85	115				

Sample ID **N032326-001DDUP** SampType: **DUP** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129094**
Client ID: **ZZZZZZ** Batch ID: **R129094** TestNo: **SM4500-NO3** Analysis Date: **10/8/2018** SeqNo: **3165617**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	3.212	0.25						2.628	20.0	20	

Sample ID **N032326-002DMS** SampType: **MS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129094**
Client ID: **ZZZZZZ** Batch ID: **R129094** TestNo: **SM4500-NO3** Analysis Date: **10/8/2018** SeqNo: **3165619**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.504	0.25	2.500	2.812	108	75	125				

Sample ID **N032326-002DMSD** SampType: **MSD** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129094**
Client ID: **ZZZZZZ** Batch ID: **R129094** TestNo: **SM4500-NO3** Analysis Date: **10/8/2018** SeqNo: **3165620**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.282	0.25	2.500	2.812	98.8	75	125	5.504	4.12	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

Calculations are based on raw values

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.03.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-579
Turnaround Time 10 Days
Shipping Date:
COC Number: 579

			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			
	DATE	TIME	Matrix	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-579	10-2-18	0900	Water	X	X		X	X	X	X		X		X	N032326-01	4	
SC-700B-WDR-579	10-2-18	0902	Water	X	X		X	X	X	X		X		X	-02	4	
SC-701-WDR-579	10-2-18	0904	Water			X	X	X		X	X		X		-03	3	
															TOTAL NUMBER OF CONTAINERS	11	

	Signatures	Date/Time
Approved by		10-2-18 0630
Sampled by		10-2-18 0900
Relinquished by		10-2-18 13:55
Received by		10/2/18 @ 1355
Relinquished by		10/2/18 @ 1659
Received by	Jordan Reguy	10/2/18 16:59

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 5.4°C
Airbill No: IRAR, ASSET
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:
The SC-100B & SC-700B Total metals List:
Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn

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:	10/2/2018	Workorder:	N032326
Rep sample Temp (Deg C):	5.4	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 Amoonia/NO3- were alb preserved with H2SO4 and for Total Metals with HNO3. Both adjusted to pH < 2

Checklist Completed By: YR 10/4/2018

Reviewed By: LG 100718

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:
BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

03-Oct-18

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N032326-001A / SC-100B-WDR-579	Water	10/2/2018 9:00:00 AM	32OZP	1		
N032326-002A / SC-700B-WDR-579	Water	10/2/2018 9:02:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N32326A 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 #: 542281605

		Date/Time			Date/Time
Relinquished by:		10/3/2018 17:00		**Received by:**	
Relinquished by:				**Received by:**	

List of Analysts

ASSET Laboratories Work Order: N032326

NAME	TEST METHOD
Quennie Manimtim	EPA 200.7, SM 4500-NO3F
Claire Ignacio	EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B
Mark Gesmundo	EPA 245.1

October 24, 2018

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

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

Workorder No.: N032327

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 02, 2018 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

Quennie Manimtim
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N032327

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 300.0:

Matrix Spike (MS) is outside recovery criteria for Fluoride in QC sample N032327-001AMS possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 6010B:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Barium in QC samples N032334-001A-MS and N032334-001A-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 7199:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria in QC samples N032327-001A-MS and N032327-001A-MSD possibly due to matrix interference. Post Spike and Matrix Spike Insoluble met 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 some analytes ; however, the associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N032327
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N032327-001A	Phase Separator-579-Sludge	Soil	10/2/2018 7:30:00 AM	10/2/2018	10/24/2018
N032327-001B	Phase Separator-579-Sludge	Soil	10/2/2018 7:30:00 AM	10/2/2018	10/24/2018

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-579-Sludge
Lab Order:	N032327	**Collection Date:**	10/2/2018 7:30:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N032327-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181008B** QC Batch: **R129164** PrepDate							Analyst: **RAB**
Fluoride	22	0.27	3.8		mg/Kg-dry	2	10/8/2018 04:02 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID **MB-R129164** SampType: **MBLK** TestCode: **300_S** Units: **mg/Kg** Prep Date: RunNo: **129164**
Client ID: **PBS** Batch ID: **R129164** TestNo: **EPA 300.0** Analysis Date: **10/8/2018** SeqNo: **3168672**

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

Sample ID **LCS-R129164** SampType: **LCS** TestCode: **300_S** Units: **mg/Kg** Prep Date: RunNo: **129164**
Client ID: **LCSS** Batch ID: **R129164** TestNo: **EPA 300.0** Analysis Date: **10/8/2018** SeqNo: **3168673**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	11.864	1.0	12.50	0	94.9	90	110				

Sample ID **N032327-001ADUP** SampType: **DUP** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **129164**
Client ID: **ZZZZZZ** Batch ID: **R129164** TestNo: **EPA 300.0** Analysis Date: **10/8/2018** SeqNo: **3168678**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	21.657	3.8						21.58	0.338	20	

Sample ID **N032327-001AMS** SampType: **MS** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **129164**
Client ID: **ZZZZZZ** Batch ID: **R129164** TestNo: **EPA 300.0** Analysis Date: **10/8/2018** SeqNo: **3168679**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	40.380	3.8	24.06	21.58	78.1	80	120				S

Sample ID **N032327-001AMSD** SampType: **MSD** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **129164**
Client ID: **ZZZZZZ** Batch ID: **R129164** TestNo: **EPA 300.0** Analysis Date: **10/8/2018** SeqNo: **3168680**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	41.211	3.8	24.06	21.58	81.6	80	120	40.38	2.04	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID	**N032327-001APS**	SampType:	**MS**	TestCode:	**300_S**	Units:	**mg/Kg-dry**	Prep Date:			RunNo:	**129164**	
Client ID:	**ZZZZZZ**	Batch ID:	**R129164**	TestNo:	**EPA 300.0**			Analysis Date:	**10/8/2018**		SeqNo:	**3168681**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	68.661	3.8	48.12	21.58	97.8	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT: CH2M HILL
Lab Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00
Lab ID: N032327-001

Client Sample ID: Phase Separator-579-Sludge
Collection Date: 10/2/2018 7:30:00 AM
Matrix: SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
	EPA 3050B		**EPA 6010B**				
RunID: **NV00922-ICP2_181005D**	QC Batch: **70871**				PrepDate	**10/3/2018**	Analyst: **CEI**
Antimony	18	0.63	3.8		mg/Kg-dry	1	10/5/2018 04:05 PM
Arsenic	19	1.0	1.9		mg/Kg-dry	1	10/4/2018 04:01 AM
Barium	64	0.60	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Beryllium	ND	0.41	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Cadmium	ND	0.51	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Chromium	2800	0.62	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Cobalt	3.8	0.55	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Copper	140	1.7	3.8		mg/Kg-dry	1	10/3/2018 08:36 PM
Lead	ND	0.57	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Manganese	330	0.98	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Molybdenum	4.6	0.57	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Nickel	26	0.65	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Selenium	ND	1.1	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Silver	ND	1.2	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Thallium	6.8	0.68	3.8		mg/Kg-dry	1	10/3/2018 08:36 PM
Vanadium	43	0.43	1.9		mg/Kg-dry	1	10/3/2018 08:36 PM
Zinc	34	0.57	1.9		mg/Kg-dry	1	10/3/2018 08:36 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: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **MB-70871** SampType: **MBLK** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128992**
Client ID: **PBS** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/3/2018** SeqNo: **3161144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
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 **LCS-70871** SampType: **LCS** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128992**
Client ID: **LCSS** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/3/2018** SeqNo: **3161145**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.160	2.0	25.00	0	101	85	115				
Barium	25.372	1.0	25.00	0	101	85	115				
Beryllium	25.265	1.0	25.00	0	101	85	115				
Cadmium	25.584	1.0	25.00	0	102	85	115				
Chromium	25.410	1.0	25.00	0	102	85	115				
Cobalt	25.363	1.0	25.00	0	101	85	115				
Copper	25.439	2.0	25.00	0	102	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **LCS-70871** SampType: **LCS** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128992**
Client ID: **LCSS** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/3/2018** SeqNo: **3161145**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	25.490	1.0	25.00	0	102	85	115				
Manganese	50.168	1.0	50.00	0	100	85	115				
Molybdenum	25.452	1.0	25.00	0	102	85	115				
Nickel	25.428	1.0	25.00	0	102	85	115				
Selenium	25.195	1.0	25.00	0	101	85	115				
Silver	25.398	1.0	25.00	0	102	85	115				
Thallium	25.484	2.0	25.00	0	102	85	115				
Vanadium	25.675	1.0	25.00	0	103	85	115				
Zinc	25.327	1.0	25.00	0	101	85	115				

Sample ID **N032334-001A-MS** SampType: **MS** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128992**
Client ID: **ZZZZZZ** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/3/2018** SeqNo: **3161149**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	22.364	2.0	24.99	0	89.5	75	125				
Barium	334.464	1.0	24.99	315.9	74.1	75	125				S
Beryllium	22.082	1.0	24.99	0	88.4	75	125				
Cadmium	20.754	1.0	24.99	0.5398	80.9	75	125				
Chromium	45.375	1.0	24.99	24.53	83.4	75	125				
Cobalt	32.057	1.0	24.99	10.82	85.0	75	125				
Copper	46.859	2.0	24.99	23.26	94.4	75	125				
Lead	42.773	1.0	24.99	23.27	78.1	75	125				
Manganese	603.715	1.0	49.98	564.4	78.7	75	125				
Molybdenum	20.676	1.0	24.99	0	82.7	75	125				
Nickel	45.630	1.0	24.99	25.98	78.6	75	125				
Selenium	20.741	1.0	24.99	0	83.0	75	125				
Silver	25.217	1.0	24.99	0	101	75	125				
Thallium	20.693	2.0	24.99	1.199	78.0	75	125				
Vanadium	74.336	1.0	24.99	51.64	90.8	75	125				
Zinc	68.542	1.0	24.99	49.66	75.6	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
	Calculations are based on raw values				

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **N032334-001A-MSD** SampType: **MSD** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128992**
Client ID: **ZZZZZZ** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/3/2018** SeqNo: **3161150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	22.658	2.0	24.99	0	90.7	75	125	22.36	1.30	20	
Barium	334.932	1.0	24.99	315.9	76.0	75	125	334.5	0.140	20	
Beryllium	21.889	1.0	24.99	0	87.6	75	125	22.08	0.876	20	
Cadmium	20.951	1.0	24.99	0.5398	81.7	75	125	20.75	0.947	20	
Chromium	45.517	1.0	24.99	24.53	84.0	75	125	45.37	0.313	20	
Cobalt	32.428	1.0	24.99	10.82	86.5	75	125	32.06	1.15	20	
Copper	47.358	2.0	24.99	23.26	96.4	75	125	46.86	1.06	20	
Lead	43.127	1.0	24.99	23.27	79.5	75	125	42.77	0.825	20	
Manganese	605.547	1.0	49.98	564.4	82.3	75	125	603.7	0.303	20	
Molybdenum	20.570	1.0	24.99	0	82.3	75	125	20.68	0.513	20	
Nickel	45.936	1.0	24.99	25.98	79.9	75	125	45.63	0.669	20	
Selenium	21.564	1.0	24.99	0	86.3	75	125	20.74	3.89	20	
Silver	25.484	1.0	24.99	0	102	75	125	25.22	1.06	20	
Thallium	21.105	2.0	24.99	1.199	79.7	75	125	20.69	1.97	20	
Vanadium	74.476	1.0	24.99	51.64	91.4	75	125	74.34	0.189	20	
Zinc	69.146	1.0	24.99	49.66	78.0	75	125	68.54	0.878	20	

Sample ID **MB-70871** SampType: **MBLK** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **129002**
Client ID: **PBS** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/4/2018** SeqNo: **3161494**

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

Sample ID **LCS-70871** SampType: **LCS** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **129002**
Client ID: **LCSS** Batch ID: **70871** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/4/2018** SeqNo: **3161495**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	24.817	1.0	25.00	0	99.3	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	N032334-001A-MS	SampType:	MS	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/3/2018	RunNo:	129002
Client ID:	ZZZZZZ	Batch ID:	70871	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/4/2018	SeqNo:	3161499

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	65.882	1.0	24.99	43.67	88.9	75	125				

Sample ID	N032334-001A-MSD	SampType:	MSD	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/3/2018	RunNo:	129002
Client ID:	ZZZZZZ	Batch ID:	70871	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/4/2018	SeqNo:	3161500

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	65.724	1.0	24.99	43.67	88.2	75	125	65.88	0.242	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-579-Sludge
Lab Order:	N032327	**Collection Date:**	10/2/2018 7:30:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N032327-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 3060A			**EPA 7199**				
RunID: **NV00922-IC6_181004A**	QC Batch: **70867**			PrepDate	**10/3/2018**		Analyst: **RAB**
Hexavalent Chromium	53	0.56	1.9		mg/Kg-dry	5	10/4/2018 01:48 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID **MB-70867** SampType: **MBLK** TestCode: **7199_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **129053**
Client ID: **PBS** Batch ID: **70867** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2018** SeqNo: **3163673**

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-70867** SampType: **LCS** TestCode: **7199_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **129053**
Client ID: **LCSS** Batch ID: **70867** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2018** SeqNo: **3163674**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	3.684	0.20	4.000	0	92.1	80	120				

Sample ID **N032327-001A-REP** SampType: **DUP** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/3/2018** RunNo: **129053**
Client ID: **ZZZZZZ** Batch ID: **70867** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2018** SeqNo: **3163676**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	52.955	1.9						52.84	0.219	20	

Sample ID **N032327-001A-DUP** SampType: **DUP** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/3/2018** RunNo: **129053**
Client ID: **ZZZZZZ** Batch ID: **70867** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2018** SeqNo: **3163677**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	51.122	1.9						52.84	3.30	20	

Sample ID **N032327-001A-MS I** SampType: **MS** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/3/2018** RunNo: **129053**
Client ID: **ZZZZZZ** Batch ID: **70867** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2018** SeqNo: **3163678**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1151.149	19	1309	52.84	83.9	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

Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	N032327-001A-MS	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/3/2018	RunNo:	129053
Client ID:	ZZZZZZ	Batch ID:	70867	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2018	SeqNo:	3163689

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	54.998	1.9	7.673	52.84	28.1	75	125				S

Sample ID	N032327-001A-MSD	SampType:	MSD	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/3/2018	RunNo:	129053
Client ID:	ZZZZZZ	Batch ID:	70867	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2018	SeqNo:	3163690

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	73.729	1.9	7.688	52.84	272	75	125	55.00	29.1	20	SR

Sample ID	N032327-001A-PS	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:		RunNo:	129053
Client ID:	ZZZZZZ	Batch ID:	70867	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2018	SeqNo:	3163691

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	91.520	1.9	38.37	52.84	101	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-579-Sludge
Lab Order:	N032327	**Collection Date:**	10/2/2018 7:30:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N032327-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 7471A							
RunID: **NV00922-AA1_181003A** QC Batch: **70872** PrepDate **10/3/2018** Analyst: **MG**							
Mercury	ND	0.051	0.19		mg/Kg-dry	1	10/3/2018 01:38 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S_PGE

Sample ID **MB-70872** SampType: **MBLK** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128974**
Client ID: **PBS** Batch ID: **70872** TestNo: **EPA 7471A** Analysis Date: **10/3/2018** SeqNo: **3159229**

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

Sample ID **LCS-70872** SampType: **LCS** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128974**
Client ID: **LCSS** Batch ID: **70872** TestNo: **EPA 7471A** Analysis Date: **10/3/2018** SeqNo: **3159230**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.442	0.10	0.4167	0	106	75	125				

Sample ID **N032334-006A-MS** SampType: **MS** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128974**
Client ID: **ZZZZZZ** Batch ID: **70872** TestNo: **EPA 7471A** Analysis Date: **10/3/2018** SeqNo: **3159231**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.413	0.10	0.4146	0	99.7	75	125				

Sample ID **N032334-006A-MSD** SampType: **MSD** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/3/2018** RunNo: **128974**
Client ID: **ZZZZZZ** Batch ID: **70872** TestNo: **EPA 7471A** Analysis Date: **10/3/2018** SeqNo: **3159232**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.461	0.099	0.4105	0	112	75	125	0.4135	10.9	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
	Calculations are based on raw values				

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *24-Oct-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-579-Sludge
Lab Order:	N032327	**Collection Date:**	10/2/2018 7:30:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N032327-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE							
			D2216				
RunID: **NV00922-WC_181003F**	QC Batch: **R128998**			PrepDate			Analyst: **LR**
Percent Moisture	48.04	0.1000	0.1000		wt%	1	10/3/2018 12:15 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		

ASSET Laboratories

Date: *24-Oct-18*

CLIENT: CH2M HILL
Work Order: N032327
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: PMOIST

Sample ID **MB-R128998** SampType: **MBLK** TestCode: **PMOIST** Units: **wt%** Prep Date: RunNo: **128998**
Client ID: **PBS** Batch ID: **R128998** TestNo: **D2216** Analysis Date: **10/3/2018** SeqNo: **3161460**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	ND	0.1000									

Sample ID **N032327-001BDUP** SampType: **DUP** TestCode: **PMOIST** Units: **wt%** Prep Date: RunNo: **128998**
Client ID: **ZZZZZZ** Batch ID: **R128998** TestNo: **D2216** Analysis Date: **10/3/2018** SeqNo: **3161462**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	47.783	0.1000						48.04	0.543	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
	Calculations are based on raw values				

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.03.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-579-SLUDGE
Turnaround Time 10 Days
Shipping Date:
COC Number: 579-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) Fl	Metals (6010B_Soil) Title 22, Mercury, Mn	Metals (7199)		Number of Containers	COMMENTS
Phase Separator-579-Sludge	10-2-18	730	Soil	x	x	x	N032327-01	3	
							TOTAL NUMBER OF CONTAINERS	3	

	Signatures	Date/Time
Approved by		10-2-18 0630
Sampled by		10-2-18 730
Relinquished by		10-2-18 · 13:55
Received by		10/2/18 @1355
Relinquished by		10/2/18 @1659
Received by		10/2/18 16:59

Shipping Details
Method of Shipment: FedEx
On Ice: (yes) no 5.4°C
Airbill No: 1RH2, ASSET
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2859

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:	10/2/2018	Workorder:	N032327
Rep sample Temp (Deg C):	5.4	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 10/4/2018

Reviewed By: LG 100418

List of Analysts

ASSET Laboratories Work Order: N032327

NAME	TEST METHOD
Claire Ignacio	EPA 6010B
Ria Abes	EPA 300.0, EPA 7199
Lilia Ramit	ASTM D2216
Mark Gesmundo	EPA 7471A

Date of Report: 110190/ 512

8 arlon Martin

CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Mlient Project:	N5V/ 264
BML Project:	Level I-
BML Work Order:	12V3V9#
Invoice ID:	BV/ / 6#6

Enclosed are the results of analyses for samples received by the laboratory on 110190/ 512. If you have any questions concerning this report, please feel free to contact me.

Revised Report: This report supercedes Report ID 15552/ 5634

Sincerely,

Montact Person: - anessa Sandoval
Mlient Service Rep

Stuart Buttram
Technical Director

Mertifications: MC ELCP ; 112#K N- ; MC55514K OR ELCP ; 45V/ A551K CU (ST151

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

18-35396

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:
BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

08-Nov-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: SM4500-NH3D		
N032874-002A / SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	32OZP	1		

CHK BY
DISTRIBUTION
SUB-OUT

Please CC Report to Lucille Golosinda at lucille.golosinda@assetlaboratories.com

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N32874A 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 #: 542714202

		Date/Time			Date/Time
Relinquished by:		11/8/2018 17:00	Received by:	11-9-18	08:40
Relinquished by:			Received by:		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

Chain of Custody and Cooler Receipt Form for 1835396 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 18-35396

SHIPPING INFORMATION	SHIPPING CONTAINER	FREE LIQUID
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐	Ice Chest ☒ None ☐ Box ☐	YES ☐ NO ☐
BC Lab Field Service ☐ Other ☒ (Specify) GSO	Other ☐ (Specify)	W / S

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes No Container ☐ Intact? Yes No None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: .97 Container: Tape Thermometer ID: 294 Date/Time 11.9.18

Temperature: (A) 3.0 °C / (C) 2.7 °C Analyst Init 08:40

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS	A									
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: Date/Time: 11/9/18 1153 Rev 21 05/23/2016

CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Reported: 110190/512 15:/6
Project: Level I-
Project Number: N5V/264
Project 8 anager: 8 arlon Martin

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1835396-01	**COC Number:**	AAA	**Receive Date:**	110590/512 52:45
	Project Number:	AAA	**Sampling Date:**	1105#0/512 16:5V
	Sampling Location:	AAA	**Sample Depth:**	AAA
	Sampling Point:	N5V/264A55/C0SMA655BAWDRA325	**Lab Matrix:**	Water
	Sampled By:	AAA	**Sample Type:**	Water

CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Reported: 110190/512 15:/6
Project: Level I-
Project Number: N5V/264
Project 8 anager: 8 arlon Martin

Water Analysis (General Chemistry)

BCL Sample ID: 12V3V9#A51 | **Client Sample Name:** N5V/264A55/C0SMA655BAWDRA325, 116#0/512 3:5V:55P8

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Cmmonia as N)Distilled7	ND	mg0L	5./5		S8 A4355ANHVG	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	S8 A4355ANHVG	110140/12 1V:V3	110130/12 1#:4/	J8 H	SMA1	1	B5V559/

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CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Reported: 110190/ 512 15:/ 6
Project: Level I-
Project Number: N5V/ 264
Project 8 anager: 8 arlon Martin

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B030092						
Cmmonia as N)Distilled7	B5V559/ ABLU1	ND	mg0L	5./ 5		

CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Reported: 110190/ 512 15:/ 6
Project: Level I-
Project Number: N5V/ 264
Project 8 anager: 8 arlon Martin

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B030092										
Cmmonia as N)Distilled7	B5V559/ ABS1	LMS	1.5566	1.5555	mg0L	151		23 A113		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

CSSET LaboratoriesALas - egas
V131A/13V W. Post Rd
Las - egas, N- 29112

Reported: 110190/ 512 15:/ 6
Project: Level I-
Project Number: N5V/ 264
Project 8 anager: 8 arlon Martin

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B030092	(sed client sample: N										
Cmmonia as N)Distilled7	D(P	12V3W2A5/	5.13945	ND		mg0L			/ 5		
	8 S	12V3W2A5/	5.13945	1.V3V6	1.1111	mg0L		156		25 A1/ 5	
	8 SD	12V3W2A5/	5.13945	1./ 6#5	1.1111	mg0L	3.9	155	/ 5	25 A1/ 5	

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November 20, 2018

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

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

Workorder No.: N032874

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on November 06, 2018 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 Liku cao for

Quennie Manimtim
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and ASSET Laboratories - Las Vegas.

ASSET Laboratories **Date:** *02-Jan-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N032874

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 BC Labs- Bakersfield,CA.

Analytical Comments for EPA 200.7:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Boron in QC samples N032874-002E-MS1 and N032874-002E-MSD1 possibly due to matrix interference. 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 Copper in QC samples N032944-001D-MS and N032944-001D-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N032874
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N032874-001A	SC-100B-WDR-580	Water	11/6/2018 5:00:00 PM	11/6/2018	11/20/2018
N032874-001B	SC-100B-WDR-580	Water	11/6/2018 5:00:00 PM	11/6/2018	11/20/2018
N032874-001C	SC-100B-WDR-580	Water	11/6/2018 5:00:00 PM	11/6/2018	11/20/2018
N032874-002A	SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	11/6/2018	11/20/2018
N032874-002B	SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	11/6/2018	11/20/2018
N032874-002C	SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	11/6/2018	11/20/2018
N032874-002D	SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	11/6/2018	11/20/2018
N032874-002E	SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	11/6/2018	11/20/2018

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:00:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_181107C**	QC Batch: **R129810**			PrepDate			Analyst: **LR**
Specific Conductance	7400	0.10	0.10		umhos/cm	1	11/7/2018 01:00 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_181107C**	QC Batch: **R129810**			PrepDate			Analyst: **LR**
Specific Conductance	7600	0.10	0.10		umhos/cm	1	11/7/2018 01:00 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N032874-002BDUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **129810**
Client ID: **ZZZZZZ** Batch ID: **R129810** TestNo: **EPA 120.1** Analysis Date: **11/7/2018** SeqNo: **3197795**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7550.000	0.10						7570	0.265	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:00:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_181107I**	QC Batch: **71302**				PrepDate	**11/7/2018**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4600	50	50		mg/L	1	11/7/2018 03:15 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_181107I**	QC Batch: **71302**				PrepDate	**11/7/2018**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	3900	50	50		mg/L	1	11/7/2018 03:15 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **LCS-71302** SampType: **LCS** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/7/2018** RunNo: **129861**
Client ID: **LCSW** Batch ID: **71302** TestNo: **SM2540C** Analysis Date: **11/7/2018** SeqNo: **3199646**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	954.000	10	1000	0	95.4	80	120				

Sample ID **MB-71302** SampType: **MBLK** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/7/2018** RunNo: **129861**
Client ID: **PBW** Batch ID: **71302** TestNo: **SM2540C** Analysis Date: **11/7/2018** SeqNo: **3199647**

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 **N032874-002BDUP** SampType: **DUP** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/7/2018** RunNo: **129861**
Client ID: **ZZZZZZ** Batch ID: **71302** TestNo: **SM2540C** Analysis Date: **11/7/2018** SeqNo: **3199650**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	4135.000	50						3945	4.70	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_181120A** QC Batch: **71380**				PrepDate	**11/14/2018**		Analyst: **CEI**
Aluminum	ND	40	50		µg/L	1	11/20/2018 09:23 AM
Boron	1100	74	100		µg/L	1	11/20/2018 09:23 AM
Iron	ND	18	20		µg/L	1	11/20/2018 09:23 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **LCS1-71380** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/14/2018** RunNo: **130057**
Client ID: **LCSW** Batch ID: **71380** TestNo: **EPA 200.7** Analysis Date: **11/20/2018** SeqNo: **3209754**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5183.544	50	5000	0	104	85	115				
Boron	941.358	100	1000	0	94.1	85	115				
Iron	106.160	20	100.0	0	106	85	115				

Sample ID **N032874-002E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/14/2018** RunNo: **130057**
Client ID: **ZZZZZZ** Batch ID: **71380** TestNo: **EPA 200.7** Analysis Date: **11/20/2018** SeqNo: **3209758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5525.346	50	5000	0	111	75	125				
Boron	2400.666	100	1000	1069	133	75	125				S
Iron	114.459	20	100.0	0	114	75	125				

Sample ID **N032874-002E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/14/2018** RunNo: **130057**
Client ID: **ZZZZZZ** Batch ID: **71380** TestNo: **EPA 200.7** Analysis Date: **11/20/2018** SeqNo: **3209759**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5536.242	50	5000	0	111	75	125	5525	0.197	20	
Boron	2412.211	100	1000	1069	134	75	125	2401	0.480	20	S
Iron	113.866	20	100.0	0	114	75	125	114.5	0.520	20	

Sample ID **MB-71380** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/14/2018** RunNo: **130057**
Client ID: **PBW** Batch ID: **71380** TestNo: **EPA 200.7** Analysis Date: **11/20/2018** SeqNo: **3209762**

Analyte	Result	PQL
Aluminum	ND	50
Boron	ND	100
Iron	ND	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:00:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181115C** QC Batch: **71359** PrepDate **11/13/2018** Analyst: **CEI**							
Manganese	7.7	0.26	0.50		µg/L	1	11/15/2018 07:51 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181115C** QC Batch: **71359**				PrepDate	**11/13/2018**		Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	11/15/2018 08:14 PM
Arsenic	ND	0.081	0.10		µg/L	1	11/15/2018 08:14 PM
Barium	13	0.15	1.0		µg/L	1	11/15/2018 08:14 PM
Copper	ND	0.55	1.0		µg/L	1	11/15/2018 08:14 PM
Lead	ND	0.13	1.0		µg/L	1	11/15/2018 08:14 PM
Manganese	1.9	0.26	0.50		µg/L	1	11/15/2018 08:14 PM
Molybdenum	24	0.21	0.50		µg/L	1	11/15/2018 08:14 PM
Nickel	ND	0.26	1.0		µg/L	1	11/16/2018 01:16 PM
Zinc	ND	2.3	10		µg/L	1	11/15/2018 08:14 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-71359** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **PBW** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208387**

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									
Zinc	ND	10									

Sample ID **LCS-71359** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **LCSW** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208388**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.636	0.50	10.00	0	106	85	115				
Arsenic	10.075	0.10	10.00	0	101	85	115				
Barium	9.908	1.0	10.00	0	99.1	85	115				
Copper	10.394	1.0	10.00	0	104	85	115				
Lead	10.620	1.0	10.00	0	106	85	115				
Manganese	104.693	0.50	100.0	0	105	85	115				
Molybdenum	9.439	0.50	10.00	0	94.4	85	115				
Zinc	9.849	10	10.00	0	98.5	85	115				

Sample ID **N032944-001D-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **ZZZZZZ** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208393**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.858	0.50	10.00	0.3106	105	75	125				
Arsenic	16.158	0.10	10.00	6.695	94.6	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: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N032944-001D-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **ZZZZZZ** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208393**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	57.776	1.0	10.00	49.37	84.1	75	125				
Copper	5.799	1.0	10.00	0	58.0	75	125				S
Lead	10.990	1.0	10.00	0	110	75	125				
Manganese	128.169	0.50	100.0	26.81	101	75	125				
Molybdenum	14.908	0.50	10.00	3.311	116	75	125				
Zinc	12.695	10	10.00	3.691	90.0	75	125				

Sample ID **N032944-001D-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **ZZZZZZ** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208394**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.637	0.50	10.00	0.3106	103	75	125	10.86	2.06	20	
Arsenic	15.648	0.10	10.00	6.695	89.5	75	125	16.16	3.21	20	
Barium	57.163	1.0	10.00	49.37	77.9	75	125	57.78	1.07	20	
Copper	5.537	1.0	10.00	0	55.4	75	125	5.799	4.62	20	S
Lead	11.010	1.0	10.00	0	110	75	125	10.99	0.183	20	
Manganese	128.005	0.50	100.0	26.81	101	75	125	128.2	0.128	20	
Molybdenum	15.032	0.50	10.00	3.311	117	75	125	14.91	0.832	20	
Zinc	12.088	10	10.00	3.691	84.0	75	125	12.70	4.90	20	

Sample ID **MB-71359** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130038**
Client ID: **PBW** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/16/2018** SeqNo: **3208903**

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

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: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-71359	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/13/2018	RunNo:	130038
Client ID:	LCSW	Batch ID:	71359	TestNo:	EPA 200.8			Analysis Date:	11/16/2018	SeqNo:	3208904

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nickel	9.697	1.0	10.00	0	97.0	85	115				

Sample ID	N032944-001D-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/13/2018	RunNo:	130038
Client ID:	ZZZZZZ	Batch ID:	71359	TestNo:	EPA 200.8			Analysis Date:	11/16/2018	SeqNo:	3208908

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nickel	22.691	1.0	10.00	13.14	95.5	75	125				

Sample ID	N032944-001D-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/13/2018	RunNo:	130038
Client ID:	ZZZZZZ	Batch ID:	71359	TestNo:	EPA 200.8			Analysis Date:	11/16/2018	SeqNo:	3208909

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nickel	22.741	1.0	10.00	13.14	96.0	75	125	22.69	0.222	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:00:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181107A** QC Batch: **R129816** PrepDate Analyst: **RAB**							
Hexavalent Chromium	490	3.3	20		µg/L	100	11/8/2018 06:31 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181115C** QC Batch: **71359** PrepDate **11/13/2018** Analyst: **CEI**							
Chromium	520	0.65	5.0		µg/L	5	11/15/2018 08:08 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181107A** QC Batch: **R129816** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	11/8/2018 05:52 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181115C** QC Batch: **71359** PrepDate **11/13/2018**							Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	11/15/2018 08:14 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-71359** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **PBW** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208351**

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

Sample ID **LCS-71359** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **LCSW** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.186	1.0	10.00	0	102	85	115				

Sample ID **N032944-001D-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **ZZZZZZ** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208357**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	13.496	1.0	10.00	3.924	95.7	75	125				

Sample ID **N032944-001D-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/13/2018** RunNo: **130026**
Client ID: **ZZZZZZ** Batch ID: **71359** TestNo: **EPA 200.8** Analysis Date: **11/15/2018** SeqNo: **3208358**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	13.275	1.0	10.00	3.924	93.5	75	125	13.50	1.66	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: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R129816	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	129816
Client ID:	PBW	Batch ID:	R129816	TestNo:	EPA 218.6			Analysis Date:	11/7/2018	SeqNo:	3199013

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-R129816	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	129816
Client ID:	LCSW	Batch ID:	R129816	TestNo:	EPA 218.6			Analysis Date:	11/7/2018	SeqNo:	3199014

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.047	0.20	5.000	0	101	90	110				

Sample ID	N032898-001CDUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	129816
Client ID:	ZZZZZZ	Batch ID:	R129816	TestNo:	EPA 218.6			Analysis Date:	11/8/2018	SeqNo:	3199030

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1856.980	40						1851	0.320	20	

Sample ID	N032888-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	129816
Client ID:	ZZZZZZ	Batch ID:	R129816	TestNo:	EPA 218.6			Analysis Date:	11/8/2018	SeqNo:	3199048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	12386.800	200	5000	7309	102	90	110				

Sample ID	N032888-001AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	129816
Client ID:	ZZZZZZ	Batch ID:	R129816	TestNo:	EPA 218.6			Analysis Date:	11/8/2018	SeqNo:	3199049

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	12321.300	200	5000	7309	100	90	110	12390	0.530	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: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N032874-002CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129816**
Client ID: **ZZZZZZ** Batch ID: **R129816** TestNo: **EPA 218.6** Analysis Date: **11/8/2018** SeqNo: **3199056**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.951	0.20	1.000	0	95.0	90	110				

Sample ID **N032874-001BMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **129816**
Client ID: **ZZZZZZ** Batch ID: **R129816** TestNo: **EPA 218.6** Analysis Date: **11/8/2018** SeqNo: **3199060**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1007.790	20	500.0	489.6	104	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:00:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181107F**	QC Batch: **R129815**			PrepDate			Analyst: **LR**
Turbidity	0.21	0.10	0.10		NTU	1	11/7/2018 05:13 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181107F**	QC Batch: **R129815**			PrepDate			Analyst: **LR**
Turbidity	0.21	0.10	0.10		NTU	1	11/7/2018 05:13 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	MB-R129815	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	129815
Client ID:	PBW	Batch ID:	R129815	TestNo:	SM 2130B			Analysis Date:	11/7/2018	SeqNo:	3197893

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

Sample ID	N032874-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	129815
Client ID:	ZZZZZZ	Batch ID:	R129815	TestNo:	SM 2130B			Analysis Date:	11/7/2018	SeqNo:	3197896

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.220	0.10						0.2100	4.65	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181106A** QC Batch: **R129806** PrepDate							Analyst: **RAB**
Fluoride	2.2	0.032	0.50		mg/L	5	11/7/2018 02:02 AM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181106A** QC Batch: **R129806** PrepDate							Analyst: **RAB**
Sulfate	490	1.1	25		mg/L	50	11/7/2018 03:37 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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R129806_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **PBW** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/6/2018** SeqNo: **3197587**

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

Sample ID **LCS-R129806_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **LCSW** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/6/2018** SeqNo: **3197588**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.220	0.10	1.250	0	97.6	90	110				

Sample ID **N032874-002BDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197590**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.180	0.50						2.240	2.72	20	

Sample ID **N032874-002BMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197593**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	7.724	0.50	6.250	2.240	87.7	80	120				

Sample ID **N032874-002BMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197594**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	7.781	0.50	6.250	2.240	88.7	80	120	7.724	0.742	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: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **MB-R129806_SO4** SampType: **MBLK** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **PBW** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/6/2018** SeqNo: **3197603**

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

Sample ID **LCS-R129806_SO4** SampType: **LCS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **LCSW** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/6/2018** SeqNo: **3197604**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.949	0.50	4.000	0	98.7	90	110				

Sample ID **N032874-002BDUP** SampType: **DUP** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197608**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	487.385	25						490.8	0.696	20	

Sample ID **N032874-002BMS** SampType: **MS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197609**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	687.845	25	200.0	490.8	98.5	80	120				

Sample ID **N032874-002BMSD** SampType: **MSD** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **129806**
Client ID: **ZZZZZZ** Batch ID: **R129806** TestNo: **EPA 300.0** Analysis Date: **11/7/2018** SeqNo: **3197610**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	688.910	25	200.0	490.8	99.1	80	120	687.8	0.155	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *20-Nov-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-580
Lab Order:	N032874	**Collection Date:**	11/6/2018 5:03:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N032874-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_181109A** QC Batch: **R129855** PrepDate Analyst: **QBM**							
Nitrate/Nitrite as N	2.7	0.16	0.25		mg/L	5	11/9/2018

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		

ASSET Laboratories

Date: *20-Nov-18*

CLIENT: CH2M HILL
Work Order: N032874
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R129855** SampType: **MBLK** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129855**
Client ID: **PBW** Batch ID: **R129855** TestNo: **SM4500-NO3** Analysis Date: **11/9/2018** SeqNo: **3199496**

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-R129855** SampType: **LCS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129855**
Client ID: **LCSW** Batch ID: **R129855** TestNo: **SM4500-NO3** Analysis Date: **11/9/2018** SeqNo: **3199497**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.535	0.050	0.5000	0	107	85	115				

Sample ID **N032892-002CDUP** SampType: **DUP** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129855**
Client ID: **ZZZZZZ** Batch ID: **R129855** TestNo: **SM4500-NO3** Analysis Date: **11/9/2018** SeqNo: **3199501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	2.781	0.25						2.683	3.57	20	

Sample ID **N032874-002DMS** SampType: **MS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129855**
Client ID: **ZZZZZZ** Batch ID: **R129855** TestNo: **SM4500-NO3** Analysis Date: **11/9/2018** SeqNo: **3199503**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	4.984	0.25	2.500	2.740	89.8	75	125				

Sample ID **N032874-002DMSD** SampType: **MSD** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **129855**
Client ID: **ZZZZZZ** Batch ID: **R129855** TestNo: **SM4500-NO3** Analysis Date: **11/9/2018** SeqNo: **3199504**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	4.652	0.25	2.500	2.740	76.5	75	125	4.984	6.88	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		

N032874

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.03.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-580
Turnaround Time 10 Days
Shipping Date:
COC Number: 580

			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			
	DATE	TIME	Matrix	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	Turbidity (SM2130)		Number of Containers	COMMENTS
SC-100B-WDR-580	11-6-18	17:00	Water			X	X		X		X	X	N032874-01	3	
SC-700B-WDR-580	11-6-18	17:03	Water	X	X	X	X	X	X	X		X	-02	4	
													TOTAL NUMBER OF CONTAINERS	7	

	Signatures	Date/Time
Approved by		11-6-18 0800
Sampled by		11-6-18 17:00
Relinquished by		11/6/18 1759
Received by		11/6/18 1759
Relinquished by		11/6/18 1959
Received by		11/6/18 1959

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no #1 3.1°C
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
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:	11/6/2018	Workorder:	N032874
Rep sample Temp (Deg C):	3.1	IR Gun ID:	1
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	N/A	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 Ammonia/NO3- were lab preserved with H2SO4 and for Total Metals with HNO3. Both adjusted to pH < 2.

For:

Checklist Completed By: RM 11/7/2018

Reviewed By: MBC 11/20/2018

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:

BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

08-Nov-18

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N032874-002A / SC-700B-WDR-580	Water	11/6/2018 5:03:00 PM	32OZP	1		

Please CC Report to Lucille Golosinda at lucille.golosinda@assetlaboratories.com

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N32874A 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 #: 542714202

		Date/Time			Date/Time
Relinquished by:	11/8/2018	17:00	**Received by:**		
Relinquished by:			**Received by:**		

List of Analysts

ASSET Laboratories Work Order: N032874

NAME	TEST METHOD
Quennie Manimtim	SM 4500-NO3F
Claire Ignacio	EPA 200.7, EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B

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Supplemental Report 1

The original report has been revised to include the Level IV deliverables package.

WORK ORDER NUMBER: 18-12-0462

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Asset Laboratories

Client Project Name: N033236

Attention: Marlon Cartin
3151 West Post Road
Las Vegas, NV 89118-3859

Approved for release on 12/18/2018 by:
Don Burley
Project Manager

ResultLink

Email your PM

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Work Order Narrative

Work Order: 18-12-0462 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 12/06/18. They were assigned to Work Order 18-12-0462.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

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Sample Summary

Client:	Asset Laboratories 3151 West Post Road Las Vegas, NV 89118-3859	Work Order:	18-12-0462
		Project Name:	N033236
		PO Number:	N33236B
		Date/Time Received:	12/06/18 10:15
		Number of Containers:	1
Attn:	Marlon Cartin		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
N033236-002D / SC-700B-WDR-581	18-12-0462-1	12/04/18 16:45	1	Aqueous

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QC Association Summary

Work Order: 18-12-0462

Client Sample ID	Method Name	Type	Ext Name	Instrument	MS/MSD/SDP	LCS/LCSD
N033236-002D / SC-700B-WDR-581	SM 4500-NO3 E Nitrate + Nitrite		N/A	UV 7	I1208NO3S1	I1208NO3L1

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Analytical Report

Asset Laboratories		Date Received:	12/06/18
3151 West Post Road		Work Order:	18-12-0462
Las Vegas, NV 89118-3859		Preparation:	N/A
		Method:	SM 4500-NO3 E
		Units:	mg/L
Project: N033236			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
N033236-002D / SC-700B-WDR-581	**18-12-0462-1-A**	**12/04/18 16:45**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3L1**

Parameter	Result	RL	DF	Qualifiers
Nitrate-Nitrite (as N)	2.4	1.0	10.0	

Method Blank	**099-14-282-714**	**N/A**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3L1**

Parameter	Result	RL	DF	Qualifiers
Nitrate-Nitrite (as N)	ND	0.10	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Asset Laboratories		Date Received:	12/06/18
3151 West Post Road		Work Order:	18-12-0462
Las Vegas, NV 89118-3859		Preparation:	N/A
		Method:	SM 4500-NO3 E
Project: N033236			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-12-0459-4	**Sample**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3S1**
18-12-0459-4	**Matrix Spike**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3S1**
18-12-0459-4	**Matrix Spike Duplicate**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3S1**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Nitrate-Nitrite (as N)	1.931	5.000	6.886	99	6.928	100	70-130	1	0-25	

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Asset Laboratories		Date Received:	12/06/18
3151 West Post Road		Work Order:	18-12-0462
Las Vegas, NV 89118-3859		Preparation:	N/A
		Method:	SM 4500-NO3 E
Project: N033236			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-282-714	**LCS**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3L1**
099-14-282-714	**LCSD**	**Aqueous**	**UV 7**	**12/08/18**	**12/08/18 12:31**	**I1208NO3L1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Nitrate-Nitrite (as N)	0.5000	0.5344	107	0.5339	107	80-120	0	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 18-12-0462

Method	Extraction	Chemist ID	Instrument	Analytical Location
SM 4500-NO3 E	N/A	1086	UV 7	1

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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:
Eurofins Calscience, Inc.
7440 Lincoln Way
Garden Grove, CA 92841

TEL: +1 714 895 5494
FAX:
Acct #:

Field Sampler: SIGNED

18-12-0462

05-Dec-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: SM4500-NO3F		
N033236-002D / SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	8OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N33236B 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 NO3- by SM4500. EDD Requirement Labspec7edata.

GSO #: 543011997

		Date/Time			Date/Time
Relinquished by:	YLT	12/5/2018 17:00	**Received by:**	[illegible] - EC	12/6/18 MJ
Relinquished by:	(GSO)		**Received by:**		

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WORK ORDER NUMBER: 18-12-0462

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: ASSET Labs.

DATE: 12/06/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: 0.0°C); Temperature (w/o CF): 2.8 °C (w/ CF): 2.8 °C; ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☑ Filter Checked by: WJO

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: WJO

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: MOL

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☑	☐	☐
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	☑	☐	☐
Container(s) for certain analysis free of headspace	☐	☐	☑
☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOAh ☐ VOAna$_2$ ☐ 100PJ ☐ 100PJna$_2$ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 125PB ☐ 125PBznna (pH__9)

☐ 250AGB ☐ 250CGB ☐ 250CGBs (pH__2) ☐ 250PB ☐ 250PBn (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJs (pH__2) ☐ 500PB

☐ 1AGB ☐ 1AGBna$_2$ ☐ 1AGBs (pH__2) ☐ 1AGBs (O&G) ☐ 1PB ☐ 1PBna (pH__12) ☑ 250PJ (pH<2) ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (___) ☐ EnCores® (___) ☐ TerraCores® (___) ☐ _____ ☐ _____ ☐ _____

Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **x** = Na_2SO_3+$NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: MOL

Reviewed by: WJO

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Case Narrative

Client Project Name: N033236
Work Order Number: 18-12-0462

CONDITION UPON RECEIPT:

Eurofins Calscience received (1) water sample on 12/06/18. A total of (1) container was received in good condition and at a temperature of 2.8°C, which is within the recommended temperature criteria of >0°C – 6°C.

Client Sample ID	Lab Sample ID	Date & Time Sampled	Date & Time Received
N033236-002D / SC-700B-WDR-581	18-12-0462-1	12/04/18 16:45	12/06/18 10:15

DATA SUMMARY:

As per the chain of custody (COC), the sample was analyzed using

SM 4500-NO3 E Nitrate + Nitrite

The sample was analyzed within the suggested holding time for the requested method.

Sample results were reported in the RL format.

Any dilutions made to the sample and/or QC will be noted in the following narrative. Reporting limits have been adjusted accordingly.

Unless otherwise noted below, all sample and instrument QC were within acceptance criteria.

SM 4500-NO3 E Nitrate + Nitrite

Sample -1 was analyzed for Nitrate + Nitrite by SM 4500-NO3 E. The sample was prepared and analyzed on 12/08/18 in batch #s I1208NO3L1 / I1208NO3S1 on UV 7.

Initial Calibration and Initial Calibration Verification:

The initial calibration was performed on 12/08/18 on UV 7. All values were within acceptance criteria.

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL: (714) 895-5494 • FAX: (714) 894-7501

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Case Narrative

Client Project Name: N033236
Work Order Number: 18-12-0462

Sample and QC:

Sample 18-12-0459-4 was used for the MS/MSD. The method blank was non-detect; the LCS/LCSD and MS/MSD were within acceptance criteria.

Sample -1 was analyzed at a 10x dilution.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL: (714) 895-5494 • FAX: (714) 894-7501

Date of Report: 10/14/0512

L8cille MolosinCa

ASSET Laboratories- Las Vegas
31W1-31W3 . Pdost RC
Las Vegas, NV 29112

j lient d roeect:	N3303BA
kj L d roeect:	Level IV
kj L . orOh rCer:	123211B
Invoice ID:	k 30W0#2

EncloseC are tue res8lts of analyses for samples receiveC by tue laboratory on 10/B/0512P If yo8 uave any q8estions concerning tuis report, please feel free to contact meP

ReviseC Report: Tuis report s8perceCes Report ID 155520990#

Sincerely,

j ontact d erson: Vanessa SanCoval
j lient Service Rep

St8art k 8ttram
Tecunical Director

j ertifications: j A ELAd ; 112BK NV ; j A55514K h R ELAd ; 4530-551K AU (ST151

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

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

CHAIN-OF-CUSTODY RECORD

18-38116

QC Level: Level IV

Subcontractor:
BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

05-Dec-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N033236-002A / SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	32OZP	1		

Please CC Report to Lucille Golosinda at lucille.golosinda@assetlaboratories.com

CHK BY GS
DISTRIBUTION
SUB-OUT

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N33236A 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 SM4500-NH3D. EDD Requirement Labspec7edata.

GSO #: 543011865

		Date/Time			Date/Time
Relinquished by:	YD	12/5/2018 17:00	**Received by:**	12-6-18	09:08
Relinquished by:			**Received by:**		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
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Chain of Custody and Cooler Receipt Form for 1838116 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 18-38116

SHIPPING INFORMATION	SHIPPING CONTAINER	FREE LIQUID
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐ BC Lab Field Service ☐ Other ☑ (Specify) GSO	Ice Chest ☑ None ☐ Box ☐ Other ☐ (Specify)	YES ☐ NO ☐ W / S

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☑ Comments:

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received ☑ YES ☐ NO

Emissivity: .97 Container: Pipe Thermometer ID: 274 Date/Time 12-6-18

Temperature: (A) 2.9 °C / (C) 2.6 °C Analyst Init AD 09:08

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT PE UNPRES	~~A~~ 11									
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS 32oz	A									
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 505/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: EAK Date/Time: 12-6-18 1728 Rev 21 05/23/2016

A = Actual / C = Corrected

(S:\WPDocWordPerfect\LAB_DOCS\FORMS\SAMREC rev 20)

ASSET Laboratories- Las Vegas 31W1-31W3 . Pdost RC Las Vegas, NV 29112	**Reported:** 10/14/0512 10:11 droect: Level IV droect N8mber: N3303BA droect Ganager: L8cille MolosinCa

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1838116-01	**COC Number:**	---	**Receive Date:**	10/5B/0512 59:52
	Project Number:	---	**Sampling Date:**	10/54/0512 1B:4W
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	N53303B-550A / Sj -#55k -. DR-W21	**Lab Matrix:**	. ater
	Sampled By:	---	**Sample Type:**	. ater

ASSET Laboratories- Las Vegas
31W1-31W3 . Pdost RC
Las Vegas, NV 29112

Reported: 10/14/0512 10:11
droect: Level IV
droect N8mber: N3303BA
droect Ganager: L8cille MolosinCa

Water Analysis (General Chemistry)

BCL Sample ID: 123211B-51 | **Client Sample Name:** N53303B-550A / Sj -#55k -. DR-W21, 10/4/0512 4:4W55d G

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Ammonia as N)DistilleC7	ND	mg/L	5P05		SG-4W55-NH3M	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	SG-4W55-NH3M	10/13/12 10:39	10/13/12 1B:4#	JGH	Sj -1	1	k530205

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ASSET Laboratories- Las Vegas
31W1-31W3 . Pdost RC
Las Vegas, NV 29112

Reported: 10/14/0512 10:11
droect: Level IV
droect N8mber: N3303BA
droect Ganager: L8cille MolosinCa

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B032820						
Ammonia as N)DistilleC7	k530205-kLU1	ND	mg/L	5P05		

ASSET Laboratories- Las Vegas
31W1-31W3 . Pdost RC
Las Vegas, NV 29112

Reported: 10/14/0512 10:11
droect: Level IV
droect N8mber: N3303BA
droect Ganager: L8cille MolosinCa

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B032820										
Ammonia as N)DistilleC7	k530205-kS1	Lj S	5P94W05	1P5555	mg/L	94PW		2W- 11W		

ASSET Laboratories- Las Vegas
31W1-31W3 . Pdost RC
Las Vegas, NV 29112

Reported: 10/14/0512 10:11
droect: Level IV
droect N8mber: N3303BA
droect Ganager: L8cille MolosinCa

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B032820	(seC client sample: N										
Ammonia as N)DistilleC7	D(d	123#B#4-53	5P050W5	5P01315		mg/L	WP1		05		
	GS	123#B#4-53	5P050W5	1P0B#3	1P1111	mg/L		9WP2		25 - 105	
	GSD	123#B#4-53	5P050W5	1P3943	1P1111	mg/L	9PW	15#	05	25 - 105	

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CH2M HILL

Project: PG&E Topock

Project No.: 680375.03.IM.OP.00

ASSET Laboratories Work Order:

N033236

ANALYTICAL and QC RESULTS
SAMPLE RECEIVING ITEMS

PRIVILEGED AND CONFIDENTIAL

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ASSET Laboratories Work Order: N033236

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December 19, 2018

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

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

Workorder No.: N033236

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on December 04, 2018 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,

Quennie Manimtim
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and ASSET Laboratories - Las Vegas.

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N033236

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 BC Labs- Bakersfield,CA.

Nitrate & Nitrite by SM 4500 was subcontracted to Eurofins CalScience Inc.- Garden Grove, CA.

Analytical Comments for EPA 200.7:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Boron in QC samples N033238-001E-MS1, N033238-001E-MSD1 and N033238-011E-MS1 possibly due to matrix interference. 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 N033238-001E-MS and N033238-001E-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 300.0:

Dilution was necessary for sample N033236-002 due to precipitation upon the addition of eluent.

ASSET Laboratories

Date: *19-Dec-18*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N033236
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N033236-001A	SC-100B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-001B	SC-100B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-001C	SC-100B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-002A	SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-002B	SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-002C	SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-002D	SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018
N033236-002E	SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	12/4/2018	12/19/2018

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_181205C**	QC Batch: **R130333**			PrepDate			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	12/5/2018 12:00 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_181205C**	QC Batch: **R130333**			PrepDate			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	12/5/2018 12:00 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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N033236-001ADUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **130333**
Client ID: **ZZZZZZ** Batch ID: **R130333** TestNo: **EPA 120.1** Analysis Date: **12/5/2018** SeqNo: **3219614**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7510.000	0.10						7470	0.534	2	

Sample ID **N033238-007BDUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **130333**
Client ID: **ZZZZZZ** Batch ID: **R130333** TestNo: **EPA 120.1** Analysis Date: **12/5/2018** SeqNo: **3219624**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	5190.000	0.10						5150	0.774	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_181205J** QC Batch: **71625** PrepDate **12/5/2018** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4400	50	50		mg/L	1	12/5/2018 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_181205J**	QC Batch: **71625**				PrepDate	**12/5/2018**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4300	50	50		mg/L	1	12/5/2018 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		

ASSET Laboratories

Date: *19-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **LCS-71625** SampType: **LCS** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **12/5/2018** RunNo: **130375**
Client ID: **LCSW** Batch ID: **71625** TestNo: **SM2540C** Analysis Date: **12/5/2018** SeqNo: **3221590**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	971.000	10	1000	0	97.1	80	120				

Sample ID **MB-71625** SampType: **MBLK** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **12/5/2018** RunNo: **130375**
Client ID: **PBW** Batch ID: **71625** TestNo: **SM2540C** Analysis Date: **12/5/2018** SeqNo: **3221591**

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 **N033239-001CDUP** SampType: **DUP** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **12/5/2018** RunNo: **130375**
Client ID: **ZZZZZZ** Batch ID: **71625** TestNo: **SM2540C** Analysis Date: **12/5/2018** SeqNo: **3221601**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	13100.000	200						12540	4.37	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_181206B** QC Batch: **71612**				PrepDate	**12/5/2018**		Analyst: **CEI**
Aluminum	ND	40	50		µg/L	1	12/6/2018 02:08 PM
Boron	1100	74	100		µg/L	1	12/6/2018 02:08 PM
Iron	ND	18	20		µg/L	1	12/6/2018 02:08 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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-71612** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130366**
Client ID: **PBW** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230736**

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 **LCS1-71612** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130366**
Client ID: **LCSW** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230737**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5136.238	50	5000	0	103	85	115				
Boron	963.377	100	1000	0	96.3	85	115				
Iron	109.655	20	100.0	0	110	85	115				

Sample ID **N033238-001E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230754**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5307.013	50	5000	0	106	75	125				
Boron	2457.729	100	1000	1164	129	75	125				S
Iron	104.063	20	100.0	0	104	75	125				

Sample ID **N033238-001E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230755**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5300.423	50	5000	0	106	75	125	5307	0.124	20	
Boron	2466.136	100	1000	1164	130	75	125	2458	0.341	20	S
Iron	105.452	20	100.0	0	105	75	125	104.1	1.33	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **N033238-011E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230756**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5249.959	50	5000	0	105	75	125				
Boron	2431.098	100	1000	1087	134	75	125				S
Iron	109.581	20	100.0	0	110	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181205C** QC Batch: **71615** PrepDate **12/5/2018** Analyst: **CEI**							
Manganese	7.0	0.26	0.50		µg/L	1	12/5/2018 07:23 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181205C** QC Batch: **71615**				PrepDate	**12/5/2018**		Analyst: **CEI**
Antimony	ND	0.16	0.50		µg/L	1	12/5/2018 07:34 PM
Arsenic	ND	0.081	0.10		µg/L	1	12/5/2018 07:34 PM
Barium	14	0.15	1.0		µg/L	1	12/5/2018 07:34 PM
Copper	ND	0.55	1.0		µg/L	1	12/5/2018 07:34 PM
Lead	ND	0.13	1.0		µg/L	1	12/5/2018 07:34 PM
Manganese	9.0	0.26	0.50		µg/L	1	12/5/2018 07:34 PM
Molybdenum	23	0.21	0.50		µg/L	1	12/7/2018 01:07 AM
Nickel	ND	0.26	1.0		µg/L	1	12/5/2018 07:34 PM
Zinc	ND	2.3	10		µg/L	1	12/5/2018 07:34 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		

ASSET Laboratories

Date: *19-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-71615** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **PBW** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221738**

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									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **LCS-71615** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **LCSW** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221739**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.526	0.50	10.00	0	95.3	85	115				
Arsenic	9.781	0.10	10.00	0	97.8	85	115				
Barium	10.084	1.0	10.00	0	101	85	115				
Copper	10.071	1.0	10.00	0	101	85	115				
Lead	9.452	1.0	10.00	0	94.5	85	115				
Manganese	101.385	0.50	100.0	0	101	85	115				
Nickel	9.904	1.0	10.00	0	99.0	85	115				
Zinc	10.105	10	10.00	0	101	85	115				

Sample ID **N033238-001E-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221743**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.882	0.50	10.00	0	98.8	75	125				
Arsenic	13.270	0.10	10.00	2.983	103	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N033238-001E-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221743**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	28.347	1.0	10.00	18.77	95.8	75	125				
Copper	2.834	1.0	10.00	0	28.3	75	125				S
Lead	9.605	1.0	10.00	0	96.1	75	125				
Manganese	98.857	0.50	100.0	1.652	97.2	75	125				
Nickel	9.055	1.0	10.00	0	90.5	75	125				
Zinc	3.445	10	10.00	0	34.4	75	125				S

Sample ID **N033238-001E-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221744**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.903	0.50	10.00	0	99.0	75	125	9.882	0.207	20	
Arsenic	13.289	0.10	10.00	2.983	103	75	125	13.27	0.140	20	
Barium	28.369	1.0	10.00	18.77	96.0	75	125	28.35	0.0766	20	
Copper	3.000	1.0	10.00	0	30.0	75	125	2.834	5.67	20	S
Lead	9.673	1.0	10.00	0	96.7	75	125	9.605	0.705	20	
Manganese	98.756	0.50	100.0	1.652	97.1	75	125	98.86	0.103	20	
Nickel	9.237	1.0	10.00	0	92.4	75	125	9.055	1.99	20	
Zinc	3.249	10	10.00	0	32.5	75	125	3.445	0	20	S

Sample ID **MB-71615** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130388**
Client ID: **PBW** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222178**

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

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-71615	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/5/2018	RunNo:	130388
Client ID:	LCSW	Batch ID:	71615	TestNo:	EPA 200.8			Analysis Date:	12/6/2018	SeqNo:	3222179

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	9.827	0.50	10.00	0	98.3	85	115				

Sample ID	N033238-001E-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/5/2018	RunNo:	130388
Client ID:	ZZZZZZ	Batch ID:	71615	TestNo:	EPA 200.8			Analysis Date:	12/6/2018	SeqNo:	3222183

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	32.510	0.50	10.00	20.29	122	75	125				

Sample ID	N033238-001E-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/5/2018	RunNo:	130388
Client ID:	ZZZZZZ	Batch ID:	71615	TestNo:	EPA 200.8			Analysis Date:	12/6/2018	SeqNo:	3222184

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	32.693	0.50	10.00	20.29	124	75	125	32.51	0.562	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181205A** QC Batch: **R130313**				PrepDate			Analyst: **RAB**
Hexavalent Chromium	490	3.3	20		µg/L	100	12/5/2018 06:15 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181205C** QC Batch: **71615**				PrepDate	**12/5/2018**		Analyst: **CEI**
Chromium	490	0.65	5.0		µg/L	5	12/5/2018 07:28 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_181205A** QC Batch: **R130313** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	12/5/2018 06:49 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_181205C** QC Batch: **71615** PrepDate **12/5/2018**							Analyst: **CEI**
Chromium	ND	0.13	1.0		µg/L	1	12/5/2018 07:34 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		

ASSET Laboratories

Date: *19-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-71615** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **PBW** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221781**

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

Sample ID **LCS-71615** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **LCSW** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221782**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.916	1.0	10.00	0	99.2	85	115				

Sample ID **N033238-001E-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221786**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.131	1.0	10.00	0.4974	96.3	75	125				

Sample ID **N033238-001E-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/5/2018** RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221787**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.154	1.0	10.00	0.4974	96.6	75	125	10.13	0.220	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R130313** SampType: **MBLK** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **PBW** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221131**

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-R130313** SampType: **LCS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **LCSW** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221132**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.994	0.20	5.000	0	99.9	90	110				

Sample ID **N033230-001AMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221136**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.968	0.20	1.000	0	96.8	90	110				

Sample ID **N033230-001AMSD** SampType: **MSD** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221139**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.943	0.20	1.000	0	94.3	90	110	0.9682	2.62	20	

Sample ID **N033238-001ADUP** SampType: **DUP** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221147**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.302	0.20						0.3055	1.15	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N033236-001BMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221212**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	980.500	20	500.0	485.8	98.9	90	110				

Sample ID **N033236-002CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221214**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.906	0.20	1.000	0	90.6	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181205E**	QC Batch: **R130336**			PrepDate			Analyst: **LR**
Turbidity	0.20	0.10	0.10		NTU	1	12/5/2018 02:30 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_181205E**	QC Batch: **R130336**			PrepDate			Analyst: **LR**
Turbidity	0.40	0.10	0.10		NTU	1	12/5/2018 02:30 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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID **MB-R130336** SampType: **MBLK** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **130336**
Client ID: **PBW** Batch ID: **R130336** TestNo: **SM 2130B** Analysis Date: **12/5/2018** SeqNo: **3219677**

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

Sample ID **N033238-001BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **130336**
Client ID: **ZZZZZZ** Batch ID: **R130336** TestNo: **SM 2130B** Analysis Date: **12/5/2018** SeqNo: **3219690**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.590	0.10						0.6000	1.68	30	

Sample ID **N033238-011BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **130336**
Client ID: **ZZZZZZ** Batch ID: **R130336** TestNo: **SM 2130B** Analysis Date: **12/5/2018** SeqNo: **3219701**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	3.680	0.10						3.750	1.88	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-18*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-581
Lab Order:	N033236	**Collection Date:**	12/4/2018 4:45:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033236-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181205A** QC Batch: **R130352** PrepDate							Analyst: **RAB**
Fluoride	2.4	0.032	0.50		mg/L	5	12/5/2018 03:10 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_181205A** QC Batch: **R130352** PrepDate							Analyst: **RAB**
Sulfate	500	1.1	25		mg/L	50	12/6/2018 04:04 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		

ASSET Laboratories

Date: *19-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R130352_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **PBW** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220632**

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

Sample ID **LCS-R130352_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **LCSW** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220633**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.220	0.10	1.250	0	97.6	90	110				

Sample ID **N033238-003BDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220653**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.949	0.50						1.940	0.489	20	

Sample ID **N033238-005BMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220654**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	7.914	0.50	6.250	2.004	94.6	80	120				

Sample ID **N033238-005BMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220655**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.035	0.50	6.250	2.004	96.5	80	120	7.914	1.51	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**N033238-008BMS**	SampType:	**MS**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:			RunNo:	**130352**	
Client ID:	**ZZZZZZ**	Batch ID:	**R130352**	TestNo:	**EPA 300.0**			Analysis Date:	**12/5/2018**		SeqNo:	**3220656**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.402	0.50	6.250	2.224	98.8	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **MB-R130352_SO4** SampType: **MBLK** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **PBW** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220712**

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

Sample ID **LCS-R130352_SO4** SampType: **LCS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **LCSW** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220713**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.946	0.50	4.000	0	98.7	90	110				

Sample ID **N033238-008BMS** SampType: **MS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220721**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	705.280	25	200.0	493.3	106	80	120				

Sample ID **N033238-008BMSD** SampType: **MSD** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220722**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	702.535	25	200.0	493.3	105	80	120	705.3	0.390	20	

Sample ID **N033238-015BMS** SampType: **MS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ZZZZZZ** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220724**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	678.880	25	200.0	485.4	96.8	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	**N033238-005BDUP**	SampType:	**DUP**	TestCode:	**300_W_SO4P**	Units:	**mg/L**	Prep Date:			RunNo:	**130352**	
Client ID:	**ZZZZZZ**	Batch ID:	**R130352**	TestNo:	**EPA 300.0**			Analysis Date:	**12/5/2018**		SeqNo:	**3220726**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	496.575	25						489.0	1.53	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		

SAMPLE RECEIVING ITEMS

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.03.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-581
Turnaround Time 10 Days
Shipping Date:
COC Number: 581

			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			
	DATE	**TIME**	**Matrix**	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	Turbidity (SM2130)		Number of Containers	**COMMENTS**
SC-100B-WDR-581	12-4-18	1645	Water			X	X		X		X	X	N033236-01	3	
SC-700B-WDR-581	12-4-18	1645	Water	X	X	X	X	X	X	X		X	-02	4	
													TOTAL NUMBER OF CONTAINERS	7	

	Signatures	Date/Time
Approved by		12-4-18 10:00
Sampled by		12-4-18 1645
Relinquished by		12-4-18 17:15
Received by		12/4/18 @ 1715
Relinquished by		12/4/18 @ 1930
Received by		

Shipping Details
Method of Shipment: FedEx
On Ice: (yes) no 1.8°C
Airbill No: IR#2
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
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:	12/4/2018	Workorder:	N033236
Rep sample Temp (Deg C):	1.8	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 Ammonia/NO3- were lab preserved with H2SO4 and for Total Metals with HNO3. Both adjusted to pH < 2.

For:

Checklist Completed By: MBC 12/6/2018

Reviewed By: LG 121018

ASSET Laboratories

WORK ORDER Summary

05-Dec-18

WorkOrder: N033236

Client ID: CH2HI01

Project: PG&E Topock, 680375.03.IM.OP.00 **QC Level:** Level IV **Date Received:** 12/4/2018

Comments: SC-700B Total metal list:

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N033236-001A	SC-100B-WDR-581	12/4/2018 4:45:00 PM	12/18/2018	Water	EPA 120.1	SPECIFIC CONDUCTANCE	☐	☐	☐	WW
			12/18/2018		SM2540C	TOTAL FILTERABLE RESIDUE	☐	☐	☐	WW
			12/18/2018			Total Dissolved Solids Prep	☐	☐	☐	WW
			12/18/2018		SM 2130B	TURBIDITY	☐	☐	☐	WW
N033236-001B			12/18/2018		EPA 218.6	Hexavalent Chromium by IC	☐	☐	☐	WW
N033236-001C			12/18/2018			AQPREP TOTAL METALS: ICP, FLAA	☐	☐	☐	WW
			12/18/2018		EPA 200.8	TOTAL METALS BY ICPMS	☐	☐	☐	WW
			12/18/2018		EPA 200.8	TOTAL METALS BY ICPMS	☐	☐	☐	WW
N033236-002A	SC-700B-WDR-581		12/18/2018		SM4500-NH3D	AMMONIA-N BY ION SELECTIVE ELECTRODE	☐	☐	☑	SUB
N033236-002B			12/18/2018		EPA 120.1	SPECIFIC CONDUCTANCE	☐	☐	☐	WW
			12/18/2018		SM2540C	TOTAL FILTERABLE RESIDUE	☐	☐	☐	WW
			12/18/2018			Total Dissolved Solids Prep	☐	☐	☐	WW
			12/18/2018		SM 2130B	TURBIDITY	☐	☐	☐	WW
			12/18/2018		EPA 300.0	ANIONS BY ION CHROMATOGRAPHY	☐	☐	☐	WW
			12/18/2018		EPA 300.0	ANIONS BY ION CHROMATOGRAPHY	☐	☐	☐	WW
N033236-002C			12/18/2018		EPA 218.6	Hexavalent Chromium by IC	☐	☐	☐	WW
N033236-002D			12/18/2018		SM4500-NO3F	NITRATE/NITRITE-N BY CADMIUM REDUCTION	☐	☐	☑	SUB
N033236-002E			12/18/2018			AQPREP TOTAL METALS: ICP, FLAA	☐	☐	☐	WW
			12/18/2018		EPA 200.7	TOTAL METALS BY ICP	☐	☐	☐	WW
			12/18/2018			AQPREP TOTAL METALS: ICP, FLAA	☐	☐	☐	WW
			12/18/2018		EPA 200.8	TOTAL METALS BY ICPMS	☐	☐	☐	WW

ASSET Laboratories

WORK ORDER Summary

05-Dec-18

WorkOrder: N033236

Client ID: CH2HI01

Project: PG&E Topock, 680375.03.IM.OP.00 **QC Level:** Level IV **Date Received:** 12/4/2018

Comments: SC-700B Total metal list:

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N033236-002E	SC-700B-WDR-581	12/4/2018 4:45:00 PM	12/18/2018	Water	EPA 200.8	TOTAL METALS BY ICPMS	☐	☐	☐	WW
N033236-003A	FOLDER	12/18/2018	12/18/2018		Folder	Folder	☐	☐	☐	LAB
			12/18/2018		Folder	Folder	☐	☐	☐	LAB

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:
BC Labs
4100 Atlas Court
Bakersfield, CA 93308

TEL: (661) 327-4911
FAX: (661) 327-1918
Acct #:

Field Sampler: SIGNED

05-Dec-18

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N033236-002A / SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	32OZP	1		

Please CC Report to Lucille Golosinda at lucille.golosinda@assetlaboratories.com

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N33236A 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 SM4500-NH3D. EDD Requirement Labspec7edata.

GSO #: 543011865

		Date/Time			Date/Time
Relinquished by:	YRJ	12/5/2018 17:00		**Received by:**	
Relinquished by:				**Received by:**	

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:

Eurofins Calscience, Inc.
7440 Lincoln Way
Garden Grove, CA 92841

TEL: +1 714 895 5494
FAX:
Acct #:

Field Sampler: SIGNED

05-Dec-18

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NO3F**		
N033236-002D / SC-700B-WDR-581	Water	12/4/2018 4:45:00 PM	8OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N33236B 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 NO3- by SM4500. EDD Requirement Labspec7edata.

GSO #: 543011997

		Date/Time			Date/Time
Relinquished by:		12/5/2018 17:00		**Received by:**	
Relinquished by:				**Received by:**	

List of Analysts

ASSET Laboratories Work Order: N033236

NAME	TEST METHOD
Claire Ignacio	EPA 200.7, EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B

EPA 120.1

Wet Chemistry Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: R130333 **Analyst:** LSR

ASSET #: N033236 **Date Analyzed:** 5-Dec

Method: EPA 120.1

	Ist Level Review			2nd Level Review		
Initial Calibration	**Y**	**N**	**N/A**	**Y**	**N**	**N/A**
1. ICAL before initial sample analysis or every 24 hrs.			X			
2. Does correlation coefficient,r, meet criteria ?(r = 0.995)			X			
3. ICV within ± 15% of expected value.			X			
Continuing Calibration						
4. CCV after every 10 samples and at the end of analysis sequence.			X			
5. CCV within ± 15% of expected value.			X			
6. Calibration blanks run after ICV and CCV?			X			
7. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)			X			
Sample Information						
8. All samples are within linear range.			X			
9. Are all samples analyzed within hold time.	X					
QC Items						
10. Method blank values are below 1/2 the reporting limit.			X			
11. LCS compounds within control limits.			X			
12. MS/MSD, RPD's are within control limits	X					
Raw Data and Miscellaneous Information						
13. Are Non-Conformances documented			X			
14. Runlog complete and included in package.	X					
15. Spectrophotometer tape included (Spec work only)			X			
16. Digestion log complete and included in package (if applicable)			X			
Preliminary Report						
17. Does the raw data match the preliminary report?	X					
18. Are analytical results correct?	X					
19. Is the QC summary report present and complete?	X					

Comments:

SECOND LEVEL REVIEW:

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer Lilia Ramit Date: 12/15/2018

2nd Level Reviewer 12/18/2018 Date: —

LOGBOOK DATA, QUANTITATION REPORT and/or SPECTRA

Conductivity Logbook

Date: 12/5/18 1200

Analyst: LSR

Standard	Std ID	Reading	Comments
9.91 uS/cm	CMW – 180731G	9.75 @ 18.4°C	% Rec: (90-110%)
1413	180414A	1437 @ 18.2°C	
99922	180731F	10120 @ 18.3°C	
99922	180414B	100300 @ 18.4°C	

	Sample ID	Matrix	Reading	Comments
1	N033236-001A	H2O	7470 @ 18.2°C	
2	1ADUP		7510 @ 17.9°C	
3	2AB		7490 @ 18.1°C	
4	N033237-001C		3680 @ 18.0°C	
5	2C		7590 @ 18.5°C	
6	N033238-001B		7370 @ 18.1°C	
7	2B		7340 @ 18.4°C	
8	3B		7220 @ 18.7°C	
9	4B		7210 @ 18.8°C	
10	5B		7160 @ 18.5°C	2% ice 12/5
Dup	6B		5040 @ 18.2°C	Accept: ~~10% water, 20% soil~~
	Std Chk:			% Rec: (90-110%)

Julia Ramit 12/7/2018

Date: CONT'D

Analyst:

Standard	Std ID	Reading	Comments
1413 uS/cm	CMW – 180417B	1464 @ 18.5°C	% Rec: (90-110%)
10000	180516A	9930 @ 18.4°C	
99922	181022C	97500 @ 18.3°C	

	Sample ID	Matrix	Reading	Comments
1	N033238-007B	H2O	5150 @ 18.3°C	
2	7BDUP		5190 @ 18.1°C	STD CHECK:
3	8B		7350 @ 18.8°C	1413 CMW/180417B
4	9B		7430 @ 17.9°C	= 1472 @ 18.4°C
5	10B		7440 @ 18.1°C	10000 CMW 180516A
6	11B		7420 @ 17.9°C	= 9860 @ 18.1°C
7	12B		7310 @ 18.4°C	99922 CMW 181022C
8	13B		3320 @ 18.4°C	= 97700 @ 18.1°C
9	15B		7350 @ 18.6°C	
10	N033239-001C		20900 @ 18.1°C	2% ice 12/5
Dup	2C		15290 @ 18.0°C	Accept: ~~10% water, 20% soil~~
	Std Chk:			% Rec: (90-110%)

CALIFORNIA | P:562.219.7435 F:562.219.7436
NEVADA | P:702.307.2659 F:702.3
3151 W. Post Rd., Las Vegas, NV

SM 2540C

Wet Chemistry Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: 71625 **Analyst:** LSR

ASSET #: N033236 **Date Analyzed:** 5-Dec

Method: EPA 160.1 / SM 2540C

	Ist Level Review			2nd Level Review		
Initial Calibration	**Y**	**N**	**N/A**	**Y**	**N**	**N/A**
1. ICAL before initial sample analysis or every 24 hrs.			X			
2. Does correlation coefficient,r, meet criteria ?(r = 0.995)			X			
3. ICV within ± 15% of expected value.			X			
Continuing Calibration						
4. CCV after every 10 samples and at the end of analysis sequence.			X			
5. CCV within ± 15% of expected value.			X			
6. Calibration blanks run after ICV and CCV?			X			
7. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)			X			
Sample Information						
8. All samples are within linear range.			X			
9. Are all samples analyzed within hold time.	X					
QC Items						
10. Method blank values are below 1/2 the reporting limit.	X					
11. LCS compounds within control limits.	X					
12. MS/MSD, RPD's are within control limits	X					
Raw Data and Miscellaneous Information						
13. Are Non-Conformances documented			X			
14. Runlog complete and included in package.	X					
15. Spectrophotometer tape included (Spec work only)			X			
16. Digestion log complete and included in package (if applicable)			X			
Preliminary Report						
17. Does the raw data match the preliminary report?	X					
18. Are analytical results correct?	X					
19. Is the QC summary report present and complete?	X					

Comments:

SECOND LEVEL REVIEW:

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer Julia Ramit Date: 12/7/2018

2nd Level Reviewer Nancy 12/18/2018 Date: —

SAMPLE CALCULATION

SAMPLE CALCULATION

METHOD: SM 2540C
TEST NAME: Total Filterable Residue
MATRIX: Water

FORMULA:

Calculate TDS concentration in mg/L, in the original sample as follows:

$$\text{TDS, mg/L} = \frac{(A-B)*1000000}{C}$$

Where:

A = weight in g of dish + residue after drying
B = weight of dish in g
C = volume of sample used in mL

For **N033236-001A,** TDS concentration in mg/L is calculated as follows:

$$\text{TDS, mg/L} = \frac{(53.7068-53.6182)*1000000}{20}$$
$$= 4430 \text{ mg/L}$$

Reporting result in two significant figures,

TDS= 4400 mg/L

Julia Ramit 12/7/2018

SAMPLE PREPARATION LOG

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: **12/5/2018 1:16:59 P**
Prep End Date: **12/6/2018 11:00:00**

Reviewed/ Date: 12/18/2018

Initials/ Date: Lilia Ramit 12/7/2018

Prep Batch **71625** Prep Code: **160.1_W_PRE** Technician: **Lilia Ramit**

Prep Factor Units: **mL / mL** Temp. (°C): **180**

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
LCS-71625	Water		100	☐	0	0	100	1.000		
MB-71625	Water		100	☐	0	0	100	1.000		
N033236-001A	Water		20	☐	0	0	100	5.000		
N033236-002B	Water		20	☐	0	0	100	5.000		
N033237-001C	Groundwater		40	☐	0	0	100	2.500		
N033237-002C	Groundwater		20	☐	0	0	100	5.000		
N033238-011B	Groundwater		20	☐	0	0	100	5.000		
N033238-012B	Groundwater		20	☐	0	0	100	5.000		
N033238-013B	Groundwater		40	☐	0	0	100	2.500		
N033238-015B	Groundwater		20	☐	0	0	100	5.000		
N033239-001C	Groundwater		5	☐	0	0	100	20.000		
N033239-001C-DU	Groundwater		5	☐	0	0	100	20.000		
N033239-002C	Groundwater		10	☐	0	0	100	10.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

Number	Reagent Name
10399	Glass Fiber Filter, 47mm

Spk ID	Spike Name	SampType	AmtAdd
IWST181108A	1000 ppm NaCl	LCS	100

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: **12/5/2018 1:16:59 P**
Prep End Date:

Reviewed/ Date: _____
Initials/ Date: Lilia Ramit 12/7/2018

Prep Batch **71625** Prep Code: **160.1_W_PRE** Technician: **Lilia Ramit** Prep Factor Units **mL / mL**

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
LCS-71625	Water	IWST 181108A	100	☐	0	0	100	1.000		
MB-71625	Water		100	☐	0	0	100	1.000		
N033236-001A	Water	7470	100 1/20	☐	0	0	100	1.000		
N033236-002B	Water	7490	100 1/20	☐	0	0	100	1.000		
N033237-001C	Groundwater	3680	100 1/40	☐	0	0	100	1.000		
N033237-002C	Groundwater	7590	100 1/20	☐	0	0	100	1.000		
N033238-011B	Groundwater	7420	100 1/20	☐	0	0	100	1.000		
N033238-012B	Groundwater	7310	100 1/20	☐	0	0	100	1.000		
N033238-013B	Groundwater	3320	100 1/40	☐	0	0	100	1.000		
N033238-015B	Groundwater	7350	100 1/20	☐	0	0	100	1.000		
N033239-001C	Groundwater	20900	100 1/5	☐	0	0	100	1.000		
N033239-001C-DU	Groundwater	1	100 1/5	☐	0	0	100	1.000		
N033239-002C	Groundwater	15290	100 1/10	☐	0	0	100	1.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

10399

LOGBOOK DATA, QUANTITATION REPORT and/or SPECTRA

SOLIDS RAW DATA

TEST :TSS/TDS/TS

Date	Sample ID	Sample Vol. (ml)	Crucible + Filter (TSS) Crucible (TDS, TS) Tare Wt.(g)	Crucible + Filter+Sample (TSS) Crucible + Sample (TDS, TS) Tare Wt.(g)	Comments
12/5/18 131C L2	MB 71625	100	76.4233 76.4221	76.4222 76.4222	
EE	LCS 71625	100	68.1078 68.1076	68.2045 68.2047	
12	N033236-001A	20	53.6181 53.6182	53.7064 53.7068	
15	2B	20	61.4882 61.4882	61.5734 61.5736	
1C	N033237-001C	40 ~~20~~ 1mL 1:5	59.5403 59.5401	59.6311 59.6315	
1F2	2C	20	60.5926 60.5927	60.6790 60.6793	
T	N033238-011B	20	46.0172 46.0170	46.1012 46.1015	
1C	12B	20	60.2649 60.2647	60.3492 60.3495	
1G	13B	40	60.9419 60.9416	61.0182 61.0184	
1F	15B	20	60.7169 60.7171	60.7990 60.7994	

Julia Ramit 12/7/2018

ASSET Laboratories

Logbook#13

SOLIDS RAW DATA

TEST :TSS/ TDS/TS

Date	Sample ID	Sample Vol. (ml)	Crucible + Filter (TSS) Crucible (TDS, TS) Tare Wt.(g)	Crucible + Filter+Sample (TSS) Crucible + Sample (TDS, TS) Tare Wt.(g)	Comments
12/5/18 V	N03239-001C	5	48.8653 48.8655	48.9298 48.9282	
1B	1C DUP	5	60.5777 60.5779	60.6432 60.6434	
1C	2C	10	59.8243 59.8245	59.9196 59.9198	
	Lilia Ramit	12/7/2018			
	Leaving lab	49.9998 @ 1100		12/6/18	

ASSET Laboratories

Logbook#13

TOTAL DISSOLVED SOLIDS, TDS

TDS, mg/L = (A-B) X 10000*PF

where:
A = weight in grams of dish + residue after drying
B = weight of dish in grams
PF = 100/volume of sample used in mL

Date Finished:	vol of sample (mL)	weight of dish in grams (B)	weight in grams of dish + residue after drying (A)	(A-B)*10000	prep fact (PF)	TDS, mg/L	CONDUCTIVITY	RATIO	Sample Type
12/6/2018									
MB-71625	100	76.4221	76.4222	1	1	1			MBLK
LCS-71625	100	68.1076	68.2047	971	1	971			LCS
N033236-001A	20	53.6182	53.7068	886	5	4430	7470	0.593	SAMP
N033236-002B	20	61.4882	61.5736	854	5	4270	7490	0.570	SAMP
N033237-001C	40	59.5401	59.6315	914	2.5	2285	3680	0.621	SAMP
N033237-002C	20	60.5927	60.6793	866	5	4330	7590	0.570	SAMP
N033238-011B	20	46.017	46.1015	845	5	4225	7420	0.569	SAMP
N033238-012B	20	60.2647	60.3495	848	5	4240	7310	0.580	SAMP
N033238-013B	40	60.9416	61.0184	768	2.5	1920	3320	0.578	SAMP
N033238-015B	20	60.7171	60.7994	823	5	4115	7350	0.560	SAMP
N033239-001C	5	48.8655	48.9282	627	20	12540	20900	0.600	SAMP
N033239-001CDUP	5	60.5779	60.6434	655	20	13100	20900	0.627	DUP
N033239-002C	10	59.8245	59.9198	953	10	9530	15290	0.623	SAMP

Silia Ramit 12/7/2018

EPA 200.7

Metals Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: 71612 **Instrument ID:** ICP-02
ASSET #: N033236 **Analyst:** CEI
Method: **Date Analyzed:** 12/6/2018

[X] EPA 6010B / 200.7 [ ] EPA 7470A / 7471A/245.1
[ ] EPA 6020 / 200.8 [ ] Other _____

Initial Calibration and Initial Calibration Verification	1st Level Review			2nd Level Review		
	Y	N	N/A	Y	N	N/A
1. Does correlation coefficient,r, meet criteria ?(r = 0.995)	X					
2. For ICV, all analytes within ± 10% of expected value? (±5% for EPA 200.7)	X					
3. Does the ICP/MS meet tune criteria? (ICP/MS Only)			X			
4. % RSD calculated from 3 injections?	X					
5. Is low level check at PQL within ± 20% of expected value? (ICP/ICPMS only)	X					
Interference Check						
6. ICS A and AB at the start and end of sequence or twice during an 8-hr period.	X					
7. Are ICSA and AB within ± 20% of expected value?	X					
Continuing Calibration						
8. CCV after every 10 samples and end of analysis sequence.	X					
9. For CCV, all analytes within ± 10% of expected value?	X					
10. Calibration blank after ICVand CCV analysis.	X					
11. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)	X					
12. Is low level check twice during 8 hr period or at end within ± 30% of expected value? (ICP/ICPMS only)	X					
Sample Information						
13. All samples are within linear dynamic range.	X					
14. All hits above PQL have %RSD of less than or equal to 15%? (ICP/ICPMS only)	X					
15. Are all samples analyzed/digested within hold time.	X					
16. Dilution test performed and within ± 10% of undiluted sample.	X					
17. When dilution test fails, post digestion spike recovery within 80-120% of expected value.			X			
18. For samples < 4 ppb, does the Cr result differs with Cr6+ by no more than 0.7 ppb?			X			
19. For samples > 4 ppb, does the Cr result differs with Cr6+ by no more than 20%?			X			
20 For samples that failed Cr6 vs CrT criteria, are samples reanalyzed for confirmation?			X			
21. For samples with Total and Dissolved analysis, is Total concentration higher or equal to Dissolved concentration?			X			
QC Items						
22. IS are within control limits (70-125% for ICPMS).	X					
23. Method blank values are below 1/2 the reporting limit.	X					
24. LCS compounds within control limits.	X					
25. MS/MSD, RPD's are within control limits		X				
Raw Data and Miscellaneous Information						
26. Are Non-Conformances documented	X					
27. Runlog complete and included in package.	X					
28. Digestion log complete and included in package (if applicable)	X					
29. All sample raw data present in package.	X					
Preliminary Report						
30. Does the raw data match the preliminary report?	X					
31. Are analytical results correct?(Ex. dilutions, calculations.etc.)	X					
32. Are special instructions met?	X					

Comments:

% Rec of B in N033238-001E PS/MS/MSD and N033238-011E MS failed, high bias. However, LCS passed criteria.

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer CEI Date: 12/18/18
2nd Level Reviewer [signature] 12/18/2018 Date: ——

SAMPLE CALCULATION

SAMPLE CALCULATION

METHOD: EPA 6010B
TEST NAME: Heavy Metals by ICP
MATRIX: Water

FORMULA:

Calculate the Boron concentration, in ug/L , in the original sample as follows:

Boron , ug/L = A * DF * PF *CF

where:

A = mg/L, calculated concentration
DF = Dilution Factor
PF = Final Volume of Digestate, mL / Amount of Sample, mL
CF= Conversion Factor from mg/L to ug/L, 1000

For Sample **N033236-002E** , the concentration in ug/L is calculated as follows:

Boron , ug/L = 1.11737 * 1 *(25/25) * 1000

Boron , ug/L = 1117.37

Reporting results in two significant figures,

Boron , ug/L = 1100

% RSD SUMMARY

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
CalBlk	IBLK	1	Al	0	15.3	15	<PQL
Standard1	ICAL	1	Al	0.05	1.84	15	PASS
Standard2	ICAL	1	Al	1	0.51	15	PASS
Standard3	ICAL	1	Al	2	0.49	15	PASS
Standard4	ICAL	1	Al	5	0.63	15	PASS
Standard5	ICAL	1	Al	7.5	0.5	15	PASS
Standard6	ICAL	1	Al	10	0.3	15	PASS
Standard7	ICAL	1	Al	20	0.15	15	PASS
ICV	ICV	1	Al	10.15	0.61	15	PASS
ICB	ICB	1	Al	0.00027	446.81	15	<PQL
LLICV	CCV1	1	Al	0.066	3.5	20	PASS
ICSA1	ICSA	1	Al	437.59	0.085	15	PASS
ICSAB1	ICSAB	1	Al	547	0.39	15	PASS
LLICV	CCV1	1	Al	0.055	2.42	20	PASS
MB-71612	MBLK	1	Al	0.0023	48.14	15	<PQL
LCS1-71612	LCS	1	Al	5.14	0.33	15	PASS
N033238-001E	SAMP	1	Al	0.0037	19.69	15	<PQL
N033238-002E	SAMP	1	Al	0.018	4.63	15	PASS
N033238-003E	SAMP	1	Al	0.0044	20.09	15	<PQL
N033238-004E	SAMP	1	Al	0.0081	12.38	15	PASS
N033238-005E	SAMP	1	Al	0.018	60.45	15	<PQL
N033238-010E	SAMP	1	Al	0.39	0.32	15	PASS
N033238-011E	SAMP	1	Al	0.0024	16.32	15	<PQL
N033238-012E	SAMP	1	Al	0.021	4.14	15	PASS
CCV1	CCV	1	Al	10.008	0.77	15	PASS
CCB1	CCB	1	Al	0.013	28.042	15	<PQL
N033238-015E	SAMP	1	Al	0.023	4.89	15	PASS
N033236-002E	SAMP	1	Al	0.022	7.27	15	PASS
N033237-001B	SAMP	1	Al	0.0082	10.96	15	PASS
N033237-002B	SAMP	1	Al	0.013	9.14	15	PASS
N033238-001E	SAMP	5	Al	0.015	4.53	15	PASS
N033238-001E-PS	PS	1	Al	5.29	0.61	15	PASS
N033238-001E-MS1	MS	1	Al	5.31	0.43	15	PASS
N033238-001E-MSD1	MSD	1	Al	5.3	0.59	15	PASS
N033238-011E-MS1	MS	1	Al	5.25	0.61	15	PASS
CCV2	CCV	1	Al	10.071	1.043	15	PASS
CCB2	CCB	1	Al	0.022	6.17	15	PASS
CCV3	CCV	1	Al	10.12	0.36	15	PASS
CCB3	CCB	1	Al	0.019	7.51	15	PASS
ICSA2	ICSA	1	Al	438.34	0.13	15	PASS
ICSAB2	ICSAB	1	Al	548.59	0.17	15	PASS
CCV4	CCV	1	Al	10.1	0.39	15	PASS

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
CCB4	CCB	1	Al	0.0041	46.96	15	<PQL
ICSA3	ICSA	1	Al	438.75	0.03	15	PASS
ICSAB3	ICSAB	1	Al	547.99	0.021	15	PASS
CalBlk	IBLK	1	B	0	0.41	15	PASS
Standard1	ICAL	1	B	0.1	0.94	15	PASS
Standard3	ICAL	1	B	1	1.25	15	PASS
Standard4	ICAL	1	B	2.5	1.19	15	PASS
Standard5	ICAL	1	B	3.75	0.93	15	PASS
Standard6	ICAL	1	B	5	0.62	15	PASS
Standard7	ICAL	1	B	10	0.87	15	PASS
ICV	ICV	1	B	5.14	0.04	15	PASS
ICB	ICB	1	B	0.048	4.65	15	PASS
LLICV	CCV1	1	B	0.12	1.1	20	PASS
ICSA1	ICSA	1	B	0.047	2.81	15	PASS
ICSAB1	ICSAB	1	B	1.14	0.96	15	PASS
LLICV	CCV1	1	B	0.095	0.5	20	PASS
MB-71612	MBLK	1	B	0.0089	7.87	15	PASS
LCS1-71612	LCS	1	B	0.96	0.75	15	PASS
N033238-001E	SAMP	1	B	1.16	1.3	15	PASS
N033238-002E	SAMP	1	B	1.058	0.43	15	PASS
N033238-003E	SAMP	1	B	1.064	1.14	15	PASS
N033238-004E	SAMP	1	B	1	1.1	15	PASS
N033238-005E	SAMP	1	B	0.98	0.71	15	PASS
N033238-010E	SAMP	1	B	1.034	1.12	15	PASS
N033238-011E	SAMP	1	B	1.087	0.65	15	PASS
N033238-012E	SAMP	1	B	1.093	0.92	15	PASS
CCV1	CCV	1	B	4.95	0.83	15	PASS
CCB1	CCB	1	B	0.039	8.5	15	PASS
N033238-015E	SAMP	1	B	1.1	0.65	15	PASS
N033236-002E	SAMP	1	B	1.12	0.69	15	PASS
N033237-001B	SAMP	1	B	0.34	0.79	15	PASS
N033237-002B	SAMP	1	B	1.093	0.96	15	PASS
N033238-001E	SAMP	5	B	0.28	0.59	15	PASS
N033238-001E-PS	PS	1	B	2.45	0.64	15	PASS
N033238-001E-MS1	MS	1	B	2.46	0.23	15	PASS
N033238-001E-MSD1	MSD	1	B	2.47	1.36	15	PASS
N033238-011E-MS1	MS	1	B	2.43	0.76	15	PASS
CCV2	CCV	1	B	4.87	0.64	15	PASS
CCB2	CCB	1	B	0.042	6.12	15	PASS
CCV3	CCV	1	B	4.95	0.85	15	PASS
CCB3	CCB	1	B	0.044	9.039	15	PASS
ICSA2	ICSA	1	B	0.055	1.52	15	PASS

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
ICSAB2	ICSAB	1	B	1.14	0.66	15	PASS
CCV4	CCV	1	B	4.91	0.98	15	PASS
CCB4	CCB	1	B	0.043	5.26	15	PASS
ICSA3	ICSA	1	B	0.052	3.85	15	PASS
ICSAB3	ICSAB	1	B	1.14	0.5	15	PASS
CalBlk	IBLK	1	Ca	0	2.9	15	PASS
Standard1	ICAL	1	Ca	0.2	7.96	15	PASS
Standard2	ICAL	1	Ca	1	3.11	15	PASS
Standard3	ICAL	1	Ca	2	1.038	15	PASS
Standard4	ICAL	1	Ca	5	18.1	15	NR!
Standard5	ICAL	1	Ca	7.5	0.46	15	PASS
Standard6	ICAL	1	Ca	10	0.76	15	PASS
Standard7	ICAL	1	Ca	20	0.29	15	PASS
ICV	ICV	1	Ca	10.1	0.48	15	PASS
ICB	ICB	1	Ca	-0.021	80.13	15	<PQL
LLICV	CCV1	1	Ca	0.19	17.81	20	PASS
ICSA1	ICSA	1	Ca	438.69	0.15	15	PASS
ICSAB1	ICSAB	1	Ca	546.96	0.42	15	PASS
LLICV	CCV1	1	Ca	0.17	9.61	20	PASS
MB-71612	MBLK	1	Ca	-0.034	33.54	15	<PQL
LCS1-71612	LCS	1	Ca	5.035	0.72	15	PASS
N033238-001E	SAMP	1	Ca	152.17	0.52	15	PASS
N033238-002E	SAMP	1	Ca	140.67	0.6	15	PASS
N033238-003E	SAMP	1	Ca	206.49	0.63	15	PASS
N033238-004E	SAMP	1	Ca	198.52	0.82	15	PASS
N033238-005E	SAMP	1	Ca	193.39	0.36	15	PASS
N033238-010E	SAMP	1	Ca	150.86	0.5	15	PASS
N033238-011E	SAMP	1	Ca	155.76	0.51	15	PASS
N033238-012E	SAMP	1	Ca	151.75	0.61	15	PASS
CCV1	CCV	1	Ca	10.079	0.35	15	PASS
CCB1	CCB	1	Ca	-0.021	137.6	15	<PQL
N033238-015E	SAMP	1	Ca	161.95	0.62	15	PASS
N033236-002E	SAMP	1	Ca	124.53	1.12	15	PASS
N033237-001B	SAMP	1	Ca	138.84	0.47	15	PASS
N033237-002B	SAMP	1	Ca	212.87	0.42	15	PASS
N033238-001E	SAMP	5	Ca	31.94	0.27	15	PASS
N033238-001E-PS	PS	1	Ca	144.81	0.73	15	PASS
N033238-001E-MS1	MS	1	Ca	145.57	0.67	15	PASS
N033238-001E-MSD1	MSD	1	Ca	145.49	0.72	15	PASS
N033238-011E-MS1	MS	1	Ca	158.32	0.45	15	PASS
CCV2	CCV	1	Ca	9.95	0.18	15	PASS
CCB2	CCB	1	Ca	-0.034	39.078	15	<PQL

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
CCV3	CCV	1	Ca	10.094	0.43	15	PASS
CCB3	CCB	1	Ca	0.0086	296.0063	15	<PQL
ICSA2	ICSA	1	Ca	438.57	0.19	15	PASS
ICSAB2	ICSAB	1	Ca	546.17	0.15	15	PASS
CCV4	CCV	1	Ca	10.08	0.48	15	PASS
CCB4	CCB	1	Ca	-0.018	114.8	15	<PQL
ICSA3	ICSA	1	Ca	438.63	0.068	15	PASS
ICSAB3	ICSAB	1	Ca	545.93	0.045	15	PASS
CalBlk	IBLK	1	Fe	0	4.0086	15	PASS
Standard1	ICAL	1	Fe	0.02	2.43	15	PASS
Standard2	ICAL	1	Fe	0.05	1.27	15	PASS
Standard3	ICAL	1	Fe	2	0.48	15	PASS
Standard4	ICAL	1	Fe	5	0.6	15	PASS
Standard5	ICAL	1	Fe	7.5	0.68	15	PASS
Standard6	ICAL	1	Fe	10	0.43	15	PASS
Standard7	ICAL	1	Fe	20	0.2	15	PASS
ICV	ICV	1	Fe	10.41	0.64	15	PASS
ICB	ICB	1	Fe	0.00034	127.7	15	<PQL
LLICV	CCV1	1	Fe	0.022	1.02	20	PASS
ICSA1	ICSA	1	Fe	183.66	0.3	15	PASS
ICSAB1	ICSAB	1	Fe	179.73	0.42	15	PASS
LLICV	CCV1	1	Fe	0.024	4.46	20	PASS
MB-71612	MBLK	1	Fe	0.0029	10.44	15	PASS
LCS1-71612	LCS	1	Fe	0.11	1.058	15	PASS
N033238-001E	SAMP	1	Fe	0.008	0.63	15	PASS
N033238-002E	SAMP	1	Fe	0.028	1.13	15	PASS
N033238-003E	SAMP	1	Fe	0.011	3.55	15	PASS
N033238-004E	SAMP	1	Fe	0.0064	3.2	15	PASS
N033238-005E	SAMP	1	Fe	0.0056	17.57	15	<PQL
N033238-010E	SAMP	1	Fe	1.18	0.7	15	PASS
N033238-011E	SAMP	1	Fe	0.0059	5.85	15	PASS
N033238-012E	SAMP	1	Fe	0.049	1.97	15	PASS
CCV1	CCV	1	Fe	10.47	0.67	15	PASS
CCB1	CCB	1	Fe	0.0011	38.023	15	<PQL
N033238-015E	SAMP	1	Fe	0.018	1.68	15	PASS
N033236-002E	SAMP	1	Fe	0.0086	3.72	15	PASS
N033237-001B	SAMP	1	Fe	0.0088	5.41	15	PASS
N033237-002B	SAMP	1	Fe	0.0016	23.037	15	<PQL
N033238-001E	SAMP	5	Fe	0.0027	21.65	15	<PQL
N033238-001E-PS	PS	1	Fe	0.11	1.66	15	PASS
N033238-001E-MS1	MS	1	Fe	0.1	0.75	15	PASS
N033238-001E-MSD1	MSD	1	Fe	0.11	0.7	15	PASS

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
N033238-011E-MS1	MS	1	Fe	0.11	0.5	15	PASS
CCV2	CCV	1	Fe	10.53	1.18	15	PASS
CCB2	CCB	1	Fe	0.00067	127.51	15	<PQL
CCV3	CCV	1	Fe	10.52	0.27	15	PASS
CCB3	CCB	1	Fe	0.0016	32.34	15	<PQL
ICSA2	ICSA	1	Fe	186.49	0.56	15	PASS
ICSAB2	ICSAB	1	Fe	183.4	0.86	15	PASS
CCV4	CCV	1	Fe	10.47	0.26	15	PASS
CCB4	CCB	1	Fe	0.0015	67.44	15	<PQL
ICSA3	ICSA	1	Fe	186.96	0.66	15	PASS
ICSAB3	ICSAB	1	Fe	183.23	0.24	15	PASS
CalBlk	IBLK	1	Mg	0	3.71	15	PASS
Standard1	ICAL	1	Mg	0.1	1.27	15	PASS
Standard2	ICAL	1	Mg	1	0.2	15	PASS
Standard3	ICAL	1	Mg	2	0.68	15	PASS
Standard4	ICAL	1	Mg	5	0.45	15	PASS
Standard5	ICAL	1	Mg	7.5	0.48	15	PASS
Standard6	ICAL	1	Mg	10	0.4	15	PASS
Standard7	ICAL	1	Mg	20	0.2	15	PASS
ICV	ICV	1	Mg	10.4	0.7	15	PASS
ICB	ICB	1	Mg	0.0007	84.94	15	<PQL
LLICV	CCV1	1	Mg	0.097	0.76	20	PASS
ICSA1	ICSA	1	Mg	408.82	0.33	15	PASS
ICSAB1	ICSAB	1	Mg	507.87	0.58	15	PASS
LLICV	CCV1	1	Mg	0.093	0.84	20	PASS
MB-71612	MBLK	1	Mg	0.0024	9.61	15	PASS
LCS1-71612	LCS	1	Mg	5.24	0.34	15	PASS
N033238-001E	SAMP	1	Mg	9.094	0.52	15	PASS
N033238-002E	SAMP	1	Mg	8.41	0.51	15	PASS
N033238-003E	SAMP	1	Mg	16.1	0.68	15	PASS
N033238-004E	SAMP	1	Mg	15.17	0.83	15	PASS
N033238-005E	SAMP	1	Mg	14.78	0.67	15	PASS
N033238-010E	SAMP	1	Mg	25.28	1.052	15	PASS
N033238-011E	SAMP	1	Mg	25.82	0.31	15	PASS
N033238-012E	SAMP	1	Mg	26.4	0.14	15	PASS
CCV1	CCV	1	Mg	10.67	0.71	15	PASS
CCB1	CCB	1	Mg	0.0017	4.43	15	PASS
N033238-015E	SAMP	1	Mg	24.41	0.37	15	PASS
N033236-002E	SAMP	1	Mg	32.011	0.19	15	PASS
N033237-001B	SAMP	1	Mg	38.025	0.32	15	PASS
N033237-002B	SAMP	1	Mg	30.35	0.59	15	PASS
N033238-001E	SAMP	5	Mg	2.22	0.33	15	PASS

RSD SUMMARY: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Analyte	Reported Conc	RSD	Criteria	Comment
N033238-001E-PS	PS	1	Mg	14.36	0.32	15	PASS
N033238-001E-MS1	MS	1	Mg	14.22	0.31	15	PASS
N033238-001E-MSD1	MSD	1	Mg	14.2	1.081	15	PASS
N033238-011E-MS1	MS	1	Mg	30.64	0.16	15	PASS
CCV2	CCV	1	Mg	10.73	1.14	15	PASS
CCB2	CCB	1	Mg	0.0026	8.82	15	PASS
CCV3	CCV	1	Mg	10.64	0.3	15	PASS
CCB3	CCB	1	Mg	0.0011	40.71	15	<PQL
ICSA2	ICSA	1	Mg	418.5	0.59	15	PASS
ICSAB2	ICSAB	1	Mg	523.34	0.99	15	PASS
CCV4	CCV	1	Mg	10.55	0.22	15	PASS
CCB4	CCB	1	Mg	0.0028	25.96	15	<PQL
ICSA3	ICSA	1	Mg	419.81	0.8	15	PASS
ICSAB3	ICSAB	1	Mg	523.31	0.25	15	PASS

ANALYSIS RUN LOG

INJECTION LOG: 181206B

Instrument ID: ICP-02

STANDARD CODE	
Standard1	MWST-181001A,0.5<50mL
Standard2	MWST-181001E
Standard3	MWST-181001J,5<50mL
Standard4	MWST-181001J,12.5<50mL
Standard5	MWST-181001J,15<40mL
Standard6	MWST-181001J,25<50mL
Standard7	MWST-181001J
ICV	MWST-181001O
CCV	MWST-181001J,25<50mL
ICSA/ICSAB	MWST-181001R/MWST-180730A
Int. Std. (Y)	MSST-180926A/B
PS Spike	MWST-180930D/E/F

A/S Loc	Sample Name	Type	DF	Acq Date	Acq Time
1	CalBlk	IBLK	1	12/06/2018	09:28:53 AM
2	Standard1	ICAL	1	12/06/2018	09:34:44 AM
3	Standard2	ICAL	1	12/06/2018	09:41:05 AM
11	Standard3	ICAL	1	12/06/2018	09:47:25 AM
12	Standard4	ICAL	1	12/06/2018	09:53:46 AM
6	Standard5	ICAL	1	12/06/2018	10:02:08 AM
7	Standard6	ICAL	1	12/06/2018	10:10:29 AM
8	Standard7	ICAL	1	12/06/2018	10:18:50 AM
9	ICV	ICV	1	12/06/2018	10:22:11 AM
1	ICB	ICB	1	12/06/2018	10:37:30 AM
2	LLICV	CCV1	1	12/06/2018	10:48:55 AM
4	ICSA1	ICSA	1	12/06/2018	10:55:15 AM
5	ICSAB1	ICSAB	1	12/06/2018	11:03:48 AM
2	LLICV	CCV1	1	12/06/2018	11:15:13 AM
38	MB-71612	MBLK	1	12/06/2018	11:19:47 AM
39	LCS1-71612	LCS	1	12/06/2018	11:25:36 AM
42	N033238-001E	SAMP	1	12/06/2018	11:31:56 AM
44	N033238-002E	SAMP	1	12/06/2018	11:40:16 AM
54	N033238-003E	SAMP	1	12/06/2018	12:09:53 PM
56	N033238-004E	SAMP	1	12/06/2018	12:18:14 PM
58	N033238-005E	SAMP	1	12/06/2018	12:26:35 PM
64	N033238-010E	SAMP	1	12/06/2018	12:34:56 PM
66	N033238-011E	SAMP	1	12/06/2018	12:47:49 PM
68	N033238-012E	SAMP	1	12/06/2018	01:04:17 PM
7	CCV1	CCV	1	12/06/2018	01:12:39 PM
1	CCB1	CCB	1	12/06/2018	01:21:01 PM
73	N033238-015E	SAMP	1	12/06/2018	01:27:20 PM
79	N033236-002E	SAMP	1	12/06/2018	02:08:45 PM

A/S Loc	Sample Name	Type	DF	Acq Date	Acq Time
80	N033237-001B	SAMP	1	12/06/2018	02:17:07 PM
81	N033237-002B	SAMP	1	12/06/2018	02:25:29 PM
82	N033238-001E	SAMP	5	12/06/2018	02:33:51 PM
83	N033238-001E-PS	PS	1	12/06/2018	02:40:13 PM
84	N033238-001E-MS1	MS	1	12/06/2018	02:48:34 PM
85	N033238-001E-MSD1	MSD	1	12/06/2018	02:56:56 PM
86	N033238-011E-MS1	MS	1	12/06/2018	03:12:53 PM
98	MB-71613	MBLK	1	12/06/2018	03:21:15 PM
7	CCV2	CCV	1	12/06/2018	03:27:38 PM
1	CCB2	CCB	1	12/06/2018	03:39:29 PM
99	LCS1-71613	LCS	1	12/06/2018	03:45:48 PM
100	N033238-001F	SAMP	1	12/06/2018	03:54:09 PM
101	N033238-002F	SAMP	1	12/06/2018	04:02:31 PM
102	N033238-003F	SAMP	1	12/06/2018	04:10:53 PM
103	N033238-004F	SAMP	1	12/06/2018	04:19:15 PM
104	N033238-004F	SAMP	5	12/06/2018	04:27:38 PM
105	N033238-004F-PS	PS	1	12/06/2018	04:33:59 PM
106	N033238-004F-MS1	MS	1	12/06/2018	04:42:22 PM
107	N033238-004F-MSD1	MSD	1	12/06/2018	04:50:45 PM
108	N033238-005F	SAMP	1	12/06/2018	04:59:09 PM
7	CCV3	CCV	1	12/06/2018	05:07:30 PM
1	CCB3	CCB	1	12/06/2018	05:15:52 PM
4	ICSA2	ICSA	1	12/06/2018	05:22:10 PM
5	ICSAB2	ICSAB	1	12/06/2018	05:30:43 PM
109	N033238-010F	SAMP	1	12/06/2018	05:39:18 PM
110	N033238-011F	SAMP	1	12/06/2018	05:47:41 PM
111	N033238-012F	SAMP	1	12/06/2018	05:56:04 PM
112	N033238-015F	SAMP	1	12/06/2018	06:04:26 PM
7	CCV4	CCV	1	12/06/2018	06:12:49 PM
1	CCB4	CCB	1	12/06/2018	06:21:12 PM
4	ICSA3	ICSA	1	12/06/2018	06:27:31 PM
5	ICSAB3	ICSAB	1	12/06/2018	06:36:04 PM

SAMPLE PREPARATION LOG

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: 12/5/2018 8:00:00
Prep End Date: 12/5/2018 12:00:00

Reviewed/ Date: Mary for 12/18/2018

Initials/ Date: _____

Prep Batch 71612 Prep Code: 200.7_PR Technician Mark Gesmundo

Prep Factor Units	Temp. (°C):	Location:
mL / mL	95	DB-2-10

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
LCS1-71612	Aqueous		25	☐	0	0	25	1.000		
LCS2-71612	Aqueous		25	☐	0	0	25	1.000		
MB-71612	Aqueous		25	☐	0	0	25	1.000		
N033236-002E	Water	<2	25	☐	0	0	25	1.000		
N033237-001B	Groundwater	<2	25	☐	0	0	25	1.000		
N033237-002B	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-002E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-002E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-002E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-003E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-004E	Groundwater	<2	25	☐	0	0	25	1.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

Number	Reagent Name
10132	NITRIC ACID
10136	HYDROCHLORIC ACID

Spk ID	Spike Name	SampType	AmtAdd
MSST-140120B	Sodium	LCS,MS,MSD	0.05
MSST-180608A	Strontium	LCS,MS,MSD	0.125
MSST-180608B	Potassium	LCS,MS,MSD	0.05
MWST-180930D	ICP Solution A	LCS,MS,MSD	0.5
MWST-180930E	ICP Solution B	LCS,MS,MSD	0.5
MWST-180930F	ICP Solution C	LCS,MS,MSD	0.5

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: 12/5/2018 8:00:00
Prep End Date: 12/5/2018 12:00:00

Reviewed/ Date: Nancy 12/18/2018
Initials/ Date: for

Prep Batch 71612 Prep Code: 200.7_PR Technician Mark Gesmundo

Prep Factor Units	Temp. (°C):	Location:
mL / mL	95	DB-2-10

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
N033238-005E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-006D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-007D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-008D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-009D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-010E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-011E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-011E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-012E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-012E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-013D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-015E	Groundwater	<2	25	☐	0	0	25	1.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

Number	Reagent Name
10132	NITRIC ACID
10136	HYDROCHLORIC ACID

Spk ID	Spike Name	SampType	AmtAdd
MSST-140120B	Sodium	LCS,MS,MSD	0.05
MSST-180608A	Strontium	LCS,MS,MSD	0.125
MSST-180608B	Potassium	LCS,MS,MSD	0.05
MWST-180930D	ICP Solution A	LCS,MS,MSD	0.5
MWST-180930E	ICP Solution B	LCS,MS,MSD	0.5
MWST-180930F	ICP Solution C	LCS,MS,MSD	0.5

INITIAL CALIBRATION DATA SUMMARY

INITIAL CALIBRATION SUMMARY: 181206B

Instrument ID: ICP-02

Sample ID	Date	Time	Elem	Wavelength	Corrected Intensity	Concentration	Units	R
Boron								
CalBlk	12/06/2018	09:28:53 AM	B	249.677	5882	0.00	mg/L	
Standard1	12/06/2018	09:34:44 AM	B	249.677	4678	0.1000	mg/L	
Standard3	12/06/2018	09:47:25 AM	B	249.677	52738	1.000	mg/L	
Standard4	12/06/2018	09:53:46 AM	B	249.677	136006	2.500	mg/L	
Standard5	12/06/2018	10:02:08 AM	B	249.677	199440	3.750	mg/L	
Standard6	12/06/2018	10:10:29 AM	B	249.677	267058	5.000	mg/L	
Standard7	12/06/2018	10:18:50 AM	B	249.677	537514	10.000	mg/L	1.0000
Magnesium								
CalBlk	12/06/2018	09:28:53 AM	Mg	279.079	142	0.00	mg/L	
Standard1	12/06/2018	09:34:44 AM	Mg	279.079	1646	0.1000	mg/L	
Standard2	12/06/2018	09:41:05 AM	Mg	279.079	16739	1.000	mg/L	
Standard3	12/06/2018	09:47:25 AM	Mg	279.079	34127	2.000	mg/L	
Standard4	12/06/2018	09:53:46 AM	Mg	279.079	86326	5.000	mg/L	
Standard5	12/06/2018	10:02:08 AM	Mg	279.079	129100	7.500	mg/L	
Standard6	12/06/2018	10:10:29 AM	Mg	279.079	172085	10.000	mg/L	
Standard7	12/06/2018	10:18:50 AM	Mg	279.079	329373	20.000	mg/L	0.9998
Aluminum								
CalBlk	12/06/2018	09:28:53 AM	Al	237.313	-50	0.00	mg/L	
Standard1	12/06/2018	09:34:44 AM	Al	237.313	488	0.0500	mg/L	
Standard2	12/06/2018	09:41:05 AM	Al	237.313	7542	1.000	mg/L	
Standard3	12/06/2018	09:47:25 AM	Al	237.313	15059	2.000	mg/L	
Standard4	12/06/2018	09:53:46 AM	Al	237.313	37797	5.000	mg/L	
Standard5	12/06/2018	10:02:08 AM	Al	237.313	56322	7.500	mg/L	
Standard6	12/06/2018	10:10:29 AM	Al	237.313	74412	10.000	mg/L	
Standard7	12/06/2018	10:18:50 AM	Al	237.313	147450	20.000	mg/L	1.0000
Calcium								
CalBlk	12/06/2018	09:28:53 AM	Ca	227.546	-146	0.00	mg/L	
Standard1	12/06/2018	09:34:44 AM	Ca	227.546	64	0.2000	mg/L	
Standard2	12/06/2018	09:41:05 AM	Ca	227.546	332	1.000	mg/L	
Standard3	12/06/2018	09:47:25 AM	Ca	227.546	672	2.000	mg/L	
Standard4	12/06/2018	09:53:46 AM	Ca	227.546	1530	5.000	mg/L	
Standard5	12/06/2018	10:02:08 AM	Ca	227.546	2529	7.500	mg/L	
Standard6	12/06/2018	10:10:29 AM	Ca	227.546	3368	10.000	mg/L	
Standard7	12/06/2018	10:18:50 AM	Ca	227.546	6734	20.000	mg/L	0.9998
Iron								
CalBlk	12/06/2018	09:28:53 AM	Fe	273.953	-232	0.00	mg/L	
Standard1	12/06/2018	09:34:44 AM	Fe	273.953	546	0.0200	mg/L	
Standard2	12/06/2018	09:41:05 AM	Fe	273.953	1907	0.050	mg/L	
Standard3	12/06/2018	09:47:25 AM	Fe	273.953	53500	2.000	mg/L	
Standard4	12/06/2018	09:53:46 AM	Fe	273.953	134910	5.000	mg/L	
Standard5	12/06/2018	10:02:08 AM	Fe	273.953	202180	7.500	mg/L	
Standard6	12/06/2018	10:10:29 AM	Fe	273.953	268201	10.000	mg/L	
Standard7	12/06/2018	10:18:50 AM	Fe	273.953	513034	20.000	mg/L	0.9998

Calibration Acceptance Criteria: > 0.995 Correlation

INITIAL CALIBRATION AND CONTINUING CALIBRATION VERIFICATION SUMMARY

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **ICV** SampType: **ICV** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICV** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230730**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10150.390	50	10000	0	102	90	110				
Boron	5141.765	100	5000	0	103	90	110				
Iron	10411.208	20	10000	0	104	90	110				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230732**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	115.200	100	100.0	0	115	80	120				
Iron	21.667	20	20.00	0	108	80	120				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230735**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	55.458	50	50.00	0	111	80	120				

Sample ID **CCV1** SampType: **CCV** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCV** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230746**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10008.079	50	10000	0	100	90	110				
Boron	4949.429	100	5000	0	99.0	90	110				
Iron	10472.325	20	10000	0	105	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **CCV2** SampType: **CCV** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCV** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10071.181	50	10000	0	101	90	110				
Boron	4868.308	100	5000	0	97.4	90	110				
Iron	10529.621	20	10000	0	105	90	110				

Sample ID **CCV3** SampType: **CCV** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCV** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10118.360	50	10000	0	101	90	110				
Boron	4951.132	100	5000	0	99.0	90	110				
Iron	10515.070	20	10000	0	105	90	110				

Sample ID **CCV4** SampType: **CCV** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCV** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230778**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10100.189	50	10000	0	101	90	110				
Boron	4914.576	100	5000	0	98.3	90	110				
Iron	10471.943	20	10000	0	105	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		

SUMMARY OF INSTRUMENT BLANKS

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **ICB** SampType: **ICB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230731**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.274	50									
Boron	48.476	100									
Iron	0.343	20									

Sample ID **CCB1** SampType: **CCB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230747**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	13.241	50									
Boron	39.000	100									
Iron	1.126	20									

Sample ID **CCB2** SampType: **CCB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230759**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	22.261	50									
Boron	42.068	100									
Iron	0.667	20									

Sample ID **CCB3** SampType: **CCB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **CCB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230771**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	18.889	50									
Boron	43.837	100									
Iron	1.574	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	CCB4	SampType:	CCB	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:		RunNo:	130366
Client ID:	CCB	Batch ID:	R130366	TestNo:	EPA 200.7			Analysis Date:	12/6/2018	SeqNo:	3230779

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	4.098	50									
Boron	43.323	100									
Iron	1.518	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		

SUMMARY OF INSTRUMENT CHECK (ICSA & ICSAB)

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **ICSA1** SampType: **ICSA** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSA** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230733**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	437588.831	50	500000	0	87.5	80	120				
Boron	47.170	100									
Calcium	438688.000	500	500000	0	87.7	80	120				
Iron	183657.138	20	200000	0	91.8	80	120				
Magnesium	408823.701	100	500000	0	81.8	80	120				

Sample ID **ICSAB1** SampType: **ICSAB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSAB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230734**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	547001.681	50	500000	0	109	80	120				
Boron	1137.747	100	1000	0	114	80	120				
Calcium	546960.679	500	500000	0	109	80	120				
Iron	179731.509	20	200000	0	89.9	80	120				
Magnesium	507865.853	100	500000	0	102	80	120				

Sample ID **ICSA2** SampType: **ICSA** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSA** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230772**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	438343.171	50	500000	0	87.7	80	120				
Boron	54.876	100									
Calcium	438573.447	500	500000	0	87.7	80	120				
Iron	186485.451	20	200000	0	93.2	80	120				
Magnesium	418501.973	100	500000	0	83.7	80	120				

Boron in ICSA2 and ICSA3 has detect > 1/2 RL, however, samples for this analyte are > 5x the ICSA detection.

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		

Nancy 12/18/2018

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **ICSAB2** SampType: **ICSAB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSAB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230773**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	548585.123	50	500000	0	110	80	120				
Boron	1140.748	100	1000	0	114	80	120				
Calcium	546171.040	500	500000	0	109	80	120				
Iron	183399.051	20	200000	0	91.7	80	120				
Magnesium	523341.125	100	500000	0	105	80	120				

Sample ID **ICSA3** SampType: **ICSA** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSA** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	438745.445	50	500000	0	87.7	80	120				
Boron	51.507	100									
Calcium	438627.069	500	500000	0	87.7	80	120				
Iron	186963.821	20	200000	0	93.5	80	120				
Magnesium	419805.882	100	500000	0	84.0	80	120				

Sample ID **ICSAB3** SampType: **ICSAB** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ICSAB** Batch ID: **R130366** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230781**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	547991.695	50	500000	0	110	80	120				
Boron	1136.396	100	1000	0	114	80	120				
Calcium	545930.235	500	500000	0	109	80	120				
Iron	183227.481	20	200000	0	91.6	80	120				
Magnesium	523309.773	100	500000	0	105	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		

INTERNAL STANDARD SUMMARY

INTERNAL STANDARD: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Yttrium, 1.0 mg/L			
			Reported Conc	%REC	Criteria	Comment
CalBlk	IBLK	1	1	100	65-125	PASS
Standard1	ICAL	1	1.021	102.12	65-125	PASS
Standard2	ICAL	1	1.07	106.97	65-125	PASS
Standard3	ICAL	1	1.05	104.95	65-125	PASS
Standard4	ICAL	1	1.033	103.31	65-125	PASS
Standard5	ICAL	1	1.041	104.11	65-125	PASS
Standard6	ICAL	1	1.015	101.54	65-125	PASS
Standard7	ICAL	1	1.0002	100.02	65-125	PASS
ICV	ICV	1	1.01	101.04	65-125	PASS
ICB	ICB	1	1.001	100.1	65-125	PASS
LLICV	CCV1	1	1.028	102.81	65-125	PASS
ICSA1	ICSA	1	1.13	112.8	65-125	PASS
ICSAB1	ICSAB	1	0.88	87.88	65-125	PASS
LLICV	CCV1	1	1	99.86	65-125	PASS
MB-71612	MBLK	1	1.012	101.18	65-125	PASS
LCS1-71612	LCS	1	0.97	96.66	65-125	PASS
N033238-001E	SAMP	1	0.91	91.001	65-125	PASS
N033238-002E	SAMP	1	0.91	91.14	65-125	PASS
N033238-003E	SAMP	1	0.86	85.68	65-125	PASS
N033238-004E	SAMP	1	0.9	89.55	65-125	PASS
N033238-005E	SAMP	1	0.89	89.11	65-125	PASS
N033238-010E	SAMP	1	0.91	90.95	65-125	PASS
N033238-011E	SAMP	1	0.85	84.66	65-125	PASS
N033238-012E	SAMP	1	0.86	85.64	65-125	PASS
CCV1	CCV	1	0.98	98.029	65-125	PASS
CCB1	CCB	1	0.97	97.4	65-125	PASS
N033238-015E	SAMP	1	0.88	87.87	65-125	PASS
N033236-002E	SAMP	1	0.83	82.83	65-125	PASS
N033237-001B	SAMP	1	0.92	92.043	65-125	PASS
N033237-002B	SAMP	1	0.88	87.62	65-125	PASS
N033238-001E	SAMP	5	0.9	90.012	65-125	PASS
N033238-001E-PS	PS	1	0.86	85.64	65-125	PASS
N033238-001E-MS1	MS	1	0.89	88.76	65-125	PASS
N033238-001E-MSD1	MSD	1	0.88	87.87	65-125	PASS
N033238-011E-MS1	MS	1	0.84	84.5	65-125	PASS
CCV2	CCV	1	0.98	98.48	65-125	PASS
CCB2	CCB	1	0.97	97.42	65-125	PASS
CCV3	CCV	1	1.032	103.18	65-125	PASS
CCB3	CCB	1	1.017	101.73	65-125	PASS
ICSA2	ICSA	1	1.13	113.26	65-125	PASS
ICSAB2	ICSAB	1	0.88	88.11	65-125	PASS

INTERNAL STANDARD: 181206B

Instrument ID: ICP-02

Sample Name	Type	DF	Yttrium, 1.0 mg/L			
			Reported Conc	%REC	Criteria	Comment
CCV4	CCV	1	1.042	104.19	65-125	PASS
CCB4	CCB	1	1	99.7	65-125	PASS
ICSA3	ICSA	1	1.14	113.58	65-125	PASS
ICSAB3	ICSAB	1	0.88	88.27	65-125	PASS

SERIAL DILUTION/
POST DIGESTION SPIKE

ASSET Laboratories

ICP-Metals in Water

Dilution Test Summary

Work Order No.: N033236
Test Method: EPA 200.7
Analysis Date: 12/6/2018

Matrix: Water
Batch No.: 71612

Instrument ID: ICP-02
Instrument Description: Perkin Elmer Optima DV Series

Comments:

Analyzed By: Mary Claire Ignacio

Dilution test is not applicable to all analytes. The calculated concentration is <25RL.

Sample ID	Analyte	Units	Calc Val	OQual	SAMPRefVal	%DIFF	%DIFFlimit
N033238-001E DT 5X	Aluminum	ug/L	0		0		10
N033238-001E DT 5X	Boron	ug/L	1388.858	NA	1164.347	19.28%	10
N033238-001E DT 5X	Iron	ug/L	0		0		10

Note: NA - Not applicable

ASSET Laboratories

Date: *17-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **N033238-001E-PS** SampType: **PS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: RunNo: **130366**
Client ID: **ZZZZZZ** Batch ID: **71612** TestNo: **EPA 200.7** Analysis Date: **12/6/2018** SeqNo: **3230753**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	5291.191	50	5000	0	106	80	120				
Boron	2451.102	100	1000	1164	129	80	120				S
Iron	105.508	20	100.0	0	106	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		

MDL STUDY

METHOD DETECTION LIMIT 2017

Method Name: **Metals by ICP**
Method Number: EPA 200.7/ 6010
Analysis Date(s): 10/6, 10/7,11/10/17
Analyst: Mary Claire Ignacio

Matrix: **WATER**
Unit: mg/L

Instrument Name: **ICP-02**

Acceptance Criteria: MDL < spike < 10XMDL

Analyte	Wavelength	#1	#2	#3	#4	#5	#6	#7	Spike Conc., mg/L	SD	MDL	PQL
Ag	328.069	0.0033	0.0031	0.0033	0.0033	0.0031	0.0030	0.0047	0.003	0.00061604	**0.001936**	0.003
Al	237.312	0.0664	0.0603	0.0656	0.0650	0.0658	0.0660	0.0946	0.050	0.01254823	**0.039439**	0.050
As	188.983	0.0131	0.0089	0.0120	0.0089	0.0060	0.0102	0.0080	0.010	0.00223806	**0.007034**	0.010
B	249.679	0.1491	0.1267	0.1281	0.1467	0.1261	0.1195	0.1015	0.100	0.01801843	**0.056632**	0.100
Ba	233.529	0.0033	0.0031	0.0033	0.0031	0.0032	0.0030	0.0024	0.003	0.00033070	**0.001039**	0.003
Be	313.104	0.0012	0.0011	0.0012	0.0012	0.0011	0.0011	0.0011	0.001	0.00006873	**0.000216**	0.001
Ca	227.546	0.2381	0.2231	0.2559	0.2299	0.2194	0.2473	0.2691	0.200	0.02202408	**0.069222**	0.200
Cd	214.437	0.0031	0.0029	0.0031	0.0032	0.0031	0.0031	0.0025	0.003	0.00027049	**0.000850**	0.003
Co	228.614	0.0030	0.0028	0.0030	0.0031	0.0031	0.0031	0.0027	0.003	0.00014491	**0.000455**	0.003
Cr	267.719	0.0009	0.0008	0.0009	0.0012	0.0012	0.0013	0.0009	0.001	0.00017120	**0.000538**	0.001
Fe	273.953	0.0255	0.0226	0.0242	0.0255	0.0252	0.0248	0.0387	0.020	0.00552308	**0.017359**	0.020
Mg	279.079	0.1124	0.1052	0.1129	0.1315	0.1305	0.1314	0.1435	0.100	0.01532024	**0.048152**	0.100
Mn	257.607	0.0119	0.0111	0.0120	0.0122	0.0121	0.0122	0.0099	0.010	0.00098403	**0.003093**	0.010
Mo	202.03	0.0079	0.0068	0.0067	0.0065	0.0065	0.0062	0.0057	0.005	0.00083918	**0.002638**	0.005
Ni	231.604	0.0061	0.0056	0.0062	0.0060	0.0060	0.0062	0.0045	0.005	0.00062690	**0.001970**	0.005
Pb	220.351	0.0124	0.0117	0.0127	0.0115	0.0120	0.0118	0.0090	0.010	0.00126325	**0.003970**	0.010
Sb	206.836	0.0102	0.0095	0.0104	0.0112	0.0117	0.0111	0.0080	0.010	0.00117407	**0.003690**	0.010
Se	196.025	0.0102	0.0087	0.0114	0.0136	0.0144	0.0136	0.0075	0.010	0.00251341	**0.007900**	0.010
Sn	189.927	0.0095	0.0084	0.0090	0.0124	0.0126	0.0129	0.0099	0.010	0.00175765	**0.005524**	0.010
Ti	334.943	0.0114	0.0106	0.0115	0.0115	0.0115	0.0115	0.0098	0.010	0.00074093	**0.002329**	0.010
Tl	190.794	0.0170	0.0150	0.0165	0.0171	0.0180	0.0168	0.0151	0.015	0.00116288	**0.003655**	0.015
V	292.404	0.0025	0.0024	0.0025	0.0032	0.0032	0.0032	0.0027	0.003	0.00038496	**0.001210**	0.003
Zn	206.201	0.0109	0.0100	0.0107	0.0125	0.0124	0.0124	0.0095	0.010	0.00123731	**0.003889**	0.010

METHOD DETECTION LIMIT 2017

Method Name: **Metals by ICP**
Method Number: EPA 200.7/ 6010
Analysis Date(s): 10/6, 10/7,11/10/17
Analyst: Mary Claire Ignacio

Matrix: **WATER**
Unit: mg/L

Instrument Name: **ICP-02**

Analyte	ICP-02 MDL	MDL Blank	Higher MDL	LOD	PQL
Ag	0.001936	0.002362	0.002362	0.002	0.003
Al	0.039439	0.039859	0.039859	0.04	0.5
As	0.007034	0.007672	0.007672	0.0075	0.01
B	0.056632	0.074419	0.074419	0.075	0.1
Ba	0.001039	0.000433	0.001039	0.001	0.003
Be	0.000216	0.000311	0.000311	0.0005	0.003
Ca	0.069222	0.084832	0.084832	0.1	0.5
Cd	0.000850	0.000592	0.000850	0.001	0.003
Co	0.000455	0.001902	0.001902	0.001	0.003
Cr	0.000538	0.000527	0.000538	0.001	0.003
Fe	0.017359	0.017751	0.017751	0.018	0.1
Mg	0.048152	0.043017	0.048152	0.05	0.1
Mn	0.003093	0.000782	0.003093	0.005	0.5
Mo	0.002638	0.002482	0.002638	0.0025	0.005
Ni	0.001970	0.000822	0.001970	0.0025	0.005
Pb	0.003970	0.002762	0.003970	0.005	0.005
Sb	0.003690	0.004504	0.004504	0.005	0.01
Se	0.007900	0.008549	0.008549	0.008	0.01
Sn	0.005524	0.003415	0.005524	0.0075	0.05
Ti	0.002329	0.001493	0.002329	0.005	0.05
Tl	0.003655	0.005987	0.005987	0.005	0.015
V	0.001210	0.000749	0.001210	0.002	0.003
Zn	0.003889	0.007683	0.007683	0.008	0.01

EPA 200.8

Metals Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: 71615 **Instrument ID:** ICPMS-02
ASSET #: N033236 **Analyst:** CEI
Method: **Date Analyzed:** 12/5/2018

[ ] EPA 6010B / 200.7 [ ] EPA 7470A / 7471A/245.1
[X] EPA 6020 / 200.8 [ ] Other _____

Initial Calibration and Initial Calibration Verification	Ist Level Review			2nd Level Review		
	Y	N	N/A	Y	N	N/A
1. Does correlation coefficient,r, meet criteria ?(r = 0.995)	X					
2. For ICV, all analytes within ± 10% of expected value? (±5% for EPA 200.7)	X					
3. Does the ICP/MS meet tune criteria? (ICP/MS Only)	X					
4. % RSD calculated from 3 injections?	X					
5. Is low level check at PQL within ± 20% of expected value? (ICP/ICPMS only)	X					
Interference Check						
6. ICS A and AB at the start and end of sequence or twice during an 8-hr period.	X					
7. Are ICSA and AB within ± 20% of expected value?	X					
Continuing Calibration						
8. CCV after every 10 samples and end of analysis sequence.	X					
9. For CCV, all analytes within ± 10% of expected value?	X					
10. Calibration blank after ICVand CCV analysis.	X					
11. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)	X					
12. Is low level check twice during 8 hr period or at end within ± 30% of expected value? (ICP/ICPMS only)	X					
Sample Information						
13. All samples are within linear dynamic range.	X					
14. All hits above PQL have %RSD of less than or equal to 15%? (ICP/ICPMS only)	X					
15. Are all samples analyzed/digested within hold time.	X					
16. Dilution test performed and within ± 10% of undiluted sample.	X					
17. When dilution test fails, post digestion spike recovery within 80-120% of expected value.	X					
18. For samples < 4 ppb, does the Cr result differs with Cr6+ by no more than 0.7 ppb?	X					
19. For samples > 4 ppb, does the Cr result differs with Cr6+ by no more than 20%?	X					
20 For samples that failed Cr6 vs CrT criteria, are samples reanalyzed for confirmation?			X			
21. For samples with Total and Dissolved analysis, is Total concentration higher or equal to Dissolved concentration?			X			
QC Items						
22. IS are within control limits (70-125% for ICPMS).	X					
23. Method blank values are below 1/2 the reporting limit.	X					
24. LCS compounds within control limits.	X					
25. MS/MSD, RPD's are within control limits		X				
Raw Data and Miscellaneous Information						
26. Are Non-Conformances documented	X					
27. Runlog complete and included in package.	X					
28. Digestion log complete and included in package (if applicable)	X					
29. All sample raw data present in package.	X					
Preliminary Report						
30. Does the raw data match the preliminary report?	X					
31. Are analytical results correct?(Ex. dilutions, calculations.etc.)	X					
32. Are special instructions met?	X					

Comments:

% Rec of Mo in CCV1 / CCV2 / CCV3 failed, low bias. Samples affected are for rerun

% Rec of Cu and Zn in N033238-001E PS/MS/MSD failed, low bias. However, LCS passed criteria.

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer CEI Date: 12/18/18

2nd Level Reviewer 12/18/2018 Date: —

Metals Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: 71615 **Instrument ID:** ICPMS-02
ASSET #: N033236 **Analyst:** CEI
Method: **Date Analyzed:** 12/6/2018

[ ] EPA 6010B / 200.7 [ ] EPA 7470A / 7471A/245.1
[X] EPA 6020 / 200.8 [ ] Other _____

Initial Calibration and Initial Calibration Verification	Ist Level Review			2nd Level Review		
	Y	N	N/A	Y	N	N/A
1. Does correlation coefficient,r, meet criteria ?(r = 0.995)	X					
2. For ICV, all analytes within ± 10% of expected value? (±5% for EPA 200.7)	X					
3. Does the ICP/MS meet tune criteria? (ICP/MS Only)	X					
4. % RSD calculated from 3 injections?	X					
5. Is low level check at PQL within ± 20% of expected value? (ICP/ICPMS only)	X					
Interference Check						
6. ICS A and AB at the start and end of sequence or twice during an 8-hr period.	X					
7. Are ICSA and AB within ± 20% of expected value?	X					
Continuing Calibration						
8. CCV after every 10 samples and end of analysis sequence.	X					
9. For CCV, all analytes within ± 10% of expected value?	X					
10. Calibration blank after ICVand CCV analysis.	X					
11. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)	X					
12. Is low level check twice during 8 hr period or at end within ± 30% of expected value? (ICP/ICPMS only)	X					
Sample Information						
13. All samples are within linear dynamic range.	X					
14. All hits above PQL have %RSD of less than or equal to 15%? (ICP/ICPMS only)	X					
15. Are all samples analyzed/digested within hold time.	X					
16. Dilution test performed and within ± 10% of undiluted sample.	X					
17. When dilution test fails, post digestion spike recovery within 80-120% of expected value.	X					
18. For samples < 4 ppb, does the Cr result differs with Cr6+ by no more than 0.7 ppb?			X			
19. For samples > 4 ppb, does the Cr result differs with Cr6+ by no more than 20%?			X			
20 For samples that failed Cr6 vs CrT criteria, are samples reanalyzed for confirmation?			X			
21. For samples with Total and Dissolved analysis, is Total concentration higher or equal to Dissolved concentration?			X			
QC Items						
22. IS are within control limits (70-125% for ICPMS).	X					
23. Method blank values are below 1/2 the reporting limit.	X					
24. LCS compounds within control limits.	X					
25. MS/MSD, RPD's are within control limits	X					
Raw Data and Miscellaneous Information						
26. Are Non-Conformances documented			X			
27. Runlog complete and included in package.	X					
28. Digestion log complete and included in package (if applicable)	X					
29. All sample raw data present in package.	X					
Preliminary Report						
30. Does the raw data match the preliminary report?	X					
31. Are analytical results correct?(Ex. dilutions, calculations.etc.)	X					
32. Are special instructions met?	X					

Comments:

for Mo rerun

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer CEI Date: 12/18/18

2nd Level Reviewer [signature] 12/18/2018 Date: –

SAMPLE CALCULATION

SAMPLE CALCULATION

METHOD: EPA 6020
TEST NAME: Heavy Metals by ICP-MS
MATRIX: Water

FORMULA:

Calculate the Chromium concentration, in ug/L ,in the original sample as follows:

Chromium , ug/L = A * DF * PF

where:

A = ug/L, calculated concentration
DF = Dilution Factor
PF = Final Volume of Digestate, mL / Amount of Sample, mL

For Sample **N033236-001C** , the concentration in ug/L is calculated as follows:

Chromium , ug/L = 98.7988 * 5 *(25/25)

Chromium , ug/L = 493.994

Reporting results in two significant figures,

Chromium , ug/L = 490

% RSD SUMMARY

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	121 Sb [3]				137 Ba [3]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.087	8.94	15	PASS	0.12	6.82	15	PASS
Std2-0.5/5 ppb	ICAL	1	0.48	0.89	15	PASS	0.55	2.48	15	PASS
Std3-5/50 ppb	ICAL	1	4.85	0.59	15	PASS	5.096	2.4	15	PASS
Std4-10/100 ppb	ICAL	1	9.6	1.54	15	PASS	10.2	1.091	15	PASS
Std5-20/200 ppb	ICAL	1	19.18	0.18	15	PASS	20.24	0.55	15	PASS
Std6-40/400 ppb	ICAL	1	37.9	0.58	15	PASS	40.61	0.4	15	PASS
Std7-100/1000 ppb	ICAL	1	100.6	1.32	15	PASS	100.094	0.57	15	PASS
Std8-200/2000 ppb	ICAL	1	200.22	0.51	15	PASS	199.79	0.86	15	PASS
ICV	ICV	1	10.34	0.084	15	PASS	10.082	1.22	15	PASS
ICB	ICB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
LLICV	CCV1	1	0.5	1.62	20	PASS	1.12	2.24	20	PASS
ICSA1	ICSA	1	0.14	7.15	15	PASS	<0.000	N/A	15	<PQL
ICSAB1	ICSAB	1	20.49	2.35	15	PASS	21.91	2.14	15	PASS
LLICV	CCV1	1	0.59	4.19	20	PASS	1.085	1.67	20	PASS
MB-71615	MBLK	1	0.037	10.19	15	PASS	<0.000	N/A	15	<PQL
LCS-71615	LCS	1	9.53	1.095	15	PASS	10.084	0.85	15	PASS
N033238-001E	SAMP	1	0.03	3.63	15	PASS	18.77	1.44	15	PASS
N033238-001E	SAMP	5	0.0056	52.026	15	<PQL	3.84	2.054	15	PASS
N033238-001E-PS	PS	1	10.0054	1.27	15	PASS	28.63	0.23	15	PASS
N033238-001E-MS	MS	1	9.88	0.7	15	PASS	28.35	1.46	15	PASS
N033238-001E-MSD	MSD	1	9.9	0.68	15	PASS	28.37	1.14	15	PASS
N033238-002E	SAMP	1	<0.000	N/A	15	<PQL	18.33	1.2	15	PASS
N033238-003E	SAMP	1	<0.000	N/A	15	<PQL	99.34	0.31	15	PASS
N033238-004E	SAMP	1	<0.000	N/A	15	<PQL	103.17	0.56	15	PASS
CCV1	CCV	1	19.036	0.23	15	PASS	21.38	0.34	15	PASS
CCB1	CCB	1	0.016	8.43	15	PASS	<0.000	N/A	15	<PQL
N033238-005E	SAMP	1	0.014	41.73	15	<PQL	108.051	0.6	15	PASS
N033238-006D	SAMP	1	0.0023	52.13	15	<PQL	142.13	0.13	15	PASS
N033238-007D	SAMP	1	<0.000	N/A	15	<PQL	154.53	0.28	15	PASS
N033238-008D	SAMP	1	0.017	21.45	15	<PQL	19.7	0.65	15	PASS
N033238-009D	SAMP	1	0.34	2.43	15	PASS	25.26	0.92	15	PASS
N033238-010E	SAMP	1	0.84	2.059	15	PASS	42.057	0.26	15	PASS
N033238-011E	SAMP	1	0.084	10.73	15	PASS	39.84	1.15	15	PASS
N033238-011E-MS	MS	1	9.99	0.67	15	PASS	48.8	1.018	15	PASS
N033238-012E	SAMP	1	0.84	1.6	15	PASS	38.15	1.26	15	PASS
N033238-013D	SAMP	1	<0.000	N/A	15	<PQL	118.029	0.45	15	PASS
CCV2	CCV	1	19.091	1.17	15	PASS	21.24	0.48	15	PASS
CCB2	CCB	1	0.017	17.89	15	<PQL	<0.000	N/A	15	<PQL
N033238-015E	SAMP	1	0.021	21.43	15	<PQL	29.69	0.93	15	PASS
N033236-001C	SAMP	1	0.0074	64.65	15	<PQL	30.69	0.33	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	121 Sb [3]				137 Ba [3]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
N033236-001C	SAMP	5	<0.000	N/A	15	<PQL	6.47	1.68	15	PASS
N033236-002E	SAMP	1	0.0008	110.66	15	<PQL	14.22	1.62	15	PASS
N033236-002E	SAMP	5	<0.000	N/A	15	<PQL	3.021	1.023	15	PASS
N033237-001B	SAMP	1	0.0088	3.39	15	PASS	43.92	1.003	15	PASS
N033237-001B	SAMP	5	<0.000	N/A	15	<PQL	5.94	0.23	15	PASS
N033237-002B	SAMP	1	<0.000	N/A	15	<PQL	30.2	0.38	15	PASS
N033237-002B	SAMP	5	<0.000	N/A	15	<PQL	6.46	1.033	15	PASS
CCV3	CCV	1	18.95	0.38	15	PASS	21.09	0.9	15	PASS
CCB3	CCB	1	0.017	31.75	15	<PQL	<0.000	N/A	15	<PQL
ICSA2	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB2	ICSAB	1	19.71	0.095	15	PASS	22.32	0.54	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	208 Pb [3]				52 Cr [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.095	2.21	15	PASS	0.099	11.75	15	PASS
Std2-0.5/5 ppb	ICAL	1	0.48	0.37	15	PASS	0.5	2.05	15	PASS
Std3-5/50 ppb	ICAL	1	4.9	0.13	15	PASS	5.03	1.68	15	PASS
Std4-10/100 ppb	ICAL	1	9.74	1.72	15	PASS	10.12	1.48	15	PASS
Std5-20/200 ppb	ICAL	1	19.4	1.11	15	PASS	20.24	1.096	15	PASS
Std6-40/400 ppb	ICAL	1	38.43	0.15	15	PASS	40.66	1.16	15	PASS
Std7-100/1000 ppb	ICAL	1	98.9	0.76	15	PASS	100.41	0.45	15	PASS
Std8-200/2000 ppb	ICAL	1	200.94	0.6	15	PASS	199.63	1.18	15	PASS
ICV	ICV	1	9.43	1.14	15	PASS	10.016	2.097	15	PASS
ICB	ICB	1	0.0029	17.34	15	<PQL	0.063	4.69	15	PASS
LLICV	CCV1	1	1.017	0.42	20	PASS	1.098	2.27	20	PASS
ICSA1	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB1	ICSAB	1	18.51	3.5	15	PASS	19.89	0.55	15	PASS
LLICV	CCV1	1	1.02	0.43	20	PASS	1.065	3.81	20	PASS
MB-71615	MBLK	1	0.0011	144.6	15	<PQL	0.0067	11.12	15	PASS
LCS-71615	LCS	1	9.45	0.58	15	PASS	9.92	0.63	15	PASS
N033238-001E	SAMP	1	<0.000	N/A	15	<PQL	0.5	10.54	15	PASS
N033238-001E	SAMP	5	<0.000	N/A	15	<PQL	0.089	1.98	15	PASS
N033238-001E-PS	PS	1	9.83	0.55	15	PASS	10.19	0.85	15	PASS
N033238-001E-MS	MS	1	9.61	0.52	15	PASS	10.13	1.64	15	PASS
N033238-001E-MSD	MSD	1	9.67	1.51	15	PASS	10.15	0.83	15	PASS
N033238-002E	SAMP	1	<0.000	N/A	15	<PQL	0.64	3.88	15	PASS
N033238-003E	SAMP	1	<0.000	N/A	15	<PQL	2.071	4.34	15	PASS
N033238-004E	SAMP	1	<0.000	N/A	15	<PQL	1.86	6.15	15	PASS
CCV1	CCV	1	19.36	0.73	15	PASS	20.84	1.12	15	PASS
CCB1	CCB	1	0.00098	129.18	15	<PQL	0.041	21.52	15	<PQL
N033238-005E	SAMP	1	<0.000	N/A	15	<PQL	2.014	2.5	15	PASS
N033238-006D	SAMP	1	<0.000	N/A	15	<PQL	12.1	0.5	15	PASS
N033238-007D	SAMP	1	<0.000	N/A	15	<PQL	11.81	0.33	15	PASS
N033238-008D	SAMP	1	<0.000	N/A	15	<PQL	1.068	4.38	15	PASS
N033238-009D	SAMP	1	<0.000	N/A	15	<PQL	0.24	5.64	15	PASS
N033238-010E	SAMP	1	0.12	4.72	15	PASS	87.38	0.47	15	PASS
N033238-011E	SAMP	1	<0.000	N/A	15	<PQL	0.46	12.4	15	PASS
N033238-011E-MS	MS	1	9.6	0.12	15	PASS	10.19	0.68	15	PASS
N033238-012E	SAMP	1	<0.000	N/A	15	<PQL	4.87	1.75	15	PASS
N033238-013D	SAMP	1	<0.000	N/A	15	<PQL	16.73	1.099	15	PASS
CCV2	CCV	1	19.2	1.18	15	PASS	21.033	2.1	15	PASS
CCB2	CCB	1	<0.000	N/A	15	<PQL	0.0061	69.91	15	<PQL
N033238-015E	SAMP	1	<0.000	N/A	15	<PQL	0.59	0.75	15	PASS
N033236-001C	SAMP	1	<0.000	N/A	15	<PQL	500.57	0.9	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	208 Pb [3]				52 Cr [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
N033236-001C	SAMP	5	<0.000	N/A	15	<PQL	98.8	1.35	15	PASS
N033236-002E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033236-002E	SAMP	5	<0.000	N/A	15	<PQL	0.0047	197.25	15	<PQL
N033237-001B	SAMP	1	<0.000	N/A	15	<PQL	2.87	2.04	15	PASS
N033237-001B	SAMP	5	<0.000	N/A	15	<PQL	0.6	3.26	15	PASS
N033237-002B	SAMP	1	<0.000	N/A	15	<PQL	487.84	0.73	15	PASS
N033237-002B	SAMP	5	<0.000	N/A	15	<PQL	97.52	0.48	15	PASS
CCV3	CCV	1	19.21	0.42	15	PASS	21.07	0.13	15	PASS
CCB3	CCB	1	<0.000	N/A	15	<PQL	0.04	41.81	15	<PQL
ICSA2	ICSA	1	<0.000	N/A	15	<PQL	0.038	21.71	15	<PQL
ICSAB2	ICSAB	1	18.0014	1.19	15	PASS	20.35	1.47	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	55 Mn [2]				60 Ni [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.1	22.19	15	<PQL	0.11	22.34	15	<PQL
Std2-0.5/5 ppb	ICAL	1	0.5	2.26	15	PASS	0.51	6.3	15	PASS
Std3-5/50 ppb	ICAL	1	5.082	2.86	15	PASS	5.14	1.43	15	PASS
Std4-10/100 ppb	ICAL	1	10.16	2.42	15	PASS	10.094	3.6	15	PASS
Std5-20/200 ppb	ICAL	1	20.15	1.71	15	PASS	20.4	1.4	15	PASS
Std6-40/400 ppb	ICAL	1	40.64	0.68	15	PASS	40.35	1.36	15	PASS
Std7-100/1000 ppb	ICAL	1	100.51	0.23	15	PASS	100.68	1.012	15	PASS
Std8-200/2000 ppb	ICAL	1	199.59	1.51	15	PASS	199.54	0.96	15	PASS
ICV	ICV	1	102.12	0.17	15	PASS	9.94	0.72	15	PASS
ICB	ICB	1	0.053	6.75	15	PASS	0.28	16.44	15	<PQL
LLICV	CCV1	1	0.58	1.64	20	PASS	1.42	0.65	20	PASS
ICSA1	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB1	ICSAB	1	17.83	2.54	15	PASS	20.24	0.45	15	PASS
LLICV	CCV1	1	0.59	3.35	20	PASS	1.11	3.28	20	PASS
MB-71615	MBLK	1	<0.000	N/A	15	<PQL	0.014	30.18	15	<PQL
LCS-71615	LCS	1	101.39	0.24	15	PASS	9.9	2.19	15	PASS
N033238-001E	SAMP	1	1.65	1.28	15	PASS	<0.000	N/A	15	<PQL
N033238-001E	SAMP	5	0.34	1.86	15	PASS	<0.000	N/A	15	<PQL
N033238-001E-PS	PS	1	100.64	1.19	15	PASS	8.9	1.51	15	PASS
N033238-001E-MS	MS	1	98.86	1.32	15	PASS	9.055	2.19	15	PASS
N033238-001E-MSD	MSD	1	98.76	0.38	15	PASS	9.24	4.58	15	PASS
N033238-002E	SAMP	1	2.39	3.57	15	PASS	<0.000	N/A	15	<PQL
N033238-003E	SAMP	1	0.89	4.74	15	PASS	0.38	11.15	15	PASS
N033238-004E	SAMP	1	0.86	2.099	15	PASS	0.051	65.59	15	<PQL
CCV1	CCV	1	20.35	1.74	15	PASS	21.51	2.037	15	PASS
CCB1	CCB	1	0.081	29.22	15	<PQL	0.52	11.028	15	PASS
N033238-005E	SAMP	1	0.84	5.72	15	PASS	0.042	127.81	15	<PQL
N033238-006D	SAMP	1	<0.000	N/A	15	<PQL	0.74	7.83	15	PASS
N033238-007D	SAMP	1	<0.000	N/A	15	<PQL	0.76	8.63	15	PASS
N033238-008D	SAMP	1	0.13	48.27	15	<PQL	1.79	6.9	15	PASS
N033238-009D	SAMP	1	0.46	2.051	15	PASS	0.93	3.82	15	PASS
N033238-010E	SAMP	1	82.64	0.19	15	PASS	6.69	2.46	15	PASS
N033238-011E	SAMP	1	0.16	28.52	15	<PQL	0.3	18.11	15	<PQL
N033238-011E-MS	MS	1	98.55	0.9	15	PASS	9.92	2.87	15	PASS
N033238-012E	SAMP	1	6.26	1.22	15	PASS	1.5	3.81	15	PASS
N033238-013D	SAMP	1	0.84	5.78	15	PASS	4.35	2.91	15	PASS
CCV2	CCV	1	20.51	0.88	15	PASS	21.65	0.78	15	PASS
CCB2	CCB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-015E	SAMP	1	1.0042	5.56	15	PASS	1.43	8.59	15	PASS
N033236-001C	SAMP	1	6.95	2.44	15	PASS	<0.000	N/A	15	<PQL

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	55 Mn [2]				60 Ni [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
N033236-001C	SAMP	5	1.51	1.82	15	PASS	<0.000	N/A	15	<PQL
N033236-002E	SAMP	1	9.026	0.75	15	PASS	0.8	2.86	15	PASS
N033236-002E	SAMP	5	1.93	4.3	15	PASS	0.19	7.88	15	PASS
N033237-001B	SAMP	1	301.18	1.16	15	PASS	35.25	0.36	15	PASS
N033237-001B	SAMP	5	61.51	0.62	15	PASS	7.33	2.56	15	PASS
N033237-002B	SAMP	1	14.67	1.077	15	PASS	<0.000	N/A	15	<PQL
N033237-002B	SAMP	5	3.11	4.024	15	PASS	<0.000	N/A	15	<PQL
CCV3	CCV	1	20.59	0.84	15	PASS	21.65	3.26	15	PASS
CCB3	CCB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSA2	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB2	ICSAB	1	17.93	3.15	15	PASS	20.2	0.54	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	63 Cu [2]				66 Zn [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.11	5.18	15	PASS	0.29	17.058	15	<PQL
Std2-0.5/5 ppb	ICAL	1	0.52	3.9	15	PASS	0.66	7.39	15	PASS
Std3-5/50 ppb	ICAL	1	5.17	2.33	15	PASS	5.18	4.7	15	PASS
Std4-10/100 ppb	ICAL	1	10.3	0.86	15	PASS	9.98	1.62	15	PASS
Std5-20/200 ppb	ICAL	1	20.76	1.21	15	PASS	20.46	1.49	15	PASS
Std6-40/400 ppb	ICAL	1	40.93	0.78	15	PASS	40.3	1.35	15	PASS
Std7-100/1000 ppb	ICAL	1	100.86	1.031	15	PASS	100.48	1.021	15	PASS
Std8-200/2000 ppb	ICAL	1	199.29	1.41	15	PASS	199.65	1.38	15	PASS
ICV	ICV	1	9.95	0.42	15	PASS	10.61	2.1	15	PASS
ICB	ICB	1	0.022	11.4	15	PASS	0.81	18.5	15	<PQL
LLICV	CCV1	1	1.1	3.3	20	PASS	10.72	1.26	20	PASS
ICSA1	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB1	ICSAB	1	18.49	1.047	15	PASS	19.046	1.9	15	PASS
LLICV	CCV1	1	1.15	1.17	20	PASS	10.47	5.088	20	PASS
MB-71615	MBLK	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
LCS-71615	LCS	1	10.071	1.12	15	PASS	10.1	0.49	15	PASS
N033238-001E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-001E	SAMP	5	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-001E-PS	PS	1	2.91	2.2	15	PASS	3.83	2.22	15	PASS
N033238-001E-MS	MS	1	2.83	2.6	15	PASS	3.44	0.41	15	PASS
N033238-001E-MSD	MSD	1	3	1.74	15	PASS	3.25	10.53	15	PASS
N033238-002E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-003E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-004E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
CCV1	CCV	1	21.18	2.022	15	PASS	20.7	1.64	15	PASS
CCB1	CCB	1	0.0083	81.65	15	<PQL	<0.000	N/A	15	<PQL
N033238-005E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-006D	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-007D	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-008D	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-009D	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-010E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-011E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-011E-MS	MS	1	3.54	4.49	15	PASS	3.44	0.56	15	PASS
N033238-012E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-013D	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
CCV2	CCV	1	21.34	1.71	15	PASS	20.43	0.48	15	PASS
CCB2	CCB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033238-015E	SAMP	1	<0.000	N/A	15	<PQL	0.076	172.73	15	<PQL
N033236-001C	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	63 Cu [2]				66 Zn [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
N033236-001C	SAMP	5	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033236-002E	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033236-002E	SAMP	5	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033237-001B	SAMP	1	4.27	0.46	15	PASS	0.098	66.44	15	<PQL
N033237-001B	SAMP	5	0.92	1.54	15	PASS	<0.000	N/A	15	<PQL
N033237-002B	SAMP	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
N033237-002B	SAMP	5	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
CCV3	CCV	1	21.6	2.071	15	PASS	20.86	1.55	15	PASS
CCB3	CCB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSA2	ICSA	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
ICSAB2	ICSAB	1	18.61	0.47	15	PASS	18.86	2.68	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	75 As [2]				95 Mo [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.068	62.63	15	<PQL	0.039	6.95	15	PASS
Std2-0.5/5 ppb	ICAL	1	0.51	9.68	15	PASS	0.42	6.78	15	PASS
Std3-5/50 ppb	ICAL	1	4.93	2.2	15	PASS	4.44	1.22	15	PASS
Std4-10/100 ppb	ICAL	1	10.046	2.018	15	PASS	9.25	2.51	15	PASS
Std5-20/200 ppb	ICAL	1	20.33	1.036	15	PASS	18.9	1.19	15	PASS
Std6-40/400 ppb	ICAL	1	39.54	1.75	15	PASS	38.86	0.5	15	PASS
Std7-100/1000 ppb	ICAL	1	100.097	1.19	15	PASS	99.13	0.33	15	PASS
Std8-200/2000 ppb	ICAL	1	200.01	1.3	15	PASS	200.82	0.32	15	PASS
ICV	ICV	1	10.049	2.5	15	PASS	10.91	1.11	15	PASS
ICB	ICB	1	<0.000	N/A	15	<PQL	<0.000	N/A	15	<PQL
LLICV	CCV1	1	0.092	3.26	20	PASS	0.35	7.82	20	PASS
ICSA1	ICSA	1	0.016	49.049	15	<PQL	0.2	28.73	15	<PQL
ICSAB1	ICSAB	1	20.76	0.57	15	PASS	20.57	1.27	15	PASS
LLICV	CCV1	1	0.13	22.43	20	NR!	0.71	7.9	20	PASS
MB-71615	MBLK	1	<0.000	N/A	15	<PQL	0.074	15.08	15	<PQL
LCS-71615	LCS	1	9.78	0.98	15	PASS	9.32	2.2	15	PASS
N033238-001E	SAMP	1	2.98	3.8	15	PASS	19.43	1.12	15	PASS
N033238-001E	SAMP	5	0.62	6.9	15	PASS	3.7	4.24	15	PASS
N033238-001E-PS	PS	1	13.12	1.26	15	PASS	30.5	0.27	15	PASS
N033238-001E-MS	MS	1	13.27	0.34	15	PASS	30.76	0.44	15	PASS
N033238-001E-MSD	MSD	1	13.29	2.74	15	PASS	30.98	0.41	15	PASS
N033238-002E	SAMP	1	3.0074	1.95	15	PASS	18.94	1.57	15	PASS
N033238-003E	SAMP	1	2.0049	3.46	15	PASS	10.11	1.13	15	PASS
N033238-004E	SAMP	1	2.036	4.18	15	PASS	9.86	1.11	15	PASS
CCV1	CCV	1	20.33	1.92	15	PASS	17.42	0.71	15	PASS
CCB1	CCB	1	0.0081	210.99	15	<PQL	0.33	5.017	15	PASS
N033238-005E	SAMP	1	2.088	5.28	15	PASS	10.37	3.18	15	PASS
N033238-006D	SAMP	1	0.54	14.26	15	PASS	9.27	1.6	15	PASS
N033238-007D	SAMP	1	0.59	23.92	15	NR!	8.7	2.14	15	PASS
N033238-008D	SAMP	1	2.068	3.2	15	PASS	20.31	0.43	15	PASS
N033238-009D	SAMP	1	3.38	5.27	15	PASS	21.07	0.46	15	PASS
N033238-010E	SAMP	1	1.54	4.068	15	PASS	21.21	0.67	15	PASS
N033238-011E	SAMP	1	0.74	4.82	15	PASS	20.58	0.62	15	PASS
N033238-011E-MS	MS	1	11.33	1.82	15	PASS	31.46	0.76	15	PASS
N033238-012E	SAMP	1	0.82	4.062	15	PASS	21.041	0.73	15	PASS
N033238-013D	SAMP	1	1.21	2.12	15	PASS	25.54	0.42	15	PASS
CCV2	CCV	1	20.0096	1.34	15	PASS	17.85	0.43	15	PASS
CCB2	CCB	1	0.0071	319.72	15	<PQL	0.26	11.46	15	PASS
N033238-015E	SAMP	1	1.22	2.047	15	PASS	19.68	0.91	15	PASS
N033236-001C	SAMP	1	2.87	5.86	15	PASS	20.35	0.91	15	PASS

PERCENT RSD SUMMARY: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	75 As [2]				95 Mo [2]			
			Conc. [ppb]	RSD	Criteria	Comment	Conc. [ppb]	RSD	Criteria	Comment
N033236-001C	SAMP	5	0.53	2.2	15	PASS	4.053	2.74	15	PASS
N033236-002E	SAMP	1	0.042	19.16	15	<PQL	21.82	0.33	15	PASS
N033236-002E	SAMP	5	<0.000	N/A	15	<PQL	4.34	2.5	15	PASS
N033237-001B	SAMP	1	1.16	4.79	15	PASS	9.82	1.092	15	PASS
N033237-001B	SAMP	5	0.2	25.87	15	NR!	1.97	2.1	15	PASS
N033237-002B	SAMP	1	2.73	5.7	15	PASS	19.75	0.43	15	PASS
N033237-002B	SAMP	5	0.5	5.81	15	PASS	3.93	1.51	15	PASS
CCV3	CCV	1	20.2	1.99	15	PASS	17.88	0.63	15	PASS
CCB3	CCB	1	<0.000	N/A	15	<PQL	0.21	27.64	15	<PQL
ICSA2	ICSA	1	<0.000	N/A	15	<PQL	0.039	54.072	15	<PQL
ICSAB2	ICSAB	1	20.73	0.2	15	PASS	20.75	0.86	15	PASS

PERCENT RSD SUMMARY: 181206A

Instrument ID: ICPMS-02

Sample Name	Type	DF	95 Mo [2]			
			Conc. [ppb]	RSD	Criteria	Comment
Cal Blank	IBLK	1	0	N/A	15	<PQL
Std1-0.1/1 ppb	ICAL	1	0.052	40.41	15	<PQL
Std2-0.5/5 ppb	ICAL	1	0.4	6.44	15	PASS
Std3-5/50 ppb	ICAL	1	4.48	2.33	15	PASS
Std4-10/100 ppb	ICAL	1	9.43	2.79	15	PASS
Std5-20/200 ppb	ICAL	1	19.54	1.033	15	PASS
Std6-40/400 ppb	ICAL	1	40.44	0.19	15	PASS
Std7-100/1000 ppb	ICAL	1	104.2	0.54	15	PASS
Std8-200/2000 ppb	ICAL	1	210.61	0.36	15	PASS
ICV	ICV	1	9.065	0.34	15	PASS
ICB	ICB	1	0.16	30.94	15	<PQL
LLICV	CCV1	1	0.46	5.21	20	PASS
ICSA1	ICSA	1	0.2	12.21	15	PASS
ICSAB1	ICSAB	1	19.48	0.14	15	PASS
MB-71615	MBLK	1	0.051	22.075	15	<PQL
LCS-71615	LCS	1	9.83	1.51	15	PASS
N033238-001E	SAMP	1	20.29	0.4	15	PASS
N033238-001E	SAMP	5	4.022	2.065	15	PASS
N033238-001E-PS	PS	1	32.0087	1.65	15	PASS
N033238-001E-MS	MS	1	32.51	0.95	15	PASS
N033238-001E-MSD	MSD	1	32.69	1.45	15	PASS
N033238-002E	SAMP	1	20.19	0.98	15	PASS
N033238-003E	SAMP	1	10.8	0.98	15	PASS
N033238-004E	SAMP	1	10.37	0.77	15	PASS
CCV1	CCV	1	19.84	0.45	15	PASS
CCB1	CCB	1	0.035	17.83	15	<PQL
N033238-005E	SAMP	1	10.96	2.16	15	PASS
N033238-006D	SAMP	1	9.78	0.76	15	PASS
N033238-007D	SAMP	1	9.27	0.95	15	PASS
N033238-008D	SAMP	1	21.37	0.65	15	PASS
N033238-009D	SAMP	1	22.059	0.5	15	PASS
N033238-010E	SAMP	1	22.037	1.69	15	PASS
N033238-011E	SAMP	1	21.62	1.61	15	PASS
N033238-011E-MS	MS	1	33.015	1.48	15	PASS
N033238-012E	SAMP	1	22.3	0.44	15	PASS
N033238-013D	SAMP	1	27.35	0.78	15	PASS
CCV2	CCV	1	20.39	0.93	15	PASS
CCB2	CCB	1	<0.000	N/A	15	<PQL
N033238-015E	SAMP	1	20.89	1.19	15	PASS
N033236-002E	SAMP	1	23.02	0.88	15	PASS
CCV3	CCV	1	19.69	1.19	15	PASS

PERCENT RSD SUMMARY: 181206A

Instrument ID: ICPMS-02

Sample Name	Type	DF	95 Mo [2]			
			Conc. [ppb]	RSD	Criteria	Comment
CCB3	CCB	1	<0.000	N/A	15	<PQL
ICSA2	ICSA	1	0.15	35.3	15	<PQL
ICSAB2	ICSAB	1	19.83	1.54	15	PASS

ANALYSIS RUN LOG

INJECTION LOG: 181205B

Instrument ID: ICPMS-02

Data File	Sample Name	Type	DF	Acq. Date-Time
B1205001.D	RINSE	RINSE	1	12/05/18 3:31 PM
B1205002.D	Cal Blank	IBLK	1	12/05/18 3:37 PM
B1205003.D	Std1-0.1/1 ppb	ICAL	1	12/05/18 3:42 PM
B1205004.D	Std2-0.5/5 ppb	ICAL	1	12/05/18 3:48 PM
B1205005.D	Std3-5/50 ppb	ICAL	1	12/05/18 3:53 PM
B1205006.D	Std4-10/100 ppb	ICAL	1	12/05/18 3:59 PM
B1205007.D	Std5-20/200 ppb	ICAL	1	12/05/18 4:05 PM
B1205008.D	Std6-40/400 ppb	ICAL	1	12/05/18 4:10 PM
B1205009.D	Std7-100/1000 ppb	ICAL	1	12/05/18 4:16 PM
B1205010.D	Std8-200/2000 ppb	ICAL	1	12/05/18 4:22 PM
B1205011.D	ICV	ICV	1	12/05/18 4:27 PM
B1205012.D	ICB	ICB	1	12/05/18 4:33 PM
B1205013.D	LLICV	CCV1	1	12/05/18 4:39 PM
B1205014.D	ICSA1	ICSA	1	12/05/18 4:44 PM
B1205015.D	ICSAB1	ICSAB	1	12/05/18 4:50 PM
B1205016.D	LLICV	CCV1	1	12/05/18 4:56 PM
B1205017.D	MB-71615	MBLK	1	12/05/18 5:01 PM
B1205018.D	LCS-71615	LCS	1	12/05/18 5:07 PM
B1205019.D	N033238-001E	SAMP	1	12/05/18 5:12 PM
B1205020.D	N033238-001E	SAMP	5	12/05/18 5:18 PM
B1205021.D	N033238-001E-PS	PS	1	12/05/18 5:24 PM
B1205022.D	N033238-001E-MS	MS	1	12/05/18 5:29 PM
B1205023.D	N033238-001E-MSD	MSD	1	12/05/18 5:35 PM
B1205024.D	N033238-002E	SAMP	1	12/05/18 5:41 PM
B1205025.D	N033238-003E	SAMP	1	12/05/18 5:46 PM
B1205026.D	N033238-004E	SAMP	1	12/05/18 5:52 PM
B1205027.D	CCV1	CCV	1	12/05/18 5:58 PM
B1205028.D	CCB1	CCB	1	12/05/18 6:04 PM
B1205029.D	N033238-005E	SAMP	1	12/05/18 6:09 PM
B1205030.D	N033238-006D	SAMP	1	12/05/18 6:15 PM
B1205031.D	N033238-007D	SAMP	1	12/05/18 6:20 PM
B1205032.D	N033238-008D	SAMP	1	12/05/18 6:26 PM
B1205033.D	N033238-009D	SAMP	1	12/05/18 6:32 PM
B1205034.D	N033238-010E	SAMP	1	12/05/18 6:37 PM
B1205035.D	N033238-011E	SAMP	1	12/05/18 6:43 PM
B1205036.D	N033238-011E-MS	MS	1	12/05/18 6:49 PM
B1205037.D	N033238-012E	SAMP	1	12/05/18 6:54 PM
B1205038.D	N033238-013D	SAMP	1	12/05/18 7:00 PM
B1205039.D	CCV2	CCV	1	12/05/18 7:06 PM
B1205040.D	CCB2	CCB	1	12/05/18 7:11 PM
B1205041.D	N033238-015E	SAMP	1	12/05/18 7:17 PM
B1205042.D	N033236-001C	SAMP	1	12/05/18 7:23 PM

INJECTION LOG: 181205B

Instrument ID: ICPMS-02

Data File	Sample Name	Type	DF	Acq. Date-Time
B1205043.D	N033236-001C	SAMP	5	12/05/18 7:28 PM
B1205044.D	N033236-002E	SAMP	1	12/05/18 7:34 PM
B1205045.D	N033236-002E	SAMP	5	12/05/18 7:40 PM
B1205046.D	N033237-001B	SAMP	1	12/05/18 7:45 PM
B1205047.D	N033237-001B	SAMP	5	12/05/18 7:51 PM
B1205048.D	N033237-002B	SAMP	1	12/05/18 7:57 PM
B1205049.D	N033237-002B	SAMP	5	12/05/18 8:02 PM
B1205050.D	CCV3	CCV	1	12/05/18 8:08 PM
B1205051.D	CCB3	CCB	1	12/05/18 8:14 PM
B1205052.D	ICSA2	ICSA	1	12/05/18 8:19 PM
B1205053.D	ICSAB2	ICSAB	1	12/05/18 8:25 PM

INJECTION LOG: 181206A

Instrument ID: ICPMS-02

Data File	Sample Name	Type	DF	Acq. Date-Time
A1206001.D	RINSE	RINSE	1	12/06/18 9:24 PM
A1206002.D	Cal Blank	IBLK	1	12/06/18 9:29 PM
A1206003.D	Std1-0.1/1 ppb	ICAL	1	12/06/18 9:35 PM
A1206004.D	Std2-0.5/5 ppb	ICAL	1	12/06/18 9:40 PM
A1206005.D	Std3-5/50 ppb	ICAL	1	12/06/18 9:46 PM
A1206006.D	Std4-10/100 ppb	ICAL	1	12/06/18 9:51 PM
A1206007.D	Std5-20/200 ppb	ICAL	1	12/06/18 9:57 PM
A1206008.D	Std6-40/400 ppb	ICAL	1	12/06/18 10:03 PM
A1206009.D	Std7-100/1000 ppb	ICAL	1	12/06/18 10:08 PM
A1206010.D	Std8-200/2000 ppb	ICAL	1	12/06/18 10:14 PM
A1206011.D	ICV	ICV	1	12/06/18 10:18 PM
A1206012.D	ICB	ICB	1	12/06/18 10:24 PM
A1206013.D	LLICV	CCV1	1	12/06/18 10:29 PM
A1206014.D	ICSA1	ICSA	1	12/06/18 10:36 PM
A1206015.D	ICSAB1	ICSAB	1	12/06/18 10:42 PM
A1206016.D	MB-71615	MBLK	1	12/06/18 10:45 PM
A1206017.D	LCS-71615	LCS	1	12/06/18 10:53 PM
A1206018.D	N033238-001E	SAMP	1	12/06/18 10:58 PM
A1206019.D	N033238-001E	SAMP	5	12/06/18 11:04 PM
A1206020.D	N033238-001E-PS	PS	1	12/06/18 11:10 PM
A1206021.D	N033238-001E-MS	MS	1	12/06/18 11:15 PM
A1206022.D	N033238-001E-MSD	MSD	1	12/06/18 11:21 PM
A1206023.D	N033238-002E	SAMP	1	12/06/18 11:26 PM
A1206024.D	N033238-003E	SAMP	1	12/06/18 11:32 PM
A1206025.D	N033238-004E	SAMP	1	12/06/18 11:38 PM
A1206026.D	CCV1	CCV	1	12/06/18 11:43 PM
A1206027.D	CCB1	CCB	1	12/06/18 11:48 PM
A1206028.D	N033238-005E	SAMP	1	12/06/18 11:54 PM
A1206029.D	N033238-006D	SAMP	1	12/07/18 12:00 AM
A1206030.D	N033238-007D	SAMP	1	12/07/18 12:06 AM
A1206031.D	N033238-008D	SAMP	1	12/07/18 12:11 AM
A1206032.D	N033238-009D	SAMP	1	12/07/18 12:17 AM
A1206033.D	N033238-010E	SAMP	1	12/07/18 12:22 AM
A1206034.D	N033238-011E	SAMP	1	12/07/18 12:28 AM
A1206035.D	N033238-011E-MS	MS	1	12/07/18 12:34 AM
A1206036.D	N033238-012E	SAMP	1	12/07/18 12:39 AM
A1206037.D	N033238-013D	SAMP	1	12/07/18 12:45 AM
A1206038.D	CCV2	CCV	1	12/07/18 12:50 AM
A1206039.D	CCB2	CCB	1	12/07/18 12:56 AM
A1206040.D	N033238-015E	SAMP	1	12/07/18 1:02 AM
A1206041.D	N033236-002E	SAMP	1	12/07/18 1:07 AM
A1206042.D	CCV3	CCV	1	12/07/18 1:13 AM

INJECTION LOG: 181206A

Instrument ID: ICPMS-02

Data File	Sample Name	Type	DF	Acq. Date-Time
A1206043.D	CCB3	CCB	1	12/07/18 1:18 AM
A1206044.D	ICSA2	ICSA	1	12/07/18 1:24 AM
A1206045.D	ICSAB2	ICSAB	1	12/07/18 1:29 AM

SAMPLE PREPARATION LOG

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: **12/5/2018 8:00:00 A**
Prep End Date: **12/5/2018 12:20:00**

Reviewed/ Date: 12/18/2018

Initials/ Date: 12/18/2018

Prep Batch **71615** Prep Code: **200.8_PR**

Technician: **Claire Ignacio**

Prep Factor Units	Temp. (°C):	Location:
mL / mL	**94.6**	**02-14**

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
LCS-71615	Aqueous		25	☐	0	0	25	1.000		
MB-71615	Aqueous		25	☐	0	0	25	1.000		
N033236-001C	Water	<2	25	☐	0	0	25	1.000		
N033236-002E	Water	<2	25	☐	0	0	25	1.000		
N033237-001B	Groundwater	<2	25	☐	0	0	25	1.000		
N033237-002B	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-001E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-002E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-003E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-004E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-005E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-006D	Groundwater	<2	25	☐	0	0	25	1.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

Number	Reagent Name
10029	HYDROCHLORIC ACID
10235	NITRIC ACID

Spk ID	Spike Name	SampType	AmtAdd
2MWST-181001	ICV/MS/MSD/LCS/LCSD Solution A		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution D		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution B		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution C		0.25

ASSET Laboratories

PREP BATCH REPORT

Prep Start Date: **12/5/2018 8:00:00 A**
Prep End Date: **12/5/2018 12:20:00**

Reviewed/ Date: 12/18/2018
Initials/ Date: 12/18/2018

Prep Batch **71615** Prep Code: **200.8_PR**

Technician: **Claire Ignacio**

Prep Factor Units	Temp. (°C):	Location:
mL / mL	**94.6**	**02-14**

Sample ID	Matrix	pH	SampAmt	3 Replicates	Sol Added	Sol Recov	Fin Vol	factor	Clean Up Code	TURB Check
N033238-007D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-008D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-009D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-010E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-011E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-011E-MS	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-012E	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-013D	Groundwater	<2	25	☐	0	0	25	1.000		
N033238-015E	Groundwater	<2	25	☐	0	0	25	1.000		

Clean Up Code: A = ACID; F = FLORISIL; S = SILICA GEL; M = MERCURY; G = GPC

Number	Reagent Name
10029	HYDROCHLORIC ACID
10235	NITRIC ACID

Spk ID	Spike Name	SampType	AmtAdd
2MWST-181001	ICV/MS/MSD/LCS/LCSD Solution A		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution D		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution B		0.25
2MWST-181126	ICV/MS/MSD/LCS/LCSD Solution C		0.25

INSTRUMENT TUNING CHECK

QC Tune Report

Data File: C:\ICPMH\1\7500\QCTUNE.D
Date Acquired: 5 Dec 2018 01:35:27 pm
Operator:
Misc Info:
Vial Number: 0
Current Method: C:\ICPMH\1\METHODS\TuneCHK.m

Minimum Response(CPS)

Element	Actual	Required	Flag
9 Be	128684.00	0.00	
24 Mg	605387.00	0.00	
25 Mg	77546.70	0.00	
26 Mg	86755.90	0.00	
59 Co	366361.00	0.00	
115 In	567218.00	0.00	
206 Pb	167303.00	0.00	
207 Pb	146489.00	0.00	
208 Pb	358061.00	0.00	

RSD (%)

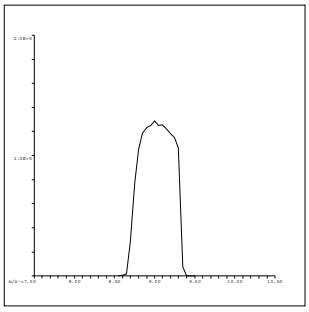
Element	Actual	Required	Flag
9 Be	0.65	5.00	
24 Mg	0.42	5.00	
25 Mg	0.33	5.00	
26 Mg	0.25	5.00	
59 Co	0.76	5.00	
115 In	0.80	5.00	
206 Pb	0.76	5.00	
207 Pb	0.76	5.00	
208 Pb	0.81	5.00	

Ion Ratio

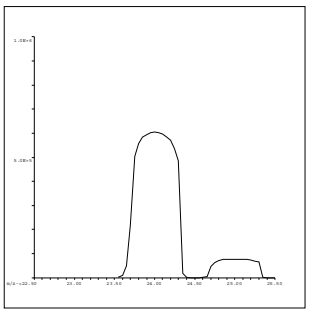
Element	Actual	Required	Flag
9 Be			
24 Mg			
25 Mg			
26 Mg			
59 Co			
115 In			
206 Pb			
207 Pb			
208 Pb			

Maximum Bkg. Count(CPS)

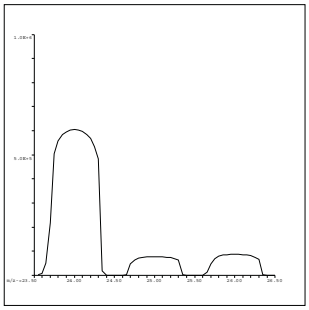
Element	Actual	Required	Flag



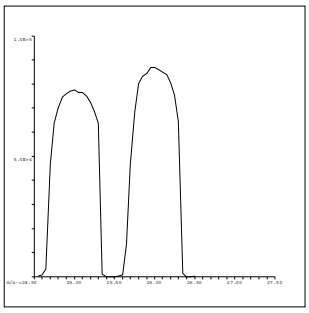
9 Be
Mass Calib.
Actual: 9.00
Required: 8.90-9.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



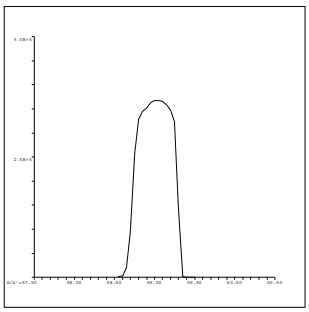
24 Mg
Mass Calib.
Actual: 24.00
Required: 23.90-24.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



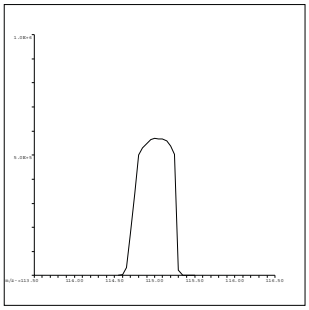
25 Mg
Mass Calib.
Actual: 25.00
Required: 24.90-25.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



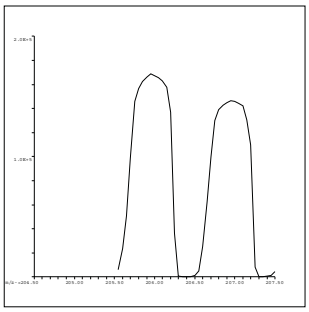
26 Mg
Mass Calib.
Actual: 26.00
Required: 25.90-26.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



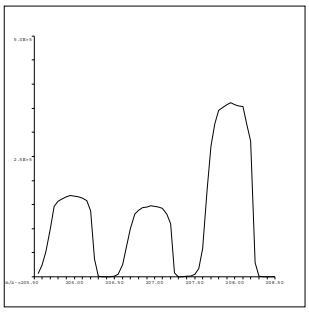
59 Co
Mass Calib.
Actual: 59.05
Required: 58.90-59.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



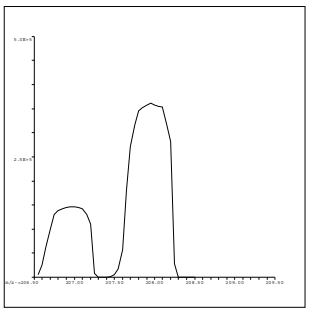
115 In
Mass Calib.
Actual: 115.05
Required: 114.90-115.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



206 Pb
Mass Calib.
Actual: 206.00
Required: 205.90-206.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



207 Pb
Mass Calib.
Actual: 206.95
Required: 206.90-207.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



208 Pb
Mass Calib.
Actual: 208.00
Required: 207.90-208.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:

QC Tune Result:Pass

QC Tune Report

Data File: C:\ICPMH\1\7500\QCTUNE.D
Date Acquired: 6 Dec 2018 08:21:49 am
Operator:
Misc Info:
Vial Number: 0
Current Method: C:\ICPMH\1\METHODS\TuneCHK.m

Minimum Response(CPS)

Element	Actual	Required	Flag
9 Be	110065.00	0.00	
24 Mg	1036430.00	0.00	
25 Mg	129717.00	0.00	
26 Mg	141978.00	0.00	
59 Co	319876.00	0.00	
115 In	478004.00	0.00	
206 Pb	133722.00	0.00	
207 Pb	115490.00	0.00	
208 Pb	286435.00	0.00	

RSD (%)

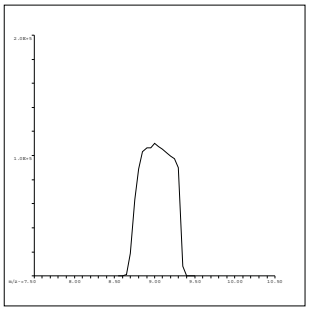
Element	Actual	Required	Flag
9 Be	0.48	5.00	
24 Mg	1.41	5.00	
25 Mg	1.51	5.00	
26 Mg	1.74	5.00	
59 Co	0.70	5.00	
115 In	1.04	5.00	
206 Pb	1.04	5.00	
207 Pb	0.90	5.00	
208 Pb	1.75	5.00	

Ion Ratio

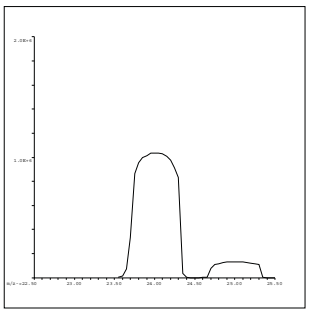
Element	Actual	Required	Flag
9 Be			
24 Mg			
25 Mg			
26 Mg			
59 Co			
115 In			
206 Pb			
207 Pb			
208 Pb			

Maximum Bkg. Count(CPS)

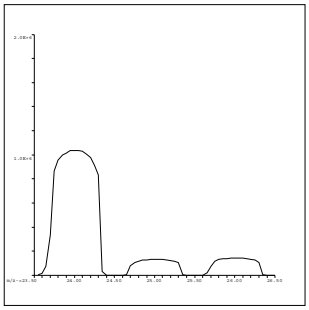
Element	Actual	Required	Flag



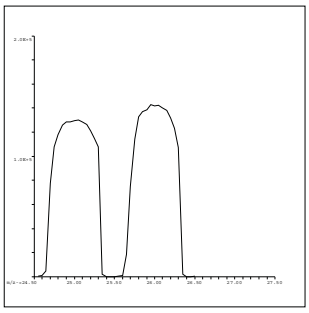
9 Be
Mass Calib.
Actual: 9.00
Required: 8.90-9.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



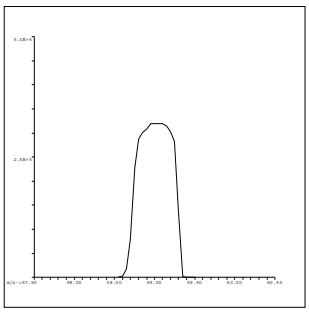
24 Mg
Mass Calib.
Actual: 24.00
Required: 23.90-24.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



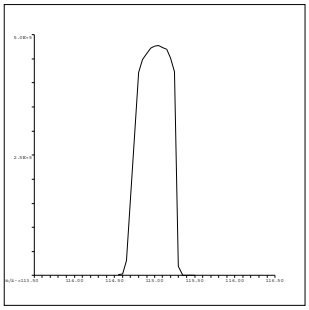
25 Mg
Mass Calib.
Actual: 25.00
Required: 24.90-25.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



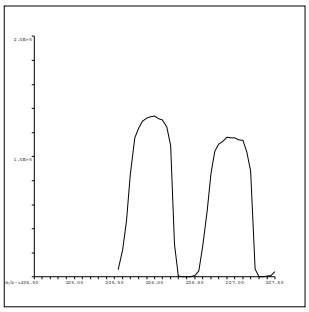
26 Mg
Mass Calib.
Actual: 26.00
Required: 25.90-26.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



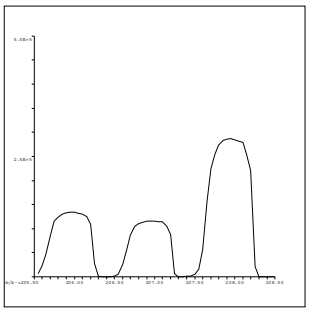
59 Co
Mass Calib.
Actual: 59.05
Required: 58.90-59.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



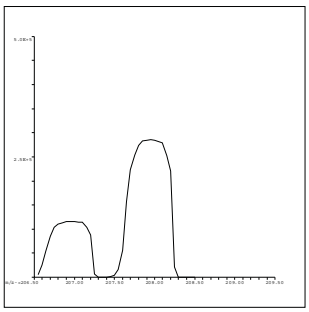
115 In
Mass Calib.
Actual: 115.05
Required: 114.90-115.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



206 Pb
Mass Calib.
Actual: 206.00
Required: 205.90-206.10
Flag:
Peak Width
Actual: 0.65
Required: 0.75
Flag:



207 Pb
Mass Calib.
Actual: 207.00
Required: 206.90-207.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:



208 Pb
Mass Calib.
Actual: 207.95
Required: 207.90-208.10
Flag:
Peak Width
Actual: 0.60
Required: 0.75
Flag:

QC Tune Result:Pass

INITIAL CALIBRATION DATA SUMMARY

INITIAL CALIBRATION SUMMARY: 181205B

Instrument ID: ICPMS-02

Analyte	Data File	B1205002.D	B1205003.D	B1205004.D	B1205005.D	B1205006.D	B1205007.D	B1205008.D	B1205009.D	B1205010.D	
	Acq. Date-Time	12/05/2018 03:37 PM	12/05/2018 03:42 PM	12/05/2018 03:48 PM	12/05/2018 03:53 PM	12/05/2018 03:59 PM	12/05/2018 04:05 PM	12/05/2018 04:10 PM	12/05/2018 04:16 PM	12/05/2018 04:22 PM	
	Type	CalBlk	CalStd	CalStd	CalStd	CalStd	CalStd	CalStd	CalStd	CalStd	
	Level	1	2	3	4	5	6	7	8	9	
	Sample Name	Cal Blank	Std1-0.1/1 ppb	Std2-0.5/5 ppb	Std3-5/50 ppb	Std4-10/100 ppb	Std5-20/200 ppb	Std6-40/400 ppb	Std7-100/1000 ppb	Std8-200/2000 ppb	
	Concentration	0.00	0.1/1 ug/L	0.5/5 ug/L	5/50 ug/L	10/100 ug/L	20/200 ug/L	40/400 ug/L	100/1000 ug/L	200/2000 ug/L	R
45 Sc (ISTD) [2]	CPS	58609.2		60213.6	60668.6	59819	59870.3	59107.5	58999.2	58287	
55 Mn [2]	CPS	64.3		1099.2	10601.1	20843	41295.4	82156.9	202712	397559.2	1.0000
52 Cr [2]	CPS	123.2		2142.3	20403.8	40362.4	80642	159804.4	393790.8	773227.9	1.0000
72 Ge (ISTD) [2]	CPS	34175.4	36037.2	35146.4	35309.9	34667.5	34577.2	34627.4	34474.7	34108.7	
75 As [2]	CPS	48	80.9	269.8	2193.5	4338.4	8709.1	16917.2	42563.5	84093.2	1.0000
66 Zn [2]	CPS	194		668.4	3905	7205.5	14525.7	28459.4	70347.6	138099.9	1.0000
63 Cu [2]	CPS	98.5		2510.8	24262	47398.2	95187.9	187854.1	460756.9	900610	1.0000
60 Ni [2]	CPS	110.9		988.7	8984.2	17198.1	34566.6	68369.2	169663.5	332592.4	1.0000
103 Rh (ISTD) [2]	CPS	900866.2		922335.8	928284.1	914672.3	914030.8	915691.7	900599.9	889495.9	
95 Mo [2]	CPS	207.8		1112.3	9685.5	19657	39924.9	82019.1	205424	410827.7	1.0000
115 In (ISTD) [3]	CPS	2135846.3		2204035.4	2208077.3	2196255.7	2152999.2	2187889.9	2163207.7	2142729.7	
121 Sb [3]	CPS	683.4		8161.3	76588	150208.8	293606.9	588774.3	1543915.1	3043166.7	0.9999
159 Tb (ISTD) [3]	CPS	3256425.8		3333107.8	3384518.5	3349095.3	3297850.6	3320395.8	3330981.2	3312498.1	
137 Ba [3]	CPS	22.5		2768.3	25858.1	51181.2	99995.1	202032.5	499461.9	991377.2	1.0000
209 Bi (ISTD) [3]	CPS	2177458.6		2243123.8	2233597.3	2224906.6	2208915	2244824.7	2237159	2212756.6	
208 Pb [3]	CPS	332.9		25692.3	255807.2	506244.5	1000600.1	2014476.5	5165492.9	10380397.3	0.9999

Standard Code
ICAL: 2MSST-180608B
ICAL: 2MSST-170620B
ICAL: 2MWST-180409H
IS Mix: 2MWST-180618C

Calibration Acceptance Criteria: > 0.995 Correlation

INITIAL CALIBRATION SUMMARY: 181206A

Instrument ID: ICPMS-02

Analyte	Data File	A1206002.D	A1206004.D	A1206005.D	A1206006.D	A1206007.D	A1206008.D	A1206009.D	A1206010.D	
	Acq. Date-Time	12/06/2018 09:29 PM	12/06/2018 09:40 PM	12/06/2018 09:46 PM	12/06/2018 09:51 PM	12/06/2018 09:57 PM	12/06/2018 10:03 PM	12/06/2018 10:08 PM	12/06/2018 10:14 PM	
	Type	CalBlk	CalStd	CalStd	CalStd	CalStd	CalStd	CalStd	CalStd	
	Level	1	3	4	5	6	7	8	9	
	Sample Name	Cal Blank	Std2-0.5/5 ppb	Std3-5/50 ppb	Std4-10/100 ppb	Std5-20/200 ppb	Std6-40/400 ppb	Std7-100/1000 ppb	Std8-200/2000 ppb	
	Concentration	0.00	0.5/5 ug/L	5/50 ug/L	10/100 ug/L	20/200 ug/L	40/400 ug/L	100/1000 ug/L	200/2000 ug/L	R
103 Rh (ISTD) [2]	CPS	923123.7	940387.9	935946	934484.1	932067.5	924721.6	908614.2	890510.9	
95 Mo [2]	CPS	172.2	994.5	9250.8	19253.3	39589.6	81105.5	205074.6	406094.5	0.9998

Standard Code
ICAL: 2MSST-180608B
ICAL: 2MSST-170620B
ICAL: 2MWST-180409H
IS Mix: 2MWST-180618C

Calibration Acceptance Criteria: > 0.995 Correlation

INITIAL CALIBRATION AND CONTINUING CALIBRATION VERIFICATION SUMMARY

ASSET Laboratories

Date: *10-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICV** SampType: **ICV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221732**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.344	0.50	10.00	0	103	90	110				
Arsenic	10.049	0.10	10.00	0	100	90	110				
Barium	10.082	1.0	10.00	0	101	90	110				
Copper	9.949	1.0	10.00	0	99.5	90	110				
Lead	9.427	1.0	10.00	0	94.3	90	110				
Manganese	102.115	0.50	100.0	0	102	90	110				
Nickel	9.943	1.0	10.00	0	99.4	90	110				
Zinc	10.607	10	10.00	0	106	90	110				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221734**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.092	0.10	0.1000	0	92.5	80	120				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221737**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.594	0.50	0.5000	0	119	80	120				
Barium	1.085	1.0	1.000	0	108	80	120				
Copper	1.149	1.0	1.000	0	115	80	120				
Lead	1.020	1.0	1.000	0	102	80	120				
Manganese	0.590	0.50	0.5000	0	118	80	120				
Nickel	1.107	1.0	1.000	0	111	80	120				
Zinc	10.467	10	10.00	0	105	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **CCV1** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221748**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	19.036	0.50	20.00	0	95.2	90	110				
Arsenic	20.335	0.10	20.00	0	102	90	110				
Barium	21.379	1.0	20.00	0	107	90	110				
Copper	21.179	1.0	20.00	0	106	90	110				
Lead	19.358	1.0	20.00	0	96.8	90	110				
Manganese	20.355	0.50	20.00	0	102	90	110				
Nickel	21.507	1.0	20.00	0	108	90	110				
Zinc	20.701	10	20.00	0	104	90	110				

Sample ID **CCV2** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221760**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	19.091	0.50	20.00	0	95.5	90	110				
Arsenic	20.010	0.10	20.00	0	100	90	110				
Barium	21.245	1.0	20.00	0	106	90	110				
Copper	21.336	1.0	20.00	0	107	90	110				
Lead	19.202	1.0	20.00	0	96.0	90	110				
Manganese	20.507	0.50	20.00	0	103	90	110				
Nickel	21.648	1.0	20.00	0	108	90	110				
Zinc	20.431	10	20.00	0	102	90	110				

Sample ID **CCV3** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221771**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	18.952	0.50	20.00	0	94.8	90	110				
Arsenic	20.204	0.10	20.00	0	101	90	110				
Barium	21.090	1.0	20.00	0	105	90	110				
Copper	21.595	1.0	20.00	0	108	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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **CCV3**	SampType: **CCV**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date:	RunNo: **130381**
Client ID: **CCV**	Batch ID: **R130381**	TestNo: **EPA 200.8**		Analysis Date: **12/5/2018**	SeqNo: **3221771**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	19.211	1.0	20.00	0	96.1	90	110				
Manganese	20.589	0.50	20.00	0	103	90	110				
Nickel	21.654	1.0	20.00	0	108	90	110				
Zinc	20.863	10	20.00	0	104	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICV** SampType: **ICV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICV** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222173**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	9.065	0.50	10.00	0	90.7	90	110				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ZZZZZZ** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.463	0.50	0.5000	0	92.5	80	120				

Sample ID **CCV1** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCV** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222188**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	19.841	0.50	20.00	0	99.2	90	110				

Sample ID **CCV2** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCV** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222200**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	20.389	0.50	20.00	0	102	90	110				

Sample ID **CCV3** SampType: **CCV** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCV** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222204**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	19.691	0.50	20.00	0	98.5	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **ICV** SampType: **ICV** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221775**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.016	1.0	10.00	0	100	90	110				

Sample ID **LLICV** SampType: **CCV1** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221777**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	1.098	1.0	1.000	0	110	80	120				

Sample ID **CCV1** SampType: **CCV** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221791**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	20.840	1.0	20.00	0	104	90	110				

Sample ID **CCV2** SampType: **CCV** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221803**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	21.033	1.0	20.00	0	105	90	110				

Sample ID **CCV3** SampType: **CCV** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCV** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221814**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	21.070	1.0	20.00	0	105	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		

SUMMARY OF INSTRUMENT BLANKS

ASSET Laboratories

Date: *10-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICB** SampType: **ICB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221733**

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									
Nickel	0.284	1.0									
Zinc	ND	10									

Sample ID **CCB1** SampType: **CCB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221749**

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									
Nickel	0.516	1.0									
Zinc	ND	10									

Sample ID **CCB2** SampType: **CCB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221761**

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									

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		

Ni in CCB1 has detect > 1/2 RL , however,N033236 samples were enclosed between CCB2 and CCB3.

12/18/2018

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	CCB2	SampType:	CCB	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	130381
Client ID:	CCB	Batch ID:	R130381	TestNo:	EPA 200.8			Analysis Date:	12/5/2018	SeqNo:	3221761

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID	CCB3	SampType:	CCB	TestCode:	200.8_W	Units:	µg/L	Prep Date:		RunNo:	130381
Client ID:	CCB	Batch ID:	R130381	TestNo:	EPA 200.8			Analysis Date:	12/5/2018	SeqNo:	3221772

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									
Nickel	ND	1.0									
Zinc	ND	10									

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICB** SampType: **ICB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222174**

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

Sample ID **CCB1** SampType: **CCB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222189**

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

Sample ID **CCB2** SampType: **CCB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222201**

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

Sample ID **CCB3** SampType: **CCB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **CCB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222205**

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

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **ICB** SampType: **ICB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221776**

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

Sample ID **CCB1** SampType: **CCB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221792**

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

Sample ID **CCB2** SampType: **CCB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221804**

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

Sample ID **CCB3** SampType: **CCB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **CCB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221815**

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

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		

SUMMARY OF INSTRUMENT CHECK (ICSA & ICSAB)

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICSA1** SampType: **ICSA** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSA** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221735**

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									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **ICSAB1** SampType: **ICSAB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSAB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221736**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	20.488	0.50	20.00	0	102	80	120				
Arsenic	20.757	0.10	20.00	0	104	80	120				
Barium	21.908	1.0	20.00	0	110	80	120				
Copper	18.487	1.0	20.00	0	92.4	80	120				
Lead	18.509	1.0	20.00	0	92.5	80	120				
Manganese	17.828	0.50	20.00	0	89.1	80	120				
Nickel	20.243	1.0	20.00	0	101	80	120				
Zinc	19.046	10	20.00	0	95.2	80	120				

Sample ID **ICSA2** SampType: **ICSA** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSA** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221773**

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									

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICSA2** SampType: **ICSA** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSA** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221773**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **ICSAB2** SampType: **ICSAB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSAB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221774**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	19.714	0.50	20.00	0	98.6	80	120				
Arsenic	20.726	0.10	20.00	0	104	80	120				
Barium	22.316	1.0	20.00	0	112	80	120				
Copper	18.612	1.0	20.00	0	93.1	80	120				
Lead	18.001	1.0	20.00	0	90.0	80	120				
Manganese	17.932	0.50	20.00	0	89.7	80	120				
Nickel	20.196	1.0	20.00	0	101	80	120				
Zinc	18.855	10	20.00	0	94.3	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **ICSA1** SampType: **ICSA** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICSA** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222176**

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

Sample ID **ICSAB1** SampType: **ICSAB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICSAB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	19.482	0.50	20.00	0	97.4	80	120				

Sample ID **ICSA2** SampType: **ICSA** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICSA** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222206**

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

Sample ID **ICSAB2** SampType: **ICSAB** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ICSAB** Batch ID: **R130388** TestNo: **EPA 200.8** Analysis Date: **12/7/2018** SeqNo: **3222207**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	19.831	0.50	20.00	0	99.2	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **ICSA1** SampType: **ICSA** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSA** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221778**

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

Sample ID **ICSAB1** SampType: **ICSAB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSAB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221779**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	19.888	1.0	20.00	0	99.4	80	120				

Sample ID **ICSA2** SampType: **ICSA** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSA** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221816**

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

Sample ID **ICSAB2** SampType: **ICSAB** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ICSAB** Batch ID: **R130381** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221817**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	20.345	1.0	20.00	0	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		

INTERNAL STANDARD SUMMARY

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	115 In (ISTD) [3]					159 Tb (ISTD) [3]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
Cal Blank	IBLK	1	2135846.3	2135846.3	100	PASS	70-125	3256425.8	3256425.8	100	PASS	70-125
Std1-0.1/1 ppb	ICAL	1	2197331.1	2135846.3	102.88	PASS	70-125	3355890.4	3256425.8	103.05	PASS	70-125
Std2-0.5/5 ppb	ICAL	1	2204035.4	2135846.3	103.19	PASS	70-125	3333107.8	3256425.8	102.35	PASS	70-125
Std3-5/50 ppb	ICAL	1	2208077.3	2135846.3	103.38	PASS	70-125	3384518.5	3256425.8	103.93	PASS	70-125
Std4-10/100 ppb	ICAL	1	2196255.7	2135846.3	102.83	PASS	70-125	3349095.3	3256425.8	102.85	PASS	70-125
Std5-20/200 ppb	ICAL	1	2152999.2	2135846.3	100.8	PASS	70-125	3297850.6	3256425.8	101.27	PASS	70-125
Std6-40/400 ppb	ICAL	1	2187889.9	2135846.3	102.44	PASS	70-125	3320395.8	3256425.8	101.96	PASS	70-125
Std7-100/1000 ppb	ICAL	1	2163207.7	2135846.3	101.28	PASS	70-125	3330981.2	3256425.8	102.29	PASS	70-125
Std8-200/2000 ppb	ICAL	1	2142729.7	2135846.3	100.32	PASS	70-125	3312498.1	3256425.8	101.72	PASS	70-125
ICV	ICV	1	2413591.6	2135846.3	113	PASS	70-125	3758344.3	3256425.8	115.41	PASS	70-125
ICB	ICB	1	2176532	2135846.3	101.9	PASS	70-125	3142467.5	3256425.8	96.5	PASS	70-125
LLICV	CCV1	1	2583579.7	2135846.3	120.96	PASS	70-125	3719998.7	3256425.8	114.24	PASS	70-125
ICSA1	ICSA	1	1977199.8	2135846.3	92.57	PASS	70-125	3044461.9	3256425.8	93.49	PASS	70-125
ICSAB1	ICSAB	1	2224572.5	2135846.3	104.15	PASS	70-125	3395477	3256425.8	104.27	PASS	70-125
LLICV	CCV1	1	2329229.5	2135846.3	109.05	PASS	70-125	3503664.5	3256425.8	107.59	PASS	70-125
MB-71615	MBLK	1	2164820.6	2135846.3	101.36	PASS	70-125	3285686.9	3256425.8	100.9	PASS	70-125
LCS-71615	LCS	1	2518537.3	2135846.3	117.92	PASS	70-125	3803078.7	3256425.8	116.79	PASS	70-125
N033238-001E	SAMP	1	1957277	2135846.3	91.64	PASS	70-125	2983584.1	3256425.8	91.62	PASS	70-125
N033238-001E	SAMP	5	2124768	2135846.3	99.48	PASS	70-125	3234875	3256425.8	99.34	PASS	70-125
N033238-001E-PS	PS	1	1968058.3	2135846.3	92.14	PASS	70-125	3026499.8	3256425.8	92.94	PASS	70-125
N033238-001E-MS	MS	1	2042245	2135846.3	95.62	PASS	70-125	3124515.6	3256425.8	95.95	PASS	70-125
N033238-001E-MSD	MSD	1	2091106.8	2135846.3	97.91	PASS	70-125	3181438.2	3256425.8	97.7	PASS	70-125
N033238-002E	SAMP	1	2029119.1	2135846.3	95.003	PASS	70-125	3095058.9	3256425.8	95.045	PASS	70-125
N033238-003E	SAMP	1	2062931.7	2135846.3	96.59	PASS	70-125	3121375.5	3256425.8	95.85	PASS	70-125
N033238-004E	SAMP	1	2089427.9	2135846.3	97.83	PASS	70-125	3169808	3256425.8	97.34	PASS	70-125
CCV1	CCV	1	2202360.7	2135846.3	103.11	PASS	70-125	3192132.6	3256425.8	98.026	PASS	70-125
CCB1	CCB	1	2082687.3	2135846.3	97.51	PASS	70-125	3016277.7	3256425.8	92.63	PASS	70-125
N033238-005E	SAMP	1	2090426.8	2135846.3	97.87	PASS	70-125	3151361.7	3256425.8	96.77	PASS	70-125
N033238-006D	SAMP	1	2211645.7	2135846.3	103.55	PASS	70-125	3325895.7	3256425.8	102.13	PASS	70-125
N033238-007D	SAMP	1	2132947.4	2135846.3	99.86	PASS	70-125	3234993.4	3256425.8	99.34	PASS	70-125
N033238-008D	SAMP	1	1996817.1	2135846.3	93.49	PASS	70-125	3008166.8	3256425.8	92.38	PASS	70-125
N033238-009D	SAMP	1	2062740.9	2135846.3	96.58	PASS	70-125	3098558	3256425.8	95.15	PASS	70-125
N033238-010E	SAMP	1	2112023.2	2135846.3	98.88	PASS	70-125	3168041	3256425.8	97.29	PASS	70-125
N033238-011E	SAMP	1	2113863.8	2135846.3	98.97	PASS	70-125	3159004.7	3256425.8	97.008	PASS	70-125
N033238-011E-MS	MS	1	2163782.2	2135846.3	101.31	PASS	70-125	3249460.9	3256425.8	99.79	PASS	70-125
N033238-012E	SAMP	1	2180366.9	2135846.3	102.08	PASS	70-125	3244433.5	3256425.8	99.63	PASS	70-125
N033238-013D	SAMP	1	2305192.7	2135846.3	107.93	PASS	70-125	3449743.7	3256425.8	105.94	PASS	70-125
CCV2	CCV	1	2146793.1	2135846.3	100.51	PASS	70-125	3133443.1	3256425.8	96.22	PASS	70-125
CCB2	CCB	1	2461633.9	2135846.3	115.25	PASS	70-125	3545825.4	3256425.8	108.89	PASS	70-125
N033238-015E	SAMP	1	2027464.1	2135846.3	94.93	PASS	70-125	3074761.9	3256425.8	94.42	PASS	70-125
N033236-001C	SAMP	1	2090551.8	2135846.3	97.88	PASS	70-125	3142345.5	3256425.8	96.5	PASS	70-125

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	115 In (ISTD) [3]					159 Tb (ISTD) [3]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
N033236-001C	SAMP	5	2161547.8	2135846.3	101.2	PASS	70-125	3236053.9	3256425.8	99.37	PASS	70-125
N033236-002E	SAMP	1	2146350.6	2135846.3	100.49	PASS	70-125	3205182.5	3256425.8	98.43	PASS	70-125
N033236-002E	SAMP	5	2144358.2	2135846.3	100.4	PASS	70-125	3185885.9	3256425.8	97.83	PASS	70-125
N033237-001B	SAMP	1	2273066.1	2135846.3	106.42	PASS	70-125	3416472.2	3256425.8	104.91	PASS	70-125
N033237-001B	SAMP	5	2112699.3	2135846.3	98.92	PASS	70-125	3134151.4	3256425.8	96.25	PASS	70-125
N033237-002B	SAMP	1	2017550	2135846.3	94.46	PASS	70-125	3059759.6	3256425.8	93.96	PASS	70-125
N033237-002B	SAMP	5	2112707.9	2135846.3	98.92	PASS	70-125	3142860.3	3256425.8	96.51	PASS	70-125
CCV3	CCV	1	2085157.3	2135846.3	97.63	PASS	70-125	3038517.1	3256425.8	93.31	PASS	70-125
CCB3	CCB	1	2357762.2	2135846.3	110.39	PASS	70-125	3446177.7	3256425.8	105.83	PASS	70-125
ICSA2	ICSA	1	2325648.2	2135846.3	108.89	PASS	70-125	3416146.2	3256425.8	104.9	PASS	70-125
ICSAB2	ICSAB	1	2353622.6	2135846.3	110.2	PASS	70-125	3548783.2	3256425.8	108.98	PASS	70-125

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	209 Bi (ISTD) [3]					45 Sc (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
Cal Blank	IBLK	1	2177458.6	2177458.6	100	PASS	70-125	58609.2	58609.2	100	PASS	70-125
Std1-0.1/1 ppb	ICAL	1	2244490.7	2177458.6	103.08	PASS	70-125	61519.5	58609.2	104.97	PASS	70-125
Std2-0.5/5 ppb	ICAL	1	2243123.8	2177458.6	103.02	PASS	70-125	60213.6	58609.2	102.74	PASS	70-125
Std3-5/50 ppb	ICAL	1	2233597.3	2177458.6	102.58	PASS	70-125	60668.6	58609.2	103.51	PASS	70-125
Std4-10/100 ppb	ICAL	1	2224906.6	2177458.6	102.18	PASS	70-125	59819	58609.2	102.06	PASS	70-125
Std5-20/200 ppb	ICAL	1	2208915	2177458.6	101.44	PASS	70-125	59870.3	58609.2	102.15	PASS	70-125
Std6-40/400 ppb	ICAL	1	2244824.7	2177458.6	103.09	PASS	70-125	59107.5	58609.2	100.85	PASS	70-125
Std7-100/1000 ppb	ICAL	1	2237159	2177458.6	102.74	PASS	70-125	58999.2	58609.2	100.67	PASS	70-125
Std8-200/2000 ppb	ICAL	1	2212756.6	2177458.6	101.62	PASS	70-125	58287	58609.2	99.45	PASS	70-125
ICV	ICV	1	2517024.4	2177458.6	115.59	PASS	70-125	64379.2	58609.2	109.84	PASS	70-125
ICB	ICB	1	2016678.7	2177458.6	92.62	PASS	70-125	56769.4	58609.2	96.86	PASS	70-125
LLICV	CCV1	1	2429287.3	2177458.6	111.57	PASS	70-125	71776.9	58609.2	122.47	PASS	70-125
ICSA1	ICSA	1	1823072.2	2177458.6	83.72	PASS	70-125	57169.6	58609.2	97.54	PASS	70-125
ICSAB1	ICSAB	1	2020583	2177458.6	92.8	PASS	70-125	71954.5	58609.2	122.77	PASS	70-125
LLICV	CCV1	1	2292645.4	2177458.6	105.29	PASS	70-125	66053.4	58609.2	112.7	PASS	70-125
MB-71615	MBLK	1	2150570.7	2177458.6	98.77	PASS	70-125	61413.6	58609.2	104.78	PASS	70-125
LCS-71615	LCS	1	2513043	2177458.6	115.41	PASS	70-125	69832.9	58609.2	119.15	PASS	70-125
N033238-001E	SAMP	1	1747098.5	2177458.6	80.24	PASS	70-125	58310.4	58609.2	99.49	PASS	70-125
N033238-001E	SAMP	5	1995969.5	2177458.6	91.67	PASS	70-125	63319.5	58609.2	108.04	PASS	70-125
N033238-001E-PS	PS	1	1753211.5	2177458.6	80.52	PASS	70-125	60182.4	58609.2	102.68	PASS	70-125
N033238-001E-MS	MS	1	1823053	2177458.6	83.72	PASS	70-125	63213.6	58609.2	107.86	PASS	70-125
N033238-001E-MSD	MSD	1	1840295.4	2177458.6	84.52	PASS	70-125	64644.5	58609.2	110.3	PASS	70-125
N033238-002E	SAMP	1	1773496.1	2177458.6	81.45	PASS	70-125	65318.2	58609.2	111.45	PASS	70-125
N033238-003E	SAMP	1	1775771.2	2177458.6	81.55	PASS	70-125	65647.4	58609.2	112.01	PASS	70-125
N033238-004E	SAMP	1	1805385	2177458.6	82.91	PASS	70-125	67096.5	58609.2	114.48	PASS	70-125
CCV1	CCV	1	2073552.6	2177458.6	95.23	PASS	70-125	58530.1	58609.2	99.87	PASS	70-125
CCB1	CCB	1	1950490.2	2177458.6	89.58	PASS	70-125	56750.6	58609.2	96.83	PASS	70-125
N033238-005E	SAMP	1	1829439.1	2177458.6	84.017	PASS	70-125	67064.2	58609.2	114.43	PASS	70-125
N033238-006D	SAMP	1	1915579.2	2177458.6	87.97	PASS	70-125	70104.2	58609.2	119.61	PASS	70-125
N033238-007D	SAMP	1	1866307.9	2177458.6	85.71	PASS	70-125	68088.3	58609.2	116.17	PASS	70-125
N033238-008D	SAMP	1	1709664.8	2177458.6	78.52	PASS	70-125	64399.2	58609.2	109.88	PASS	70-125
N033238-009D	SAMP	1	1743350.7	2177458.6	80.064	PASS	70-125	67532.6	58609.2	115.23	PASS	70-125
N033238-010E	SAMP	1	1785699.9	2177458.6	82.008	PASS	70-125	68772.9	58609.2	117.34	PASS	70-125
N033238-011E	SAMP	1	1788650.2	2177458.6	82.14	PASS	70-125	68649.3	58609.2	117.13	PASS	70-125
N033238-011E-MS	MS	1	1837152.6	2177458.6	84.37	PASS	70-125	69040	58609.2	117.8	PASS	70-125
N033238-012E	SAMP	1	1835039.8	2177458.6	84.27	PASS	70-125	70431.2	58609.2	120.17	PASS	70-125
N033238-013D	SAMP	1	2007065	2177458.6	92.17	PASS	70-125	71835.1	58609.2	122.57	PASS	70-125
CCV2	CCV	1	2051548.8	2177458.6	94.22	PASS	70-125	56215.5	58609.2	95.92	PASS	70-125
CCB2	CCB	1	2302560	2177458.6	105.75	PASS	70-125	71421.9	58609.2	121.86	PASS	70-125
N033238-015E	SAMP	1	1758962.2	2177458.6	80.78	PASS	70-125	63126.5	58609.2	107.71	PASS	70-125
N033236-001C	SAMP	1	1754957.4	2177458.6	80.6	PASS	70-125	65777.7	58609.2	112.23	PASS	70-125

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	209 Bi (ISTD) [3]					45 Sc (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
N033236-001C	SAMP	5	1926573	2177458.6	88.48	PASS	70-125	70681.3	58609.2	120.6	PASS	70-125
N033236-002E	SAMP	1	1804795.4	2177458.6	82.89	PASS	70-125	66997.1	58609.2	114.31	PASS	70-125
N033236-002E	SAMP	5	1920079.7	2177458.6	88.18	PASS	70-125	70606.3	58609.2	120.47	PASS	70-125
N033237-001B	SAMP	1	1980363.6	2177458.6	90.95	PASS	70-125	68051.1	58609.2	116.11	PASS	70-125
N033237-001B	SAMP	5	1920998.2	2177458.6	88.22	PASS	70-125	69363.7	58609.2	118.35	PASS	70-125
N033237-002B	SAMP	1	1738171.5	2177458.6	79.83	PASS	70-125	63212.6	58609.2	107.85	PASS	70-125
N033237-002B	SAMP	5	1900284.7	2177458.6	87.27	PASS	70-125	68570.1	58609.2	117	PASS	70-125
CCV3	CCV	1	1992008.5	2177458.6	91.48	PASS	70-125	54427.3	58609.2	92.86	PASS	70-125
CCB3	CCB	1	2256178.6	2177458.6	103.62	PASS	70-125	67627.4	58609.2	115.39	PASS	70-125
ICSA2	ICSA	1	2228968.6	2177458.6	102.37	PASS	70-125	66104.6	58609.2	112.79	PASS	70-125
ICSAB2	ICSAB	1	2109727.2	2177458.6	96.89	PASS	70-125	72231.2	58609.2	123.24	PASS	70-125

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	72 Ge (ISTD) [2]					103 Rh (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
Cal Blank	IBLK	1	34175.4	34175.4	100	PASS	70-125	900866.2	900866.2	100	PASS	70-125
Std1-0.1/1 ppb	ICAL	1	36037.2	34175.4	105.45	PASS	70-125	945962.1	900866.2	105.01	PASS	70-125
Std2-0.5/5 ppb	ICAL	1	35146.4	34175.4	102.84	PASS	70-125	922335.8	900866.2	102.38	PASS	70-125
Std3-5/50 ppb	ICAL	1	35309.9	34175.4	103.32	PASS	70-125	928284.1	900866.2	103.04	PASS	70-125
Std4-10/100 ppb	ICAL	1	34667.5	34175.4	101.44	PASS	70-125	914672.3	900866.2	101.53	PASS	70-125
Std5-20/200 ppb	ICAL	1	34577.2	34175.4	101.18	PASS	70-125	914030.8	900866.2	101.46	PASS	70-125
Std6-40/400 ppb	ICAL	1	34627.4	34175.4	101.32	PASS	70-125	915691.7	900866.2	101.65	PASS	70-125
Std7-100/1000 ppb	ICAL	1	34474.7	34175.4	100.88	PASS	70-125	900599.9	900866.2	99.97	PASS	70-125
Std8-200/2000 ppb	ICAL	1	34108.7	34175.4	99.8	PASS	70-125	889495.9	900866.2	98.74	PASS	70-125
ICV	ICV	1	37969.2	34175.4	111.1	PASS	70-125	1005462.9	900866.2	111.61	PASS	70-125
ICB	ICB	1	34090.8	34175.4	99.75	PASS	70-125	884169.6	900866.2	98.15	PASS	70-125
LLICV	CCV1	1	41773.1	34175.4	122.23	PASS	70-125	1078484.2	900866.2	119.72	PASS	70-125
ICSA1	ICSA	1	32755.8	34175.4	95.85	PASS	70-125	804087.8	900866.2	89.26	PASS	70-125
ICSAB1	ICSAB	1	40469.8	34175.4	118.42	PASS	70-125	984201.8	900866.2	109.25	PASS	70-125
LLICV	CCV1	1	38895.9	34175.4	113.81	PASS	70-125	1015044.2	900866.2	112.67	PASS	70-125
MB-71615	MBLK	1	35797.6	34175.4	104.75	PASS	70-125	932404.2	900866.2	103.5	PASS	70-125
LCS-71615	LCS	1	40865.2	34175.4	119.57	PASS	70-125	1060633.4	900866.2	117.73	PASS	70-125
N033238-001E	SAMP	1	33269	34175.4	97.35	PASS	70-125	779416.9	900866.2	86.52	PASS	70-125
N033238-001E	SAMP	5	36374.5	34175.4	106.43	PASS	70-125	876981.3	900866.2	97.35	PASS	70-125
N033238-001E-PS	PS	1	34345.8	34175.4	100.5	PASS	70-125	805998.8	900866.2	89.47	PASS	70-125
N033238-001E-MS	MS	1	35662	34175.4	104.35	PASS	70-125	844014	900866.2	93.69	PASS	70-125
N033238-001E-MSD	MSD	1	36049.5	34175.4	105.48	PASS	70-125	851016.4	900866.2	94.47	PASS	70-125
N033238-002E	SAMP	1	35911.4	34175.4	105.08	PASS	70-125	854685.7	900866.2	94.87	PASS	70-125
N033238-003E	SAMP	1	36281.1	34175.4	106.16	PASS	70-125	860411.8	900866.2	95.51	PASS	70-125
N033238-004E	SAMP	1	37539.5	34175.4	109.84	PASS	70-125	876422.9	900866.2	97.29	PASS	70-125
CCV1	CCV	1	34288.9	34175.4	100.33	PASS	70-125	908915.3	900866.2	100.89	PASS	70-125
CCB1	CCB	1	33416	34175.4	97.78	PASS	70-125	870226.9	900866.2	96.6	PASS	70-125
N033238-005E	SAMP	1	37151.9	34175.4	108.71	PASS	70-125	875968.1	900866.2	97.24	PASS	70-125
N033238-006D	SAMP	1	38484.9	34175.4	112.61	PASS	70-125	926745.1	900866.2	102.87	PASS	70-125
N033238-007D	SAMP	1	37641.8	34175.4	110.14	PASS	70-125	885501	900866.2	98.29	PASS	70-125
N033238-008D	SAMP	1	35433.6	34175.4	103.68	PASS	70-125	837944.8	900866.2	93.015	PASS	70-125
N033238-009D	SAMP	1	37198.6	34175.4	108.85	PASS	70-125	869067.8	900866.2	96.47	PASS	70-125
N033238-010E	SAMP	1	38036.2	34175.4	111.3	PASS	70-125	884476.3	900866.2	98.18	PASS	70-125
N033238-011E	SAMP	1	37684.1	34175.4	110.27	PASS	70-125	885282.2	900866.2	98.27	PASS	70-125
N033238-011E-MS	MS	1	38649.7	34175.4	113.09	PASS	70-125	905213.8	900866.2	100.48	PASS	70-125
N033238-012E	SAMP	1	38613	34175.4	112.98	PASS	70-125	910059.2	900866.2	101.02	PASS	70-125
N033238-013D	SAMP	1	40813.8	34175.4	119.42	PASS	70-125	959665.2	900866.2	106.53	PASS	70-125
CCV2	CCV	1	33490.6	34175.4	98	PASS	70-125	883184.8	900866.2	98.037	PASS	70-125
CCB2	CCB	1	41151.5	34175.4	120.41	PASS	70-125	1060842.7	900866.2	117.76	PASS	70-125
N033238-015E	SAMP	1	35413.6	34175.4	103.62	PASS	70-125	836648.8	900866.2	92.87	PASS	70-125
N033236-001C	SAMP	1	36355.7	34175.4	106.38	PASS	70-125	856646.2	900866.2	95.091	PASS	70-125

INTERNAL STANDARD: 181205B

Instrument ID: ICPMS-02

Sample Name	Type	DF	72 Ge (ISTD) [2]					103 Rh (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria	CPS	REF	%REC	Comment	Criteria
N033236-001C	SAMP	5	39973.2	34175.4	116.96	PASS	70-125	965781.1	900866.2	107.21	PASS	70-125
N033236-002E	SAMP	1	37714.4	34175.4	110.36	PASS	70-125	883703.4	900866.2	98.095	PASS	70-125
N033236-002E	SAMP	5	39613.3	34175.4	115.91	PASS	70-125	976688.7	900866.2	108.42	PASS	70-125
N033237-001B	SAMP	1	38953.7	34175.4	113.98	PASS	70-125	925175	900866.2	102.7	PASS	70-125
N033237-001B	SAMP	5	39671.1	34175.4	116.08	PASS	70-125	973404.8	900866.2	108.05	PASS	70-125
N033237-002B	SAMP	1	34918	34175.4	102.17	PASS	70-125	830308.7	900866.2	92.17	PASS	70-125
N033237-002B	SAMP	5	39089.6	34175.4	114.38	PASS	70-125	939363.2	900866.2	104.27	PASS	70-125
CCV3	CCV	1	32243.6	34175.4	94.35	PASS	70-125	856946.5	900866.2	95.12	PASS	70-125
CCB3	CCB	1	38778.9	34175.4	113.47	PASS	70-125	1012150.2	900866.2	112.35	PASS	70-125
ICSA2	ICSA	1	37989.3	34175.4	111.16	PASS	70-125	996444.7	900866.2	110.61	PASS	70-125
ICSAB2	ICSAB	1	40602.3	34175.4	118.81	PASS	70-125	993945.1	900866.2	110.33	PASS	70-125

INTERNAL STANDARD: 181206A

Instrument ID: ICPMS-02

Sample Name	Type	DF	103 Rh (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria
Cal Blank	IBLK	1	923123.7	923123.7	100	PASS	70-125
Std1-0.1/1 ppb	ICAL	1	952695.2	923123.7	103.2	PASS	70-125
Std2-0.5/5 ppb	ICAL	1	940387.9	923123.7	101.87	PASS	70-125
Std3-5/50 ppb	ICAL	1	935946	923123.7	101.39	PASS	70-125
Std4-10/100 ppb	ICAL	1	934484.1	923123.7	101.23	PASS	70-125
Std5-20/200 ppb	ICAL	1	932067.5	923123.7	100.97	PASS	70-125
Std6-40/400 ppb	ICAL	1	924721.6	923123.7	100.17	PASS	70-125
Std7-100/1000 ppb	ICAL	1	908614.2	923123.7	98.43	PASS	70-125
Std8-200/2000 ppb	ICAL	1	890510.9	923123.7	96.47	PASS	70-125
ICV	ICV	1	850494	923123.7	92.13	PASS	70-125
ICB	ICB	1	878442.1	923123.7	95.16	PASS	70-125
LLICV	CCV1	1	967535.1	923123.7	104.81	PASS	70-125
ICSA1	ICSA	1	831822.1	923123.7	90.11	PASS	70-125
ICSAB1	ICSAB	1	952628.8	923123.7	103.2	PASS	70-125
MB-71615	MBLK	1	812318.9	923123.7	88	PASS	70-125
LCS-71615	LCS	1	889565.1	923123.7	96.36	PASS	70-125
N033238-001E	SAMP	1	726791.6	923123.7	78.73	PASS	70-125
N033238-001E	SAMP	5	852303.8	923123.7	92.33	PASS	70-125
N033238-001E-PS	PS	1	766881.2	923123.7	83.075	PASS	70-125
N033238-001E-MS	MS	1	795059.3	923123.7	86.13	PASS	70-125
N033238-001E-MSD	MSD	1	811512.7	923123.7	87.91	PASS	70-125
N033238-002E	SAMP	1	814994.3	923123.7	88.29	PASS	70-125
N033238-003E	SAMP	1	822736.8	923123.7	89.13	PASS	70-125
N033238-004E	SAMP	1	845802	923123.7	91.62	PASS	70-125
CCV1	CCV	1	1061482	923123.7	114.99	PASS	70-125
CCB1	CCB	1	823686.6	923123.7	89.23	PASS	70-125
N033238-005E	SAMP	1	812791.1	923123.7	88.048	PASS	70-125
N033238-006D	SAMP	1	869891.6	923123.7	94.23	PASS	70-125
N033238-007D	SAMP	1	824075.8	923123.7	89.27	PASS	70-125
N033238-008D	SAMP	1	786652.3	923123.7	85.22	PASS	70-125
N033238-009D	SAMP	1	824143.6	923123.7	89.28	PASS	70-125
N033238-010E	SAMP	1	831022.3	923123.7	90.023	PASS	70-125
N033238-011E	SAMP	1	835010.8	923123.7	90.45	PASS	70-125
N033238-011E-MS	MS	1	855140.3	923123.7	92.64	PASS	70-125
N033238-012E	SAMP	1	861643.1	923123.7	93.34	PASS	70-125
N033238-013D	SAMP	1	911333.7	923123.7	98.72	PASS	70-125
CCV2	CCV	1	1039380.3	923123.7	112.59	PASS	70-125
CCB2	CCB	1	906470.4	923123.7	98.2	PASS	70-125
N033238-015E	SAMP	1	778774	923123.7	84.36	PASS	70-125
N033236-002E	SAMP	1	820115.2	923123.7	88.84	PASS	70-125
CCV3	CCV	1	883826.1	923123.7	95.74	PASS	70-125

INTERNAL STANDARD: 181206A

Instrument ID: ICPMS-02

Sample Name	Type	DF	103 Rh (ISTD) [2]				
			CPS	REF	%REC	Comment	Criteria
CCB3	CCB	1	894272.7	923123.7	96.87	PASS	70-125
ICSA2	ICSA	1	943825.7	923123.7	102.24	PASS	70-125
ICSAB2	ICSAB	1	947590.9	923123.7	102.65	PASS	70-125

SERIAL DILUTION/
POST DIGESTION SPIKE

ASSET Laboratories

ICP-MS-Metals in Water

Dilution Test Summary

Work Order No.: N033236
Test Method: EPA 200.8
Analysis Date: 12 / 05-06 / 2018

Matrix: Water
Batch No.: 71615

Instrument ID: ICP-MS #2
Instrument Description: Agilent 7700x

Comments:

Analyzed By: Mary Claire Ignacio

Dilution test is not applicable to several analytes. The calculated concentration is <25RL.

Sample ID	Analyte	Units	Calc Val	OQual	SAMPRefVal	%DIFF	%DIFFlimit
N033238-001E DT 5X	Antimony	ug/L	0		0		10
N033238-001E DT 5X	Arsenic	ug/L	3.090424	PASS	2.983404	3.59%	10
N033238-001E DT 5X	Barium	ug/L	19.18723	NA	18.76747	2.24%	10
N033238-001E DT 5X	Chromium	ug/L	0	NA	0.497413	100.00%	10
N033238-001E DT 5X	Copper	ug/L	0		0		10
N033238-001E DT 5X	Lead	ug/L	0		0		10
N033238-001E DT 5X	Manganese	ug/L	1.67776	NA	1.652399	1.53%	10
N033238-001E DT 5X	Molybdenum	ug/L	20.10972	PASS	20.29406	0.91%	10
N033238-001E DT 5X	Nickel	ug/L	0		0		10
N033238-001E DT 5X	Zinc	ug/L	0		0		10

Note: NA - Not applicable

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N033238-001E-PS** SampType: **PS** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130381**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/5/2018** SeqNo: **3221742**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.005	0.50	10.00	0	100	80	120				
Arsenic	13.119	0.10	10.00	2.983	101	80	120				
Barium	28.625	1.0	10.00	18.77	98.6	80	120				
Copper	2.908	1.0	10.00	0	29.1	80	120				S
Lead	9.825	1.0	10.00	0	98.3	80	120				
Manganese	100.637	0.50	100.0	1.652	99.0	80	120				
Nickel	8.896	1.0	10.00	0	89.0	80	120				
Zinc	3.831	10	10.00	0	38.3	80	120				S

Sample ID **N033238-001E-PS** SampType: **PS** TestCode: **200.8_W** Units: **µg/L** Prep Date: RunNo: **130388**
Client ID: **ZZZZZZ** Batch ID: **71615** TestNo: **EPA 200.8** Analysis Date: **12/6/2018** SeqNo: **3222182**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	32.009	0.50	10.00	20.29	117	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**N033238-001E-PS**	SampType:	**PS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:				RunNo:	**130381**
Client ID:	**ZZZZZZ**	Batch ID:	**71615**	TestNo:	**EPA 200.8**			Analysis Date:	**12/5/2018**			SeqNo:	**3221785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.189	1.0	10.00	0.4974	96.9	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		

MDL STUDY

Method Detection Limit

Analytical Method: EPA 6020 / 200.8
Digestion Method: EPA 3010A
Date of Analysis: 9/25,10/2,11/3/17
Digestion Date: 9/21, 9/28,10/9/17
Instrument Name: ICPMS2
Analysts: MEI

Matrix: Water
Amount of Sample: 25 mL
Units: ug/L

Analyte	AMT SPIKED, ppb	1	2	3	4	5	6	7	SD	MDL	LOD	PQL
ANTIMONY	0.50	0.525	0.514	0.473	0.500	0.492	0.486	0.530	0.0210	0.0660	0.100	0.50
ARSENIC	0.10	0.099	0.104	0.087	0.048	0.060	0.069	0.120	0.0259	0.0813	0.080	0.10
BARIUM	1.00	1.041	1.059	1.052	1.011	0.967	0.957	1.023	0.0403	0.1264	0.250	1.00
BERYLLIUM	0.50	0.469	0.476	0.473	0.495	0.480	0.488	0.507	0.0135	0.0424	0.100	0.50
CADMIUM	0.50	0.515	0.513	0.492	0.534	0.499	0.483	0.508	0.0168	0.0527	0.100	0.50
CHROMIUM	1.00	0.979	0.986	0.940	0.990	0.946	0.978	0.977	0.0197	0.0618	0.250	1.00
COBALT	0.50	0.499	0.489	0.486	0.488	0.465	0.502	0.505	0.0135	0.0424	0.100	0.50
COPPER	1.00	1.110	0.667	1.039	1.060	1.006	1.099	1.075	0.1544	0.4850	0.500	1.00
IRON	10.00	10.873	10.802	10.142	9.991	9.846	9.852	10.596	0.4463	1.4014	2.500	10.00
LEAD	1.00	0.928	0.931	0.899	0.996	0.990	0.987	0.997	0.0406	0.1274	0.250	1.00
MANGANESE	0.50	0.577	0.588	0.561	0.566	0.517	0.541	0.520	0.0276	0.0866	0.100	0.50
MOLYBDENUM	0.50	0.514	0.504	0.467	0.478	0.456	0.433	0.527	0.0338	0.1061	0.250	0.50
NICKEL	1.00	0.961	0.965	0.977	0.907	0.914	0.962	1.075	0.0551	0.1731	0.250	1.00
SELENIUM	0.50	0.450	0.478	0.419	0.693	0.707	0.495	0.555	0.1155	0.3628	0.400	0.50
SILVER	0.50	0.558	0.511	0.490	0.542	0.458	0.490	0.684	0.0745	0.2340	0.250	0.50
THALLIUM	0.50	0.437	0.428	0.408	0.538	0.446	0.438	0.525	0.0504	0.1583	0.250	0.50
URANIUM	0.50	0.478	0.467	0.461	0.517	0.510	0.521	0.521	0.0267	0.0838	0.100	0.50
VANADIUM	1.00	0.950	0.969	0.900	0.844	0.829	0.848	1.053	0.0820	0.2574	0.500	1.00
ZINC	10.00	11.259	11.279	10.915	9.620	9.849	9.745	10.241	0.7235	2.2717	2.500	10.00

Method Detection Limit

Analytical Method: EPA 6020 / 200.8
Digestion Method: EPA 3010A
Date of Analysis: 9/25,10/2,11/3/17
Digestion Date: 9/21, 9/28,10/9/17
Instrument Name: ICPMS2
Analysts: MEI

Matrix: Water
Units: ug/L

Analyte	MDLs	MDLb	MDL	LOD	PQL
ANTIMONY	0.0660	0.1564	0.1564	0.300	0.50
ARSENIC	0.0813	0.0387	0.0813	0.080	0.10
BARIUM	0.1264	0.1497	0.1497	0.300	1.00
BERYLLIUM	0.0424	0.0153	0.0424	0.100	0.50
CADMIUM	0.0527	0.0060	0.0527	0.100	0.50
CHROMIUM	0.0618	0.1298	0.1298	0.300	1.00
COBALT	0.0424	0.0339	0.0424	0.100	0.50
COPPER	0.4850	0.5459	0.5459	0.600	1.00
IRON	1.4014	4.3484	4.3484	5.000	10.00
LEAD	0.1274	0.1008	0.1274	0.300	1.00
MANGANESE	0.0866	0.2552	0.2552	0.300	0.50
MOLYBDENUM	0.1061	0.2149	0.2149	0.300	0.50
NICKEL	0.1731	0.2606	0.2606	0.300	1.00
SELENIUM	0.3628	0.0953	0.3628	0.400	0.50
SILVER	0.2340	0.2023	0.2340	0.250	0.50
THALLIUM	0.1583	0.1924	0.1924	0.300	0.50
URANIUM	0.0838	0.0020	0.0838	0.100	0.50
VANADIUM	0.2574	0.2768	0.2768	0.600	1.00
ZINC	2.2717	0.4511	2.2717	3.000	10.00

SM 2130B

Wet Chemistry Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

FIRST LEVEL REVIEW:

QC Batch Number: R130336 **Analyst:** LSR

ASSET #: N033236 **Date Analyzed:** 5-Dec

Method: EPA 2130

	Ist Level Review			2nd Level Review		
Initial Calibration	**Y**	**N**	**N/A**	**Y**	**N**	**N/A**
1. ICAL before initial sample analysis or every 24 hrs.			X			
2. Does correlation coefficient,r, meet criteria ?(r = 0.995)			X			
3. ICV within ± 15% of expected value.			X			
Continuing Calibration						
4. CCV after every 10 samples and at the end of analysis sequence.			X			
5. CCV within ± 15% of expected value.			X			
6. Calibration blanks run after ICV and CCV?			X			
7. Do all calibration blanks (ICB and CCBs) meet criteria? (< 1/2 PQL)			X			
Sample Information						
8. All samples are within linear range.			X			
9. Are all samples analyzed within hold time.	X					
QC Items						
10. Method blank values are below 1/2 the reporting limit.	X					
11. LCS compounds within control limits.			X			
12. MS/MSD, RPD's are within control limits	X					
Raw Data and Miscellaneous Information						
13. Are Non-Conformances documented			X			
14. Runlog complete and included in package.	X					
15. Spectrophotometer tape included (Spec work only)			X			
16. Digestion log complete and included in package (if applicable)			X			
Preliminary Report						
17. Does the raw data match the preliminary report?	X					
18. Are analytical results correct?	X					
19. Is the QC summary report present and complete?	X					

Comments:

SECOND LEVEL REVIEW:

	Yes	No	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Does batch meet QC requirements?			
4. Are analytical results correct? (Ex. dilutions, calculations.etc.)			
5. Is first level review correct and complete?			

1st Level Reviewer Julia Ramit Date: 12/7/2018

2nd Level Reviewer 12/18/2018 Date: —

LOGBOOK DATA, QUANTITATION REPORT and/or SPECTRA

Turbidity Preparation and Runlog

Date Analyzed: 12/5/18
Time Analyzed: 1430
Analyzed By: LSR

Sample ID.	Matrix	Sample Vol (ml)	Std Code	Dilution (F/I)	Reading	Calculations	Comments
0.02 NTU			CMC-181129A		0.02 NTU		
20			B		19.91		
100			C		99.7		
800			D		796		

1)	MBLIC	100	10		1	~~0~~ NTU		
2)	N033236-1A					0.20		
3)	2B					0.40		
4)	N033238-1B					0.60		
5)	1B DUP					0.59		
6)	2B					8.45		
7)	3B					3.07		
8)	4B					0.86		
9)	5B					0.66		
10)	6B					2.34		
11)	7B					6.85		
12)	8B					2.88		
13)	9B					0.36		
14)	10B					18.64		
15)	11B					3.75		
16)	11B DUP					3.68		
17)	12B					28.2		
18)	13B					6.45		
19)	15B					11.20	Sukha Ramit	
20)	5 NTU			CMV-180118A		4.91 NTU	12/7/2018	
	20			180620A		19.97		
	100			180620B				

Book #4
102

EPA 218.6

IC Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

IC CH2M
REV.7.0
071116

QC Batch Number: R130313
ASSET #: N033236

Instrument ID: IC-07
Analyst: RBA
Date Analyzed: 12/5/2018

Method:

- [ ] EPA 300.0
- [ ] EPA 7199
- [X] EPA 218.6/EPA 218.7
- [ ] EPA 218.6/EPA 218.7 LL
- [ ] Others _____

Initial Calibration and Initial Calibration Verification	Ist Level Review			2nd Level Review		
	Y	N	N/A	Y	N	N/A
1. ICAL before initial sample analysis and is not more than 4 weeks old.	X					
2. Does correlation coefficient,r, meet criteria ?(r = 0.995, r =0.999 (Cr6+))	X					
3. ICV within ± 10% of expected value.	X					
Continuing Calibration						
4. CCV after every 10 injections and at the end of analysis sequence.	X					
5. CCV within ± 10% of expected value. (± 5% for EPA 218.6)	X					
6. Calibration blanks run after ICV and CCV?	X					
7. Is the buffer less than MDL? If not, discontinue analysis. (Cr6+ only)	X					
8. Do all calibration blanks (ICB and CCBs) meet criteria? (<1/2PQL for 300, <0.02 for Cr6+)	~~X~~	X				
9. Is low level check at PQL within ± 20% for 218.6/218.7/7199? ± 30% for 218.6/218.7LL?	X					
Sample Information						
10. All samples are within linear range.	X					
11. All samples pH within 9.3-9.7 when analyzed?	X					
12. Duplicate sample injections for every sample. (7199 only)			X			
13. For Topock, matrix spike protocol performed on all samples? (Cr6+ only)	X					
14. For Hinkley DOM samples, matrix spike protocol performed on all samples ? (Cr6+ only)			X			
15. For samples < 4 ppb, does the Cr result differs with Cr6+ by no more than 0.7 ppb?			X			
16. For samples > 4 ppb, does the Cr result differs with Cr6+ by no more than 20%?			X			
17. For samples that failed Cr vs Cr6+ criteria, is matrix spike protocol performed ?			X			
18. For dilution and MS spike protocol, spike recovery within 90-110%? (Cr6+ only)	X					
19. EPA 3060A digestion performed on solid samples (7199 only)			X			
20. Are all peaks within RT window, ± 0.2 min?	X					
21. Are all samples analyzed within hold time?	X					
22. For Hinkley projects (DOM & ATU only), are samples with result ≤ 0.2 ug/L analyzed by low level method? (Cr6+ only)			X			
QC Items						
23. Method blank values meets criteria. (<1/2 PQL for 300, <0.02 for Cr6+)	X					
24. LCS compounds are within control limits.	X					
25. MS/MSD, RPD's are within control limits.	X					
26. Soluble and Insoluble matrix spike within control limits (7199 solids only)			X			
Raw Data and Miscellaneous Information						
27. Runlog complete and included in package.	X					
28. Extraction log complete and included in package (if applicable)			X			
29. All manual integrations initialed, date and reasons included.	X					
30. Before and after manual integration chromatogram included in the package	X					
31. All samples and QC raw data present in package.	X					
Preliminary Report						
32. Does the raw data match the preliminary report?	X					
33. Are analytical results correct?(Ex. dilutions, calculations.etc.)	X					
34 Is the QC summary report present and complete?	X					

Comments: **Detection in CCB-3 is >0.02 ppb. However, N033236 sample is enclosed between CCB-5 to CCB-6**

SECOND LEVEL REVIEW:

	Y	N	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Is QC present and complete?			
4. Are analytical results correct? (dilutions,calculations)			
5. Is first level review correct and complete?			

1st Level Reviewer rba Date: 12/9/2018

2nd Level Reviewer 12/18/2018 Date: —

SAMPLE CALCULATION

Sample Calculation

METHOD: EPA 218.6
TEST NAME: HEXAVALENT CHROMIUM BY IC
MATRIX: Water

FORMULA:

Calculate the Hexavalent Chromium concentration, in µg/L, in the original sample as follows:

$$Cr^{+6}, \mu g/L = A * DF$$

where:

A = µg/L, IC Cr+6 calculated concentration
DF = dilution factor

For Sample **N033236-001B** , the concentration in µg/L is calculated as follows:

$$Cr^{+6}, \mu g/L = 4.8581 * 100$$

$$Cr^{+6}, \mu g/L = 485.8100$$

Reporting results in two significant figures,

$$\mathbf{Cr^{+6}, \mu g/L = 490}$$

rba 12/9/2018

ANALYSIS RUN LOG

INJECTION LOG: 181119A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
1	BLANK	BLANK	1	Hexavalent Chromium	11/19/18 9:28 AM	Not Reported
2	iBLANK	iBLANK	1	Hexavalent Chromium	11/19/18 9:39 AM	Reported
3	STD-0.2 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:49 AM	Reported
4	STD-1.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:59 AM	Reported
5	STD-5.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:11 AM	Reported
6	STD-10.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:20 AM	Reported
7	STD-15.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:30 AM	Reported
8	STD-20.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:39 AM	Reported
9	ICV	ICV	1	Hexavalent Chromium	11/19/18 10:48 AM	Reported
10	PQL@0.2ppb	CCV2	1	Hexavalent Chromium	11/19/18 10:58 AM	Reported
11	ICB	ICB	1	Hexavalent Chromium	11/19/18 11:07 AM	Reported
12	MB-R130040	MBLK	1	Hexavalent Chromium	11/19/18 11:17 AM	Reported
13	LCS-R130040	LCS	1	Hexavalent Chromium	11/19/18 11:26 AM	Reported
14	N033021-001A	SAMP	1	Hexavalent Chromium	11/19/18 11:36 AM	Not Reported
15	N033021-002A	SAMP	1	Hexavalent Chromium	11/19/18 11:45 AM	Not Reported
16	N033022-001A	SAMP	1	Hexavalent Chromium	11/19/18 11:55 AM	Reported
17	N033022-002A	SAMP	1	Hexavalent Chromium	11/19/18 12:04 PM	Reported
18	N033016-002B	SAMP	1	Hexavalent Chromium	11/19/18 12:14 PM	Reported
19	N033021-001A	SAMP	20	Hexavalent Chromium	11/19/18 12:23 PM	Reported
20	N033021-001AMS	MS	20	Hexavalent Chromium	11/19/18 12:33 PM	Reported
21	N033021-001AMSD	MSD	20	Hexavalent Chromium	11/19/18 12:42 PM	Reported
22	CCV-1	CCV1	1	Hexavalent Chromium	11/19/18 12:51 PM	Reported
23	CCB-1	CCB	1	Hexavalent Chromium	11/19/18 1:01 PM	Reported
24	N033021-001ADUP	DUP	20	Hexavalent Chromium	11/19/18 1:10 PM	Reported
25	N033021-002AMS	MS	1	Hexavalent Chromium	11/19/18 1:20 PM	Not Reported
26	N033021-002A	SAMP	5	Hexavalent Chromium	11/19/18 1:29 PM	Not Reported
27	N033021-002AMS	MS	5	Hexavalent Chromium	11/19/18 1:39 PM	Reported
28	N033022-001AMS	MS	1	Hexavalent Chromium	11/19/18 1:48 PM	Reported
29	N033022-002AMS	MS	1	Hexavalent Chromium	11/19/18 1:58 PM	Reported
30	N033016-002BMS	MS	1	Hexavalent Chromium	11/19/18 2:07 PM	Reported
31	N033021-002A	SAMP	5	Hexavalent Chromium	11/19/18 2:17 PM	Reported
32	N033021-002AMS	MS	1	Hexavalent Chromium	11/19/18 2:26 PM	Not Reported
33	CCV-2	CCV	1	Hexavalent Chromium	11/19/18 2:36 PM	Reported
34	CCB-2	CCB	1	Hexavalent Chromium	11/19/18 2:45 PM	Reported
35	N033021-001A	SAMP	20	Hexavalent Chromium	11/19/18 3:05 PM	Not Reported
36	N033021-001AMS	MS	20	Hexavalent Chromium	11/19/18 3:17 PM	Not Reported
37	CCV-3	CCV1	1	Hexavalent Chromium	11/19/18 3:26 PM	Not Reported
38	CCB-3	CCB	1	Hexavalent Chromium	11/19/18 3:36 PM	Not Reported

rba 11/20/2018

Injection Log Summary

Sequence Details

Name:	**IC-07_181119A**	*Created On:*	**24/Jul/12 17:17:21**
Directory:	**Instrument Data\IC-7\2018**	*Created By:*	**ics 5000**
Data Vault:	**ChromeleonLocal2**	*Updated On:*	**19/Nov/18 16:06:19**
No. of Injections:	**41**	*Updated By:*	**ics 5000**

Injection Details

No.	Injection Name	Position	Volume µL	Type	Level	Inject Time	Status	Comment
1	BLANK	1	1000	Unknown		11/19/2018 09:28	Finished	BLANK
2	iBLANK	2	1000	Unknown		11/19/2018 09:39	Finished	INSTRUMENT BLANK
3	STD1-0.2 ppb	3	1000	Calibration Standard	01	11/19/2018 09:49	Finished	0.2 ppb, IWST-181022C
4	STD2-1.0 ppb	4	1000	Calibration Standard	02	11/19/2018 09:59	Finished	1.0 ppb, IWST-181022C
5	STD3-5.0 ppb	5	1000	Calibration Standard	03	11/19/2018 10:11	Finished	5.0 ppb, IWST-181022C
6	STD4-10.0 ppb	6	1000	Calibration Standard	04	11/19/2018 10:20	Finished	10 ppb, IWST-181022C
7	STD5-15.0 ppb	7	1000	Calibration Standard	05	11/19/2018 10:30	Finished	15 ppb, IWST-181022C
8	STD6-20.0 ppb	8	1000	Calibration Standard	06	11/19/2018 10:39	Finished	20 ppb, IWST-181022C
9	ICV,ICV,1,	9	1000	Unknown		11/19/2018 10:48	Finished	ICV @5ppb, IWST-181022D
10	PQL@0.2ppb,CCV2,1	10	1000	Unknown		11/19/2018 10:58	Finished	PQL @ 0.2ppb
11	ICB,ICB,1,	11	1000	Unknown		11/19/2018 11:07	Finished	ICB R181102B
12	MB-H2O,MBLK,1,	12	1000	Unknown		11/19/2018 11:17	Finished	MB R181102B
13	LCS-H2O,LCS,1,	13	1000	Unknown		11/19/2018 11:26	Finished	LCS @5ppb, IWST-181022D
14	N033021-001A,SAMP	14	1000	Unknown		11/19/2018 11:36	Finished	SAMP,10mL
15	N033021-002A,SAMP	15	1000	Unknown		11/19/2018 11:45	Finished	SAMP,10mL
16	N033022-001A,SAMP	16	1000	Unknown		11/19/2018 11:55	Finished	SAMP,10mL
17	N033022-002A,SAMP	17	1000	Unknown		11/19/2018 12:04	Finished	SAMP,10mL
18	N033016-002B,SAMP	18	1000	Unknown		11/19/2018 12:14	Finished	SAMP,10mL
19	N033021-001A,SAMP	19	1000	Unknown		11/19/2018 12:23	Finished	SAMP,0.5>10mL
20	N033021-001AMS,MS	20	1000	Unknown		11/19/2018 12:33	Finished	MS (5ppb), IWST-181022D,0.5
21	N033021-001AMSD,M	21	1000	Unknown		11/19/2018 12:42	Finished	MSD (5ppb), IWST-181022D,0.
22	CCV-1,CCV1,1,	22	1000	Unknown		11/19/2018 12:51	Finished	CCV @10ppb, IWST-181022C
23	CCB-1,CCB,1,	23	1000	Unknown		11/19/2018 13:01	Finished	CCB R181102B
24	N033021-001ADUP,D	24	1000	Unknown		11/19/2018 13:10	Finished	DUP,10mL
25	N033021-002AMS,MS	25	1000	Unknown		11/19/2018 13:20	Finished	MS (1ppb), IWST-181022D,10
26	N033021-002A,SAMP	26	1000	Unknown		11/19/2018 13:29	Finished	SAMP,2>10mL
27	N033021-002AMS,MS	27	1000	Unknown		11/19/2018 13:39	Finished	MS (1ppb), IWST-181022D,2>1
28	N033022-001AMS,MS	28	1000	Unknown		11/19/2018 13:48	Finished	MS (1ppb), IWST-181022D,10
29	N033022-002AMS,MS	29	1000	Unknown		11/19/2018 13:58	Finished	MS (1ppb), IWST-181022D,10
30	N033016-002BMS,MS	30	1000	Unknown		11/19/2018 14:07	Finished	MS (1ppb), IWST-181022D,10
31	N033021-002A,SAMP	31	1000	Unknown		11/19/2018 14:17	Finished	SAMP,2>10mL
32	N033021-002AMS,MS	32	1000	Unknown		11/19/2018 14:26	Finished	MS (1ppb), IWST-181022D,10
33	CCV-2,CCV,1,	33	1000	Unknown		11/19/2018 14:36	Finished	CCV @5ppb, IWST-1810222C
34	CCB-2,CCB,1,	34	1000	Unknown		11/19/2018 14:45	Finished	CCB R181102B
35	N033021-001A,SAMP	37	1000	Unknown		11/19/2018 15:05	Finished	SAMP,0.5>10mL
36	N033021-001AMS,MS	38	1000	Unknown		11/19/2018 15:17	Finished	MS (5ppb), IWST-181022D,0.5
37	CCV-3,CCV1,1,	39	1000	Unknown		11/19/2018 15:26	Finished	CCV @10ppb, IWST-1810222C
38	CCB-3,CCB,1,	40	1000	Unknown		11/19/2018 15:36	Finished	CCB R181102B
39	SHUTDOWN	41	1000	Unknown		11/19/2018 15:45	Finished	
40	Eluent: R181119A	42	1000	Unknown		n.a.	Finished	Eluent
41	PCR: R181119B	43	1000	Unknown		n.a.	Finished	Post-Column Reagent

rba 11/20/2018

INJECTION LOG: 181205A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
1	BLANK	BLANK	1	Hexavalent Chromium	11/19/18 9:28 AM	Not Reported
2	iBLANK	iBLANK	1	Hexavalent Chromium	11/19/18 9:39 AM	Reported
3	STD-0.2 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:49 AM	Reported
4	STD-1.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:59 AM	Reported
5	STD-5.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:11 AM	Reported
6	STD-10.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:20 AM	Reported
7	STD-15.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:30 AM	Reported
8	STD-20.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:39 AM	Reported
9	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 8:00 AM	Not Reported
10	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 8:11 AM	Not Reported
11	CCV-1	CCV	1	Hexavalent Chromium	12/05/18 8:20 AM	Reported
12	PQL@0.2ppb	CCV2	1	Hexavalent Chromium	12/05/18 8:30 AM	Reported
13	CCB-1	CCB	1	Hexavalent Chromium	12/05/18 8:39 AM	Reported
14	MB-R130313	MBLK	1	Hexavalent Chromium	12/05/18 8:49 AM	Reported
15	LCS-R130313	LCS	1	Hexavalent Chromium	12/05/18 8:58 AM	Reported
16	N033230-001A	SAMP	1	Hexavalent Chromium	12/05/18 9:08 AM	Reported
17	N033230-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:17 AM	Reported
18	N033231-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:27 AM	Reported
19	N033230-001AMS	MS	1	Hexavalent Chromium	12/05/18 9:36 AM	Reported
20	N033230-002AMS	MS	1	Hexavalent Chromium	12/05/18 9:46 AM	Reported
21	N033231-002AMS	MS	1	Hexavalent Chromium	12/05/18 9:55 AM	Reported
22	N033230-001AMSD	MSD	1	Hexavalent Chromium	12/05/18 10:04 AM	Reported
23	N033230-002A	SAMP	5	Hexavalent Chromium	12/05/18 10:14 AM	Not Reported
24	CCV-2	CCV1	1	Hexavalent Chromium	12/05/18 10:23 AM	Reported
25	CCB-2	CCB	1	Hexavalent Chromium	12/05/18 10:33 AM	Reported
26	N033230-002AMS	MS	5	Hexavalent Chromium	12/05/18 10:42 AM	Not Reported
27	N033238-001A	SAMP	1	Hexavalent Chromium	12/05/18 10:52 AM	Reported
28	N033238-002A	SAMP	1	Hexavalent Chromium	12/05/18 11:01 AM	Reported
29	N033238-003A	SAMP	1	Hexavalent Chromium	12/05/18 11:11 AM	Reported
30	N033238-004A	SAMP	1	Hexavalent Chromium	12/05/18 11:20 AM	Reported
31	N033238-005A	SAMP	1	Hexavalent Chromium	12/05/18 11:30 AM	Reported
32	N033238-001ADUP	DUP	1	Hexavalent Chromium	12/05/18 11:39 AM	Reported
33	N033238-001AMS	MS	1	Hexavalent Chromium	12/05/18 11:49 AM	Reported
34	N033238-002AMS	MS	1	Hexavalent Chromium	12/05/18 11:58 AM	Reported
35	N033238-003AMS	MS	1	Hexavalent Chromium	12/05/18 12:07 PM	Reported
36	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 12:17 PM	Not Reported
37	CCV-3	CCV	1	Hexavalent Chromium	12/05/18 12:26 PM	Reported
38	CCB-3	CCB	1	Hexavalent Chromium	12/05/18 1:30 PM	Reported
39	N033238-004AMS	MS	1	Hexavalent Chromium	12/05/18 1:41 PM	Reported
40	N033238-005AMS	MS	1	Hexavalent Chromium	12/05/18 1:50 PM	Reported
41	N033238-006A	SAMP	2	Hexavalent Chromium	12/05/18 2:00 PM	Reported
42	N033238-007A	SAMP	1	Hexavalent Chromium	12/05/18 2:09 PM	Reported

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Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
43	N033238-008A	SAMP	1	Hexavalent Chromium	12/05/18 2:19 PM	Reported
44	N033238-009A	SAMP	1	Hexavalent Chromium	12/05/18 2:28 PM	Reported
45	N033238-010A	SAMP	1	Hexavalent Chromium	12/05/18 2:38 PM	Reported
46	N033238-006AMS	MS	5	Hexavalent Chromium	12/05/18 2:47 PM	Not Reported
47	N033238-007AMS	MS	1	Hexavalent Chromium	12/05/18 2:57 PM	Reported
48	N033238-008AMS	MS	1	Hexavalent Chromium	12/05/18 3:06 PM	Reported
49	CCV-4	CCV1	1	Hexavalent Chromium	12/05/18 3:16 PM	Reported
50	CCB-4	CCB	1	Hexavalent Chromium	12/05/18 3:25 PM	Reported
51	N033238-009AMS	MS	1	Hexavalent Chromium	12/05/18 3:35 PM	Reported
52	N033238-010AMS	MS	1	Hexavalent Chromium	12/05/18 3:44 PM	Reported
53	N033238-006AMS	MS	2	Hexavalent Chromium	12/05/18 3:54 PM	Reported
54	N033238-011A	SAMP	1	Hexavalent Chromium	12/05/18 4:03 PM	Reported
55	N033238-012A	SAMP	1	Hexavalent Chromium	12/05/18 4:12 PM	Reported
56	N033238-013A	SAMP	5	Hexavalent Chromium	12/05/18 4:22 PM	Not Reported
57	N033238-014A	SAMP	1	Hexavalent Chromium	12/05/18 4:31 PM	Reported
58	N033238-015A	SAMP	1	Hexavalent Chromium	12/05/18 4:41 PM	Reported
59	N033238-011AMS	MS	1	Hexavalent Chromium	12/05/18 4:50 PM	Reported
60	N033238-012AMS	MS	1	Hexavalent Chromium	12/05/18 5:00 PM	Reported
61	CCV-5	CCV	1	Hexavalent Chromium	12/05/18 5:09 PM	Reported
62	CCB-5	CCB	1	Hexavalent Chromium	12/05/18 5:19 PM	Not Reported
63	CCB-5	CCB	1	Hexavalent Chromium	12/05/18 5:36 PM	Reported
64	N033238-013AMS	MS	5	Hexavalent Chromium	12/05/18 5:47 PM	Not Reported
65	N033238-014AMS	MS	1	Hexavalent Chromium	12/05/18 5:56 PM	Reported
66	N033238-015AMS	MS	1	Hexavalent Chromium	12/05/18 6:06 PM	Reported
67	N033236-001B	SAMP	100	Hexavalent Chromium	12/05/18 6:15 PM	Reported
68	N033236-001BMS	MS	100	Hexavalent Chromium	12/05/18 6:38 PM	Reported
69	N033236-002C	SAMP	1	Hexavalent Chromium	12/05/18 6:49 PM	Reported
70	N033236-002CMS	MS	1	Hexavalent Chromium	12/05/18 6:58 PM	Reported
71	N033224-001A	SAMP	1	Hexavalent Chromium	12/05/18 7:07 PM	Not Reported
72	N033238-013AMS	MS	5	Hexavalent Chromium	12/05/18 7:17 PM	Not Reported
73	N033238-013A	SAMP	5	Hexavalent Chromium	12/05/18 7:26 PM	Not Reported
74	CCV-6	CCV1	1	Hexavalent Chromium	12/05/18 7:36 PM	Reported
75	CCB-6	CCB	1	Hexavalent Chromium	12/05/18 7:45 PM	Reported
76	LCS-R130358	LCS	1	Hexavalent Chromium	12/05/18 7:55 PM	Reported
77	MB-R130358	MBLK	1	Hexavalent Chromium	12/05/18 8:04 PM	Reported
78	N033237-001A	SAMP	1	Hexavalent Chromium	12/05/18 8:14 PM	Reported
79	N033237-001AMS	MS	1	Hexavalent Chromium	12/05/18 8:23 PM	Reported
80	N033237-002A	SAMP	100	Hexavalent Chromium	12/05/18 8:33 PM	Reported
81	N033237-002AMS	MS	100	Hexavalent Chromium	12/05/18 8:42 PM	Reported
82	N033237-002AMSD	MSD	100	Hexavalent Chromium	12/05/18 8:52 PM	Reported
83	N033224-001A	SAMP	5	Hexavalent Chromium	12/05/18 9:01 PM	Reported
84	N033224-001ADUP	DUP	5	Hexavalent Chromium	12/05/18 9:10 PM	Reported

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Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
85	N033233-001A	SAMP	1	Hexavalent Chromium	12/05/18 9:20 PM	Reported
86	CCV-7	CCV	1	Hexavalent Chromium	12/05/18 9:29 PM	Reported
87	CCB-7	CCB	1	Hexavalent Chromium	12/05/18 9:39 PM	Reported
88	N033233-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:48 PM	Reported
89	N033213-004A	SAMP	1	Hexavalent Chromium	12/05/18 9:58 PM	Not Reported
90	N033213-004AMS	MS	1	Hexavalent Chromium	12/05/18 10:07 PM	Not Reported
91	N033213-008A	SAMP	1	Hexavalent Chromium	12/05/18 10:17 PM	Not Reported
92	N033213-008AMS	MS	1	Hexavalent Chromium	12/05/18 10:26 PM	Not Reported
93	N033213-012A	SAMP	1	Hexavalent Chromium	12/05/18 10:36 PM	Not Reported
94	N033213-012AMS	MS	1	Hexavalent Chromium	12/05/18 10:45 PM	Not Reported
95	N033213-014A	SAMP	1	Hexavalent Chromium	12/05/18 10:55 PM	Not Reported
96	N033213-014AMS	MS	1	Hexavalent Chromium	12/05/18 11:04 PM	Not Reported
97	N033213-015A	SAMP	1	Hexavalent Chromium	12/05/18 11:13 PM	Not Reported
98	CCV-8	CCV1	1	Hexavalent Chromium	12/05/18 11:23 PM	Reported
99	CCB-8	CCB	1	Hexavalent Chromium	12/05/18 11:32 PM	Reported
100	N033213-015AMS	MS	1	Hexavalent Chromium	12/05/18 11:42 PM	Not Reported
101	N033213-016A	SAMP	1	Hexavalent Chromium	12/05/18 11:51 PM	Not Reported
102	N033213-016AMS	MS	1	Hexavalent Chromium	12/06/18 12:01 AM	Not Reported
103	N033213-017A	SAMP	1	Hexavalent Chromium	12/06/18 12:10 AM	Not Reported
104	N033213-017AMS	MS	1	Hexavalent Chromium	12/06/18 12:20 AM	Not Reported
105	N033232-002B	SAMP	1	Hexavalent Chromium	12/06/18 12:29 AM	Reported
106	N033232-002BMS	MS	1	Hexavalent Chromium	12/06/18 12:39 AM	Reported
107	LCS-1	LCS	1	Hexavalent Chromium	12/06/18 12:48 AM	Reported
108	LCS-2	LCS	1	Hexavalent Chromium	12/06/18 12:58 AM	Reported
109	LCS-3	LCS	1	Hexavalent Chromium	12/06/18 1:07 AM	Reported
110	CCV-9	CCV	1	Hexavalent Chromium	12/06/18 1:17 AM	Reported
111	CCB-9	CCB	1	Hexavalent Chromium	12/06/18 1:26 AM	Reported
112	LCS-4	LCS	1	Hexavalent Chromium	12/06/18 1:35 AM	Reported
113	CCV-10	CCV1	1	Hexavalent Chromium	12/06/18 1:45 AM	Reported
114	CCB-10	CCB	1	Hexavalent Chromium	12/06/18 1:54 AM	Reported

Injection Log Summary

Sequence Details

Name:	**IC-07_181205A**	*Created On:*	**24/Jul/12 17:17:21**
Directory:	**Instrument Data\IC-7\2018**	*Created By:*	**ics 5000**
Data Vault:	**ChromeleonLocal2**	*Updated On:*	**06/Dec/18 02:25:07**
No. of Injections:	**117**	*Updated By:*	**ics 5000**

Injection Details

No.	Injection Name	Position	Volume µL	Type	Level	Inject Time	Status	Comment
1	BLANK	1	1000	Unknown		11/19/2018 09:28	Finished	BLANK
2	iBLANK	2	1000	Unknown		11/19/2018 09:39	Finished	INSTRUMENT BLANK
3	STD1-0.2 ppb	3	1000	Calibration Standard	01	11/19/2018 09:49	Finished	0.2 ppb, IWST-181022C
4	STD2-1.0 ppb	4	1000	Calibration Standard	02	11/19/2018 09:59	Finished	1.0 ppb, IWST-181022C
5	STD3-5.0 ppb	5	1000	Calibration Standard	03	11/19/2018 10:11	Finished	5.0 ppb, IWST-181022C
6	STD4-10.0 ppb	6	1000	Calibration Standard	04	11/19/2018 10:20	Finished	10 ppb, IWST-181022C
7	STD5-15.0 ppb	7	1000	Calibration Standard	05	11/19/2018 10:30	Finished	15 ppb, IWST-181022C
8	STD6-20.0 ppb	8	1000	Calibration Standard	06	11/19/2018 10:39	Finished	20 ppb, IWST-181022C
9	BLANK	1	1000	Unknown		12/05/2018 08:00	Finished	BLANK
10	BLANK	2	1000	Unknown		12/05/2018 08:11	Finished	BLANK
11	CCV-1,CCV,1,	3	1000	Unknown		12/05/2018 08:20	Finished	CCV @5ppb, IWST-181022C
12	PQL@0.2ppb,CCV2,1	4	1000	Unknown		12/05/2018 08:30	Finished	PQL @ 0.2ppb
13	CCB-1,CCB,1,	5	1000	Unknown		12/05/2018 08:39	Finished	CCB R181127D
14	MB-H2O,MBLK,1,	6	1000	Unknown		12/05/2018 08:49	Finished	MB R181127D
15	LCS-H2O,LCS,1,	7	1000	Unknown		12/05/2018 08:58	Finished	LCS @5ppb, IWST-181022D
16	N033230-001A,SAMF	8	1000	Unknown		12/05/2018 09:08	Finished	SAMP,10mL
17	N033230-002A,SAMF	9	1000	Unknown		12/05/2018 09:17	Finished	SAMP,10mL
18	N033231-002A,SAMF	10	1000	Unknown		12/05/2018 09:27	Finished	SAMP,10mL
19	N033230-001AMS,MS	11	1000	Unknown		12/05/2018 09:36	Finished	MS (1ppb), IWST-181022D,0.5
20	N033230-002AMS,MS	13	1000	Unknown		12/05/2018 09:46	Finished	MS (1ppb), IWST-181022D,0.5
21	N033231-002AMS,MS	14	1000	Unknown		12/05/2018 09:55	Finished	MS (1ppb), IWST-181022D,2>1
22	N033230-001AMSD,M	16	1000	Unknown		12/05/2018 10:04	Finished	MSD (1ppb), IWST-181022D,2
23	N033230-002A,SAMF	17	1000	Unknown		12/05/2018 10:14	Finished	SAMP,2>10mL
24	CCV-2,CCV1,1,	18	1000	Unknown		12/05/2018 10:23	Finished	CCV @10ppb, IWST-181022C
25	CCB-2,CCB,1,	19	1000	Unknown		12/05/2018 10:33	Finished	CCB R181127D
26	N033230-002AMS,MS	20	1000	Unknown		12/05/2018 10:42	Finished	MS (1ppb), IWST-181022D,2>1
27	N033238-001A,SAMF	21	1000	Unknown		12/05/2018 10:52	Finished	SAMP,10mL
28	N033238-002A,SAMF	22	1000	Unknown		12/05/2018 11:01	Finished	SAMP,10mL
29	N033238-003A,SAMF	23	1000	Unknown		12/05/2018 11:11	Finished	SAMP,10mL
30	N033238-004A,SAMF	24	1000	Unknown		12/05/2018 11:20	Finished	SAMP,10mL
31	N033238-005A,SAMF	25	1000	Unknown		12/05/2018 11:30	Finished	SAMP,10mL
32	N033238-001ADUP,D	26	1000	Unknown		12/05/2018 11:39	Finished	DUP,10mL
33	N033238-001AMS,MS	27	1000	Unknown		12/05/2018 11:49	Finished	MS (1ppb), IWST-181022D,2>1
34	N033238-002AMS,MS	28	1000	Unknown		12/05/2018 11:58	Finished	MS (1ppb), IWST-181022D,2>1
35	N033238-003AMS,MS	29	1000	Unknown		12/05/2018 12:07	Finished	MS (1ppb), IWST-181022D,2>1
36	BLANK	30	1000	Unknown		12/05/2018 12:17	Finished	CCV @5ppb, IWST-181022C
37	CCV-3,CCV,1,	31	1000	Unknown		12/05/2018 12:26	Finished	CCB R181127D
38	CCB-3,CCB,1,	1	1000	Unknown		12/05/2018 13:30	Finished	CCB R181127D
39	N033238-004AMS,MS	2	1000	Unknown		12/05/2018 13:41	Finished	MS (1ppb), IWST-181022D,10
40	N033238-005AMS,MS	3	1000	Unknown		12/05/2018 13:50	Finished	MS (1ppb), IWST-181022D,10
41	N033238-006A,SAMF	4	1000	Unknown		12/05/2018 14:00	Finished	SAMP,5>10mL
42	N033238-007A,SAMF	5	1000	Unknown		12/05/2018 14:09	Finished	SAMP,10mL
43	N033238-008A,SAMF	6	1000	Unknown		12/05/2018 14:19	Finished	SAMP,10mL
44	N033238-009A,SAMF	7	1000	Unknown		12/05/2018 14:28	Finished	SAMP,10mL
45	N033238-010A,SAMF	8	1000	Unknown		12/05/2018 14:38	Finished	SAMP,10mL
46	N033238-006AMS,MS	9	1000	Unknown		12/05/2018 14:47	Finished	MS (5ppb), IWST-181022D,2>1
47	N033238-007AMS,MS	10	1000	Unknown		12/05/2018 14:57	Finished	MS (5ppb), IWST-181022D,10
48	N033238-008AMS,MS	11	1000	Unknown		12/05/2018 15:06	Finished	MS (1ppb), IWST-181022D,10
49	CCV-4,CCV1,1,	12	1000	Unknown		12/05/2018 15:16	Finished	CCV @10ppb, IWST-181022C
50	CCB-4,CCB,1,	13	1000	Unknown		12/05/2018 15:25	Finished	CCB R181127D
51	N033238-009AMS,MS	14	1000	Unknown		12/05/2018 15:35	Finished	MS (1ppb), IWST-181022D,10
52	N033238-010AMS,MS	15	1000	Unknown		12/05/2018 15:44	Finished	MS (1ppb), IWST-181022D,10
53	N033238-006AMS,MS	16	1000	Unknown		12/05/2018 15:54	Finished	MS (5ppb), IWST-181022D,5>1
54	N033238-011A,SAMF	17	1000	Unknown		12/05/2018 16:03	Finished	SAMP,10mL
55	N033238-012A,SAMF	18	1000	Unknown		12/05/2018 16:12	Finished	SAMP,10mL
56	N033238-013A,SAMF	19	1000	Unknown		12/05/2018 16:22	Finished	SAMP,2>10mL
57	N033238-014A,SAMF	20	1000	Unknown		12/05/2018 16:31	Finished	SAMP,10mL
58	N033238-015A,SAMF	21	1000	Unknown		12/05/2018 16:41	Finished	SAMP,10mL
59	N033238-011AMS,MS	22	1000	Unknown		12/05/2018 16:50	Finished	MS (1ppb), IWST-181022D,10
60	N033238-012AMS,MS	23	1000	Unknown		12/05/2018 17:00	Finished	MS (1ppb), IWST-181022D,10

61	CCV-5,CCV,1,	24	1000	Unknown		12/05/2018 17:09	Finished	CCV @5ppb, IWST-181022C
62	CCB-5,CCB,1,	25	1000	Unknown		12/05/2018 17:19	Finished	CCB R181127D
63	CCB-5,CCB,1,	25	1000	Unknown		12/05/2018 17:36	Finished	CCB R181127D
64	N033238-013AMS,MS	26	1000	Unknown		12/05/2018 17:47	Finished	MS (5ppb), IWST-181022D,2>1
65	N033238-014AMS,MS	27	1000	Unknown		12/05/2018 17:56	Finished	MS (1ppb), IWST-181022D,10
66	N033238-015AMS,MS	28	1000	Unknown		12/05/2018 18:06	Finished	MS (1ppb), IWST-181022D,10
67	N033236-001B,SAMP	29	1000	Unknown		12/05/2018 18:15	Finished	SAMP,0.100>10mL
68	N033236-001BMS,MS	1	1000	Unknown		12/05/2018 18:38	Finished	MS (5ppb), IWST-181022D,0.1
69	N033236-002C,SAMP	2	1000	Unknown		12/05/2018 18:49	Finished	SAMP,10mL
70	N033236-002CMS,MS	3	1000	Unknown		12/05/2018 18:58	Finished	MSD (1ppb), IWST-181022D,10
71	N033224-001A,SAMP	4	1000	Unknown		12/05/2018 19:07	Finished	SAMP,10mL
72	~~N033238-013A,SAMP~~	5	1000	Unknown		12/05/2018 19:17	Finished	SAMP,2>10mL N033238-013AMS,MS,5
73	~~N033238-013AMS,MS~~	6	1000	Unknown		12/05/2018 19:26	Finished	MS (5ppb), IWST-181022D,2>1 N033238-013A,SAMP,5
74	CCV-6,CCV1,1,	7	1000	Unknown		12/05/2018 19:36	Finished	CCV @10ppb, IWST-181022C
75	CCB-6,CCB,1,	8	1000	Unknown		12/05/2018 19:45	Finished	CCB R181127D
76	LCS-2,LCS,1,	9	1000	Unknown		12/05/2018 19:55	Finished	LCS @5ppb, IWST-181022D
77	MB-2,MBLK,1,	10	1000	Unknown		12/05/2018 20:04	Finished	MB R181127D
78	N033237-001A,SAMP	11	1000	Unknown		12/05/2018 20:14	Finished	SAMP,10mL
79	N033237-001AMS,MS	12	1000	Unknown		12/05/2018 20:23	Finished	MS (1ppb), IWST-181022D,10
80	N033237-002A,SAMP	13	1000	Unknown		12/05/2018 20:33	Finished	SAMP,0.100>10mL
81	N033237-002AMS,MS	14	1000	Unknown		12/05/2018 20:42	Finished	MS (5ppb), IWST-181022D,0.1
82	N033237-002AMSD,M	15	1000	Unknown		12/05/2018 20:52	Finished	MSD (5ppb), IWST-181022D,0
83	N033224-001A,SAMP	16	1000	Unknown		12/05/2018 21:01	Finished	SAMP,2>10mL
84	N033224-001ADUP,D	17	1000	Unknown		12/05/2018 21:10	Finished	DUP,10mL
85	N033233-001A,SAMP	18	1000	Unknown		12/05/2018 21:20	Finished	SAMP,10mL
86	CCV-7,CCV,1,	19	1000	Unknown		12/05/2018 21:29	Finished	CCV @5ppb, IWST-181022C
87	CCB-7,CCB,1,	20	1000	Unknown		12/05/2018 21:39	Finished	CCB R181127D
88	N033233-002A,SAMP	21	1000	Unknown		12/05/2018 21:48	Finished	SAMP,10mL
89	N033213-004A,SAMP	22	1000	Unknown		12/05/2018 21:58	Finished	SAMP,10mL
90	N033213-004AMS,MS	23	1000	Unknown		12/05/2018 22:07	Finished	MS (1ppb), IWST-181022D,10
91	N033213-008A,SAMP	24	1000	Unknown		12/05/2018 22:17	Finished	SAMP,10mL
92	N033213-008AMS,MS	25	1000	Unknown		12/05/2018 22:26	Finished	MS (1ppb), IWST-181022D,10
93	N033213-012A,SAMP	26	1000	Unknown		12/05/2018 22:36	Finished	SAMP,10mL
94	N033213-012AMS,MS	27	1000	Unknown		12/05/2018 22:45	Finished	MS (1ppb), IWST-181022D,10
95	N033213-014A,SAMP	28	1000	Unknown		12/05/2018 22:55	Finished	SAMP,10mL
96	N033213-014AMS,MS	29	1000	Unknown		12/05/2018 23:04	Finished	MS (1ppb), IWST-181022D,10
97	N033213-015A,SAMP	30	1000	Unknown		12/05/2018 23:13	Finished	SAMP,10mL
98	CCV-8,CCV1,1,	31	1000	Unknown		12/05/2018 23:23	Finished	CCV @10ppb, IWST-181022C
99	CCB-8,CCB,1,	32	1000	Unknown		12/05/2018 23:32	Finished	CCB R181127D
100	N033213-015AMS,MS	33	1000	Unknown		12/05/2018 23:42	Finished	MS (1ppb), IWST-181022D,10
101	N033213-016A,SAMP	34	1000	Unknown		12/05/2018 23:51	Finished	SAMP,10mL
102	N033213-016AMS,MS	35	1000	Unknown		12/06/2018 00:01	Finished	MS (1ppb), IWST-181022D,10
103	N033213-017A,SAMP	36	1000	Unknown		12/06/2018 00:10	Finished	SAMP,10mL
104	N033213-017AMS,MS	37	1000	Unknown		12/06/2018 00:20	Finished	MS (1ppb), IWST-181022D,10
105	N033232-002B,SAMP	38	1000	Unknown		12/06/2018 00:29	Finished	SAMP,10mL
106	N033232-002BMS,MS	39	1000	Unknown		12/06/2018 00:39	Finished	MS (1ppb), IWST-181022D,10
107	LCS-1,LCS,1,	40	1000	Unknown		12/06/2018 00:48	Finished	LCS @5ppb, IWST-181022D
108	LCS-2,LCS,1,	41	1000	Unknown		12/06/2018 00:58	Finished	LCS @5ppb, IWST-181022D
109	LCS-3,LCS,1,	42	1000	Unknown		12/06/2018 01:07	Finished	LCS @5ppb, IWST-181022D
110	CCV-9,CCV,1,	43	1000	Unknown		12/06/2018 01:17	Finished	CCV @5ppb, IWST-181022C
111	CCB-9,CCB,1,	44	1000	Unknown		12/06/2018 01:26	Finished	CCB R181127D
112	LCS-4,LCS,1,	45	1000	Unknown		12/06/2018 01:35	Finished	LCS @5ppb, IWST-181022D
113	CCV-10,CCV1,1,	46	1000	Unknown		12/06/2018 01:45	Finished	CCV @10ppb, IWST-181022C
114	CCB-10,CCB,1,	47	1000	Unknown		12/06/2018 01:54	Finished	CCB R181127D
115	SHUTDOWN	48	1000	Unknown		12/06/2018 02:04	Finished	
116	Eluent: R181203A	49	1000	Unknown		n.a.	Finished	Eluent
117	PCR: R181204A	50	1000	Unknown		n.a.	Finished	Post-Column Reagent

SAMPLE PREPARATION LOG

Hexavalent Chromium Preparation and Runlog

Sample Preparation

Date Prepared: 12/5/18
Time Prepared: 0810
Prepared By: HSL

Slope: 95.9%
pH 4: 4.03
7: 7.02
10: 10.01

Reagent ID:
Sulfuric Acid: 10304
Diphenylcarbazide: CINV-181102A
NH4OH + NH4SO4 eluent: R181203A
NH4OH + NH4SO4 buffer: R181127D

	Sample ID.	pH of sample	pH after treatment	Initial Volume of sample	Final Volume after buffer add'n	Volume of buffer added	Comments
1)	N033230 - 001A	9.50	–	– 250ml	– 250ml		
2)	2A	9.56	–				
3)	N033231 - 002A	9.67	–				
4)	N033238 - 001A	9.58	–				
5)	2A	9.57	–				
6)	3A	9.54	–				
7)	4A	9.57	–				
8)	5A	9.58	–				
9)	6A	9.68	–				
10)	7A	9.64	–				
11)	8A	9.58	–				
12)	9A	9.56	–				
13)	10A	9.54	–				
14)	11A	9.69	–				
15)	12A	9.57	–				
	13A	9.70	–				

Sample Preparation

Date Prepared: 12/5/18
Time Prepared: 0810
Prepared By: HSL / NMA

Reagent ID:
Sulfuric Acid: 10304
Diphenylcarbazide: CINV-181102A
NH4OH + NH4SO4 eluent: R181203A / M081205B
NH4OH + NH4SO4 buffer: R181127D / M081012B / M081012B

6N NaOH
NaOH

	Sample ID.	pH of sample	pH after treatment	Initial Volume of sample	Final Volume after buffer add'n	Volume of buffer added	Comments
1)	N033238 - 014A	9.64	–	– 250ml	– 250ml		
2)	15A	9.60	–				
3)	N033236 - 001B	7.61	9.68			+5ml M081127D	
4)	002C	7.28	9.70			+5 " "	
5)	N033224 - 001A	9.59	–				
6)	N033233 - 001A	9.54	–				
7)	2A	9.64	–				
8)	N033237 - 001A	9.44	–				
9)	2A	9.36	–				
10)	N033239 - 001A	9.64	–				1/2
11)	1A	9.63	–				2/2
12)	2A	9.41	–				1/2
13)	2A	9.47	–				2/2
14)	3A	8.18	9.31			+10 drops NaOH	1/2
15)	3A	8.21	9.32			+ 10 " "	2/2
	4A	9.70	–				1/2

Logbook No. 15

rba 12/9/2018

INITIAL CALIBRATION DATA SUMMARY

(EPA 218.6) - INITIAL CALIBRATION

Instrument ID: IC-07
Date Calibrated: 11/19/2018

Initial Calibration:

Hexavalent Chromium	STD1	STD2	STD3	STD4	STD5	STD6	
COMPOUND, in ug/L	0.2	1	5	10	15	20	R^2
Area,mAU*min	0.0594	0.2450	1.2597	2.5370	3.8008	5.0507	1.0000

	Stock	Working
Standard Concentration:	1,000,000 PPB	1,000 PPB
Standard ID:	ISST-170814H	IWST-181022C

Calibration Acceptance Criteria: > 0.999 Correlation

* Please note that the instrument printout for Area were represented in three decimal places. The exact values are represented in the ICAL summary for calculation purposes.

INITIAL CALIBRATION AND CONTINUING CALIBRATION VERIFICATION SUMMARY

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **ICV** SampType: **ICV** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ICV** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **11/19/2018** SeqNo: **3221125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.949	0.20	5.000	0	99.0	90	110				

Sample ID **PQL@0.2ppb** SampType: **CCV2** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **11/19/2018** SeqNo: **3221126**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.219	0.20	0.2000	0	109	80	120				

Sample ID **CCV-1** SampType: **CCV** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **CCV** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221128**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.953	0.20	5.000	0	99.1	95	105				

Sample ID **PQL@0.2ppb** SampType: **CCV2** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221129**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.229	0.20	0.2000	0	114	80	120				

Sample ID **CCV-2** SampType: **CCV1** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **130313**
Client ID: **ZZZZZZ** Batch ID: **R130313** TestNo: **EPA 218.6** Analysis Date: **12/5/2018** SeqNo: **3221140**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	10.221	0.20	10.00	0	102	95	105				

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	CCV-3	SampType:	CCV	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCV	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221185

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.995	0.20	5.000	0	99.9	95	105				

Sample ID	CCV-4	SampType:	CCV1	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	ZZZZZZ	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221196

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	10.076	0.20	10.00	0	101	95	105				

Sample ID	CCV-5	SampType:	CCV	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCV	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221207

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.079	0.20	5.000	0	102	95	105				

Sample ID	CCV-6	SampType:	CCV1	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	ZZZZZZ	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221215

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	10.167	0.20	10.00	0	102	95	105				

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		

SUMMARY OF INSTRUMENT BLANKS

ASSET Laboratories

Date: *06-Dec-18*

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	ICB	SampType:	ICB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	ICB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	11/19/2018	SeqNo:	3221127

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

Sample ID	CCB-1	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221130

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

Sample ID	CCB-2	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221141

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

Sample ID	CCB-3	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221186

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.043	0.20									

Sample ID	CCB-4	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221197

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

CCB-3 has detect > 0.02ppb, however, N033236 samples were enclosed between CCB-5 and CCB-6. Also samples are either non-detect or >5x the CCB detection.

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		

Nancy 12/18/2018

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	CCB-5	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221208

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

Sample ID	CCB-6	SampType:	CCB	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	130313
Client ID:	CCB	Batch ID:	R130313	TestNo:	EPA 218.6			Analysis Date:	12/5/2018	SeqNo:	3221216

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

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		

RETENTION TIME SUMMARY

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-07

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name	Retention Time	Evaluation
ICV	4.156	
CCV-1	4.106	
CCV-2	4.115	
CCV-3	4.140	
CCV-4	4.115	
CCV-5	4.115	
CCV-6	4.115	
CCV-7	4.106	
CCV-8	4.115	
CCV-9	4.115	
CCV-10	4.115	

Average	4.116
Actual RT Window	4.036 - 4.196
Applied RT Window	3.916 - 4.316

MB-R130313	N.A.	N.A.
LCS-R130313	4.106	PASS
N033230-001A	N.A.	N.A.
N033230-002A	N.A.	N.A.
N033231-002A	4.081	PASS
N033230-001AMS	4.015	PASS
N033230-002AMS	3.981	PASS
N033231-002AMS	4.115	PASS
N033230-001AMSD	4.015	PASS
N033230-002A	N.A.	N.A.
N033230-002AMS	4.140	PASS
N033238-001A	3.965	PASS
N033238-002A	3.973	PASS
N033238-003A	3.981	PASS
N033238-004A	3.981	PASS
N033238-005A	3.965	PASS
N033238-001ADUP	3.973	PASS

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-07

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name	Retention Time	Evaluation
ICV	4.156	
CCV-1	4.106	
CCV-2	4.115	
CCV-3	4.140	
CCV-4	4.115	
CCV-5	4.115	
CCV-6	4.115	
CCV-7	4.106	
CCV-8	4.115	
CCV-9	4.115	
CCV-10	4.115	
Average	4.116	
Actual RT Window	4.036 - 4.196	
Applied RT Window	3.916 - 4.316	
N033238-001AMS	3.973	PASS
N033238-002AMS	3.973	PASS
N033238-003AMS	3.973	PASS
N033238-004AMS	3.981	PASS
N033238-005AMS	3.981	PASS
N033238-006A	4.073	PASS
N033238-007A	4.031	PASS
N033238-008A	3.965	PASS
N033238-009A	3.948	PASS
N033238-010A	3.973	PASS
N033238-006AMS	4.115	PASS
N033238-007AMS	4.023	PASS
N033238-008AMS	3.981	PASS
N033238-009AMS	3.973	PASS
N033238-010AMS	3.973	PASS
N033238-006AMS	4.081	PASS
N033238-011A	3.981	PASS
N033238-012A	3.948	PASS

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-07

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name	Retention Time	Evaluation
ICV	4.156	
CCV-1	4.106	
CCV-2	4.115	
CCV-3	4.140	
CCV-4	4.115	
CCV-5	4.115	
CCV-6	4.115	
CCV-7	4.106	
CCV-8	4.115	
CCV-9	4.115	
CCV-10	4.115	
Average	4.116	
Actual RT Window	4.036 - 4.196	
Applied RT Window	3.916 - 4.316	
N033238-013A	4.115	PASS
N033238-014A	N.A.	N.A.
N033238-015A	3.981	PASS
N033238-011AMS	3.973	PASS
N033238-012AMS	3.973	PASS
N033238-013AMS	4.106	PASS
N033238-014AMS	4.115	PASS
N033238-015AMS	3.973	PASS
N033236-001B	4.115	PASS
N033236-001BMS	4.115	PASS
N033236-002C	N.A.	N.A.
N033236-002CMS	3.956	PASS
N033224-001A	4.106	PASS
N033238-013AMS	4.106	PASS
N033238-013A	4.106	PASS
LCS-R130358	4.115	PASS
MB-R130358	N.A.	N.A.
N033237-001A	4.098	PASS

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-07

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name	Retention Time	Evaluation
ICV	4.156	
CCV-1	4.106	
CCV-2	4.115	
CCV-3	4.140	
CCV-4	4.115	
CCV-5	4.115	
CCV-6	4.115	
CCV-7	4.106	
CCV-8	4.115	
CCV-9	4.115	
CCV-10	4.115	
Average	4.116	
Actual RT Window	4.036 - 4.196	
Applied RT Window	3.916 - 4.316	
N033237-001AMS	4.090	PASS
N033237-002A	4.115	PASS
N033237-002AMS	4.115	PASS
N033237-002AMSD	4.115	PASS
N033224-001A	4.115	PASS
N033224-001ADUP	4.106	PASS
N033233-001A	4.098	PASS
N033233-002A	N.A.	N.A.
N033213-004A	3.973	PASS
N033213-004AMS	3.973	PASS
N033213-008A	3.981	PASS
N033213-008AMS	3.981	PASS
N033213-012A	3.973	PASS
N033213-012AMS	3.973	PASS
N033213-014A	3.973	PASS
N033213-014AMS	3.981	PASS
N033213-015A	3.981	PASS
N033213-015AMS	3.973	PASS

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-07

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name	Retention Time	Evaluation
ICV	4.156	
CCV-1	4.106	
CCV-2	4.115	
CCV-3	4.140	
CCV-4	4.115	
CCV-5	4.115	
CCV-6	4.115	
CCV-7	4.106	
CCV-8	4.115	
CCV-9	4.115	
CCV-10	4.115	
Average	4.116	
Actual RT Window	4.036 - 4.196	
Applied RT Window	3.916 - 4.316	
N033213-016A	3.965	PASS
N033213-016AMS	3.965	PASS
N033213-017A	3.965	PASS
N033213-017AMS	3.965	PASS
N033232-002B	4.106	PASS
N033232-002BMS	4.115	PASS
LCS-1	4.115	PASS
LCS-2	4.115	PASS
LCS-3	4.115	PASS
LCS-4	4.115	PASS

MDL STUDY

METHOD DETECTION LIMIT 2017

Method Name: **HEXAVALENT CHROMIUM by Ion Chromatography**
Method Number: EPA 218.6
Analysis Date(s): 5/5/2017, 5/8/2017, 5/9/2017, 5/10/2017, 5/11/2017, 5/12/2017, 5/15/2017
Analyst: Ria Abes

Matrix: **WATER**
Unit: ug/L

Instrument Name: **IC-07**

Acceptance Criteria: MDL < spike < 10X MDL

Datafile	170505	170508	170509	170510	170511	170512	170515						
Analyte	**#1**	**#2**	**#3**	**#4**	**#5**	**#6**	**#7**	**Spike Conc., mg/L**	**SD**	**$t_{(n-1)}$ value**	**MDL**	**PQL**	**Remarks**
Hexavalent Chromium	0.1949	0.2135	0.1840	0.1828	0.2011	0.1936	0.1911	0.20	0.0105	3.143	**0.0331**	**0.20**	OK,meets criteria

Students' **t** Values at 99% CL

#	$t_{(n-1)}$
10	2.821
9	2.896
8	2.998
7	3.143

LOD & PQL Verification 2018 (1st Quarter)

Method Name: **Hexavalent Chromium by IC** Matrix: **WATER**
Method Number: EPA Method 218.6/7199 Unit: µg/L
Analysis Date(s): 3/21/2018
Analyst: Ria Abes

Instrument Name: **IC-07**

Compound	MDL	LOD Spike Conc., µg/L	LOD actual Conc., µg/L
Hexavalent Chromium	0.0331	0.100	0.116

Compound	PQL	PQL Spike Conc., µg/L	PQL actual Conc., µg/L	% Recovery
Hexavalent Chromium	0.200	0.200	0.201	**100**

RAW DATA

INITIAL CALIBRATION

INJECTION LOG: 181119A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
1	BLANK	BLANK	1	Hexavalent Chromium	11/19/18 9:28 AM	Not Reported
2	iBLANK	iBLANK	1	Hexavalent Chromium	11/19/18 9:39 AM	Reported
3	STD-0.2 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:49 AM	Reported
4	STD-1.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:59 AM	Reported
5	STD-5.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:11 AM	Reported
6	STD-10.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:20 AM	Reported
7	STD-15.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:30 AM	Reported
8	STD-20.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:39 AM	Reported
9	ICV	ICV	1	Hexavalent Chromium	11/19/18 10:48 AM	Reported
10	PQL@0.2ppb	CCV2	1	Hexavalent Chromium	11/19/18 10:58 AM	Reported
11	ICB	ICB	1	Hexavalent Chromium	11/19/18 11:07 AM	Reported
12	MB-R130040	MBLK	1	Hexavalent Chromium	11/19/18 11:17 AM	Reported
13	LCS-R130040	LCS	1	Hexavalent Chromium	11/19/18 11:26 AM	Reported
14	N033021-001A	SAMP	1	Hexavalent Chromium	11/19/18 11:36 AM	Not Reported
15	N033021-002A	SAMP	1	Hexavalent Chromium	11/19/18 11:45 AM	Not Reported
16	N033022-001A	SAMP	1	Hexavalent Chromium	11/19/18 11:55 AM	Reported
17	N033022-002A	SAMP	1	Hexavalent Chromium	11/19/18 12:04 PM	Reported
18	N033016-002B	SAMP	1	Hexavalent Chromium	11/19/18 12:14 PM	Reported
19	N033021-001A	SAMP	20	Hexavalent Chromium	11/19/18 12:23 PM	Reported
20	N033021-001AMS	MS	20	Hexavalent Chromium	11/19/18 12:33 PM	Reported
21	N033021-001AMSD	MSD	20	Hexavalent Chromium	11/19/18 12:42 PM	Reported
22	CCV-1	CCV1	1	Hexavalent Chromium	11/19/18 12:51 PM	Reported
23	CCB-1	CCB	1	Hexavalent Chromium	11/19/18 1:01 PM	Reported
24	N033021-001ADUP	DUP	20	Hexavalent Chromium	11/19/18 1:10 PM	Reported
25	N033021-002AMS	MS	1	Hexavalent Chromium	11/19/18 1:20 PM	Not Reported
26	N033021-002A	SAMP	5	Hexavalent Chromium	11/19/18 1:29 PM	Not Reported
27	N033021-002AMS	MS	5	Hexavalent Chromium	11/19/18 1:39 PM	Reported
28	N033022-001AMS	MS	1	Hexavalent Chromium	11/19/18 1:48 PM	Reported
29	N033022-002AMS	MS	1	Hexavalent Chromium	11/19/18 1:58 PM	Reported
30	N033016-002BMS	MS	1	Hexavalent Chromium	11/19/18 2:07 PM	Reported
31	N033021-002A	SAMP	5	Hexavalent Chromium	11/19/18 2:17 PM	Reported
32	N033021-002AMS	MS	1	Hexavalent Chromium	11/19/18 2:26 PM	Not Reported
33	CCV-2	CCV	1	Hexavalent Chromium	11/19/18 2:36 PM	Reported
34	CCB-2	CCB	1	Hexavalent Chromium	11/19/18 2:45 PM	Reported
35	N033021-001A	SAMP	20	Hexavalent Chromium	11/19/18 3:05 PM	Not Reported
36	N033021-001AMS	MS	20	Hexavalent Chromium	11/19/18 3:17 PM	Not Reported
37	CCV-3	CCV1	1	Hexavalent Chromium	11/19/18 3:26 PM	Not Reported
38	CCB-3	CCB	1	Hexavalent Chromium	11/19/18 3:36 PM	Not Reported

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Injection Log Summary

Sequence Details

Name:	**IC-07_181119A**	*Created On:*	**24/Jul/12 17:17:21**
Directory:	**Instrument Data\IC-7\2018**	*Created By:*	**ics 5000**
Data Vault:	**ChromeleonLocal2**	*Updated On:*	**19/Nov/18 16:06:19**
No. of Injections:	**41**	*Updated By:*	**ics 5000**

Injection Details

No.	Injection Name	Position	Volume µL	Type	Level	Inject Time	Status	Comment
1	BLANK	1	1000	Unknown		11/19/2018 09:28	Finished	BLANK
2	iBLANK	2	1000	Unknown		11/19/2018 09:39	Finished	INSTRUMENT BLANK
3	STD1-0.2 ppb	3	1000	Calibration Standard	01	11/19/2018 09:49	Finished	0.2 ppb, IWST-181022C
4	STD2-1.0 ppb	4	1000	Calibration Standard	02	11/19/2018 09:59	Finished	1.0 ppb, IWST-181022C
5	STD3-5.0 ppb	5	1000	Calibration Standard	03	11/19/2018 10:11	Finished	5.0 ppb, IWST-181022C
6	STD4-10.0 ppb	6	1000	Calibration Standard	04	11/19/2018 10:20	Finished	10 ppb, IWST-181022C
7	STD5-15.0 ppb	7	1000	Calibration Standard	05	11/19/2018 10:30	Finished	15 ppb, IWST-181022C
8	STD6-20.0 ppb	8	1000	Calibration Standard	06	11/19/2018 10:39	Finished	20 ppb, IWST-181022C
9	ICV,ICV,1,	9	1000	Unknown		11/19/2018 10:48	Finished	ICV @5ppb, IWST-181022D
10	PQL@0.2ppb,CCV2,1	10	1000	Unknown		11/19/2018 10:58	Finished	PQL @ 0.2ppb
11	ICB,ICB,1,	11	1000	Unknown		11/19/2018 11:07	Finished	ICB R181102B
12	MB-H2O,MBLK,1,	12	1000	Unknown		11/19/2018 11:17	Finished	MB R181102B
13	LCS-H2O,LCS,1,	13	1000	Unknown		11/19/2018 11:26	Finished	LCS @5ppb, IWST-181022D
14	N033021-001A,SAMF	14	1000	Unknown		11/19/2018 11:36	Finished	SAMP,10mL
15	N033021-002A,SAMF	15	1000	Unknown		11/19/2018 11:45	Finished	SAMP,10mL
16	N033022-001A,SAMF	16	1000	Unknown		11/19/2018 11:55	Finished	SAMP,10mL
17	N033022-002A,SAMF	17	1000	Unknown		11/19/2018 12:04	Finished	SAMP,10mL
18	N033016-002B,SAMF	18	1000	Unknown		11/19/2018 12:14	Finished	SAMP,10mL
19	N033021-001A,SAMF	19	1000	Unknown		11/19/2018 12:23	Finished	SAMP,0.5>10mL
20	N033021-001AMS,MS	20	1000	Unknown		11/19/2018 12:33	Finished	MS (5ppb), IWST-181022D,0.5
21	N033021-001AMSD,M	21	1000	Unknown		11/19/2018 12:42	Finished	MSD (5ppb), IWST-181022D,0.
22	CCV-1,CCV1,1,	22	1000	Unknown		11/19/2018 12:51	Finished	CCV @10ppb, IWST-181022C
23	CCB-1,CCB,1,	23	1000	Unknown		11/19/2018 13:01	Finished	CCB R181102B
24	N033021-001ADUP,D	24	1000	Unknown		11/19/2018 13:10	Finished	DUP,10mL
25	N033021-002AMS,MS	25	1000	Unknown		11/19/2018 13:20	Finished	MS (1ppb), IWST-181022D,10
26	N033021-002A,SAMF	26	1000	Unknown		11/19/2018 13:29	Finished	SAMP,2>10mL
27	N033021-002AMS,MS	27	1000	Unknown		11/19/2018 13:39	Finished	MS (1ppb), IWST-181022D,2>1
28	N033022-001AMS,MS	28	1000	Unknown		11/19/2018 13:48	Finished	MS (1ppb), IWST-181022D,10
29	N033022-002AMS,MS	29	1000	Unknown		11/19/2018 13:58	Finished	MS (1ppb), IWST-181022D,10
30	N033016-002BMS,MS	30	1000	Unknown		11/19/2018 14:07	Finished	MS (1ppb), IWST-181022D,10
31	N033021-002A,SAMF	31	1000	Unknown		11/19/2018 14:17	Finished	SAMP,2>10mL
32	N033021-002AMS,MS	32	1000	Unknown		11/19/2018 14:26	Finished	MS (1ppb), IWST-181022D,10
33	CCV-2,CCV,1,	33	1000	Unknown		11/19/2018 14:36	Finished	CCV @5ppb, IWST-1810222C
34	CCB-2,CCB,1,	34	1000	Unknown		11/19/2018 14:45	Finished	CCB R181102B
35	N033021-001A,SAMF	37	1000	Unknown		11/19/2018 15:05	Finished	SAMP,0.5>10mL
36	N033021-001AMS,MS	38	1000	Unknown		11/19/2018 15:17	Finished	MS (5ppb), IWST-181022D,0.5
37	CCV-3,CCV1,1,	39	1000	Unknown		11/19/2018 15:26	Finished	CCV @10ppb, IWST-1810222C
38	CCB-3,CCB,1,	40	1000	Unknown		11/19/2018 15:36	Finished	CCB R181102B
39	SHUTDOWN	41	1000	Unknown		11/19/2018 15:45	Finished	
40	Eluent: R181119A	42	1000	Unknown		n.a.	Finished	Eluent
41	PCR: R181119B	43	1000	Unknown		n.a.	Finished	Post-Column Reagent

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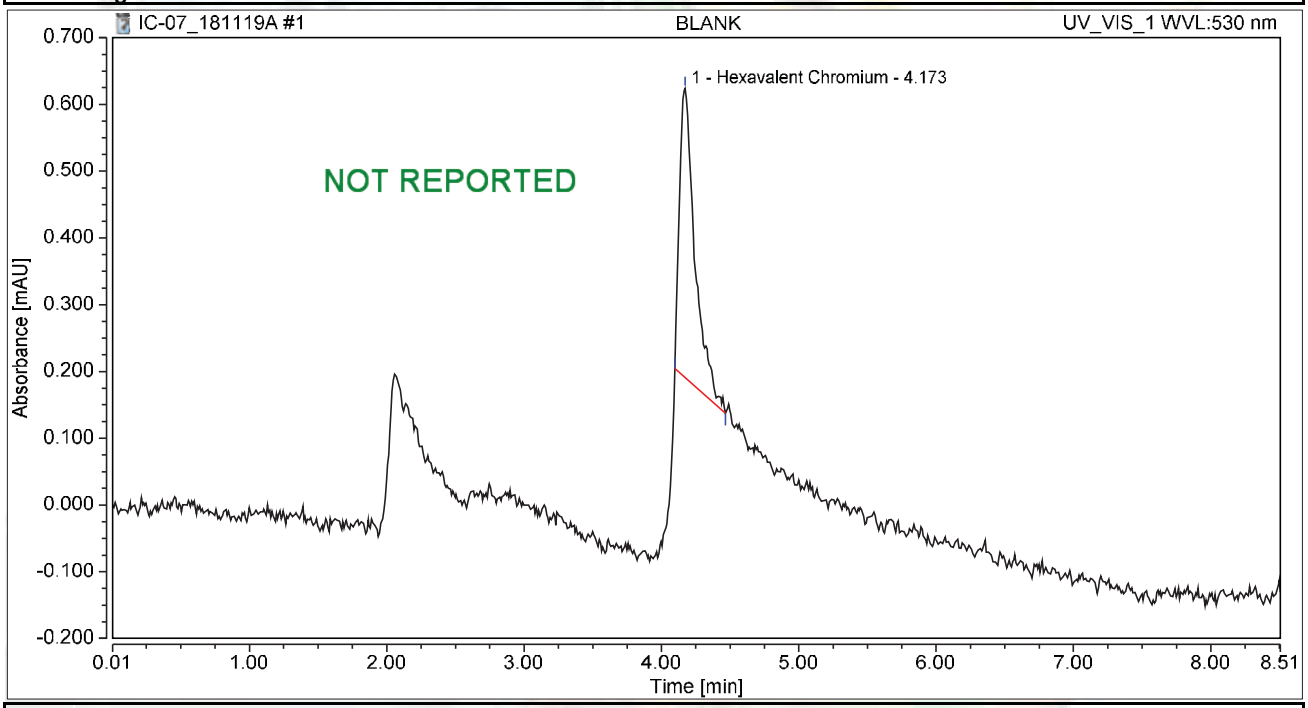
Chromatogram and Results

Injection Details

Injection Name:	**BLANK**	*Run Time (min):*	**8.50**
Vial Number:	**1**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 09:28**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

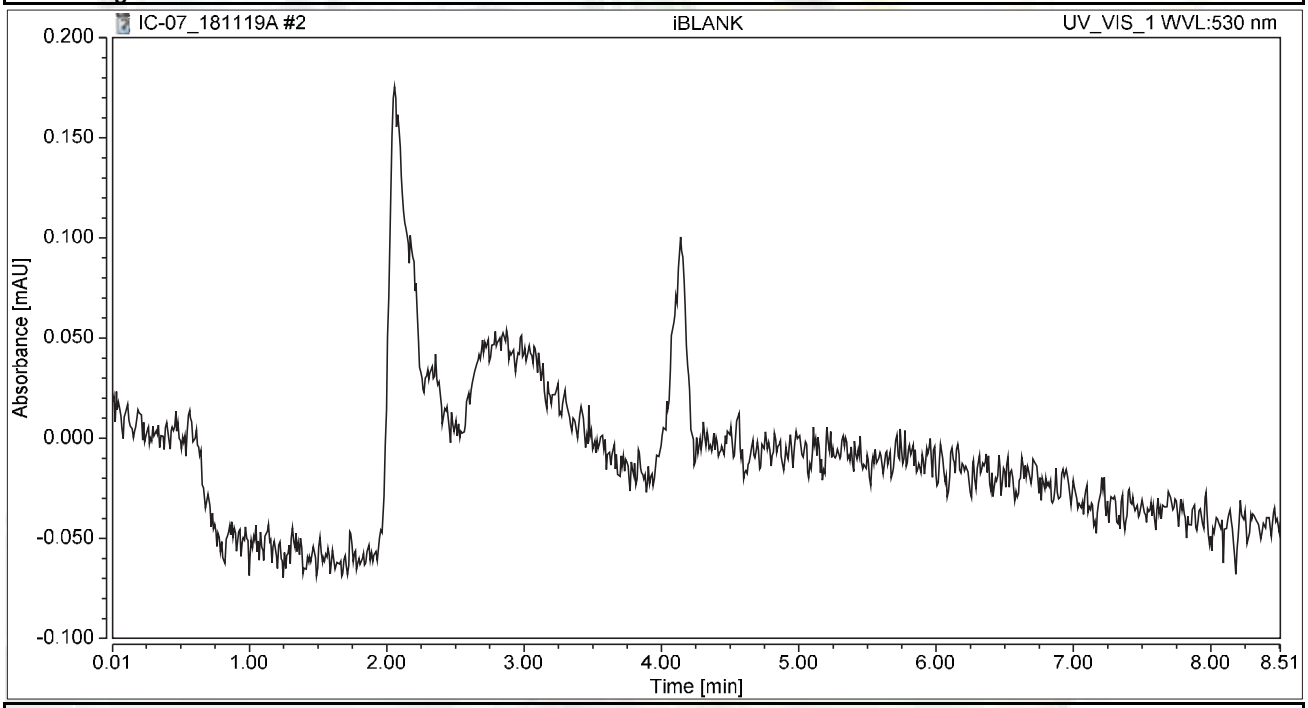
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.173	0.056	0.433	100.00	100.00	0.2231
Total:			**0.056**	**0.433**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**iBLANK**	*Run Time (min):*	**8.50**
Vial Number:	**2**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 09:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

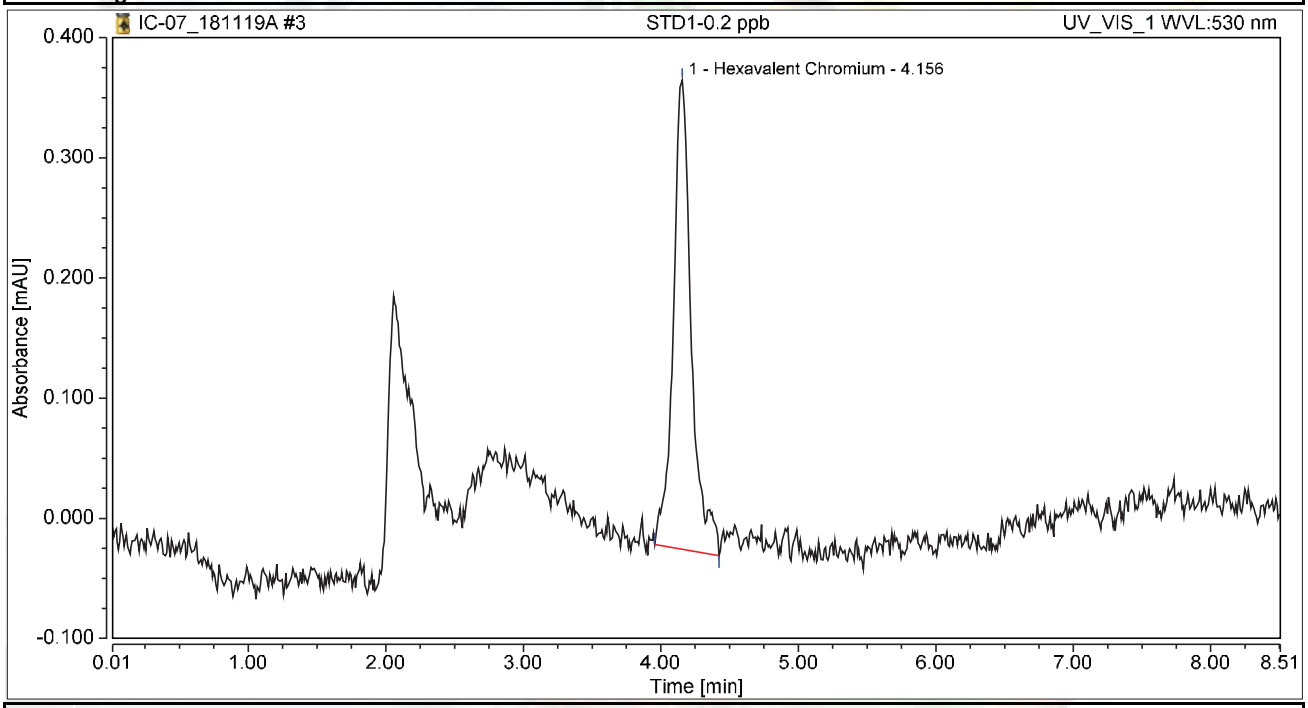
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**STD1-0.2 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**01**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 09:49**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

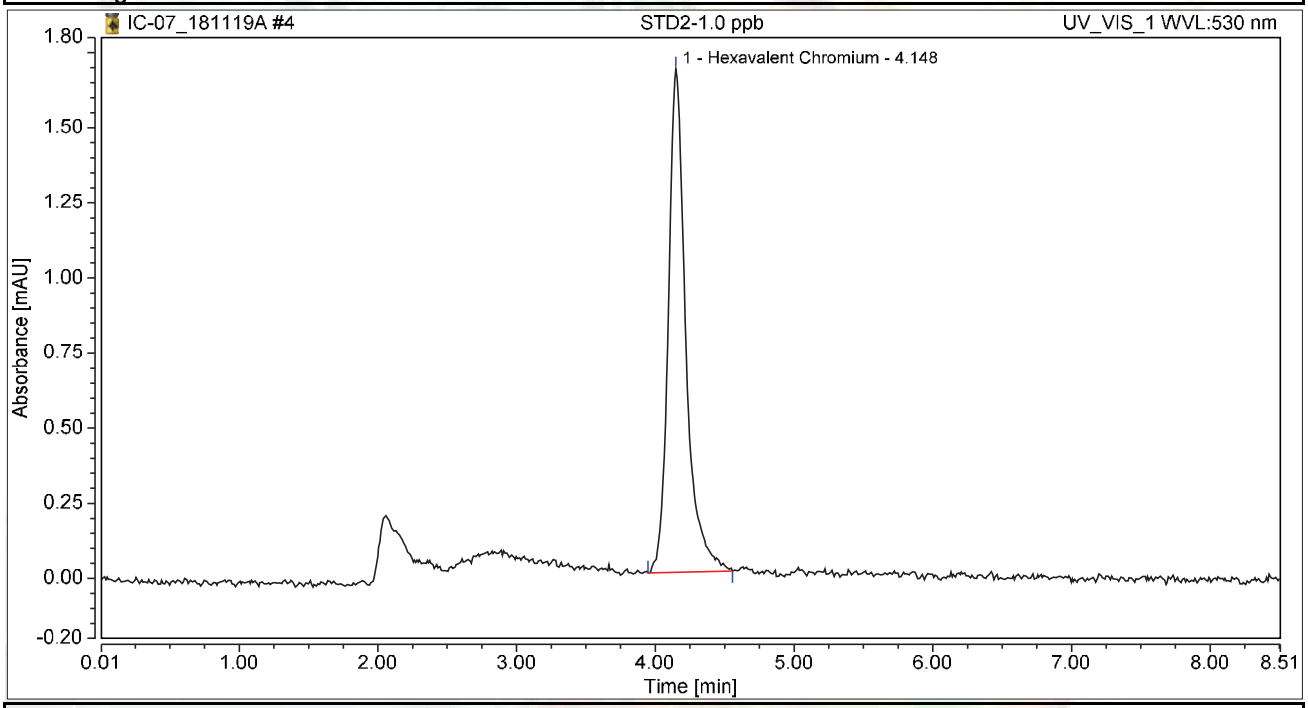
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	0.059	0.391	100.00	100.00	0.2349
Total:			**0.059**	**0.391**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**STD2-1.0 ppb**	*Run Time (min):*	**8.50**
Vial Number:	**4**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**02**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 09:59**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

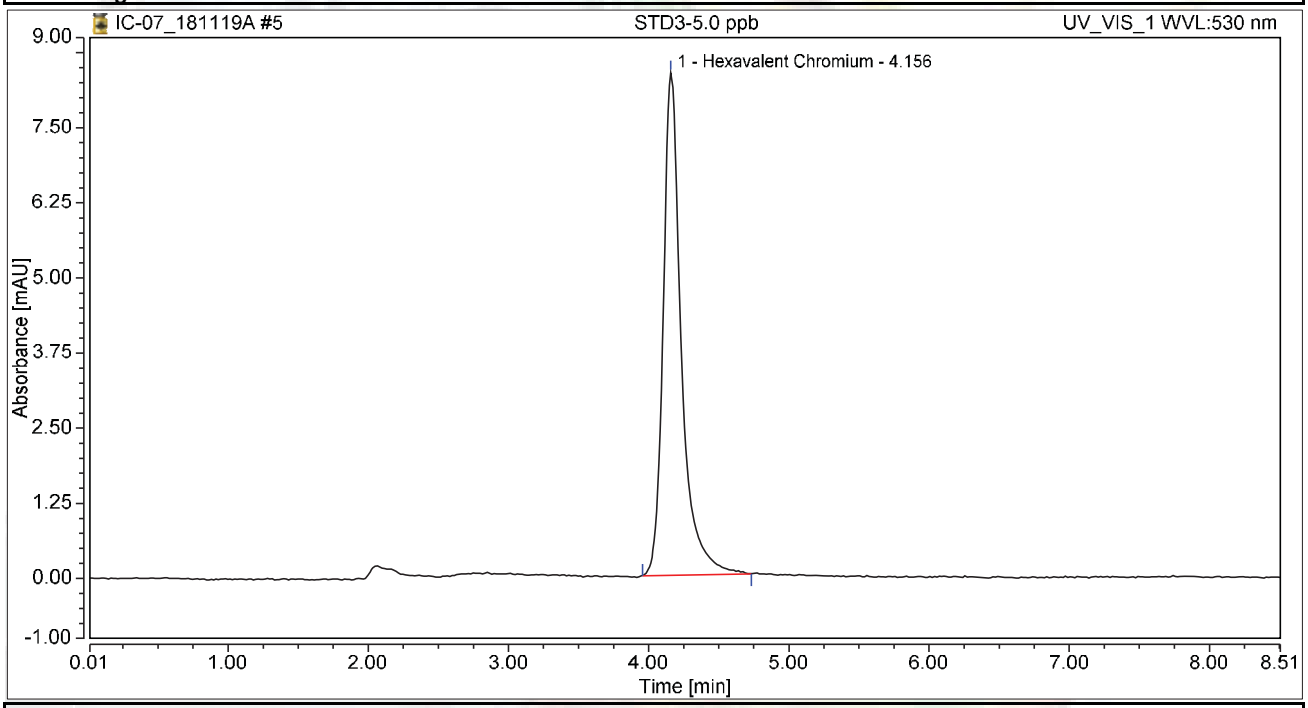
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.148	0.245	1.676	100.00	100.00	0.9686
Total:			**0.245**	**1.676**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**STD3-5.0 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**03**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:11**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

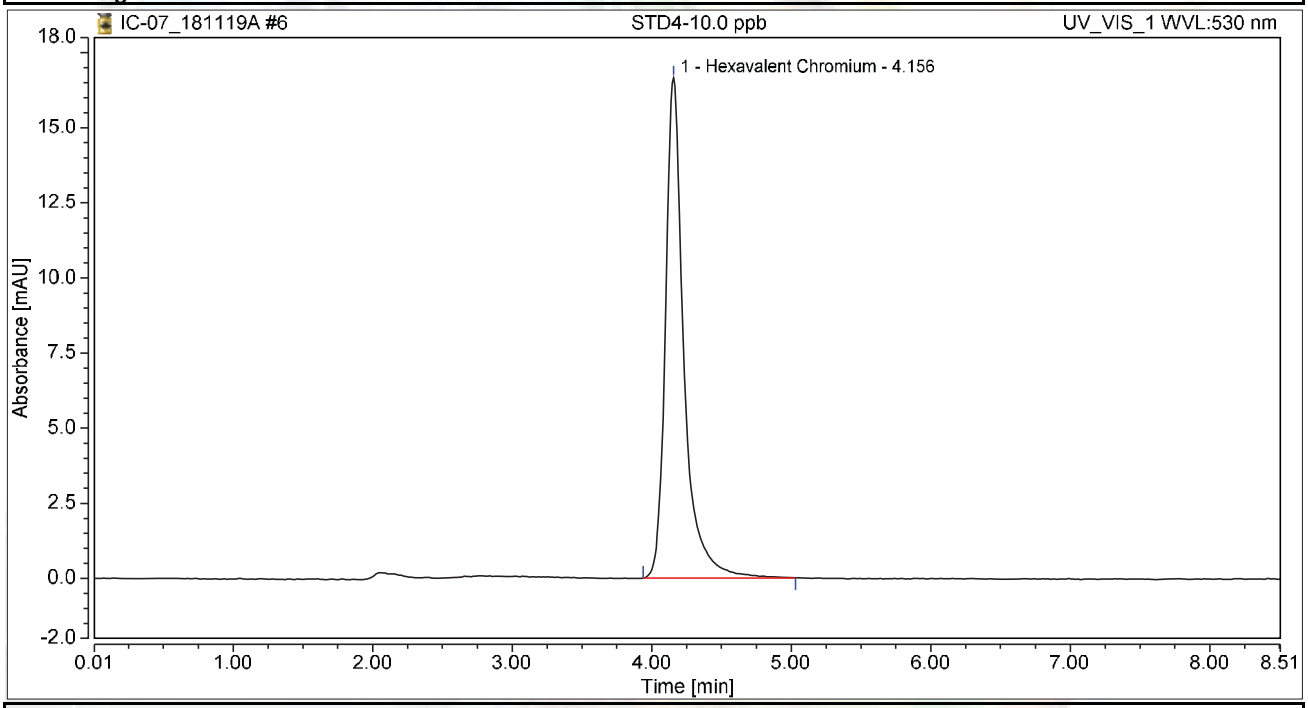
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	1.260	8.369	100.00	100.00	4.9808
Total:			**1.260**	**8.369**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**STD4-10.0 ppb**	*Run Time (min):*	**8.50**
Vial Number:	**6**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**04**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:20**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

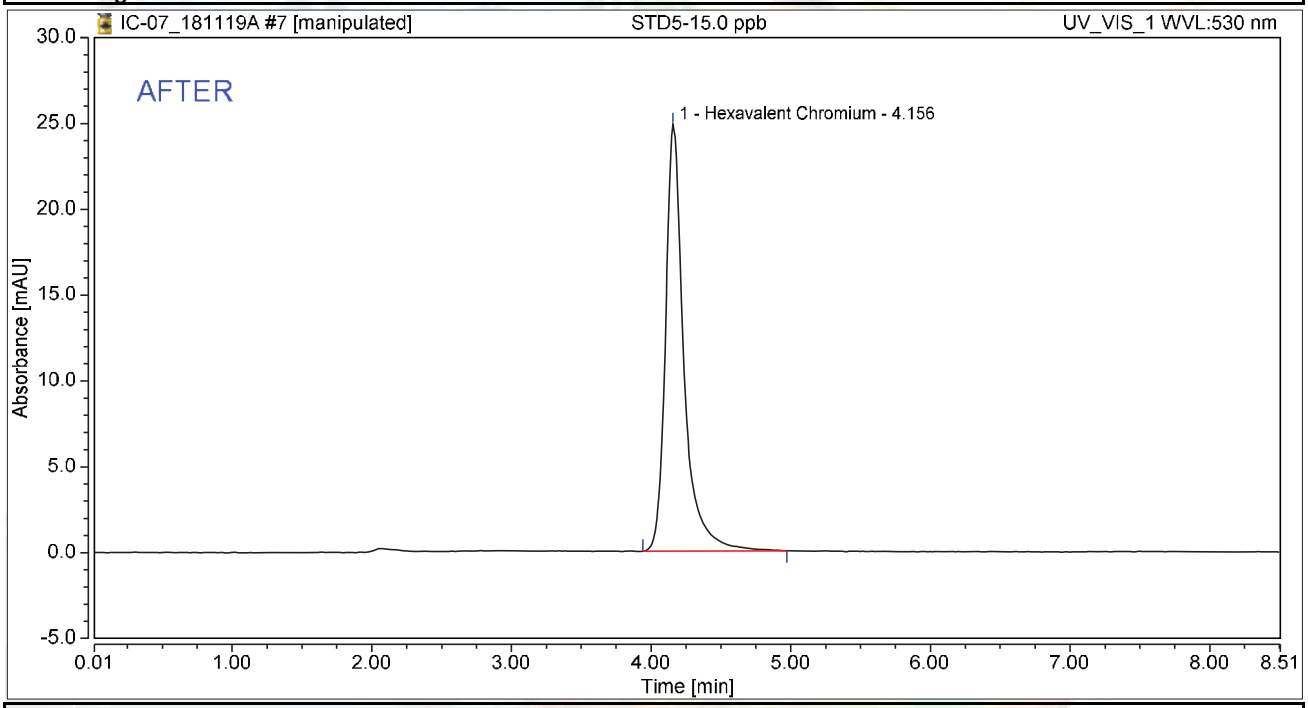
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	2.537	16.652	100.00	100.00	10.0307
Total:			**2.537**	**16.652**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**STD5-15.0 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**05**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	3.801	24.850	100.00	100.00	15.0279
Total:			**3.801**	**24.850**	**100.00**	**100.00**	

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Reviewed by:
Nancy 11/20/2018
My first report/Integration

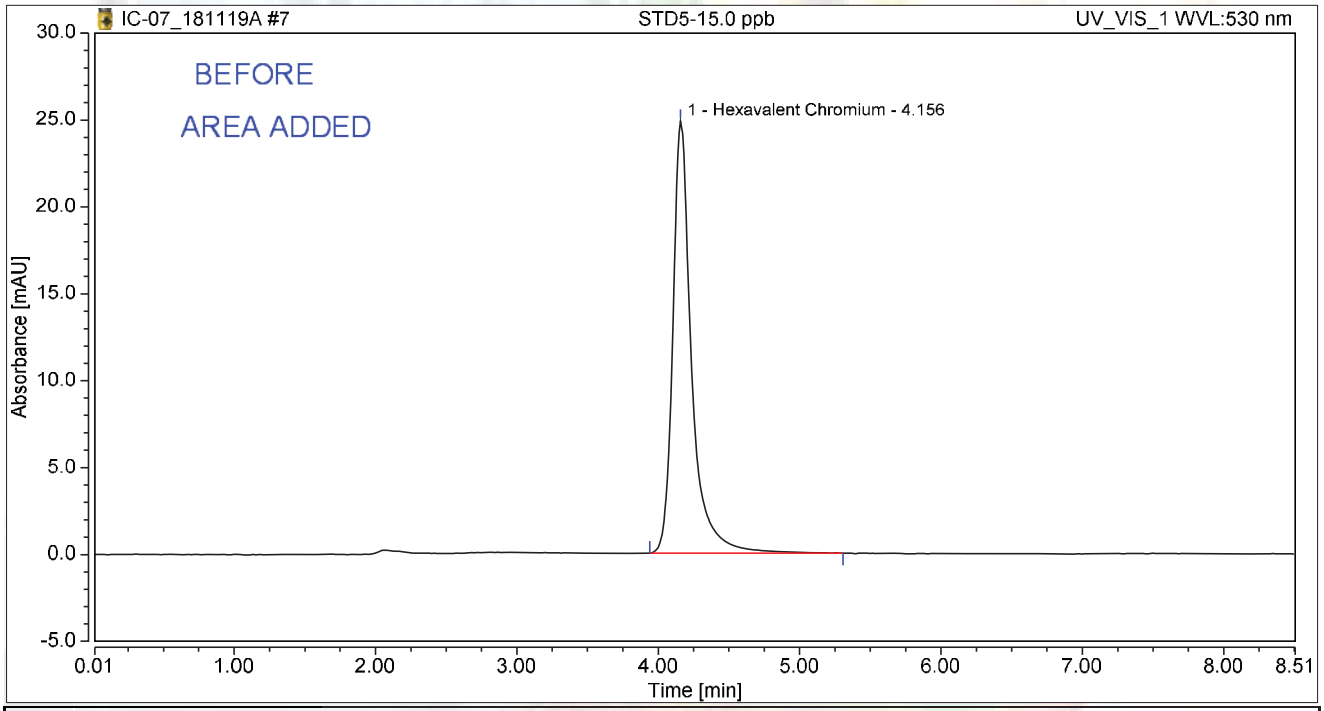
Chromeleon (c) Dionex
Version 7.1.1.1127

Chromatogram and Results

Injection Details

Injection Name:	**STD5-15.0 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**05**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	3.835	24.860	100.00	100.00	15.0347
Total:			**3.835**	**24.860**	**100.00**	**100.00**	

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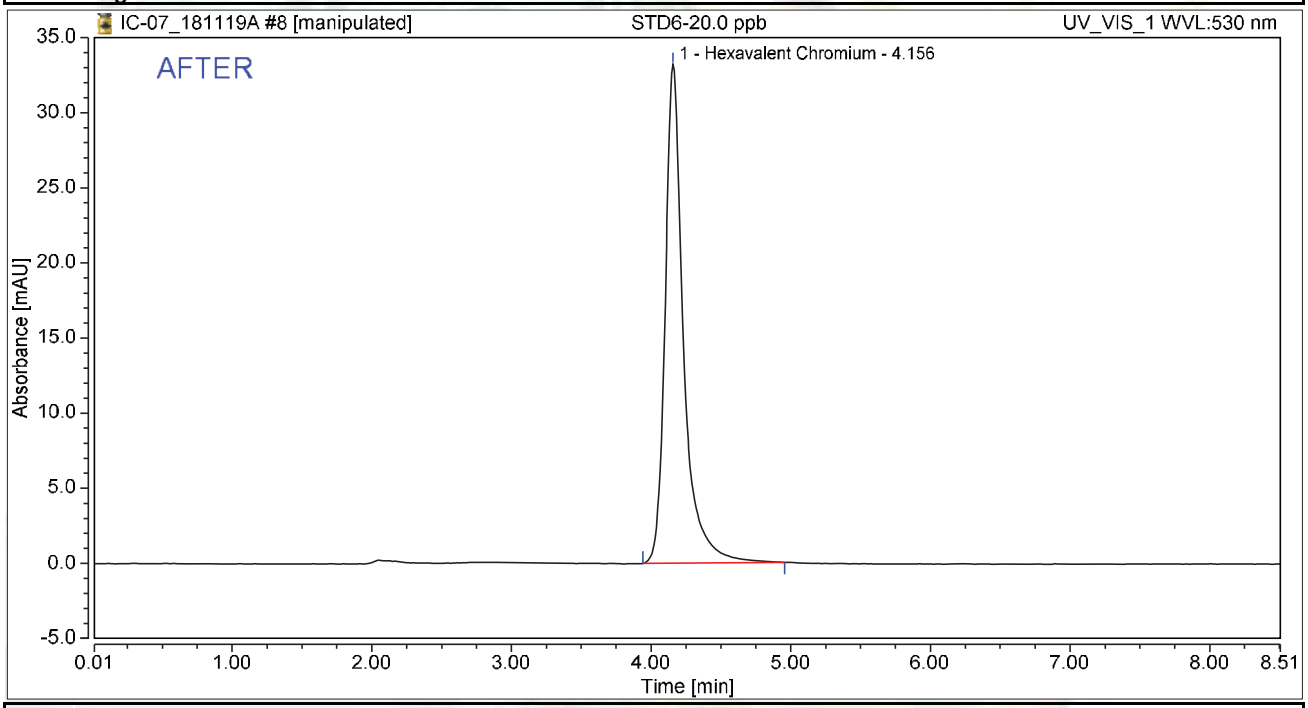
Chromatogram and Results

Injection Details

Injection Name:	**STD6-20.0 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**06**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	5.051	33.180	100.00	100.00	19.9697
Total:			**5.051**	**33.180**	**100.00**	**100.00**	

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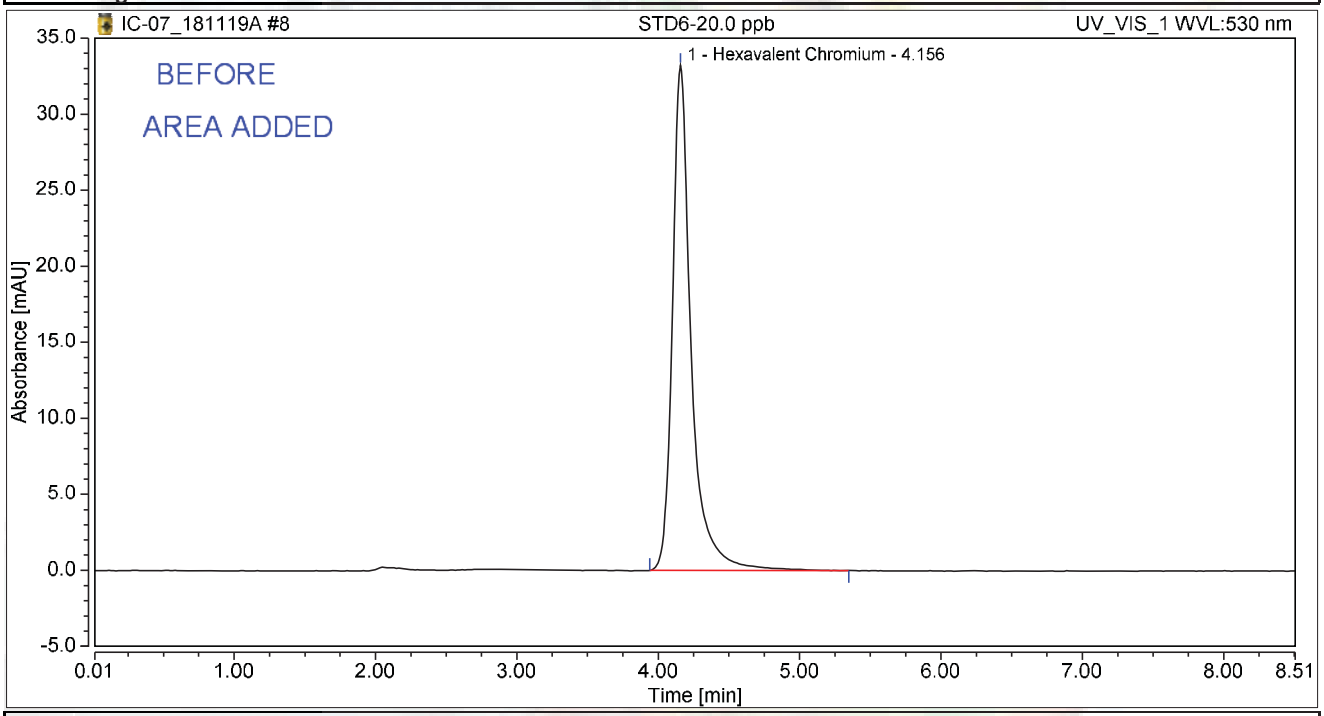
Reviewed by:
Nancy 11/20/2018

Chromatogram and Results

Injection Details

Injection Name:	**STD6-20.0 ppb**	*Run Time (min):*	**8.49**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Calibration Standard**	*Channel:*	**UV_VIS_1**
Calibration Level:	**06**	*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	5.106	33.198	100.00	100.00	20.0183
Total:			**5.106**	**33.198**	**100.00**	**100.00**	

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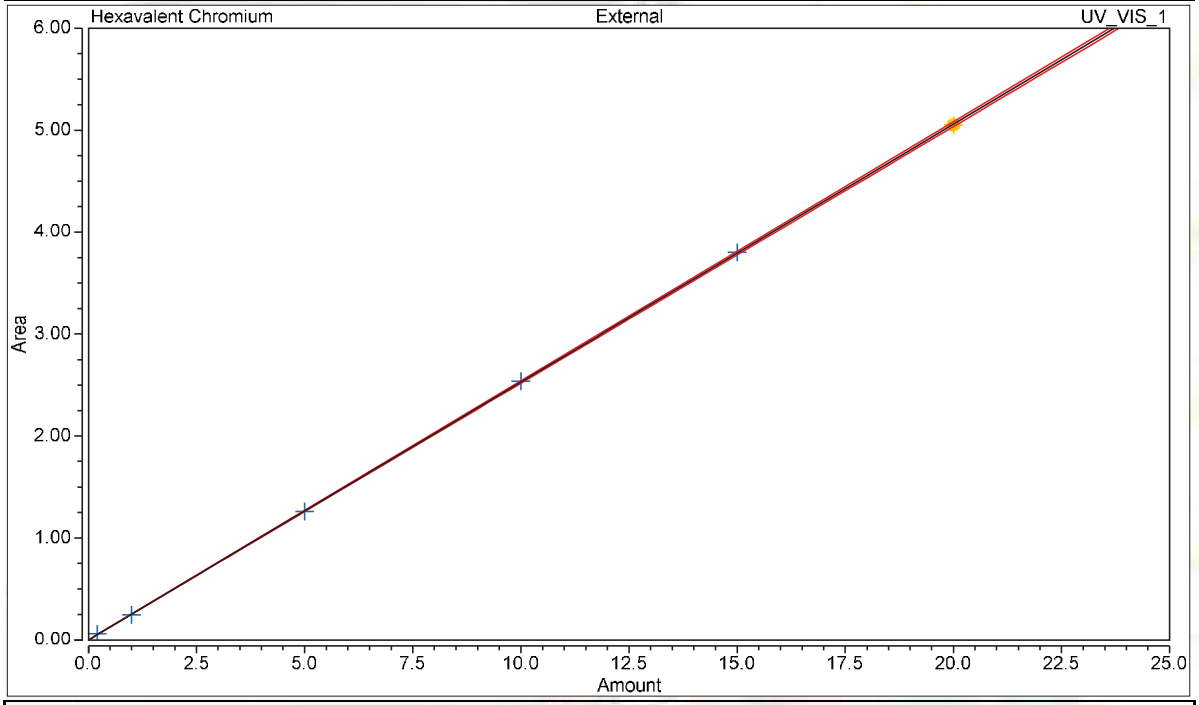
Initial Calibration Summary

Calibration Details	Hexavalent Chromium		
Calibration Type	Lin	*Offset (C0)*	0.0000
Evaluation Type	Area	*Slope (C1)*	0.2529
Number of Calibration Points	6	*Curve (C2)*	0.0000
Number of disabled Calibration Points	0	*R-Square*	0.99998

Calibration Plot **Hexavalent Chromium**



Calibration Results **Hexavalent Chromium**

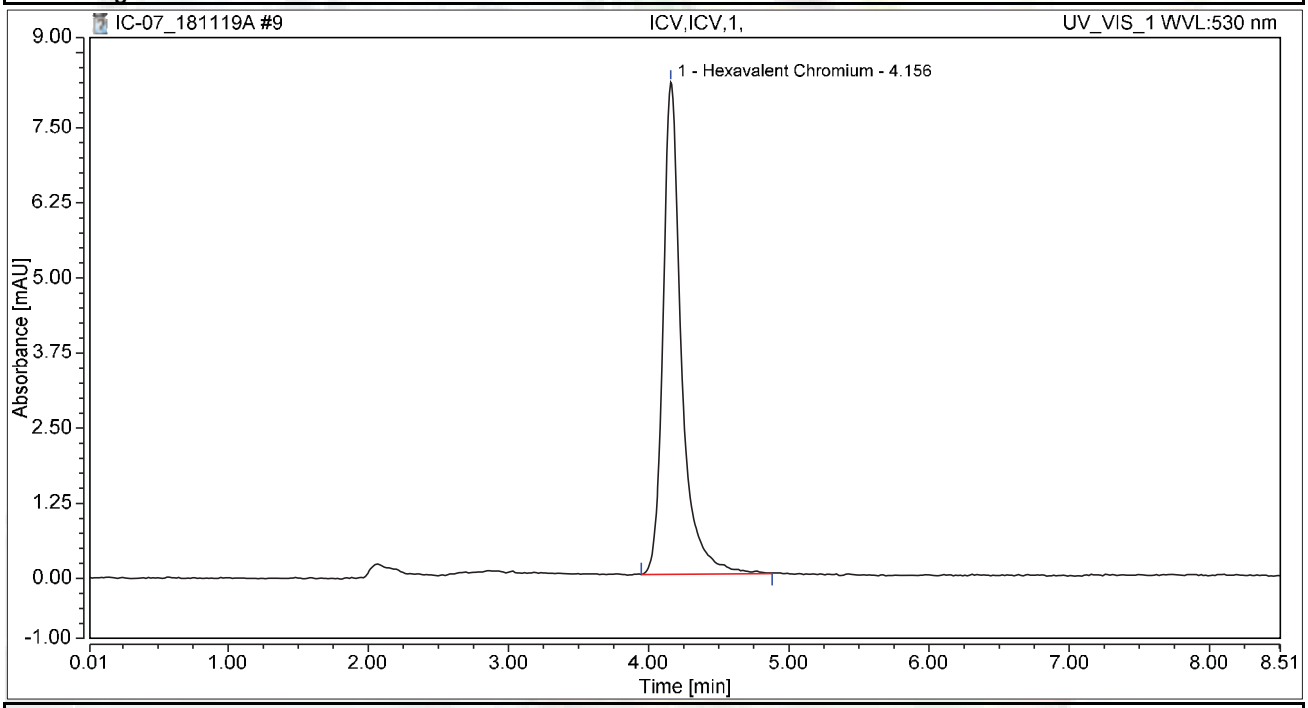
No.	Injection Name	Calibration Level	X Value	Y Value	Area mAU*min	Height mAU
3	STD1-0.2 ppb	01	0.2000	0.0594	0.059	0.391
4	STD2-1.0 ppb	02	1.0000	0.2450	0.245	1.676
5	STD3-5.0 ppb	03	5.0000	1.2597	1.260	8.369
6	STD4-10.0 ppb	04	10.0000	2.5370	2.537	16.652
7	STD5-15.0 ppb	05	15.0000	3.8008	3.801	24.850
8	STD6-20.0 ppb	06	20.0000	5.0507	5.051	33.180

Chromatogram and Results

Injection Details

Injection Name:	**ICV,ICV,1,**	*Run Time (min):*	**8.49**
Vial Number:	**9**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:48**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

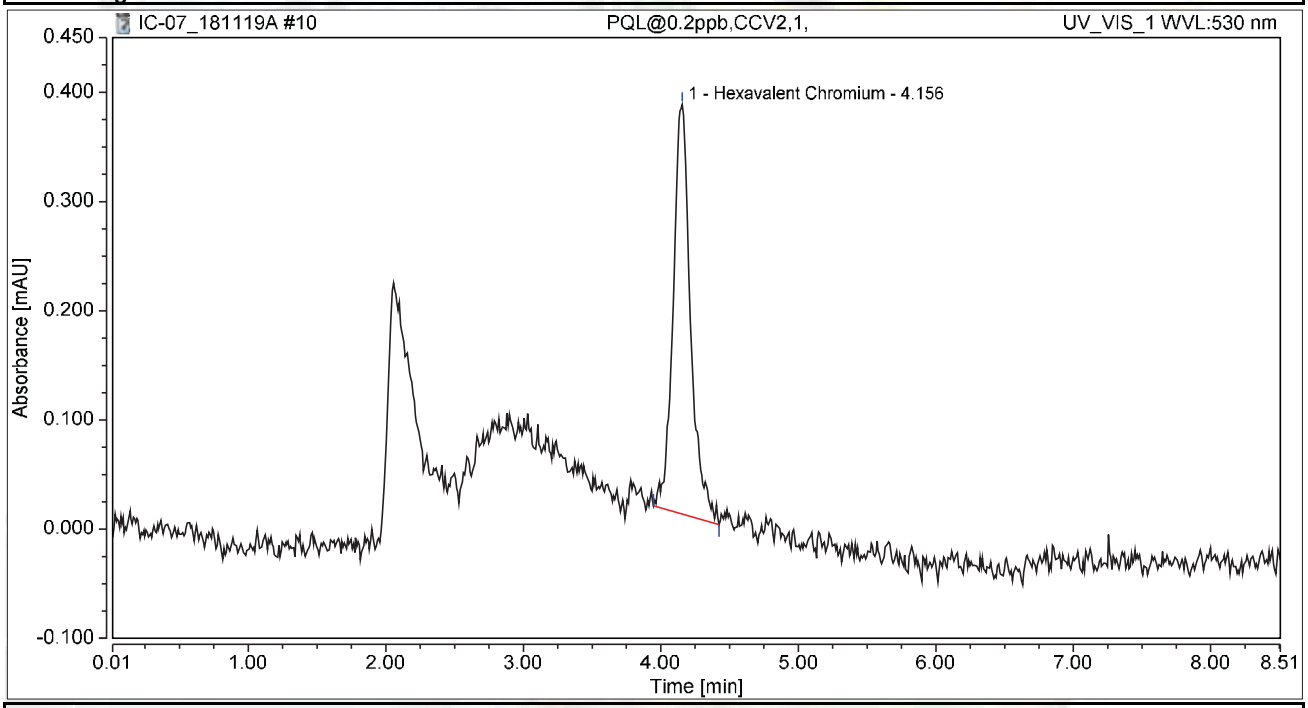
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	1.252	8.191	100.00	100.00	4.9490
Total:			**1.252**	**8.191**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**PQL@0.2ppb,CCV2,1,**	*Run Time (min):*	**8.49**
Vial Number:	**10**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 10:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

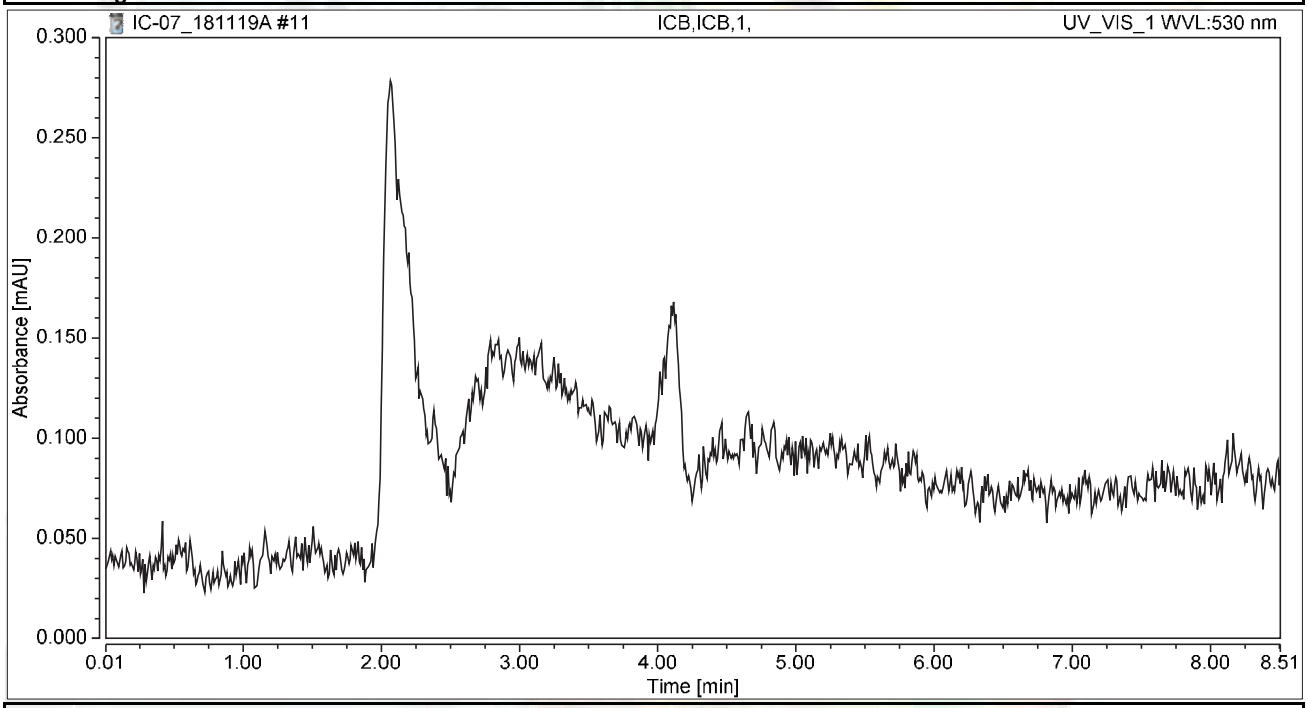
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.156	0.055	0.375	100.00	100.00	0.2189
Total:			**0.055**	**0.375**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**ICB,ICB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**11**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**19/Nov/18 11:07**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

RAW DATA

INJECTION LOG: 181205A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
1	BLANK	BLANK	1	Hexavalent Chromium	11/19/18 9:28 AM	Not Reported
2	iBLANK	iBLANK	1	Hexavalent Chromium	11/19/18 9:39 AM	Reported
3	STD-0.2 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:49 AM	Reported
4	STD-1.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 9:59 AM	Reported
5	STD-5.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:11 AM	Reported
6	STD-10.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:20 AM	Reported
7	STD-15.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:30 AM	Reported
8	STD-20.0 ppb	ICAL	1	Hexavalent Chromium	11/19/18 10:39 AM	Reported
9	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 8:00 AM	Not Reported
10	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 8:11 AM	Not Reported
11	CCV-1	CCV	1	Hexavalent Chromium	12/05/18 8:20 AM	Reported
12	PQL@0.2ppb	CCV2	1	Hexavalent Chromium	12/05/18 8:30 AM	Reported
13	CCB-1	CCB	1	Hexavalent Chromium	12/05/18 8:39 AM	Reported
14	MB-R130313	MBLK	1	Hexavalent Chromium	12/05/18 8:49 AM	Reported
15	LCS-R130313	LCS	1	Hexavalent Chromium	12/05/18 8:58 AM	Reported
16	N033230-001A	SAMP	1	Hexavalent Chromium	12/05/18 9:08 AM	Reported
17	N033230-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:17 AM	Reported
18	N033231-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:27 AM	Reported
19	N033230-001AMS	MS	1	Hexavalent Chromium	12/05/18 9:36 AM	Reported
20	N033230-002AMS	MS	1	Hexavalent Chromium	12/05/18 9:46 AM	Reported
21	N033231-002AMS	MS	1	Hexavalent Chromium	12/05/18 9:55 AM	Reported
22	N033230-001AMSD	MSD	1	Hexavalent Chromium	12/05/18 10:04 AM	Reported
23	N033230-002A	SAMP	5	Hexavalent Chromium	12/05/18 10:14 AM	Not Reported
24	CCV-2	CCV1	1	Hexavalent Chromium	12/05/18 10:23 AM	Reported
25	CCB-2	CCB	1	Hexavalent Chromium	12/05/18 10:33 AM	Reported
26	N033230-002AMS	MS	5	Hexavalent Chromium	12/05/18 10:42 AM	Not Reported
27	N033238-001A	SAMP	1	Hexavalent Chromium	12/05/18 10:52 AM	Reported
28	N033238-002A	SAMP	1	Hexavalent Chromium	12/05/18 11:01 AM	Reported
29	N033238-003A	SAMP	1	Hexavalent Chromium	12/05/18 11:11 AM	Reported
30	N033238-004A	SAMP	1	Hexavalent Chromium	12/05/18 11:20 AM	Reported
31	N033238-005A	SAMP	1	Hexavalent Chromium	12/05/18 11:30 AM	Reported
32	N033238-001ADUP	DUP	1	Hexavalent Chromium	12/05/18 11:39 AM	Reported
33	N033238-001AMS	MS	1	Hexavalent Chromium	12/05/18 11:49 AM	Reported
34	N033238-002AMS	MS	1	Hexavalent Chromium	12/05/18 11:58 AM	Reported
35	N033238-003AMS	MS	1	Hexavalent Chromium	12/05/18 12:07 PM	Reported
36	BLANK	BLANK	1	Hexavalent Chromium	12/05/18 12:17 PM	Not Reported
37	CCV-3	CCV	1	Hexavalent Chromium	12/05/18 12:26 PM	Reported
38	CCB-3	CCB	1	Hexavalent Chromium	12/05/18 1:30 PM	Reported
39	N033238-004AMS	MS	1	Hexavalent Chromium	12/05/18 1:41 PM	Reported
40	N033238-005AMS	MS	1	Hexavalent Chromium	12/05/18 1:50 PM	Reported
41	N033238-006A	SAMP	2	Hexavalent Chromium	12/05/18 2:00 PM	Reported
42	N033238-007A	SAMP	1	Hexavalent Chromium	12/05/18 2:09 PM	Reported

INJECTION LOG: 181205A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
43	N033238-008A	SAMP	1	Hexavalent Chromium	12/05/18 2:19 PM	Reported
44	N033238-009A	SAMP	1	Hexavalent Chromium	12/05/18 2:28 PM	Reported
45	N033238-010A	SAMP	1	Hexavalent Chromium	12/05/18 2:38 PM	Reported
46	N033238-006AMS	MS	5	Hexavalent Chromium	12/05/18 2:47 PM	Not Reported
47	N033238-007AMS	MS	1	Hexavalent Chromium	12/05/18 2:57 PM	Reported
48	N033238-008AMS	MS	1	Hexavalent Chromium	12/05/18 3:06 PM	Reported
49	CCV-4	CCV1	1	Hexavalent Chromium	12/05/18 3:16 PM	Reported
50	CCB-4	CCB	1	Hexavalent Chromium	12/05/18 3:25 PM	Reported
51	N033238-009AMS	MS	1	Hexavalent Chromium	12/05/18 3:35 PM	Reported
52	N033238-010AMS	MS	1	Hexavalent Chromium	12/05/18 3:44 PM	Reported
53	N033238-006AMS	MS	2	Hexavalent Chromium	12/05/18 3:54 PM	Reported
54	N033238-011A	SAMP	1	Hexavalent Chromium	12/05/18 4:03 PM	Reported
55	N033238-012A	SAMP	1	Hexavalent Chromium	12/05/18 4:12 PM	Reported
56	N033238-013A	SAMP	5	Hexavalent Chromium	12/05/18 4:22 PM	Not Reported
57	N033238-014A	SAMP	1	Hexavalent Chromium	12/05/18 4:31 PM	Reported
58	N033238-015A	SAMP	1	Hexavalent Chromium	12/05/18 4:41 PM	Reported
59	N033238-011AMS	MS	1	Hexavalent Chromium	12/05/18 4:50 PM	Reported
60	N033238-012AMS	MS	1	Hexavalent Chromium	12/05/18 5:00 PM	Reported
61	CCV-5	CCV	1	Hexavalent Chromium	12/05/18 5:09 PM	Reported
62	CCB-5	CCB	1	Hexavalent Chromium	12/05/18 5:19 PM	Not Reported
63	CCB-5	CCB	1	Hexavalent Chromium	12/05/18 5:36 PM	Reported
64	N033238-013AMS	MS	5	Hexavalent Chromium	12/05/18 5:47 PM	Not Reported
65	N033238-014AMS	MS	1	Hexavalent Chromium	12/05/18 5:56 PM	Reported
66	N033238-015AMS	MS	1	Hexavalent Chromium	12/05/18 6:06 PM	Reported
67	N033236-001B	SAMP	100	Hexavalent Chromium	12/05/18 6:15 PM	Reported
68	N033236-001BMS	MS	100	Hexavalent Chromium	12/05/18 6:38 PM	Reported
69	N033236-002C	SAMP	1	Hexavalent Chromium	12/05/18 6:49 PM	Reported
70	N033236-002CMS	MS	1	Hexavalent Chromium	12/05/18 6:58 PM	Reported
71	N033224-001A	SAMP	1	Hexavalent Chromium	12/05/18 7:07 PM	Not Reported
72	N033238-013AMS	MS	5	Hexavalent Chromium	12/05/18 7:17 PM	Not Reported
73	N033238-013A	SAMP	5	Hexavalent Chromium	12/05/18 7:26 PM	Not Reported
74	CCV-6	CCV1	1	Hexavalent Chromium	12/05/18 7:36 PM	Reported
75	CCB-6	CCB	1	Hexavalent Chromium	12/05/18 7:45 PM	Reported
76	LCS-R130358	LCS	1	Hexavalent Chromium	12/05/18 7:55 PM	Reported
77	MB-R130358	MBLK	1	Hexavalent Chromium	12/05/18 8:04 PM	Reported
78	N033237-001A	SAMP	1	Hexavalent Chromium	12/05/18 8:14 PM	Reported
79	N033237-001AMS	MS	1	Hexavalent Chromium	12/05/18 8:23 PM	Reported
80	N033237-002A	SAMP	100	Hexavalent Chromium	12/05/18 8:33 PM	Reported
81	N033237-002AMS	MS	100	Hexavalent Chromium	12/05/18 8:42 PM	Reported
82	N033237-002AMSD	MSD	100	Hexavalent Chromium	12/05/18 8:52 PM	Reported
83	N033224-001A	SAMP	5	Hexavalent Chromium	12/05/18 9:01 PM	Reported
84	N033224-001ADUP	DUP	5	Hexavalent Chromium	12/05/18 9:10 PM	Reported

INJECTION LOG: 181205A

Instrument ID: IC-07

Sample No	Sample Name	Type	DF	Peak Name	Injection Date/Time	Comments
85	N033233-001A	SAMP	1	Hexavalent Chromium	12/05/18 9:20 PM	Reported
86	CCV-7	CCV	1	Hexavalent Chromium	12/05/18 9:29 PM	Reported
87	CCB-7	CCB	1	Hexavalent Chromium	12/05/18 9:39 PM	Reported
88	N033233-002A	SAMP	1	Hexavalent Chromium	12/05/18 9:48 PM	Reported
89	N033213-004A	SAMP	1	Hexavalent Chromium	12/05/18 9:58 PM	Not Reported
90	N033213-004AMS	MS	1	Hexavalent Chromium	12/05/18 10:07 PM	Not Reported
91	N033213-008A	SAMP	1	Hexavalent Chromium	12/05/18 10:17 PM	Not Reported
92	N033213-008AMS	MS	1	Hexavalent Chromium	12/05/18 10:26 PM	Not Reported
93	N033213-012A	SAMP	1	Hexavalent Chromium	12/05/18 10:36 PM	Not Reported
94	N033213-012AMS	MS	1	Hexavalent Chromium	12/05/18 10:45 PM	Not Reported
95	N033213-014A	SAMP	1	Hexavalent Chromium	12/05/18 10:55 PM	Not Reported
96	N033213-014AMS	MS	1	Hexavalent Chromium	12/05/18 11:04 PM	Not Reported
97	N033213-015A	SAMP	1	Hexavalent Chromium	12/05/18 11:13 PM	Not Reported
98	CCV-8	CCV1	1	Hexavalent Chromium	12/05/18 11:23 PM	Reported
99	CCB-8	CCB	1	Hexavalent Chromium	12/05/18 11:32 PM	Reported
100	N033213-015AMS	MS	1	Hexavalent Chromium	12/05/18 11:42 PM	Not Reported
101	N033213-016A	SAMP	1	Hexavalent Chromium	12/05/18 11:51 PM	Not Reported
102	N033213-016AMS	MS	1	Hexavalent Chromium	12/06/18 12:01 AM	Not Reported
103	N033213-017A	SAMP	1	Hexavalent Chromium	12/06/18 12:10 AM	Not Reported
104	N033213-017AMS	MS	1	Hexavalent Chromium	12/06/18 12:20 AM	Not Reported
105	N033232-002B	SAMP	1	Hexavalent Chromium	12/06/18 12:29 AM	Reported
106	N033232-002BMS	MS	1	Hexavalent Chromium	12/06/18 12:39 AM	Reported
107	LCS-1	LCS	1	Hexavalent Chromium	12/06/18 12:48 AM	Reported
108	LCS-2	LCS	1	Hexavalent Chromium	12/06/18 12:58 AM	Reported
109	LCS-3	LCS	1	Hexavalent Chromium	12/06/18 1:07 AM	Reported
110	CCV-9	CCV	1	Hexavalent Chromium	12/06/18 1:17 AM	Reported
111	CCB-9	CCB	1	Hexavalent Chromium	12/06/18 1:26 AM	Reported
112	LCS-4	LCS	1	Hexavalent Chromium	12/06/18 1:35 AM	Reported
113	CCV-10	CCV1	1	Hexavalent Chromium	12/06/18 1:45 AM	Reported
114	CCB-10	CCB	1	Hexavalent Chromium	12/06/18 1:54 AM	Reported

Injection Log Summary

Sequence Details

Name:	**IC-07_181205A**	*Created On:*	**24/Jul/12 17:17:21**
Directory:	**Instrument Data\IC-7\2018**	*Created By:*	**ics 5000**
Data Vault:	**ChromeleonLocal2**	*Updated On:*	**06/Dec/18 02:25:07**
No. of Injections:	**117**	*Updated By:*	**ics 5000**

Injection Details

No.	Injection Name	Position	Volume µL	Type	Level	Inject Time	Status	Comment
1	BLANK	1	1000	Unknown		11/19/2018 09:28	Finished	BLANK
2	iBLANK	2	1000	Unknown		11/19/2018 09:39	Finished	INSTRUMENT BLANK
3	STD1-0.2 ppb	3	1000	Calibration Standard	01	11/19/2018 09:49	Finished	0.2 ppb, IWST-181022C
4	STD2-1.0 ppb	4	1000	Calibration Standard	02	11/19/2018 09:59	Finished	1.0 ppb, IWST-181022C
5	STD3-5.0 ppb	5	1000	Calibration Standard	03	11/19/2018 10:11	Finished	5.0 ppb, IWST-181022C
6	STD4-10.0 ppb	6	1000	Calibration Standard	04	11/19/2018 10:20	Finished	10 ppb, IWST-181022C
7	STD5-15.0 ppb	7	1000	Calibration Standard	05	11/19/2018 10:30	Finished	15 ppb, IWST-181022C
8	STD6-20.0 ppb	8	1000	Calibration Standard	06	11/19/2018 10:39	Finished	20 ppb, IWST-181022C
9	BLANK	1	1000	Unknown		12/05/2018 08:00	Finished	BLANK
10	BLANK	2	1000	Unknown		12/05/2018 08:11	Finished	BLANK
11	CCV-1,CCV,1,	3	1000	Unknown		12/05/2018 08:20	Finished	CCV @5ppb, IWST-181022C
12	PQL@0.2ppb,CCV2,1	4	1000	Unknown		12/05/2018 08:30	Finished	PQL @ 0.2ppb
13	CCB-1,CCB,1,	5	1000	Unknown		12/05/2018 08:39	Finished	CCB R181127D
14	MB-H2O,MBLK,1,	6	1000	Unknown		12/05/2018 08:49	Finished	MB R181127D
15	LCS-H2O,LCS,1,	7	1000	Unknown		12/05/2018 08:58	Finished	LCS @5ppb, IWST-181022D
16	N033230-001A,SAMF	8	1000	Unknown		12/05/2018 09:08	Finished	SAMP,10mL
17	N033230-002A,SAMF	9	1000	Unknown		12/05/2018 09:17	Finished	SAMP,10mL
18	N033231-002A,SAMF	10	1000	Unknown		12/05/2018 09:27	Finished	SAMP,10mL
19	N033230-001AMS,MS	11	1000	Unknown		12/05/2018 09:36	Finished	MS (1ppb), IWST-181022D,0.5
20	N033230-002AMS,MS	13	1000	Unknown		12/05/2018 09:46	Finished	MS (1ppb), IWST-181022D,0.5
21	N033231-002AMS,MS	14	1000	Unknown		12/05/2018 09:55	Finished	MS (1ppb), IWST-181022D,2>1
22	N033230-001AMSD,M	16	1000	Unknown		12/05/2018 10:04	Finished	MSD (1ppb), IWST-181022D,2
23	N033230-002A,SAMF	17	1000	Unknown		12/05/2018 10:14	Finished	SAMP,2>10mL
24	CCV-2,CCV1,1,	18	1000	Unknown		12/05/2018 10:23	Finished	CCV @10ppb, IWST-181022C
25	CCB-2,CCB,1,	19	1000	Unknown		12/05/2018 10:33	Finished	CCB R181127D
26	N033230-002AMS,MS	20	1000	Unknown		12/05/2018 10:42	Finished	MS (1ppb), IWST-181022D,2>1
27	N033238-001A,SAMF	21	1000	Unknown		12/05/2018 10:52	Finished	SAMP,10mL
28	N033238-002A,SAMF	22	1000	Unknown		12/05/2018 11:01	Finished	SAMP,10mL
29	N033238-003A,SAMF	23	1000	Unknown		12/05/2018 11:11	Finished	SAMP,10mL
30	N033238-004A,SAMF	24	1000	Unknown		12/05/2018 11:20	Finished	SAMP,10mL
31	N033238-005A,SAMF	25	1000	Unknown		12/05/2018 11:30	Finished	SAMP,10mL
32	N033238-001ADUP,D	26	1000	Unknown		12/05/2018 11:39	Finished	DUP,10mL
33	N033238-001AMS,MS	27	1000	Unknown		12/05/2018 11:49	Finished	MS (1ppb), IWST-181022D,2>1
34	N033238-002AMS,MS	28	1000	Unknown		12/05/2018 11:58	Finished	MS (1ppb), IWST-181022D,2>1
35	N033238-003AMS,MS	29	1000	Unknown		12/05/2018 12:07	Finished	MS (1ppb), IWST-181022D,2>1
36	BLANK	30	1000	Unknown		12/05/2018 12:17	Finished	CCV @5ppb, IWST-181022C
37	CCV-3,CCV,1,	31	1000	Unknown		12/05/2018 12:26	Finished	CCB R181127D
38	CCB-3,CCB,1,	1	1000	Unknown		12/05/2018 13:30	Finished	CCB R181127D
39	N033238-004AMS,MS	2	1000	Unknown		12/05/2018 13:41	Finished	MS (1ppb), IWST-181022D,10
40	N033238-005AMS,MS	3	1000	Unknown		12/05/2018 13:50	Finished	MS (1ppb), IWST-181022D,10
41	N033238-006A,SAMF	4	1000	Unknown		12/05/2018 14:00	Finished	SAMP,5>10mL
42	N033238-007A,SAMF	5	1000	Unknown		12/05/2018 14:09	Finished	SAMP,10mL
43	N033238-008A,SAMF	6	1000	Unknown		12/05/2018 14:19	Finished	SAMP,10mL
44	N033238-009A,SAMF	7	1000	Unknown		12/05/2018 14:28	Finished	SAMP,10mL
45	N033238-010A,SAMF	8	1000	Unknown		12/05/2018 14:38	Finished	SAMP,10mL
46	N033238-006AMS,MS	9	1000	Unknown		12/05/2018 14:47	Finished	MS (5ppb), IWST-181022D,2>1
47	N033238-007AMS,MS	10	1000	Unknown		12/05/2018 14:57	Finished	MS (5ppb), IWST-181022D,10
48	N033238-008AMS,MS	11	1000	Unknown		12/05/2018 15:06	Finished	MS (1ppb), IWST-181022D,10
49	CCV-4,CCV1,1,	12	1000	Unknown		12/05/2018 15:16	Finished	CCV @10ppb, IWST-181022C
50	CCB-4,CCB,1,	13	1000	Unknown		12/05/2018 15:25	Finished	CCB R181127D
51	N033238-009AMS,MS	14	1000	Unknown		12/05/2018 15:35	Finished	MS (1ppb), IWST-181022D,10
52	N033238-010AMS,MS	15	1000	Unknown		12/05/2018 15:44	Finished	MS (1ppb), IWST-181022D,10
53	N033238-006AMS,MS	16	1000	Unknown		12/05/2018 15:54	Finished	MS (5ppb), IWST-181022D,5>1
54	N033238-011A,SAMF	17	1000	Unknown		12/05/2018 16:03	Finished	SAMP,10mL
55	N033238-012A,SAMF	18	1000	Unknown		12/05/2018 16:12	Finished	SAMP,10mL
56	N033238-013A,SAMF	19	1000	Unknown		12/05/2018 16:22	Finished	SAMP,2>10mL
57	N033238-014A,SAMF	20	1000	Unknown		12/05/2018 16:31	Finished	SAMP,10mL
58	N033238-015A,SAMF	21	1000	Unknown		12/05/2018 16:41	Finished	SAMP,10mL
59	N033238-011AMS,MS	22	1000	Unknown		12/05/2018 16:50	Finished	MS (1ppb), IWST-181022D,10
60	N033238-012AMS,MS	23	1000	Unknown		12/05/2018 17:00	Finished	MS (1ppb), IWST-181022D,10

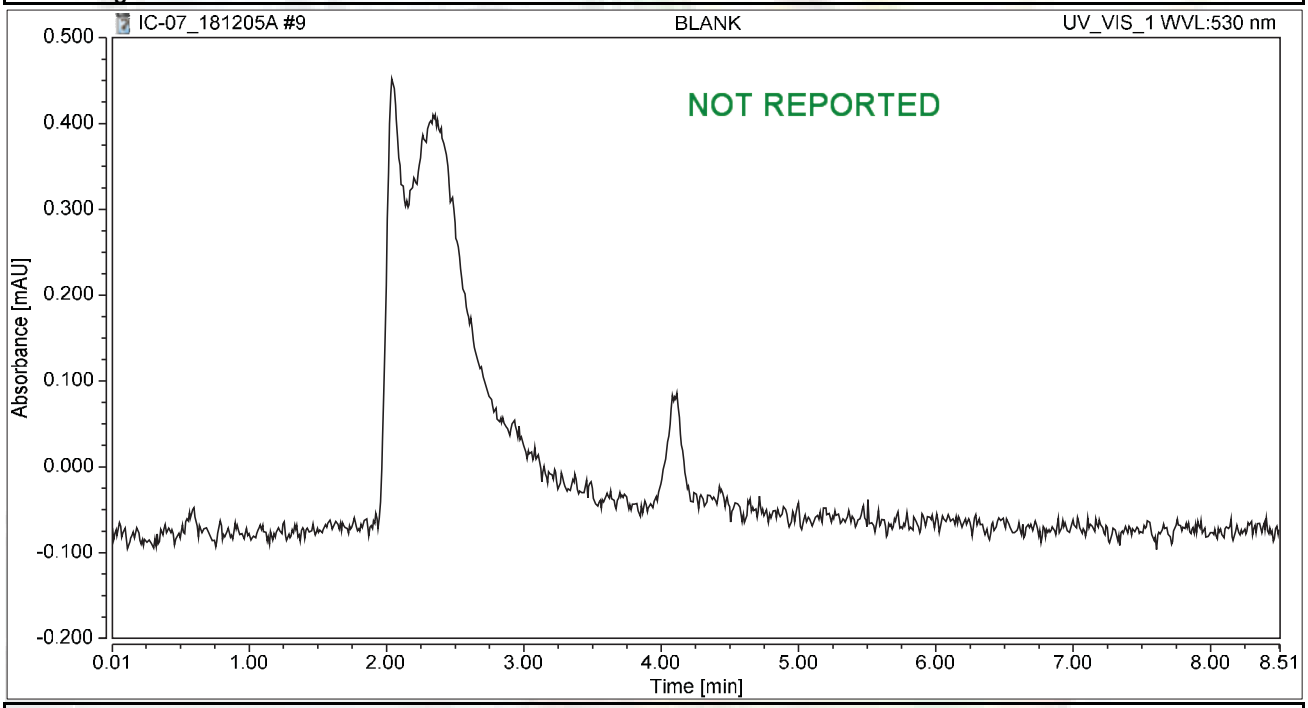
61	CCV-5,CCV,1,	24	1000	Unknown		12/05/2018 17:09	Finished	CCV @5ppb, IWST-181022C
62	CCB-5,CCB,1,	25	1000	Unknown		12/05/2018 17:19	Finished	CCB R181127D
63	CCB-5,CCB,1,	25	1000	Unknown		12/05/2018 17:36	Finished	CCB R181127D
64	N033238-013AMS,MS	26	1000	Unknown		12/05/2018 17:47	Finished	MS (5ppb), IWST-181022D,2>1
65	N033238-014AMS,MS	27	1000	Unknown		12/05/2018 17:56	Finished	MS (1ppb), IWST-181022D,10
66	N033238-015AMS,MS	28	1000	Unknown		12/05/2018 18:06	Finished	MS (1ppb), IWST-181022D,10
67	N033236-001B,SAMP	29	1000	Unknown		12/05/2018 18:15	Finished	SAMP,0.100>10mL
68	N033236-001BMS,MS	1	1000	Unknown		12/05/2018 18:38	Finished	MS (5ppb), IWST-181022D,0.1
69	N033236-002C,SAMP	2	1000	Unknown		12/05/2018 18:49	Finished	SAMP,10mL
70	N033236-002CMS,MS	3	1000	Unknown		12/05/2018 18:58	Finished	MSD (1ppb), IWST-181022D,10
71	N033224-001A,SAMP	4	1000	Unknown		12/05/2018 19:07	Finished	SAMP,10mL
72	~~N033238-013A,SAMP~~	5	1000	Unknown		12/05/2018 19:17	Finished	SAMP,2>10mL N033238-013AMS,MS,5
73	~~N033238-013AMS,MS~~	6	1000	Unknown		12/05/2018 19:26	Finished	MS (5ppb), IWST-181022D,2>1 N033238-013A,SAMP,5
74	CCV-6,CCV1,1,	7	1000	Unknown		12/05/2018 19:36	Finished	CCV @10ppb, IWST-181022C
75	CCB-6,CCB,1,	8	1000	Unknown		12/05/2018 19:45	Finished	CCB R181127D
76	LCS-2,LCS,1,	9	1000	Unknown		12/05/2018 19:55	Finished	LCS @5ppb, IWST-181022D
77	MB-2,MBLK,1,	10	1000	Unknown		12/05/2018 20:04	Finished	MB R181127D
78	N033237-001A,SAMP	11	1000	Unknown		12/05/2018 20:14	Finished	SAMP,10mL
79	N033237-001AMS,MS	12	1000	Unknown		12/05/2018 20:23	Finished	MS (1ppb), IWST-181022D,10
80	N033237-002A,SAMP	13	1000	Unknown		12/05/2018 20:33	Finished	SAMP,0.100>10mL
81	N033237-002AMS,MS	14	1000	Unknown		12/05/2018 20:42	Finished	MS (5ppb), IWST-181022D,0.1
82	N033237-002AMSD,M	15	1000	Unknown		12/05/2018 20:52	Finished	MSD (5ppb), IWST-181022D,0.
83	N033224-001A,SAMP	16	1000	Unknown		12/05/2018 21:01	Finished	SAMP,2>10mL
84	N033224-001ADUP,D	17	1000	Unknown		12/05/2018 21:10	Finished	DUP,10mL
85	N033233-001A,SAMP	18	1000	Unknown		12/05/2018 21:20	Finished	SAMP,10mL
86	CCV-7,CCV,1,	19	1000	Unknown		12/05/2018 21:29	Finished	CCV @5ppb, IWST-181022C
87	CCB-7,CCB,1,	20	1000	Unknown		12/05/2018 21:39	Finished	CCB R181127D
88	N033233-002A,SAMP	21	1000	Unknown		12/05/2018 21:48	Finished	SAMP,10mL
89	N033213-004A,SAMP	22	1000	Unknown		12/05/2018 21:58	Finished	SAMP,10mL
90	N033213-004AMS,MS	23	1000	Unknown		12/05/2018 22:07	Finished	MS (1ppb), IWST-181022D,10
91	N033213-008A,SAMP	24	1000	Unknown		12/05/2018 22:17	Finished	SAMP,10mL
92	N033213-008AMS,MS	25	1000	Unknown		12/05/2018 22:26	Finished	MS (1ppb), IWST-181022D,10
93	N033213-012A,SAMP	26	1000	Unknown		12/05/2018 22:36	Finished	SAMP,10mL
94	N033213-012AMS,MS	27	1000	Unknown		12/05/2018 22:45	Finished	MS (1ppb), IWST-181022D,10
95	N033213-014A,SAMP	28	1000	Unknown		12/05/2018 22:55	Finished	SAMP,10mL
96	N033213-014AMS,MS	29	1000	Unknown		12/05/2018 23:04	Finished	MS (1ppb), IWST-181022D,10
97	N033213-015A,SAMP	30	1000	Unknown		12/05/2018 23:13	Finished	SAMP,10mL
98	CCV-8,CCV1,1,	31	1000	Unknown		12/05/2018 23:23	Finished	CCV @10ppb, IWST-181022C
99	CCB-8,CCB,1,	32	1000	Unknown		12/05/2018 23:32	Finished	CCB R181127D
100	N033213-015AMS,MS	33	1000	Unknown		12/05/2018 23:42	Finished	MS (1ppb), IWST-181022D,10
101	N033213-016A,SAMP	34	1000	Unknown		12/05/2018 23:51	Finished	SAMP,10mL
102	N033213-016AMS,MS	35	1000	Unknown		12/06/2018 00:01	Finished	MS (1ppb), IWST-181022D,10
103	N033213-017A,SAMP	36	1000	Unknown		12/06/2018 00:10	Finished	SAMP,10mL
104	N033213-017AMS,MS	37	1000	Unknown		12/06/2018 00:20	Finished	MS (1ppb), IWST-181022D,10
105	N033232-002B,SAMP	38	1000	Unknown		12/06/2018 00:29	Finished	SAMP,10mL
106	N033232-002BMS,MS	39	1000	Unknown		12/06/2018 00:39	Finished	MS (1ppb), IWST-181022D,10
107	LCS-1,LCS,1,	40	1000	Unknown		12/06/2018 00:48	Finished	LCS @5ppb, IWST-181022D
108	LCS-2,LCS,1,	41	1000	Unknown		12/06/2018 00:58	Finished	LCS @5ppb, IWST-181022D
109	LCS-3,LCS,1,	42	1000	Unknown		12/06/2018 01:07	Finished	LCS @5ppb, IWST-181022D
110	CCV-9,CCV,1,	43	1000	Unknown		12/06/2018 01:17	Finished	CCV @5ppb, IWST-181022C
111	CCB-9,CCB,1,	44	1000	Unknown		12/06/2018 01:26	Finished	CCB R181127D
112	LCS-4,LCS,1,	45	1000	Unknown		12/06/2018 01:35	Finished	LCS @5ppb, IWST-181022D
113	CCV-10,CCV1,1,	46	1000	Unknown		12/06/2018 01:45	Finished	CCV @10ppb, IWST-181022C
114	CCB-10,CCB,1,	47	1000	Unknown		12/06/2018 01:54	Finished	CCB R181127D
115	SHUTDOWN	48	1000	Unknown		12/06/2018 02:04	Finished	
116	Eluent: R181203A	49	1000	Unknown		n.a.	Finished	Eluent
117	PCR: R181204A	50	1000	Unknown		n.a.	Finished	Post-Column Reagent

Chromatogram and Results

Injection Details

Injection Name:	**BLANK**	*Run Time (min):*	**8.50**
Vial Number:	**1**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:00**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

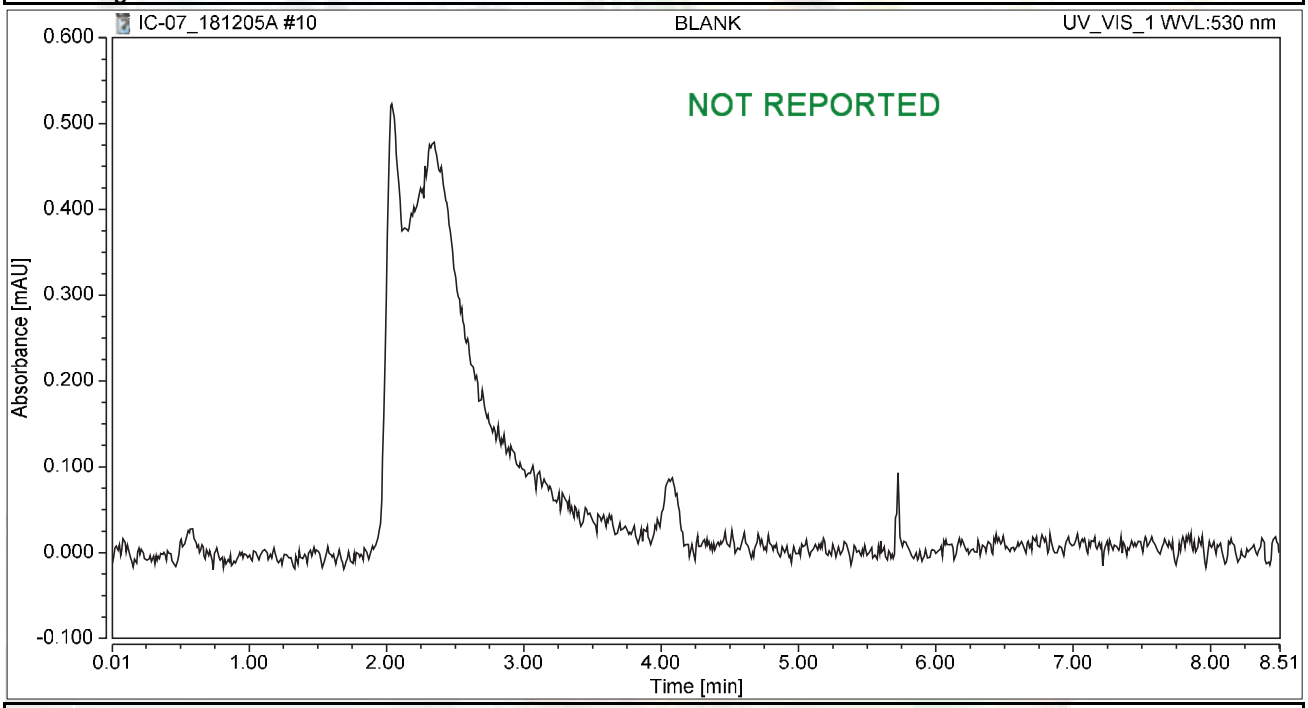
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**BLANK**	*Run Time (min):*	**8.50**
Vial Number:	**2**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:11**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

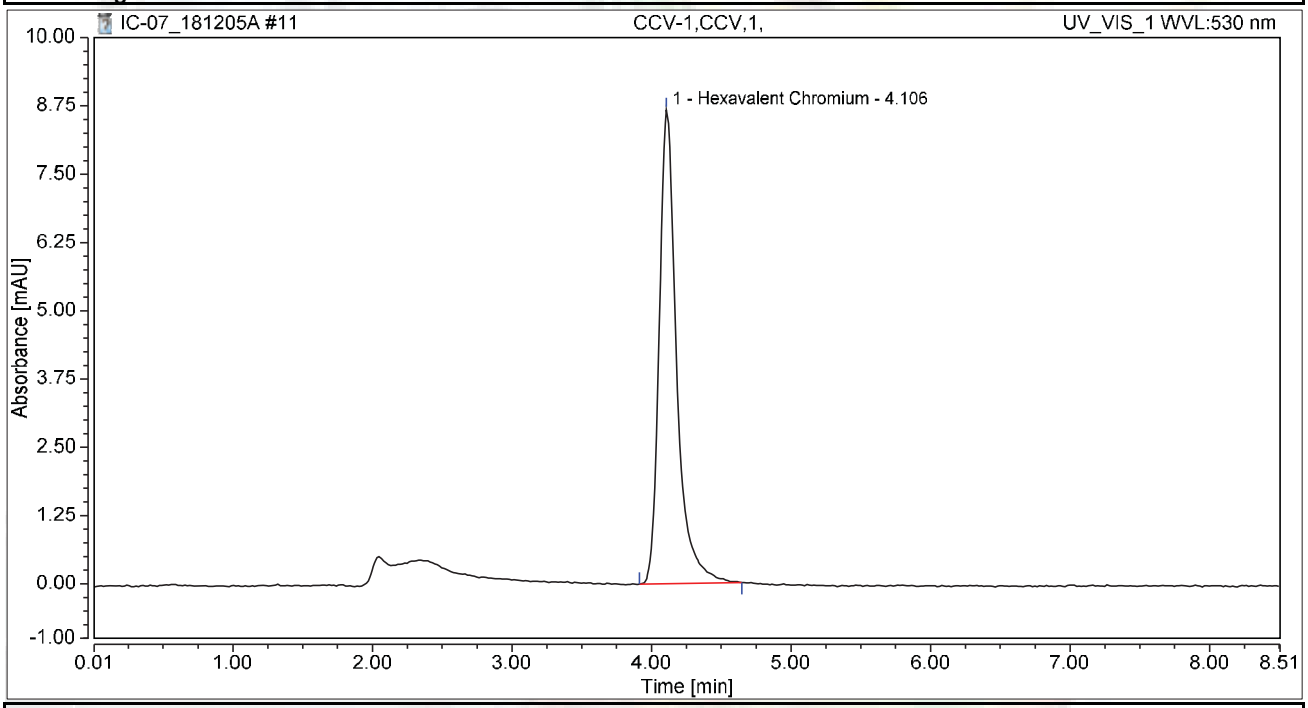
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCV-1,CCV,1,**	*Run Time (min):*	**8.50**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:20**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

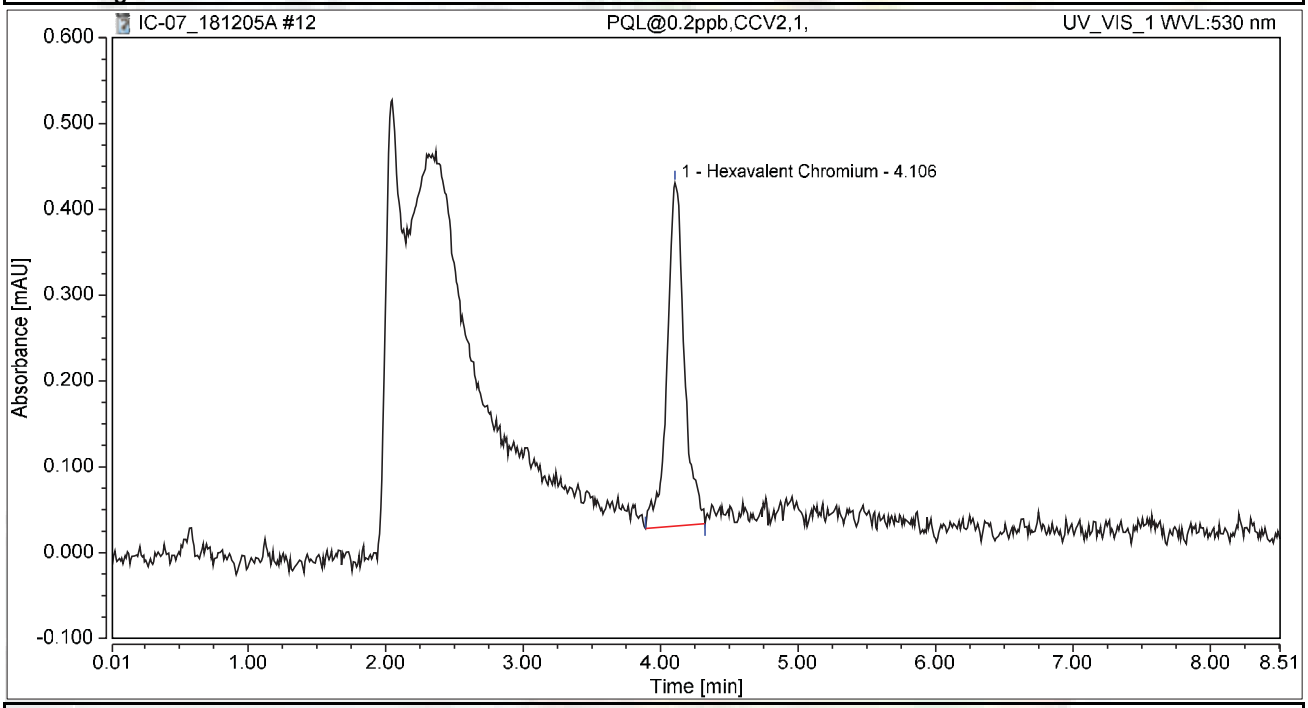
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	1.253	8.676	100.00	100.00	4.9529
Total:			**1.253**	**8.676**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**PQL@0.2ppb,CCV2,1,**	*Run Time (min):*	**8.49**
Vial Number:	**4**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

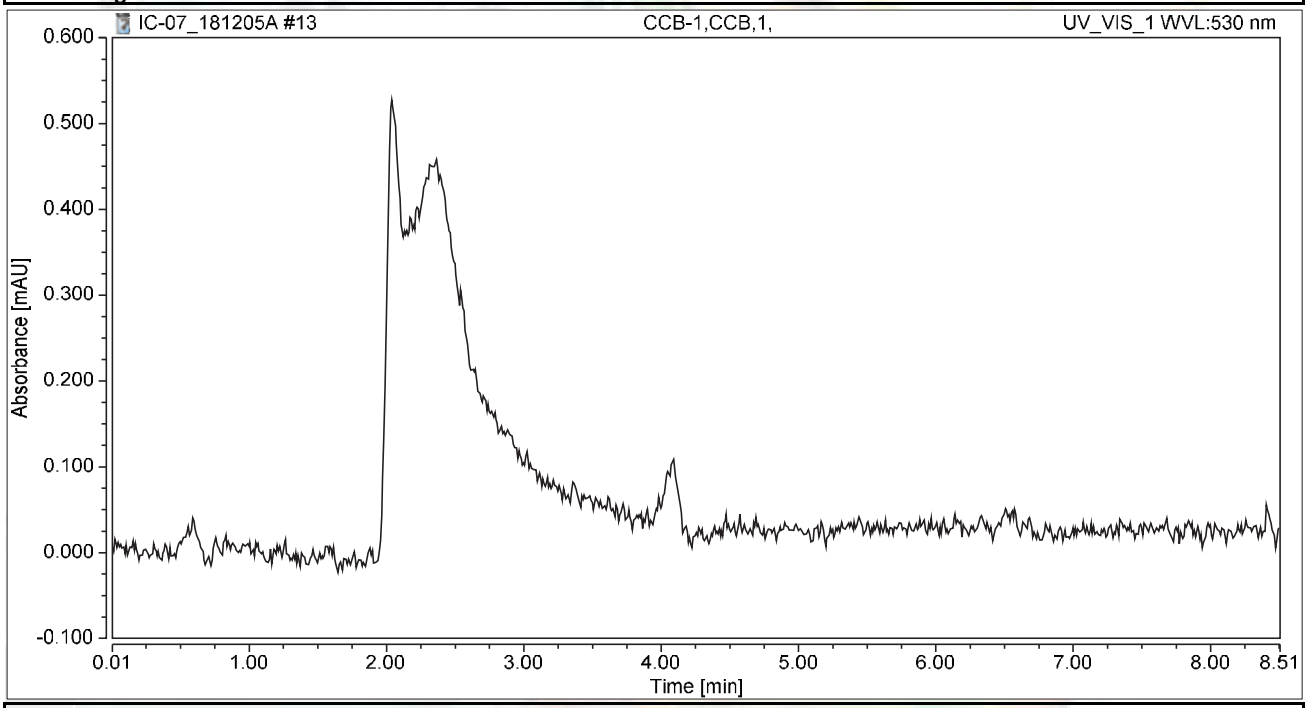
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	0.058	0.400	100.00	100.00	0.2288
Total:			**0.058**	**0.400**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-1,CCB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

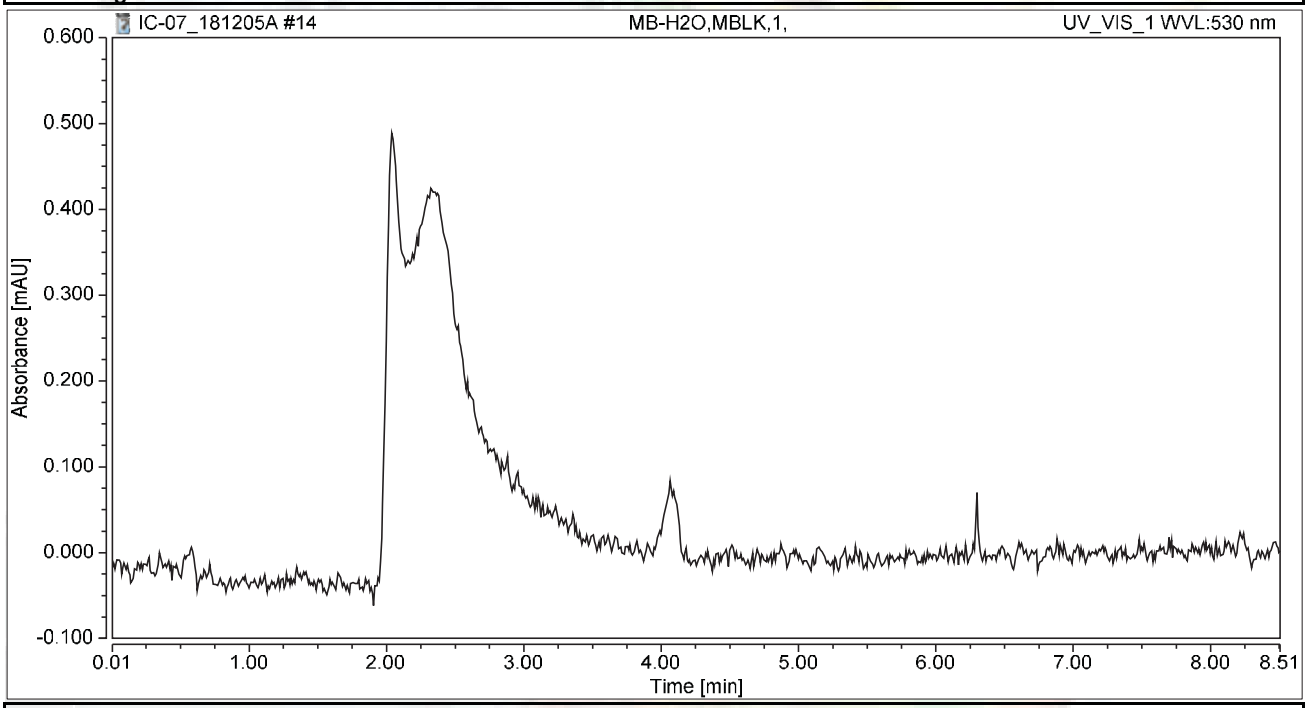
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**MB-H2O,MBLK,1,**	*Run Time (min):*	**8.50**
Vial Number:	**6**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:49**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

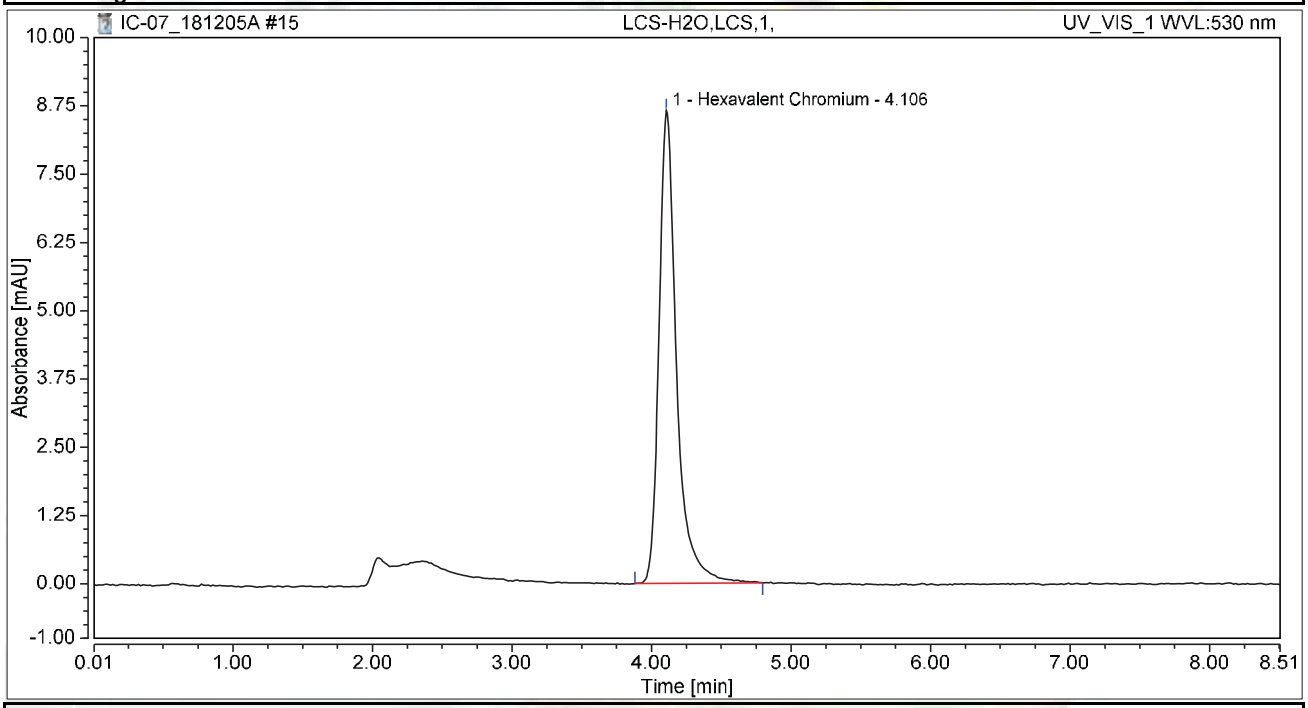
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**LCS-H2O,LCS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 08:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

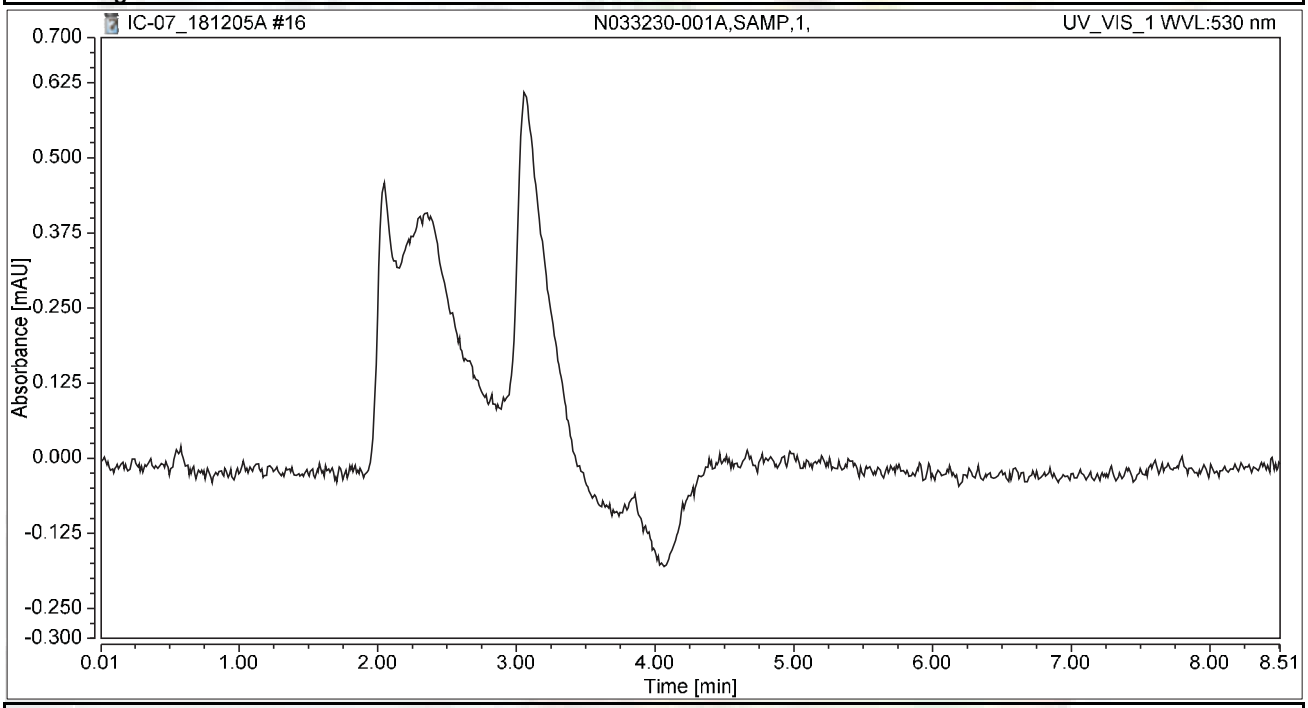
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	1.263	8.658	100.00	100.00	4.9935
Total:			**1.263**	**8.658**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033230-001A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:08**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

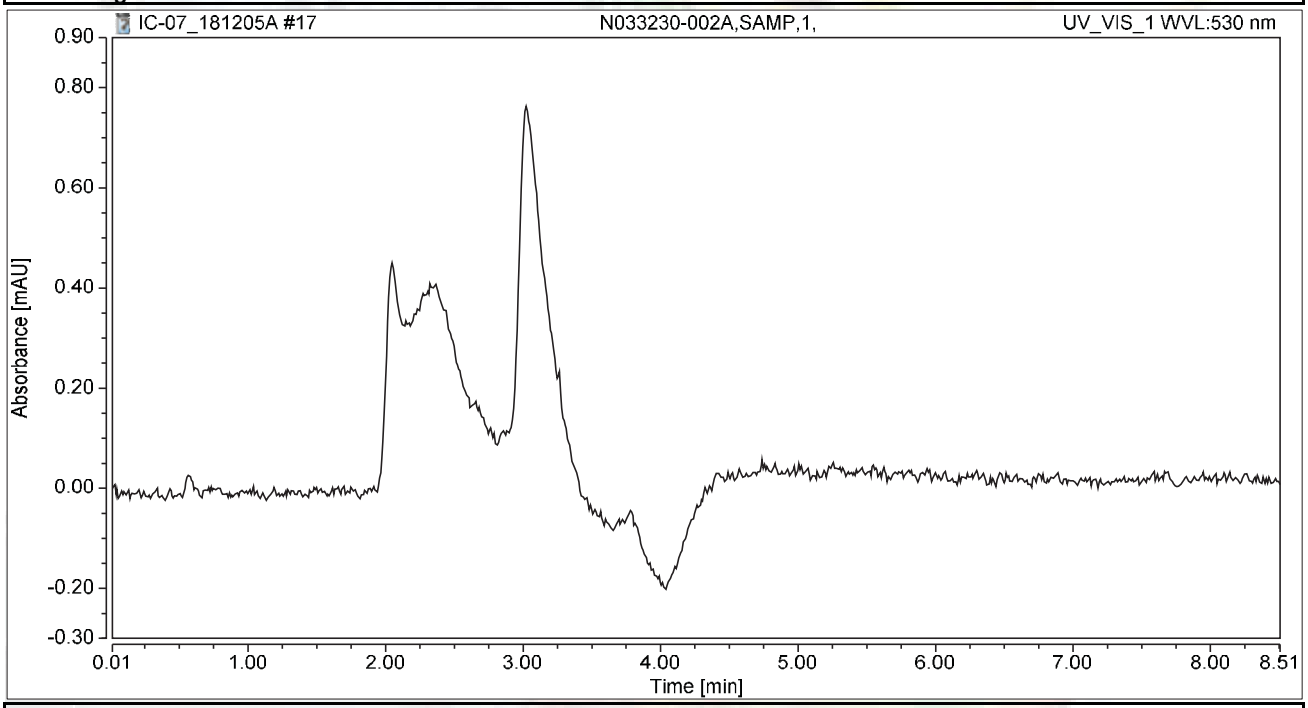
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033230-002A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**9**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:17**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

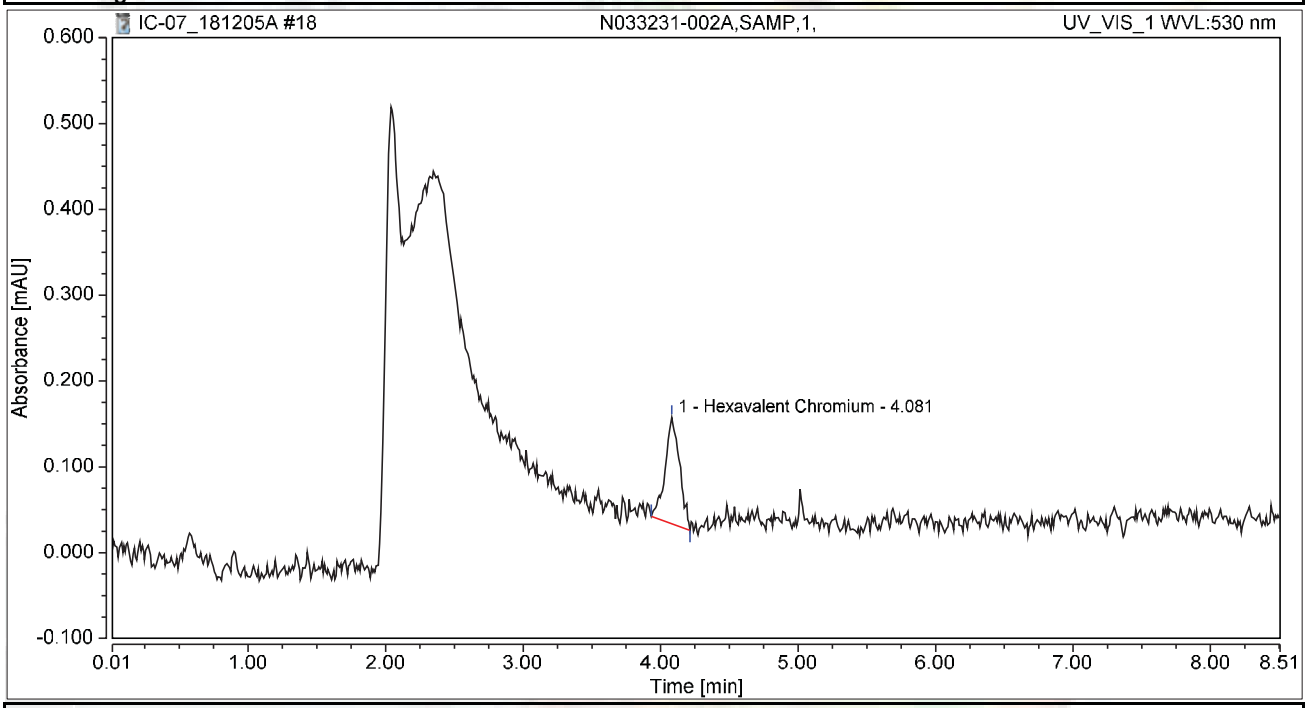
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033231-002A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**10**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:27**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

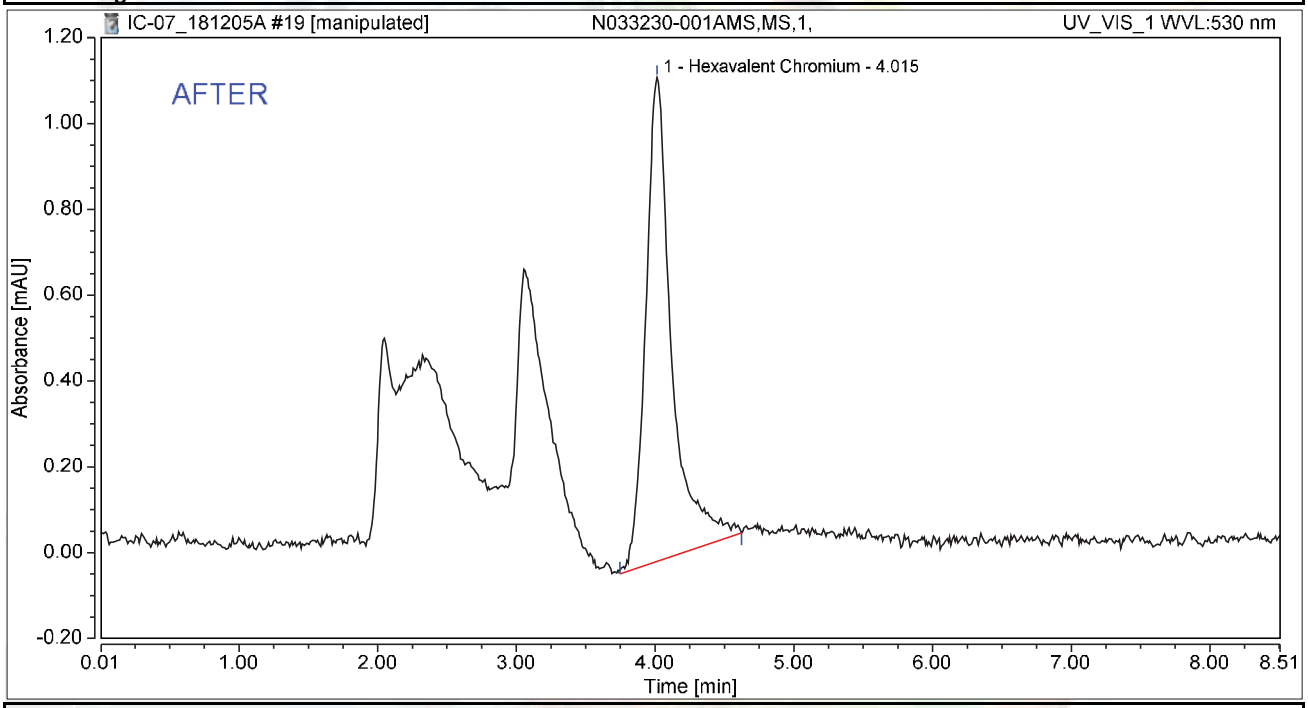
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.081	0.015	0.124	100.00	100.00	0.0591
Total:			**0.015**	**0.124**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033230-001AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**11**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:36**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.015	0.245	1.127	100.00	100.00	0.9682
Total:			**0.245**	**1.127**	**100.00**	**100.00**	

rba 12/9/2018

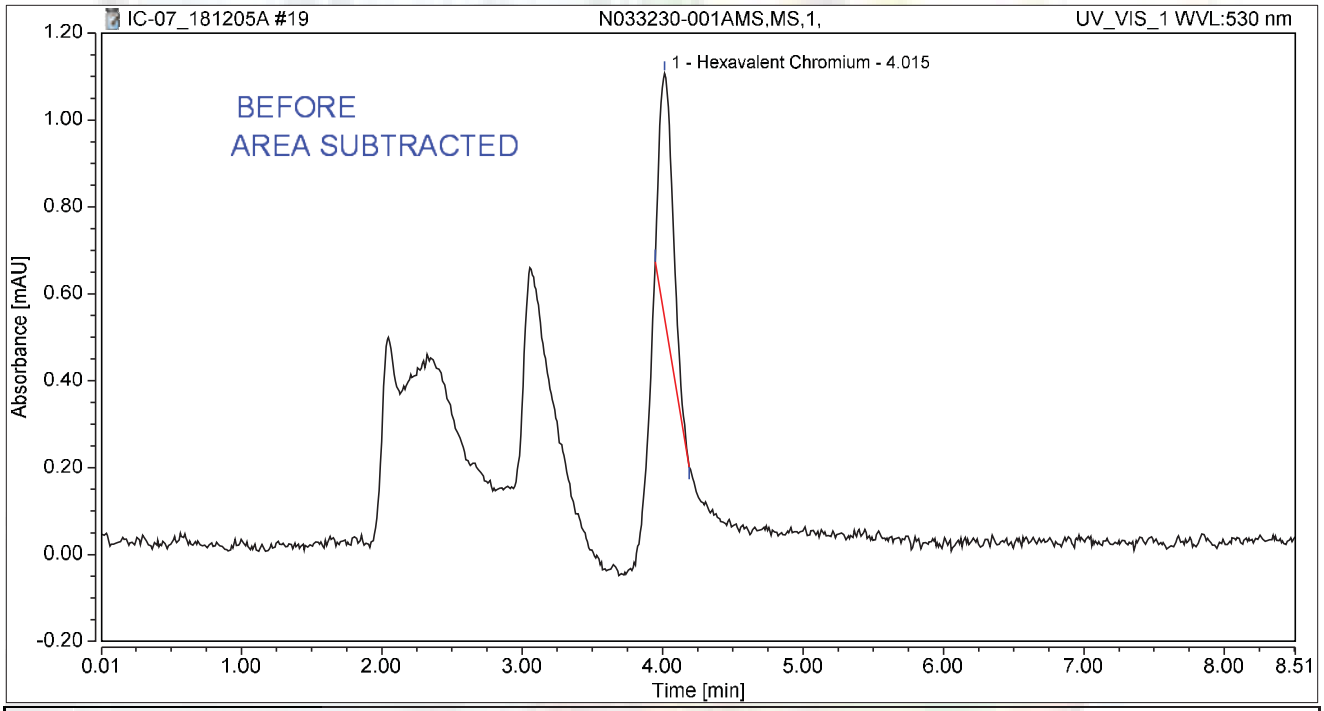
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033230-001AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**11**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:36**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.015	0.065	0.563	100.00	100.00	0.2564
Total:			**0.065**	**0.563**	**100.00**	**100.00**	

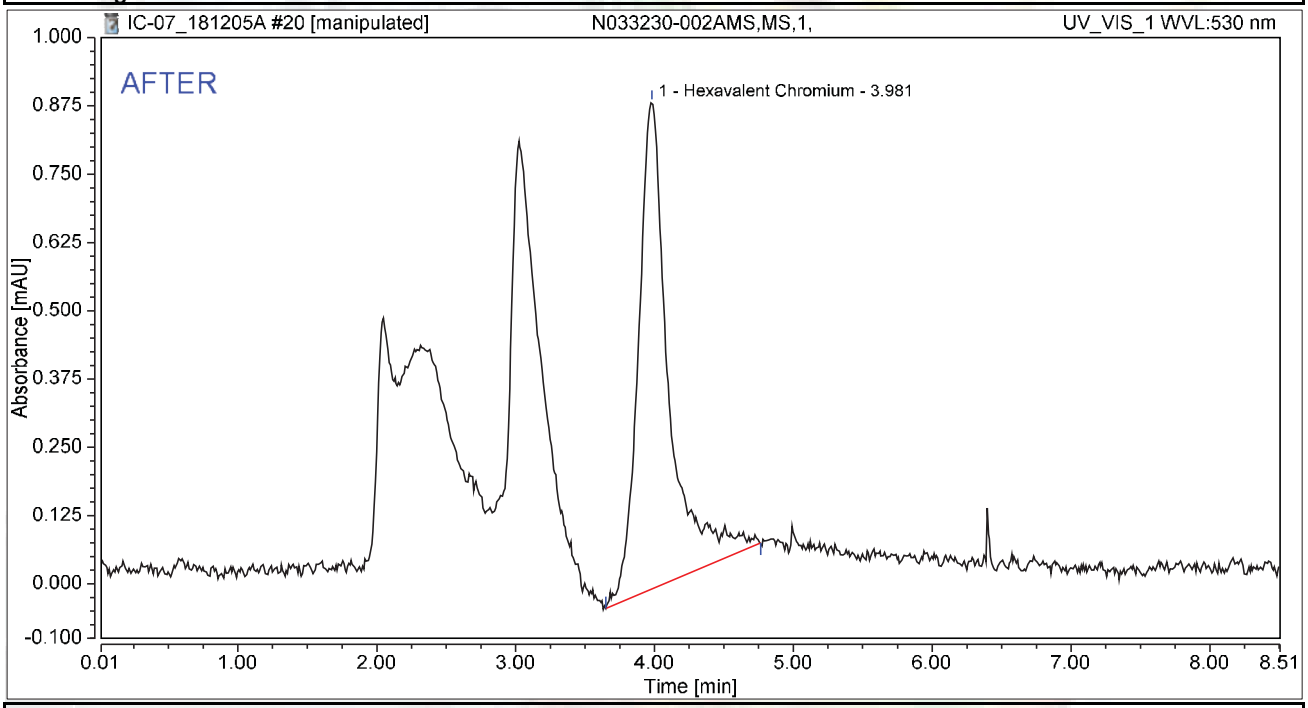
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033230-002AMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**13**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:46**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.229	0.891	100.00	100.00	0.9046
Total:			**0.229**	**0.891**	**100.00**	**100.00**	

rba 12/9/2018

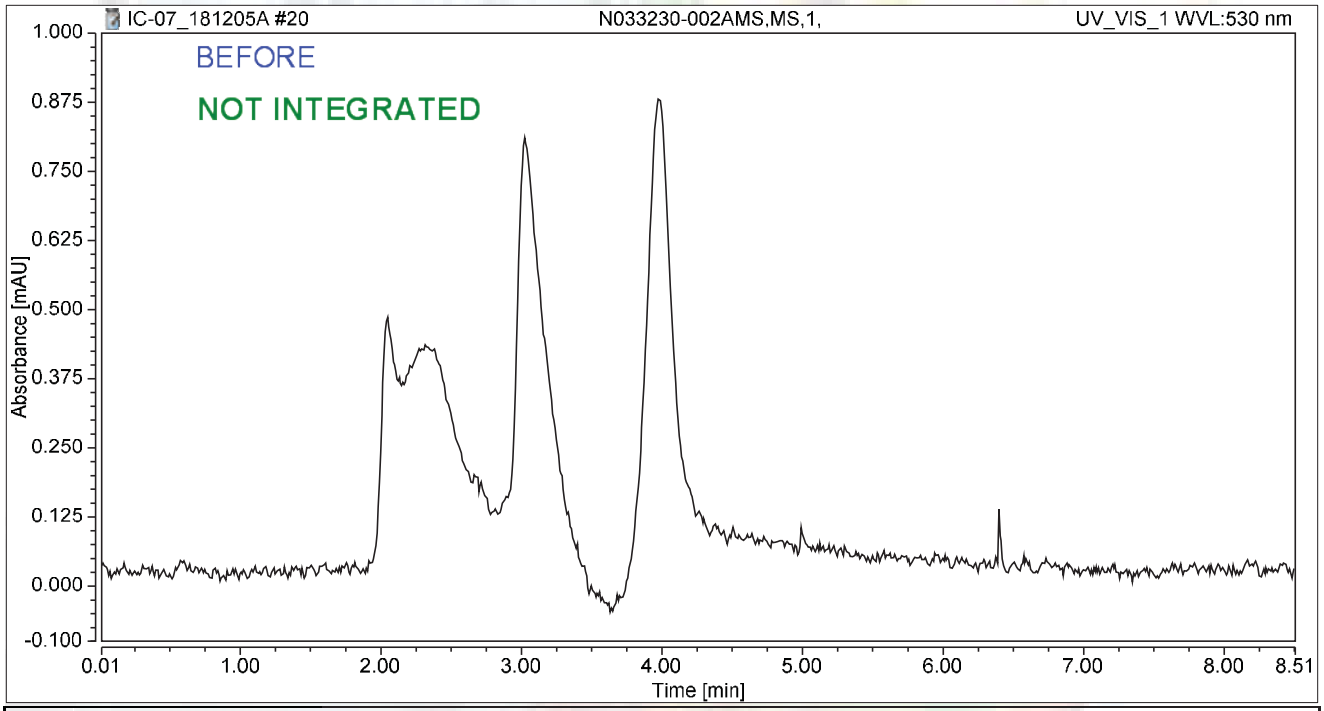
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033230-002AMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**13**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:46**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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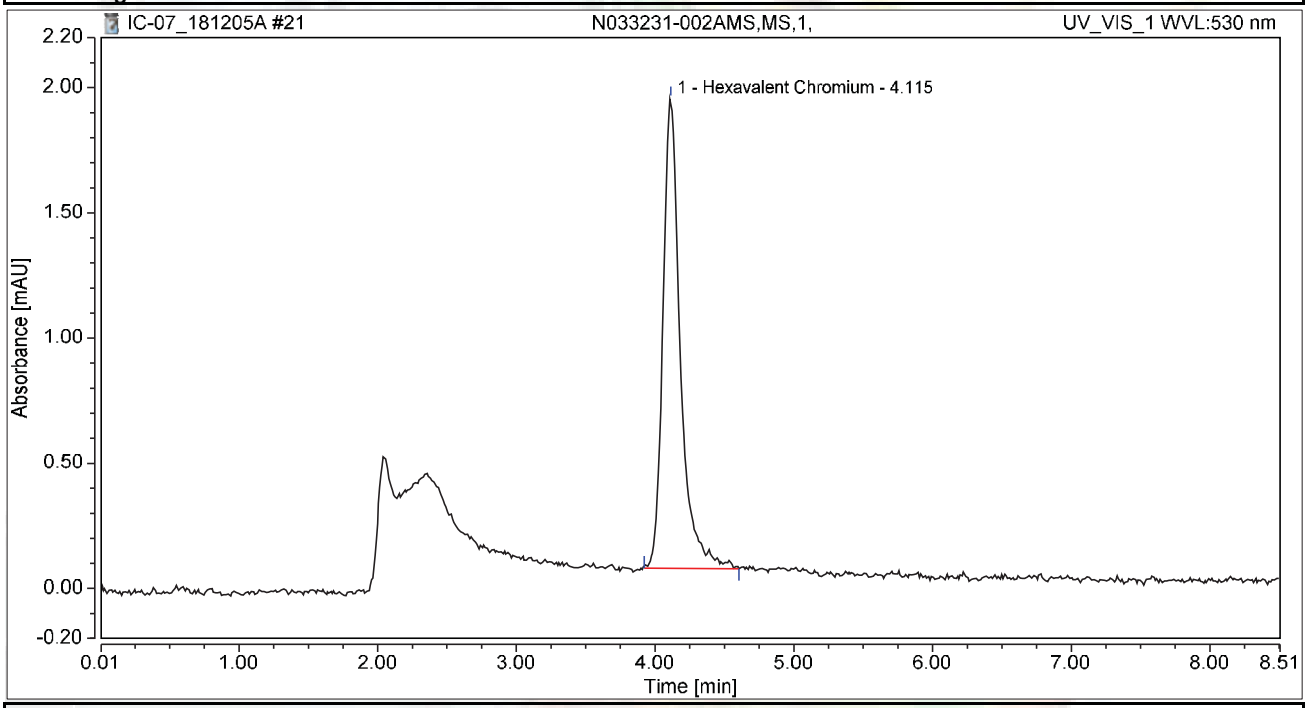
Chromatogram and Results

Injection Details

Injection Name:	**N033231-002AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**14**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 09:55**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

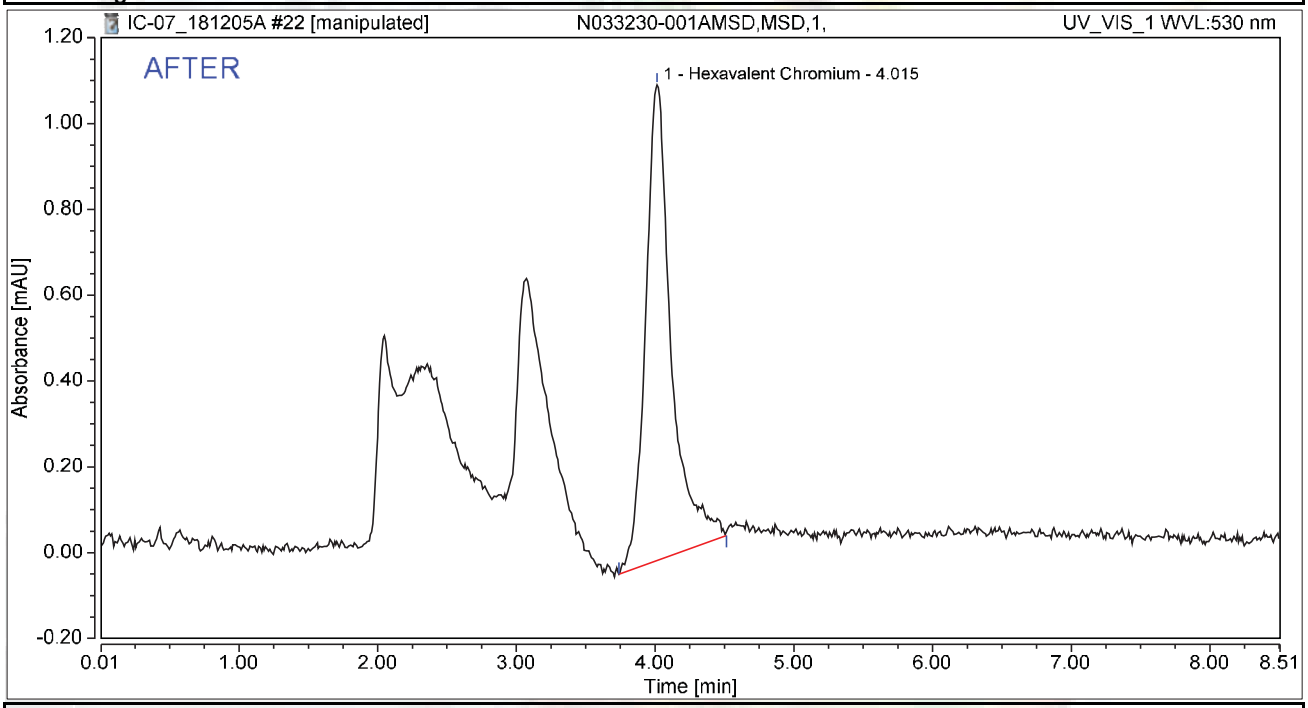
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	0.273	1.877	100.00	100.00	1.0805
Total:			**0.273**	**1.877**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033230-001AMSD,MSD,1,**	*Run Time (min):*	**8.50**
Vial Number:	**16**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:04**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.015	0.239	1.108	100.00	100.00	0.9432
Total:			**0.239**	**1.108**	**100.00**	**100.00**	

rba 12/9/2018

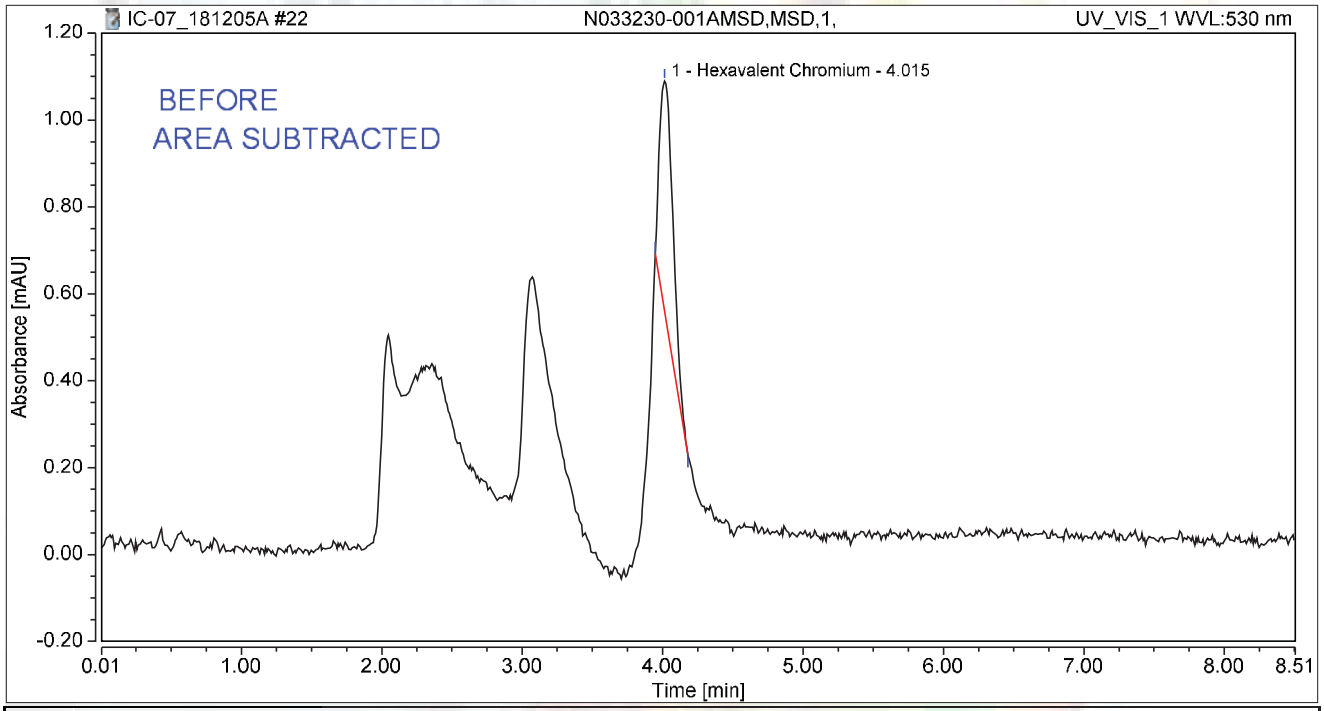
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033230-001AMSD,MSD,1,**	*Run Time (min):*	**8.50**
Vial Number:	**16**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:04**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.015	0.060	0.530	100.00	100.00	0.2357
Total:			**0.060**	**0.530**	**100.00**	**100.00**	

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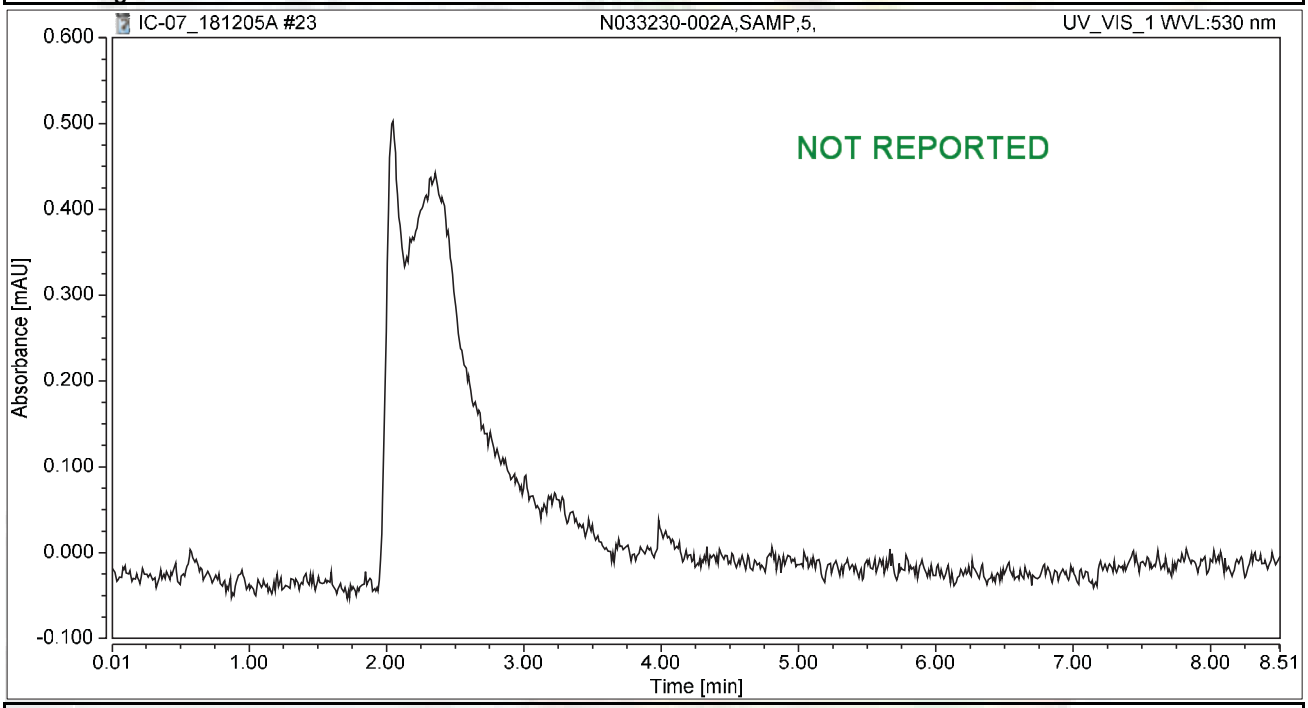
Chromatogram and Results

Injection Details

Injection Name:	**N033230-002A,SAMP,5,**	*Run Time (min):*	**8.50**
Vial Number:	**17**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:14**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

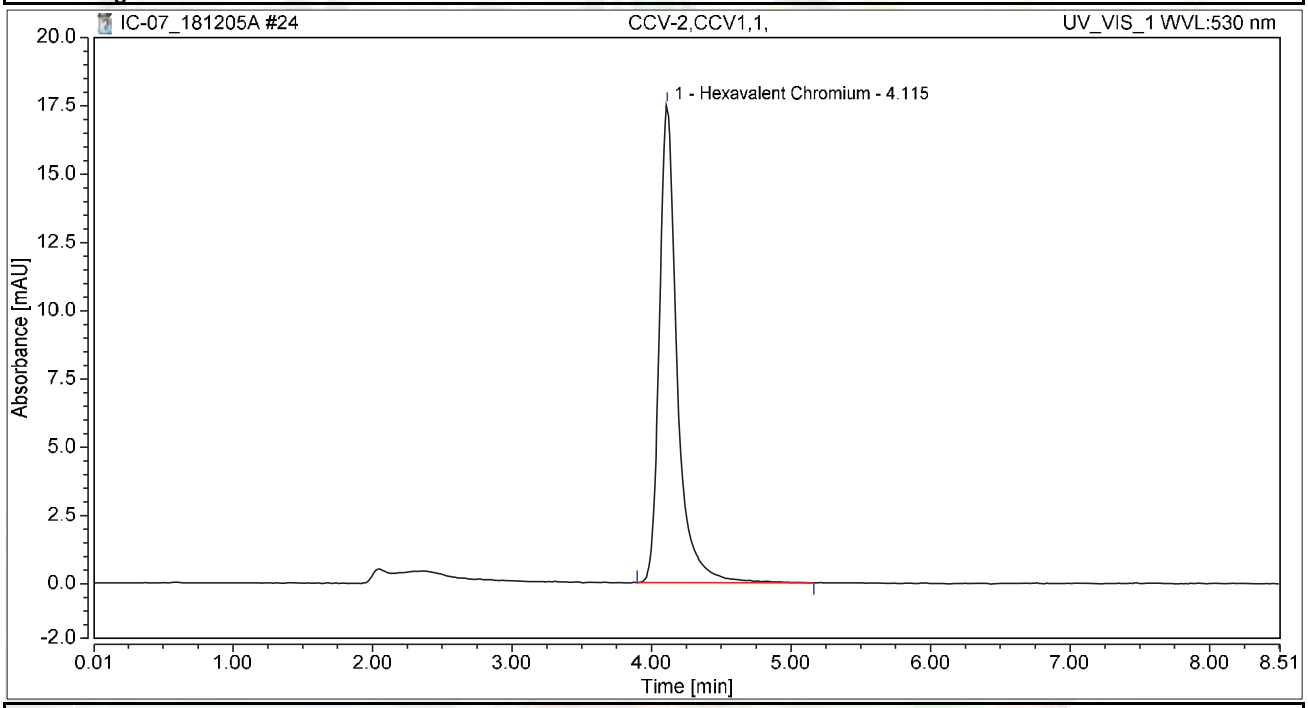
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCV-2,CCV1,1,**	*Run Time (min):*	**8.50**
Vial Number:	**18**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:23**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

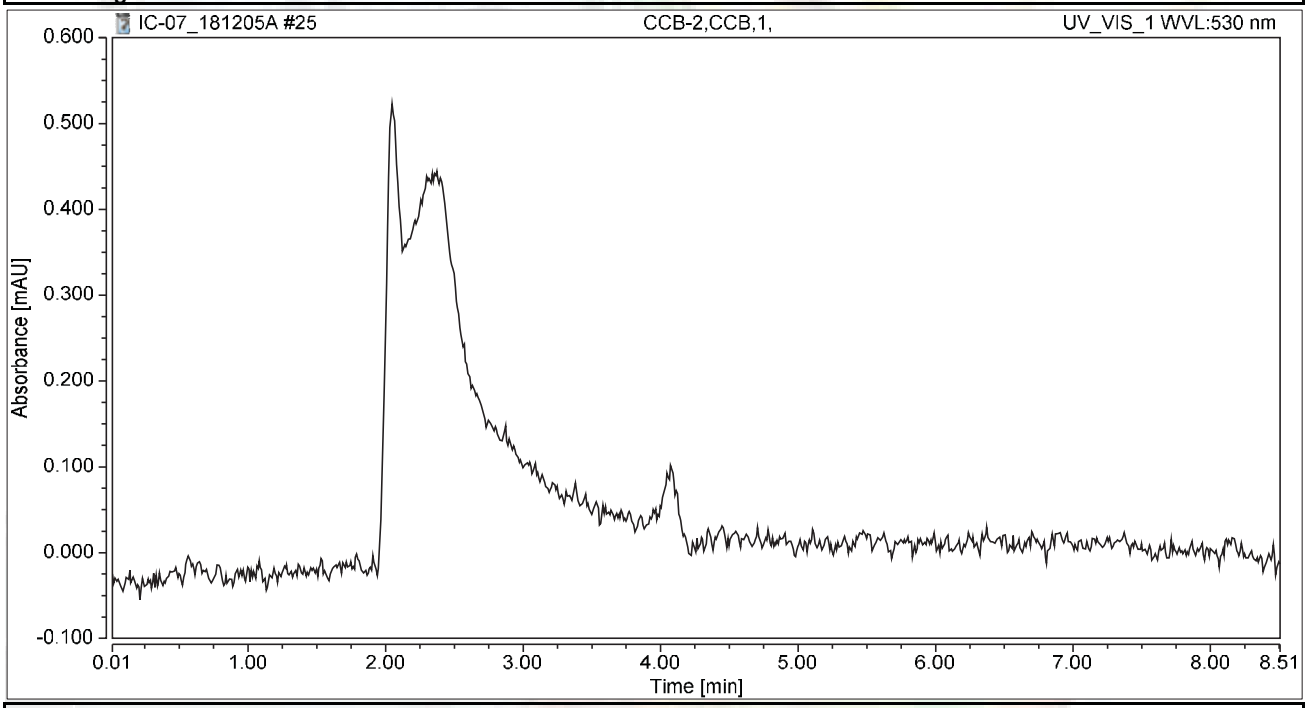
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	2.585	17.507	100.00	100.00	10.2211
Total:			**2.585**	**17.507**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-2,CCB,1,**	*Run Time (min):*	**8.49**
Vial Number:	**19**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:33**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

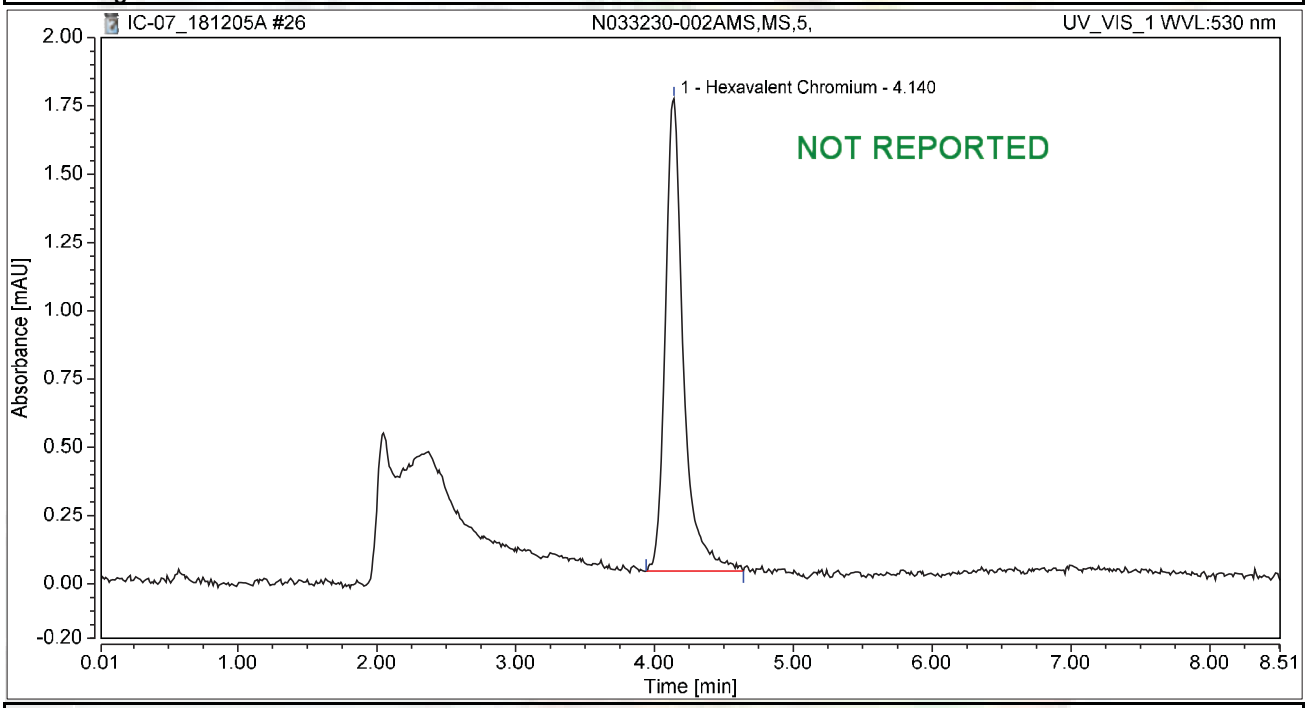
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033230-002AMS,MS,5,**	*Run Time (min):*	**8.49**
Vial Number:	**20**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:42**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

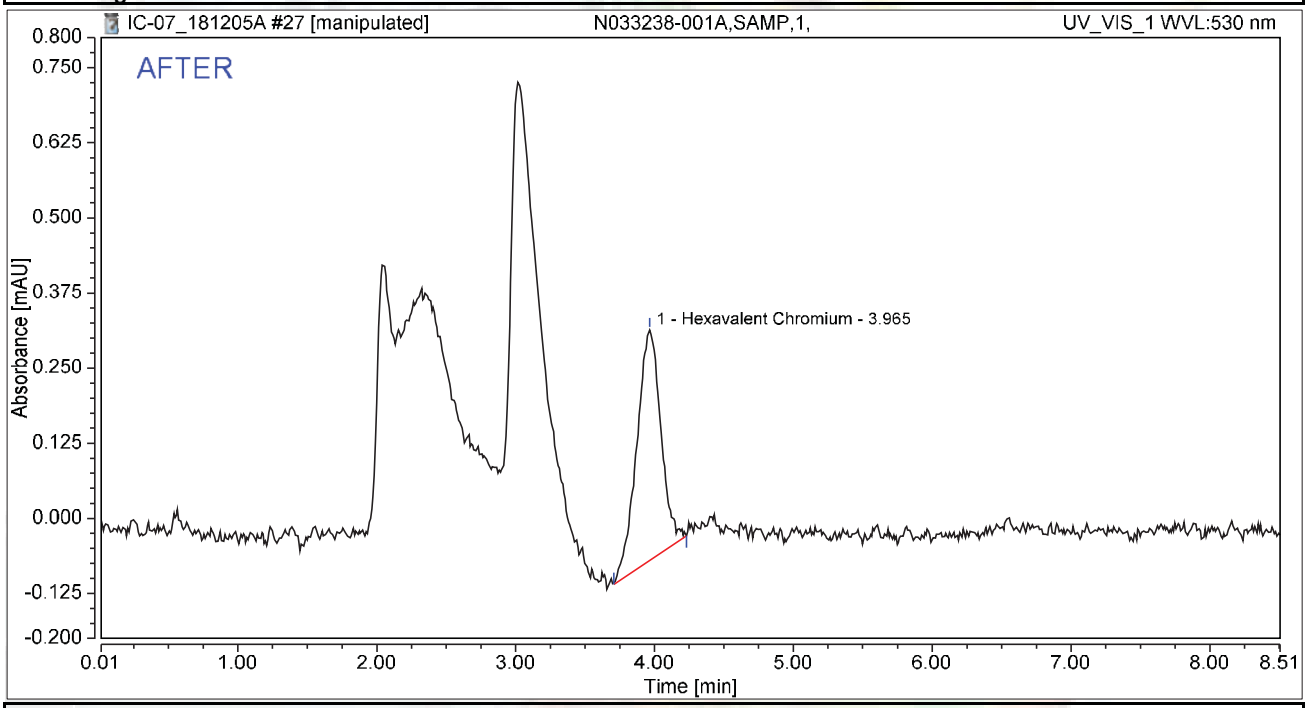
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.140	0.262	1.730	100.00	100.00	1.0357
Total:			**0.262**	**1.730**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-001A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**21**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:52**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.965	0.077	0.384	100.00	100.00	0.3055
Total:			**0.077**	**0.384**	**100.00**	**100.00**	

rba 12/9/2018

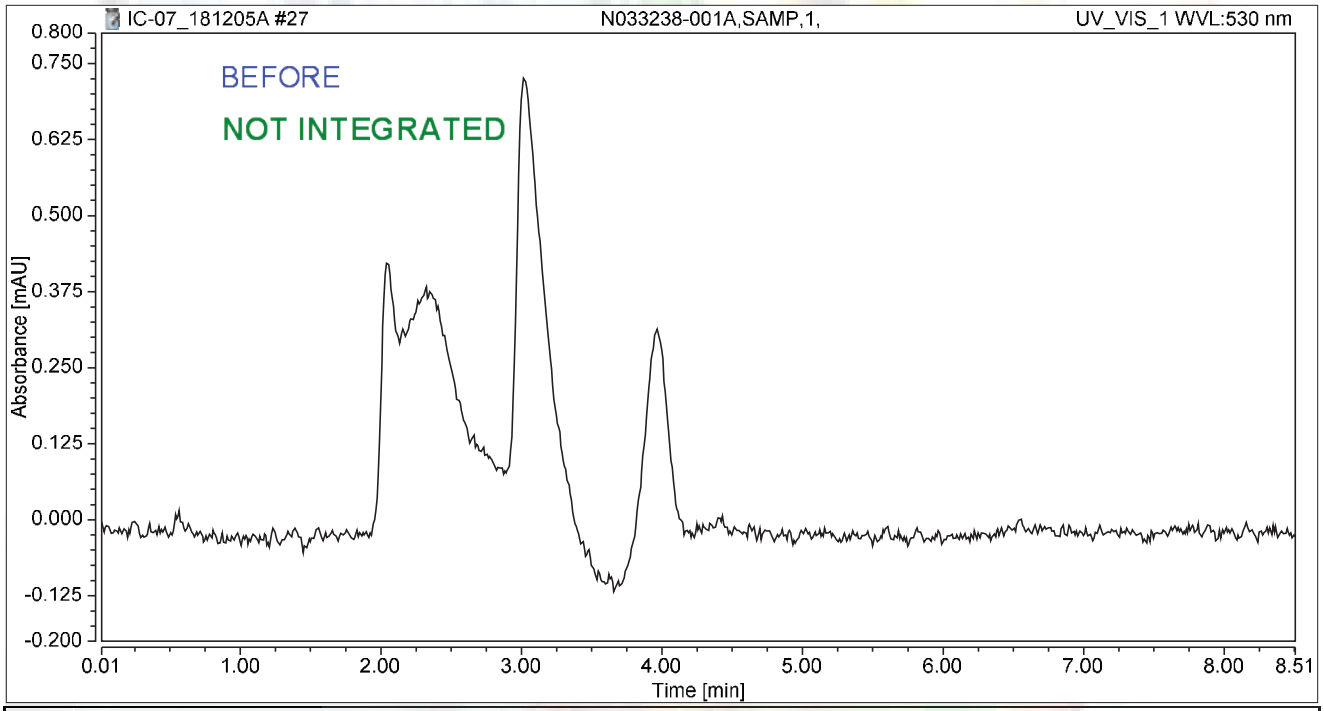
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-001A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**21**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 10:52**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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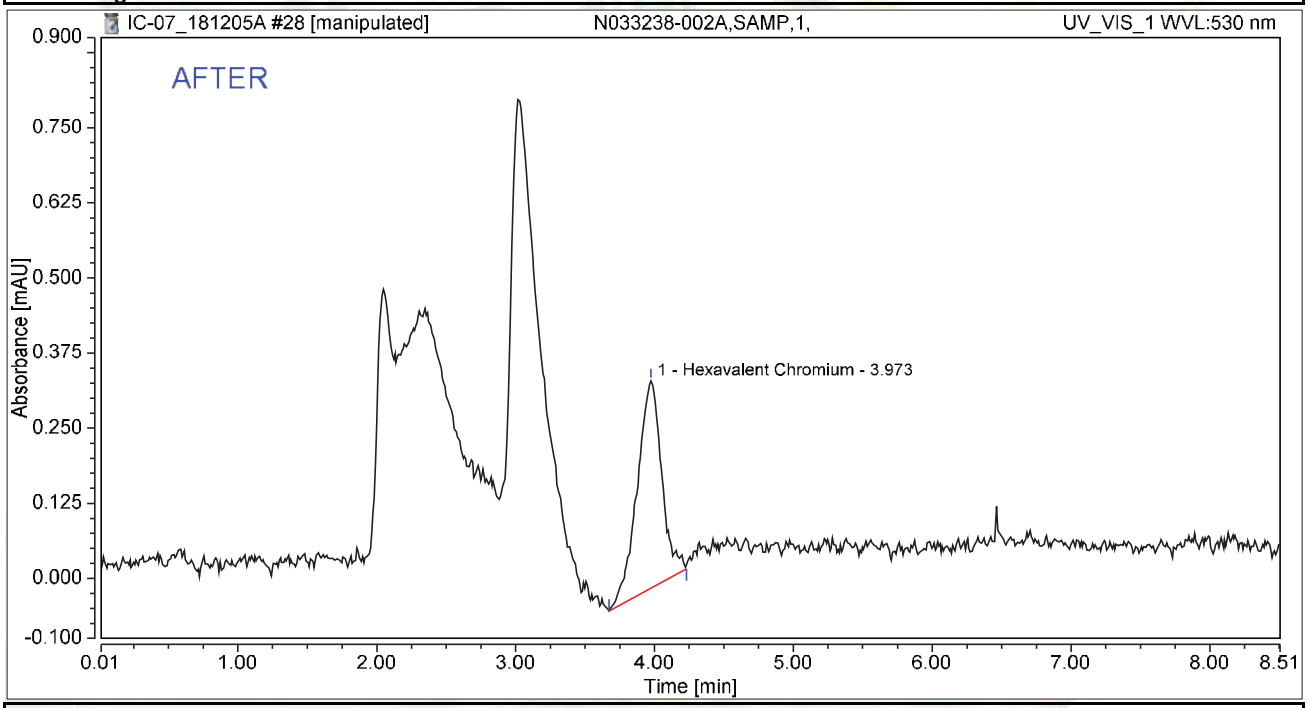
Chromatogram and Results

Injection Details

Injection Name:	**N033238-002A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**22**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:01**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.071	0.345	100.00	100.00	0.2797
Total:			**0.071**	**0.345**	**100.00**	**100.00**	

rba 12/9/2018

Reviewed by:
My first report/Integration Nancy 12/9/2018

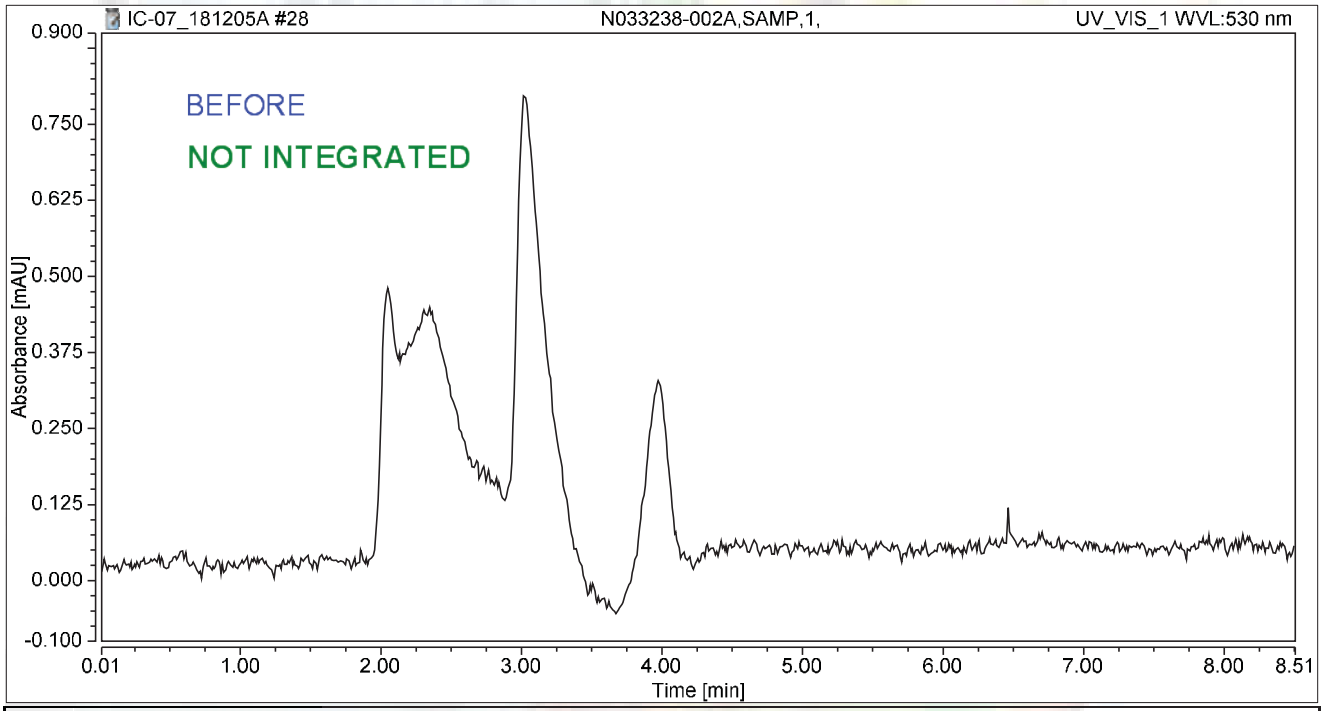
Chromeleon (c) Dionex
Version 7.1.1.1127

Chromatogram and Results

Injection Details

Injection Name:	**N033238-002A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**22**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:01**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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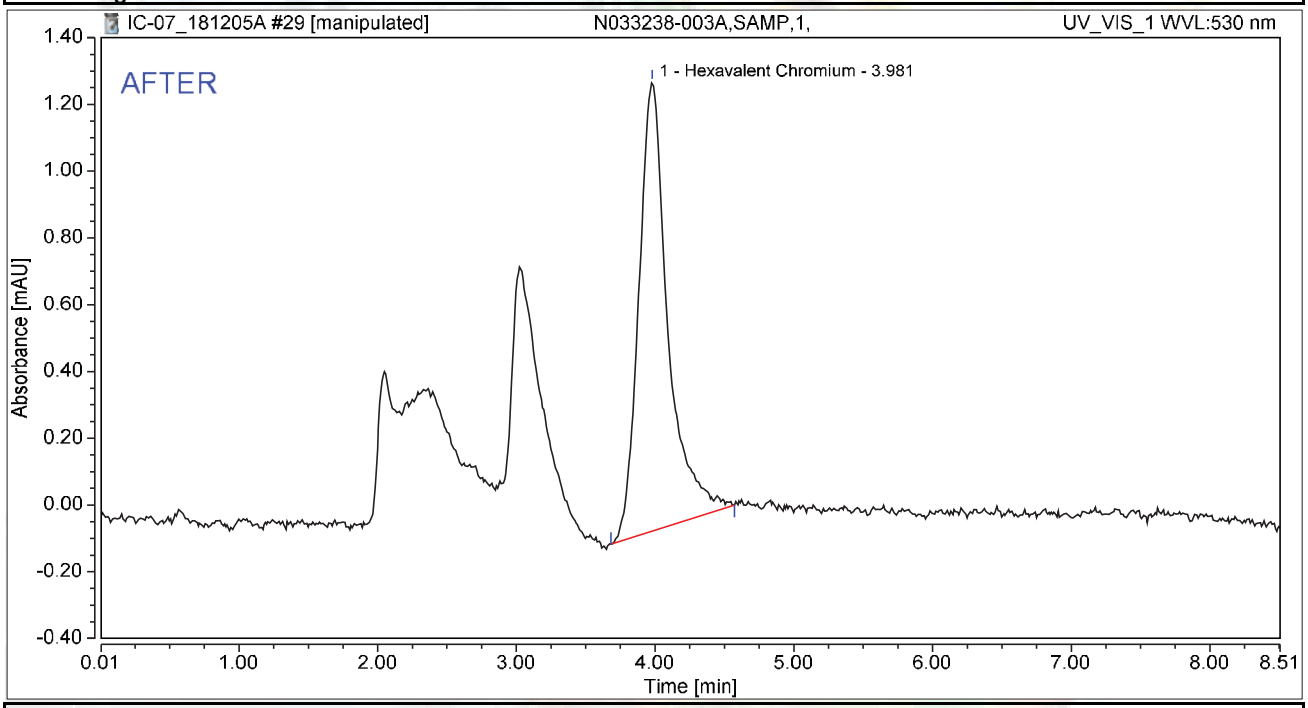
Chromatogram and Results

Injection Details

Injection Name:	**N033238-003A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**23**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:11**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.327	1.345	100.00	100.00	1.2940
Total:			**0.327**	**1.345**	**100.00**	**100.00**	

rba 12/9/2018

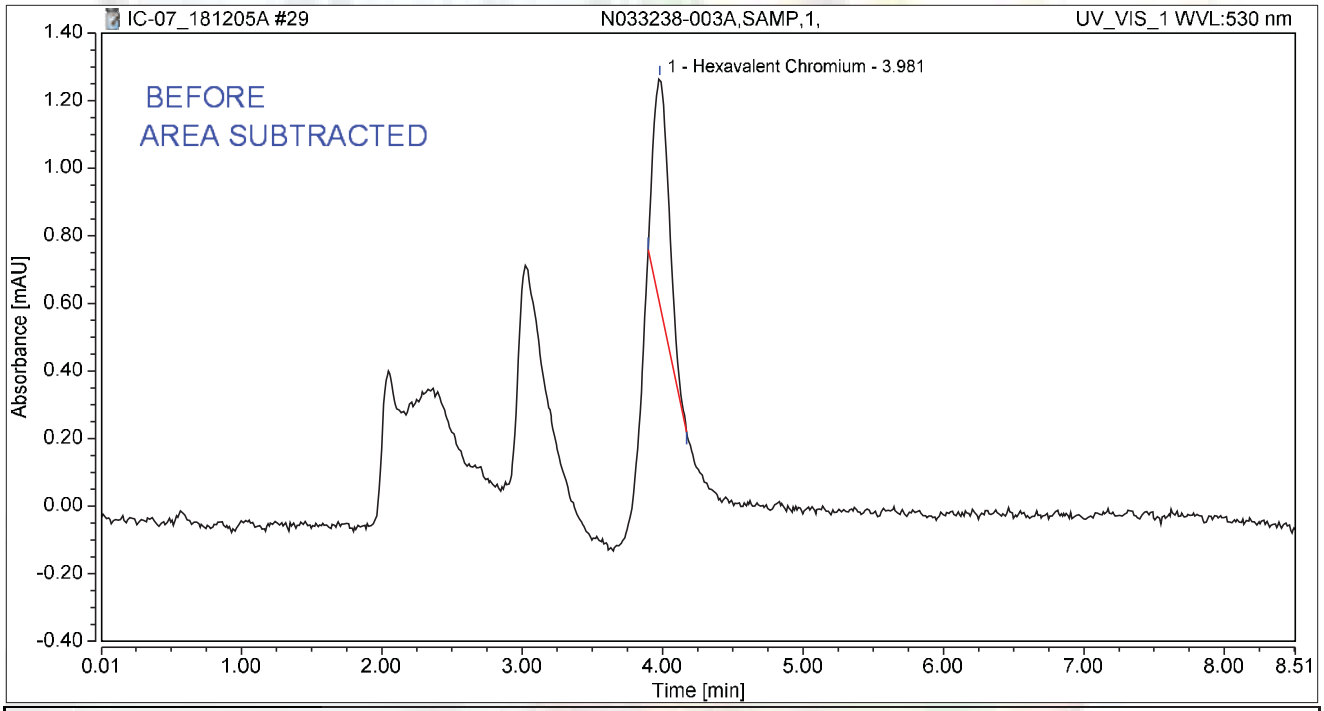
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-003A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**23**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:11**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.087	0.671	100.00	100.00	0.3444
Total:			**0.087**	**0.671**	**100.00**	**100.00**	

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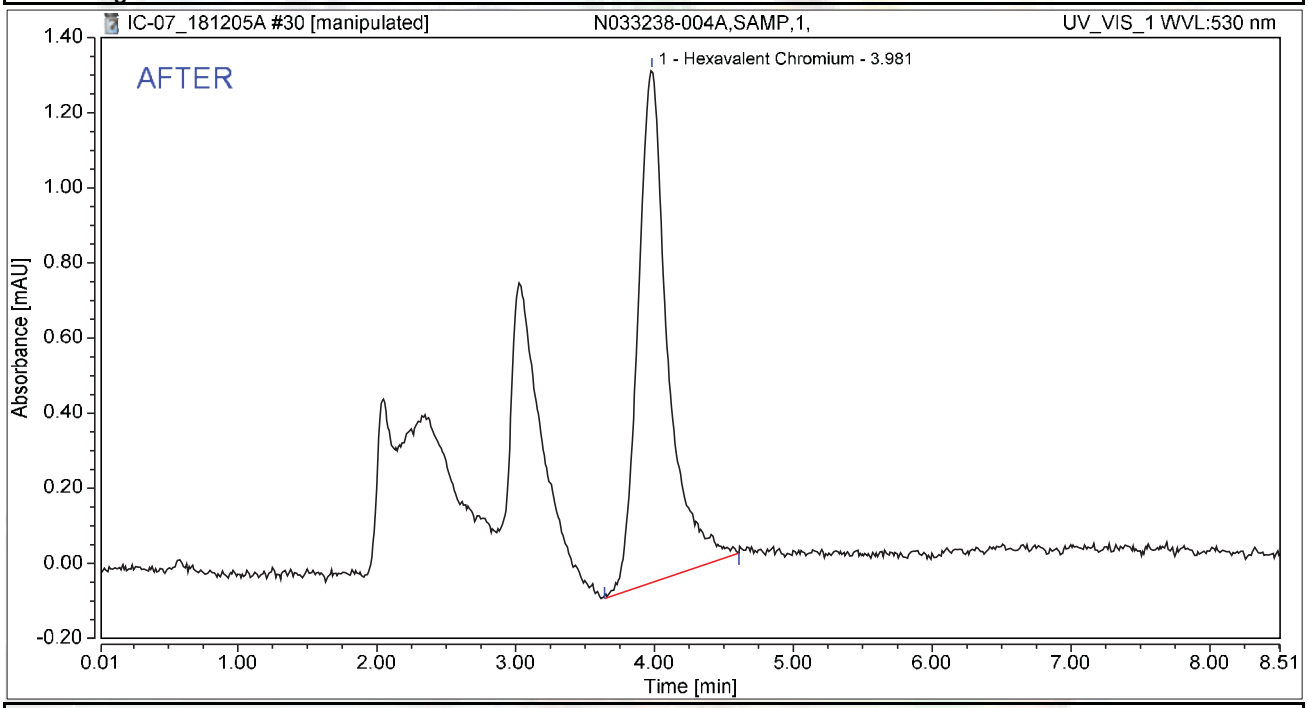
Chromatogram and Results

Injection Details

Injection Name:	**N033238-004A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**24**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:20**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.341	1.365	100.00	100.00	1.3487
Total:			**0.341**	**1.365**	**100.00**	**100.00**	

rba 12/9/2018

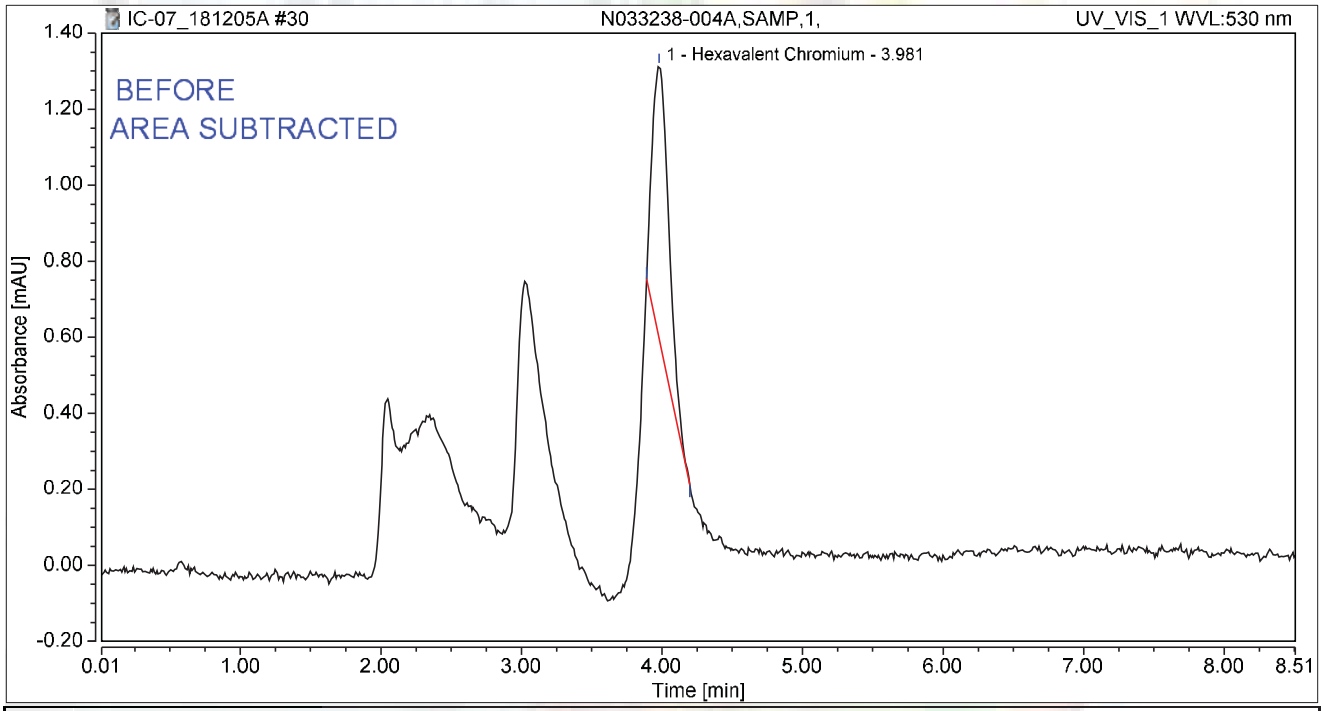
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-004A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**24**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:20**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.099	0.721	100.00	100.00	0.3915
Total:			**0.099**	**0.721**	**100.00**	**100.00**	

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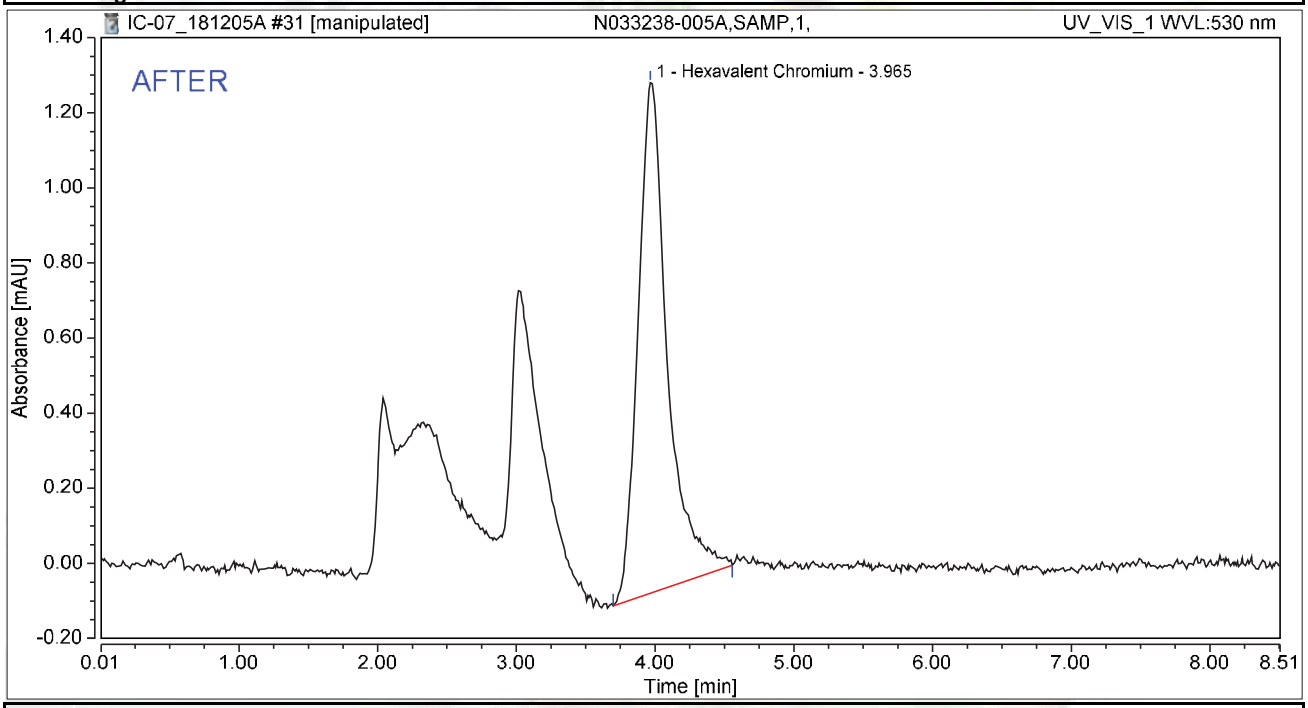
Chromatogram and Results

Injection Details

Injection Name:	**N033238-005A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**25**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.965	0.334	1.360	100.00	100.00	1.3197
Total:			**0.334**	**1.360**	**100.00**	**100.00**	

rba 12/9/2018

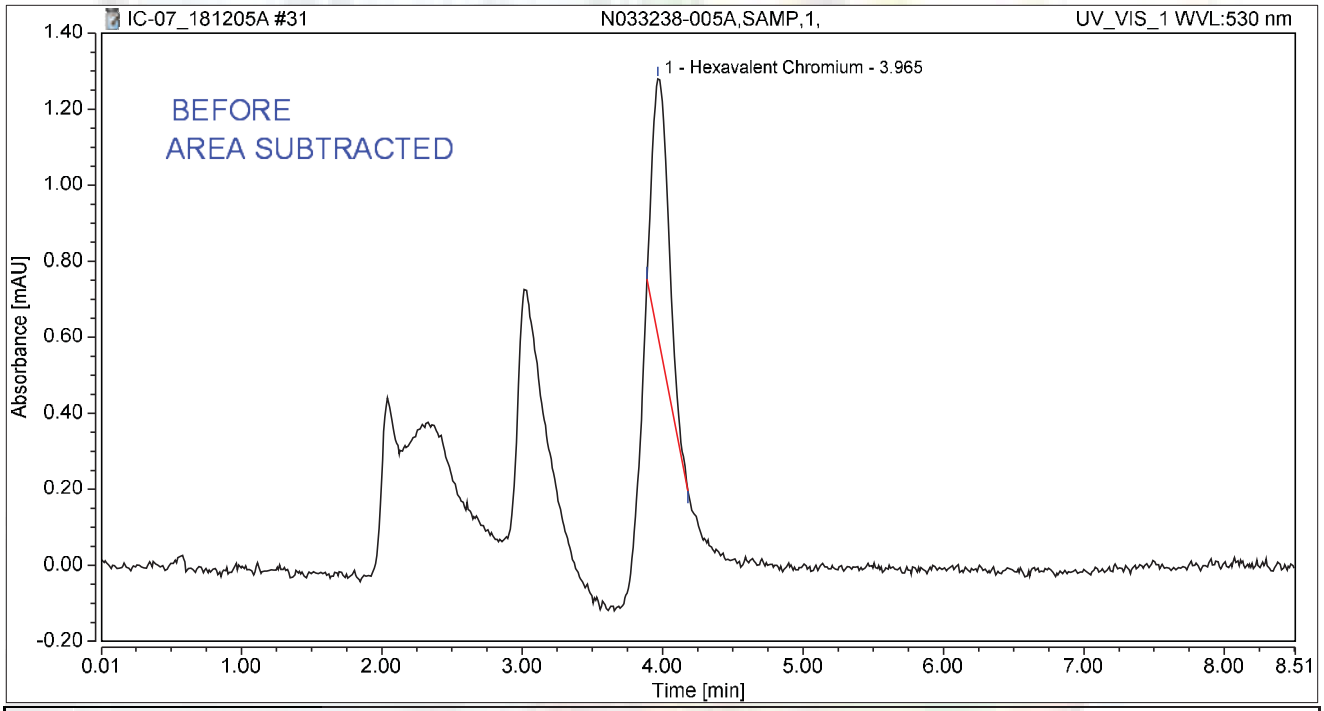
Reviewed by:
Thorley 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-005A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**25**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.965	0.093	0.670	100.00	100.00	0.3690
Total:			**0.093**	**0.670**	**100.00**	**100.00**	

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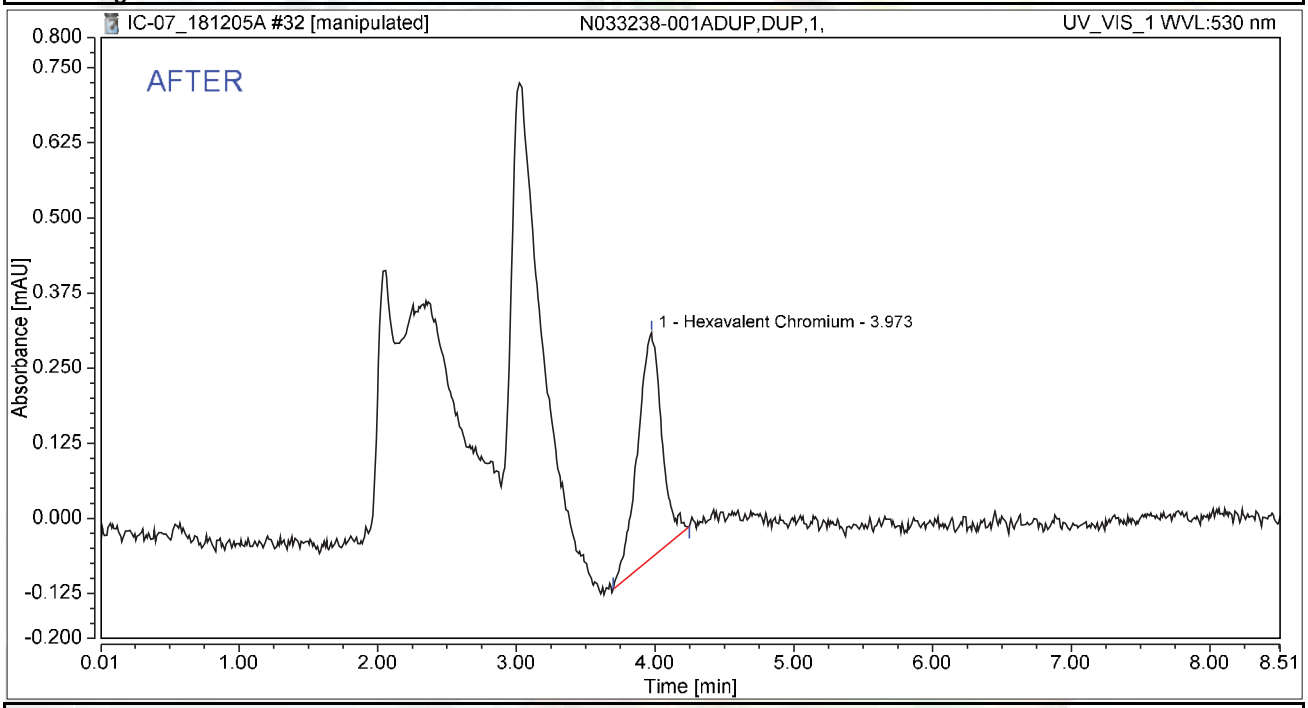
Chromatogram and Results

Injection Details

Injection Name:	**N033238-001ADUP,DUP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**26**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.076	0.375	100.00	100.00	0.3020
Total:			**0.076**	**0.375**	**100.00**	**100.00**	

rba 12/9/2018

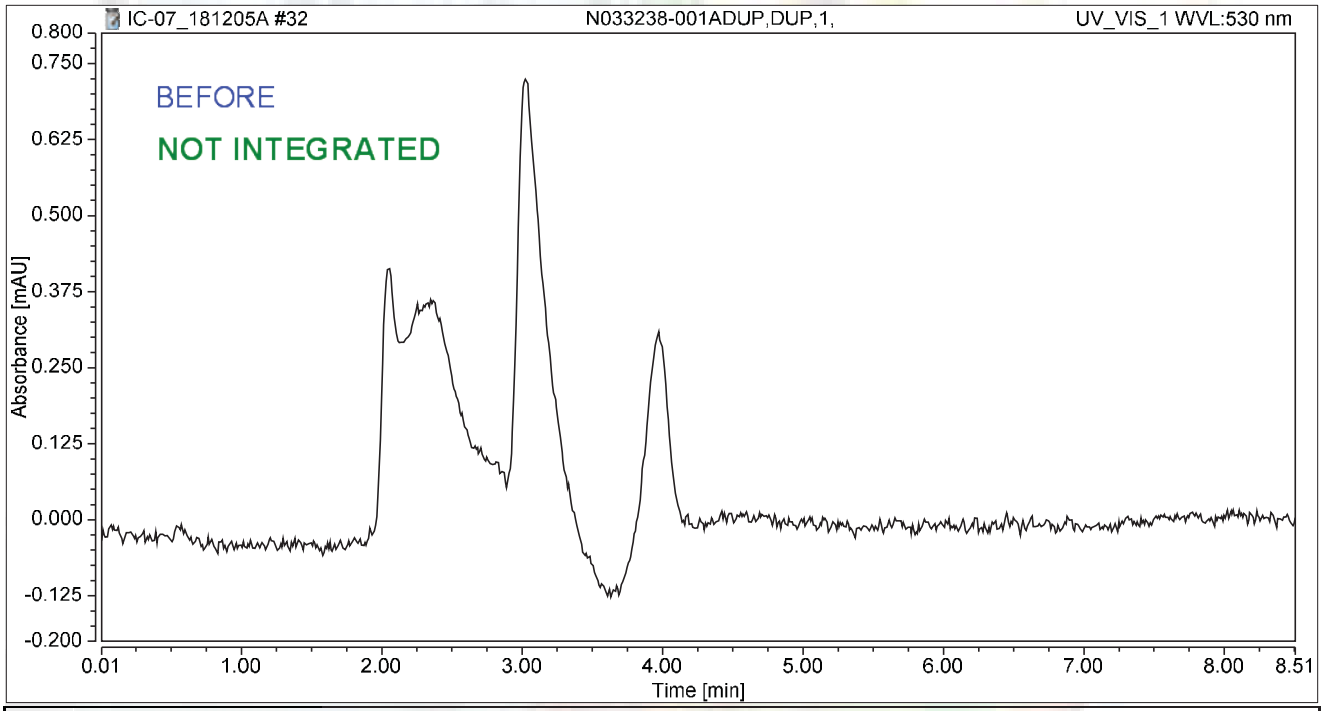
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-001ADUP,DUP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**26**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:39**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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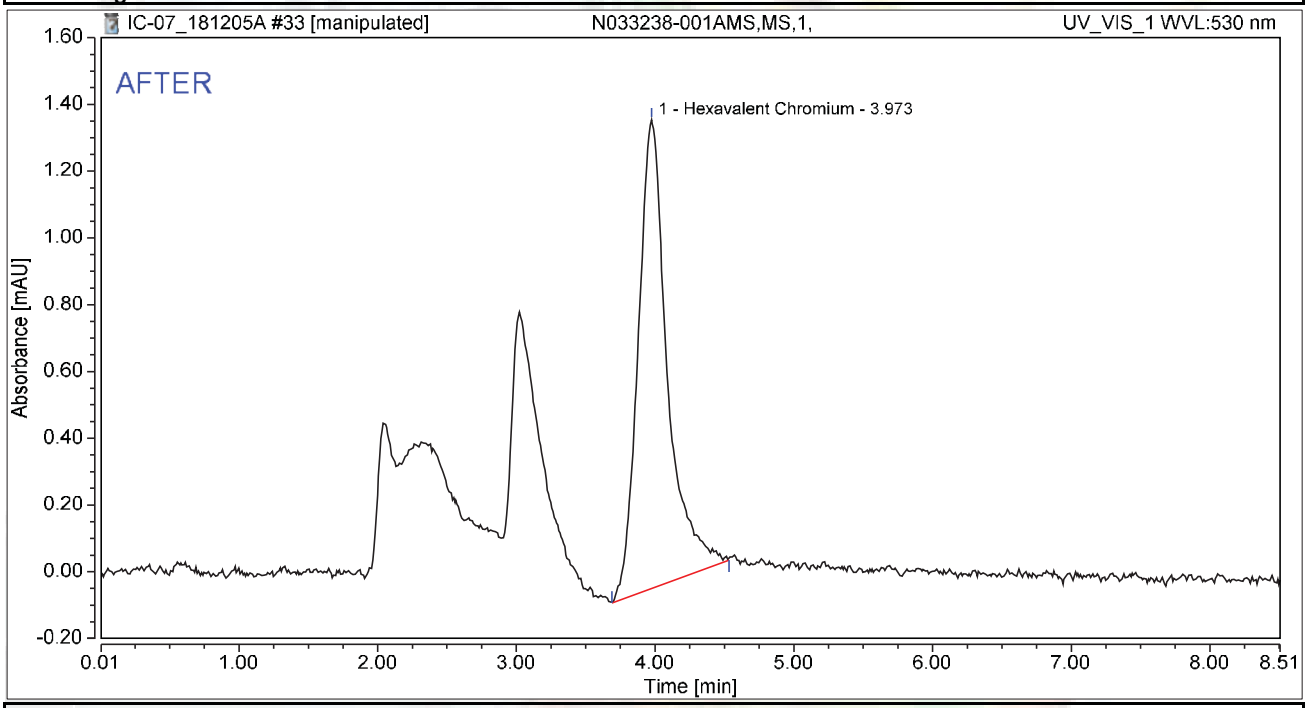
Chromatogram and Results

Injection Details

Injection Name:	**N033238-001AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**27**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:49**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.343	1.404	100.00	100.00	1.3579
Total:			**0.343**	**1.404**	**100.00**	**100.00**	

rba 12/9/2018

Reviewed by:
Nancy 12/9/2018

My first report/Integration

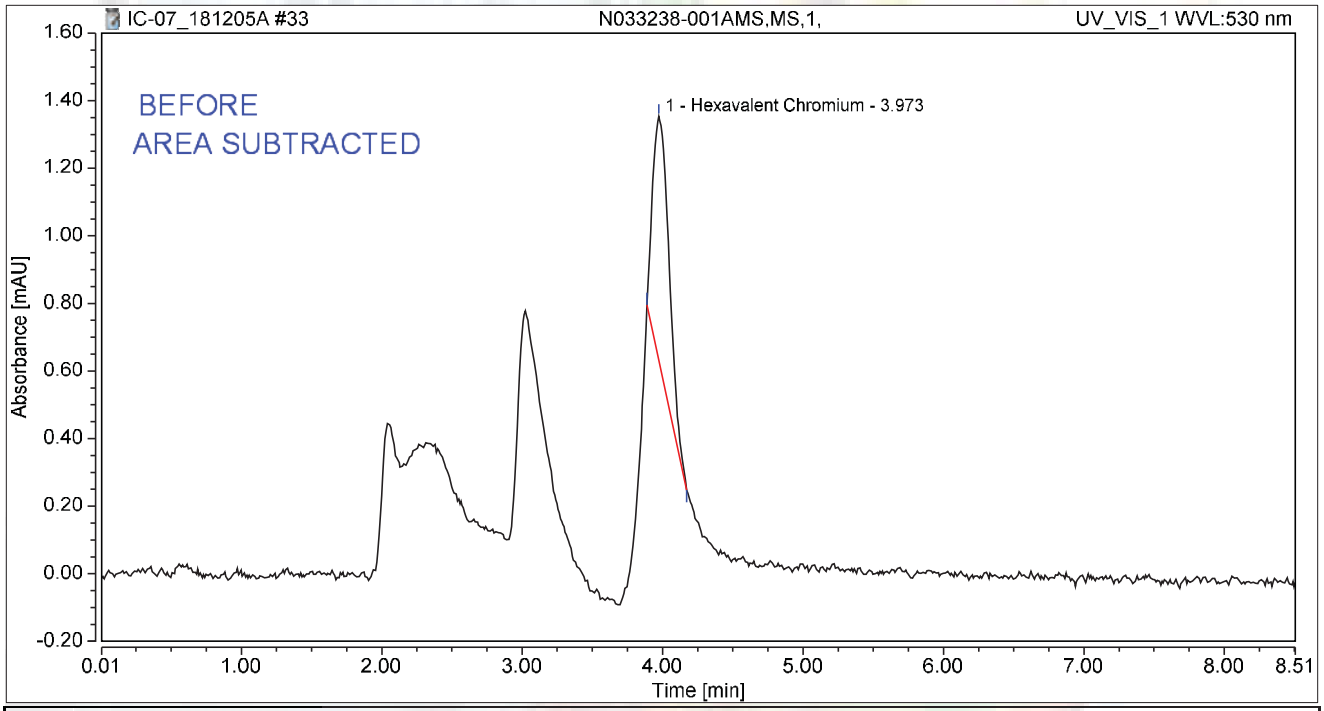
Chromeleon (c) Dionex
Version 7.1.1.1127

Chromatogram and Results

Injection Details

Injection Name:	**N033238-001AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**27**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:49**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.098	0.718	100.00	100.00	0.3863
Total:			**0.098**	**0.718**	**100.00**	**100.00**	

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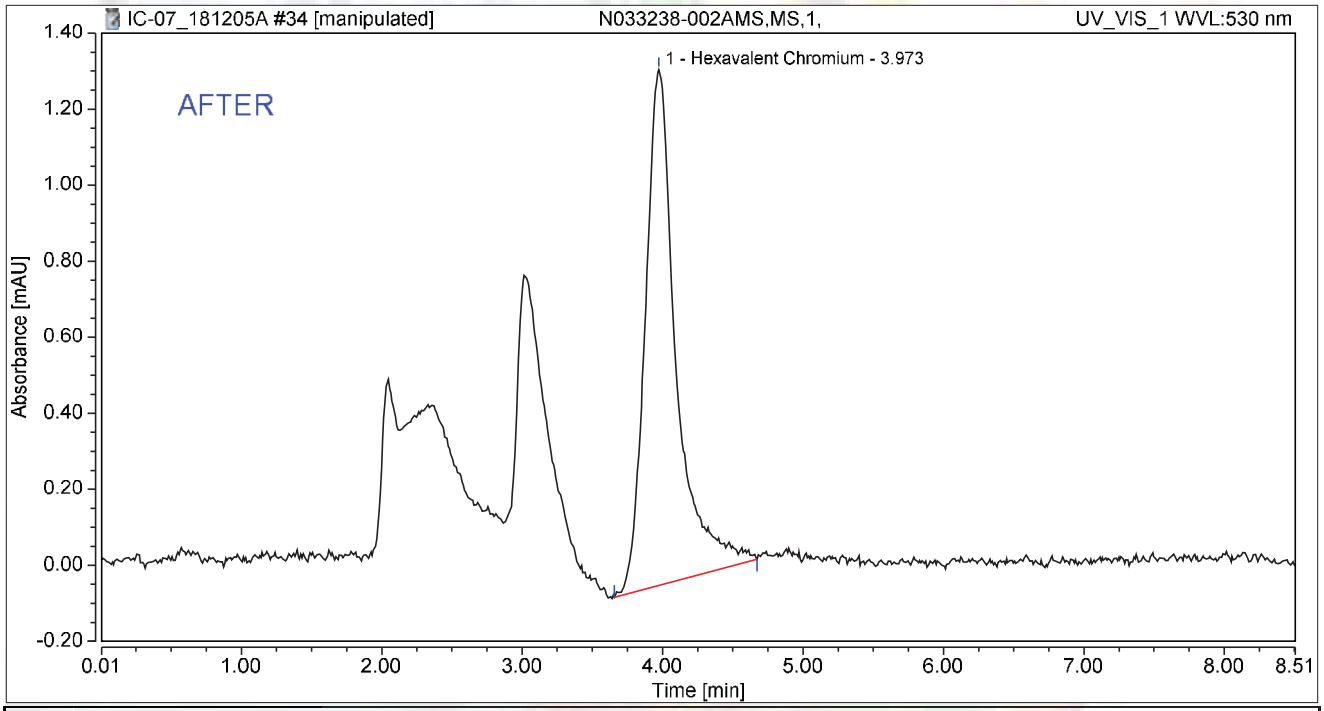
Chromatogram and Results

Injection Details

Injection Name:	**N033238-002AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**28**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.346	1.357	100.00	100.00	1.3668
Total:			**0.346**	**1.357**	**100.00**	**100.00**	

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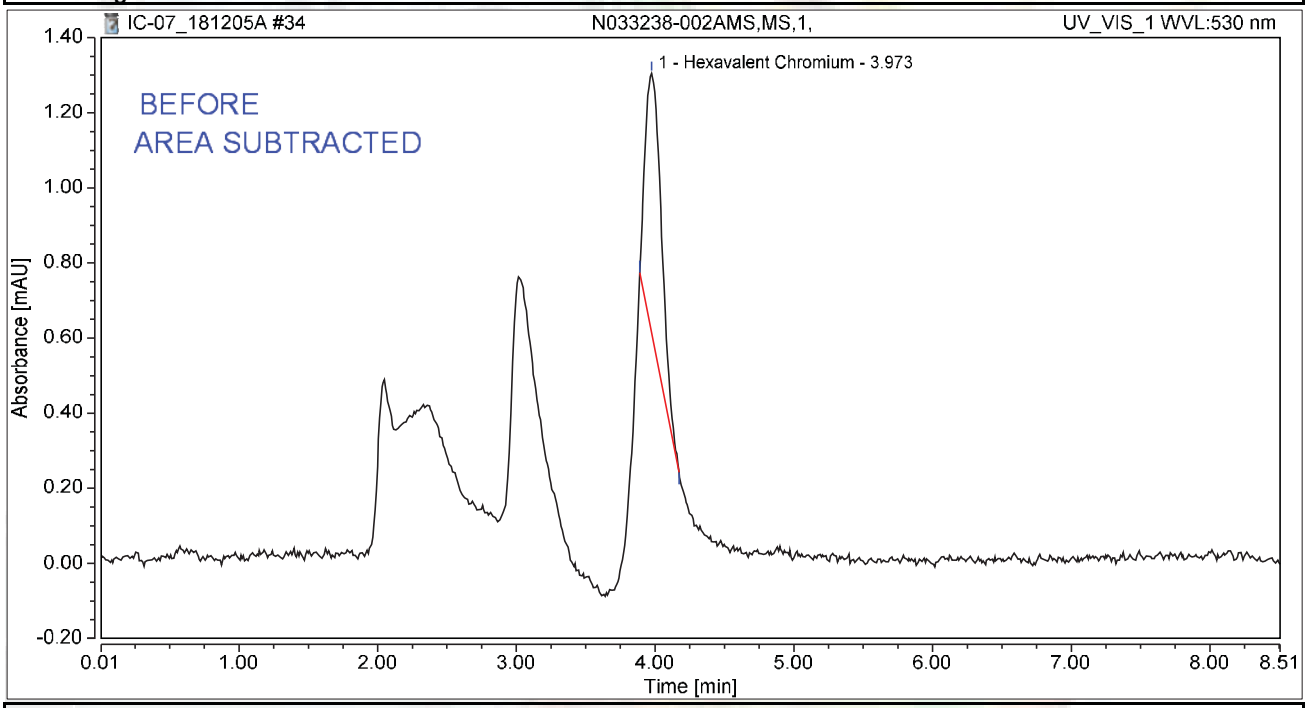
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-002AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**28**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 11:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.094	0.686	100.00	100.00	0.3716
Total:			**0.094**	**0.686**	**100.00**	**100.00**	

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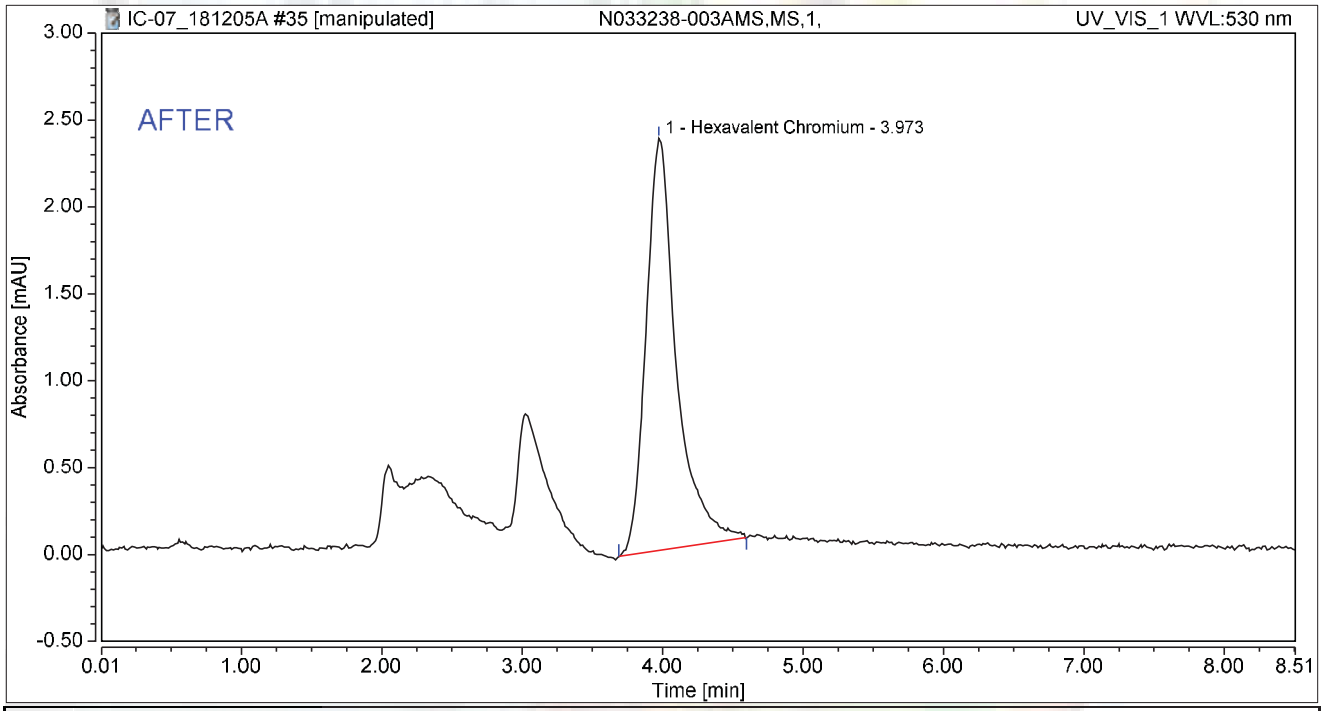
Chromatogram and Results

Injection Details

Injection Name:	**N033238-003AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**29**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 12:07**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.592	2.370	100.00	100.00	2.3411
Total:			**0.592**	**2.370**	**100.00**	**100.00**	

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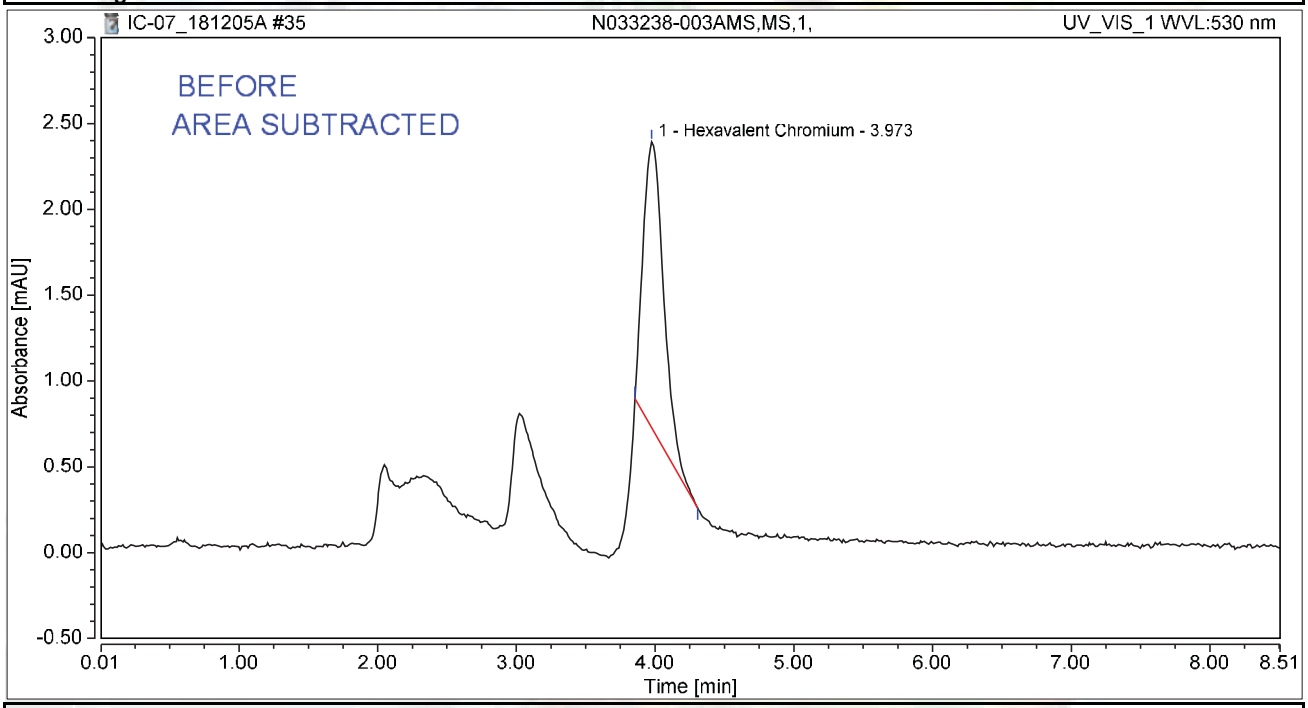
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-003AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**29**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 12:07**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.286	1.660	100.00	100.00	1.1304
Total:			**0.286**	**1.660**	**100.00**	**100.00**	

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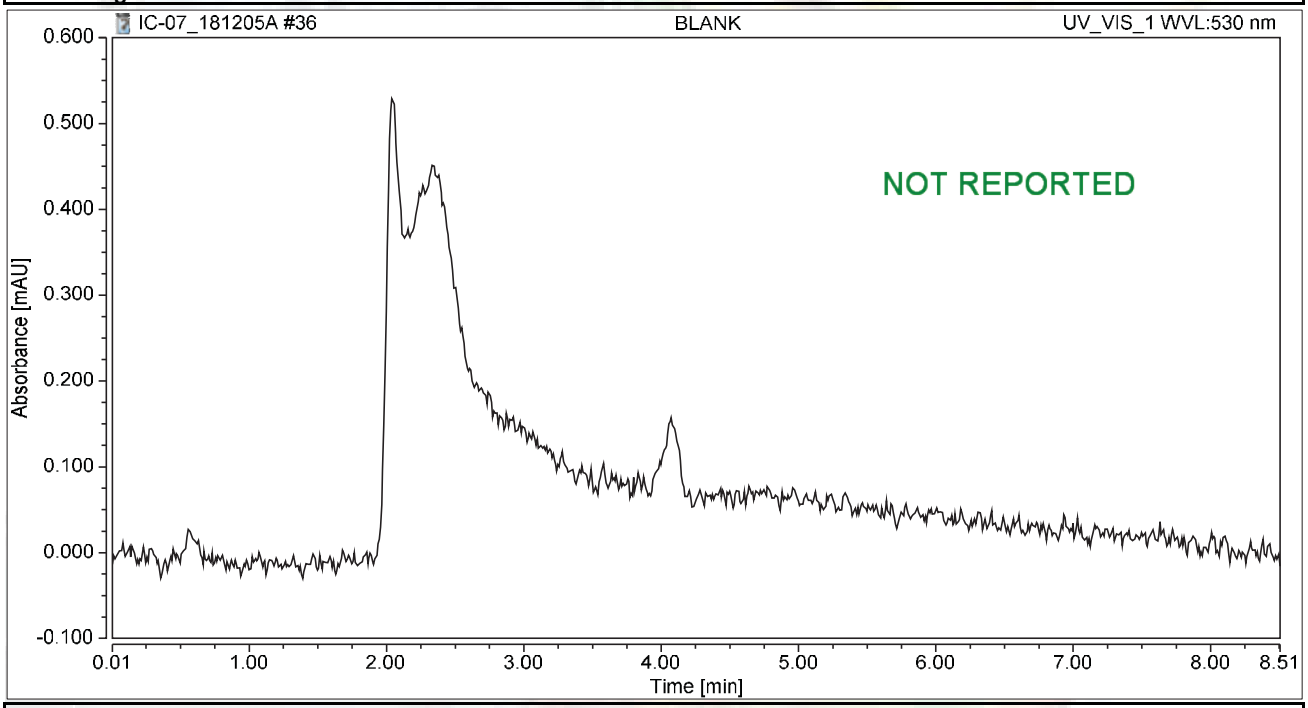
Chromatogram and Results

Injection Details

Injection Name:	**BLANK**	*Run Time (min):*	**8.50**
Vial Number:	**30**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 12:17**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

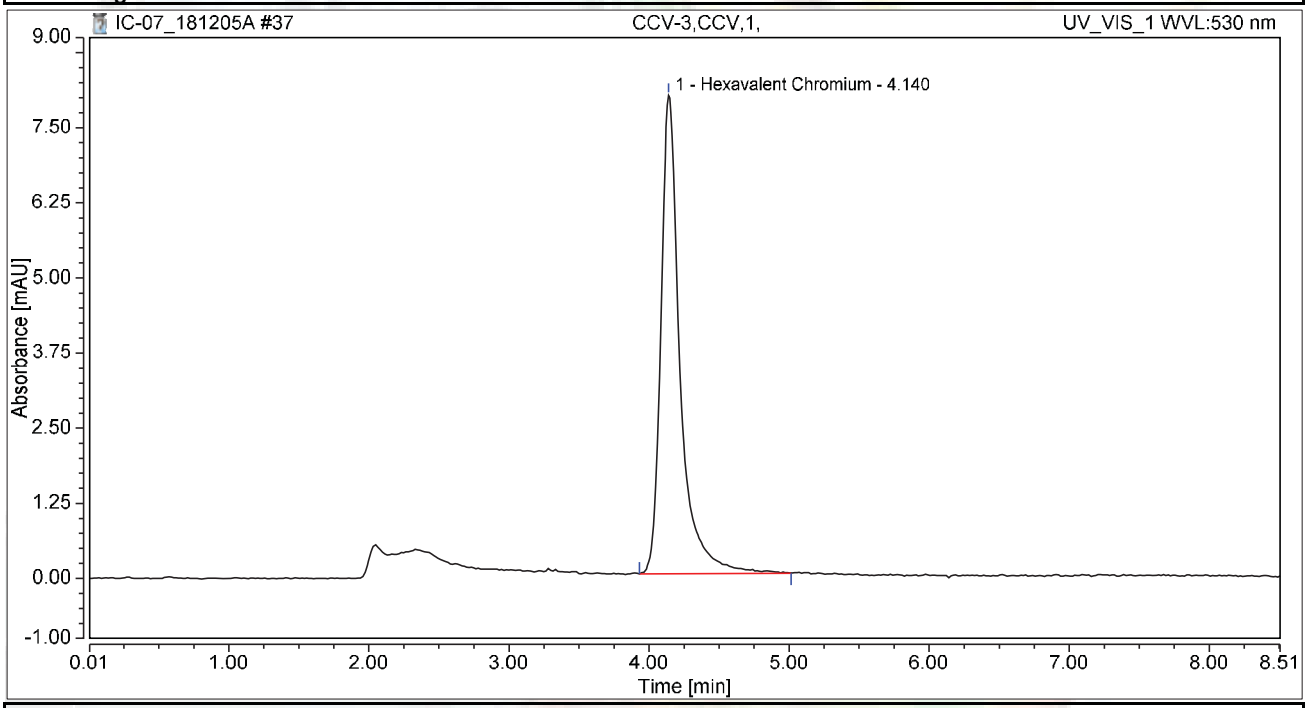
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCV-3,CCV,1,**	*Run Time (min):*	**8.50**
Vial Number:	**31**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 12:26**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

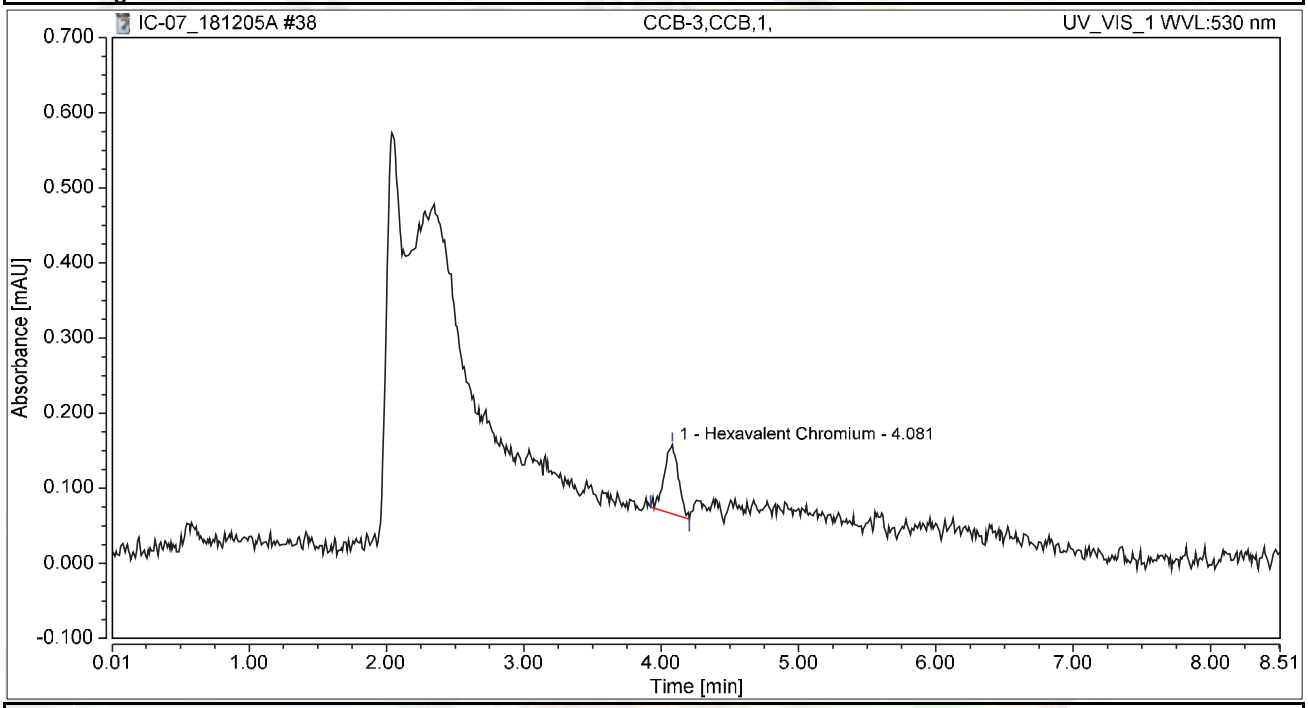
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.140	1.263	7.962	100.00	100.00	4.9945
Total:			**1.263**	**7.962**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-3,CCB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**1**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 13:30**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

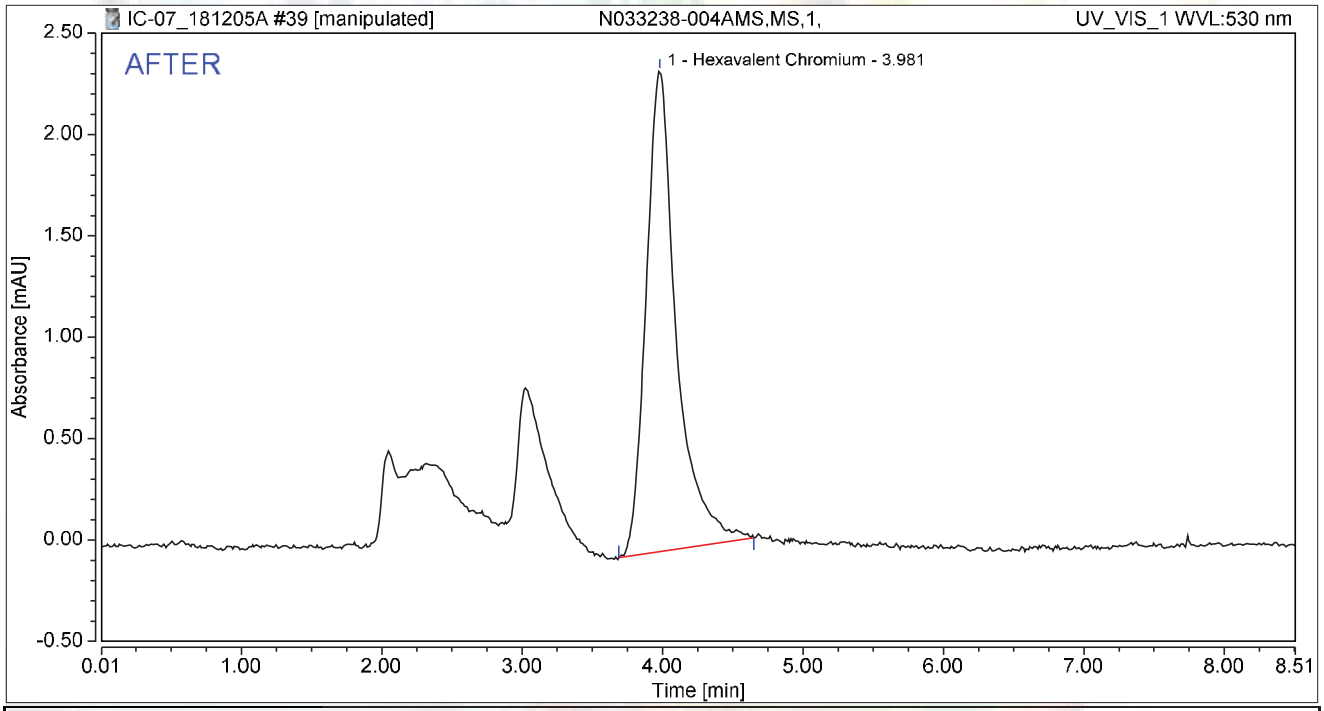
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.081	0.011	0.092	100.00	100.00	0.0430
Total:			**0.011**	**0.092**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-004AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**2**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 13:41**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.592	2.370	100.00	100.00	2.3388
Total:			**0.592**	**2.370**	**100.00**	**100.00**	

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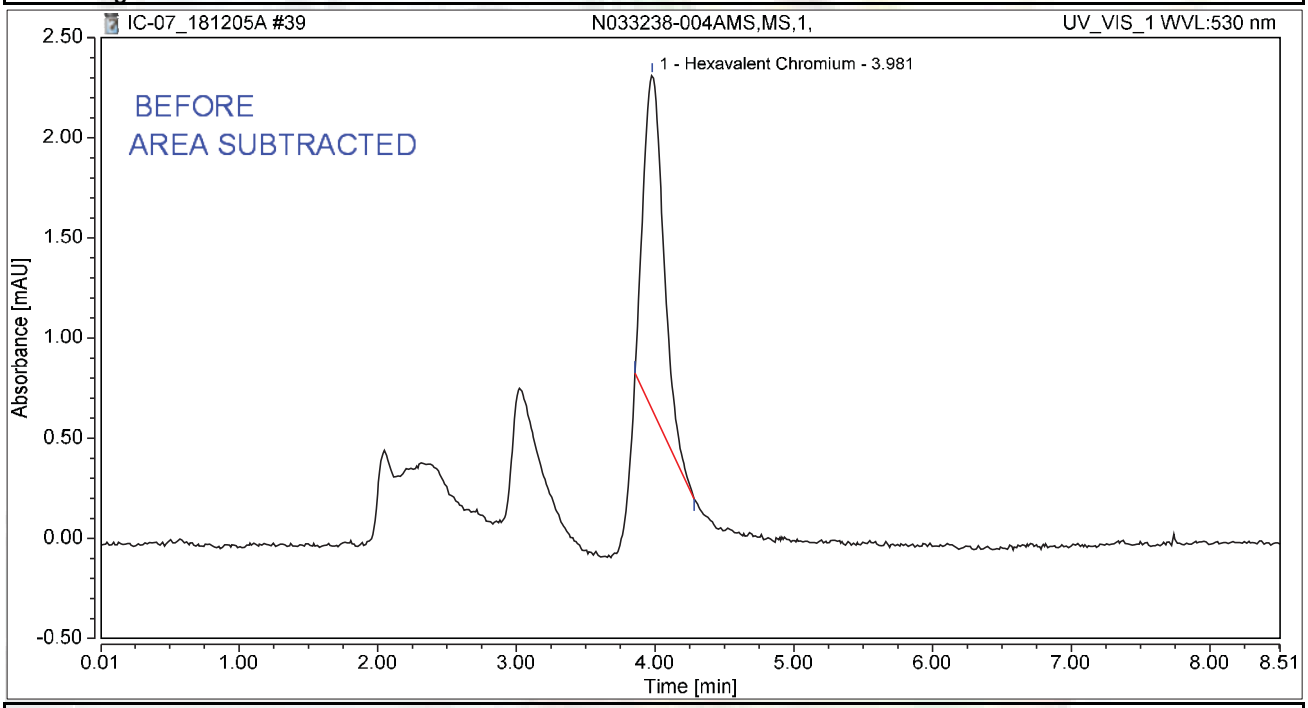
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-004AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**2**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 13:41**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.285	1.672	100.00	100.00	1.1260
Total:			**0.285**	**1.672**	**100.00**	**100.00**	

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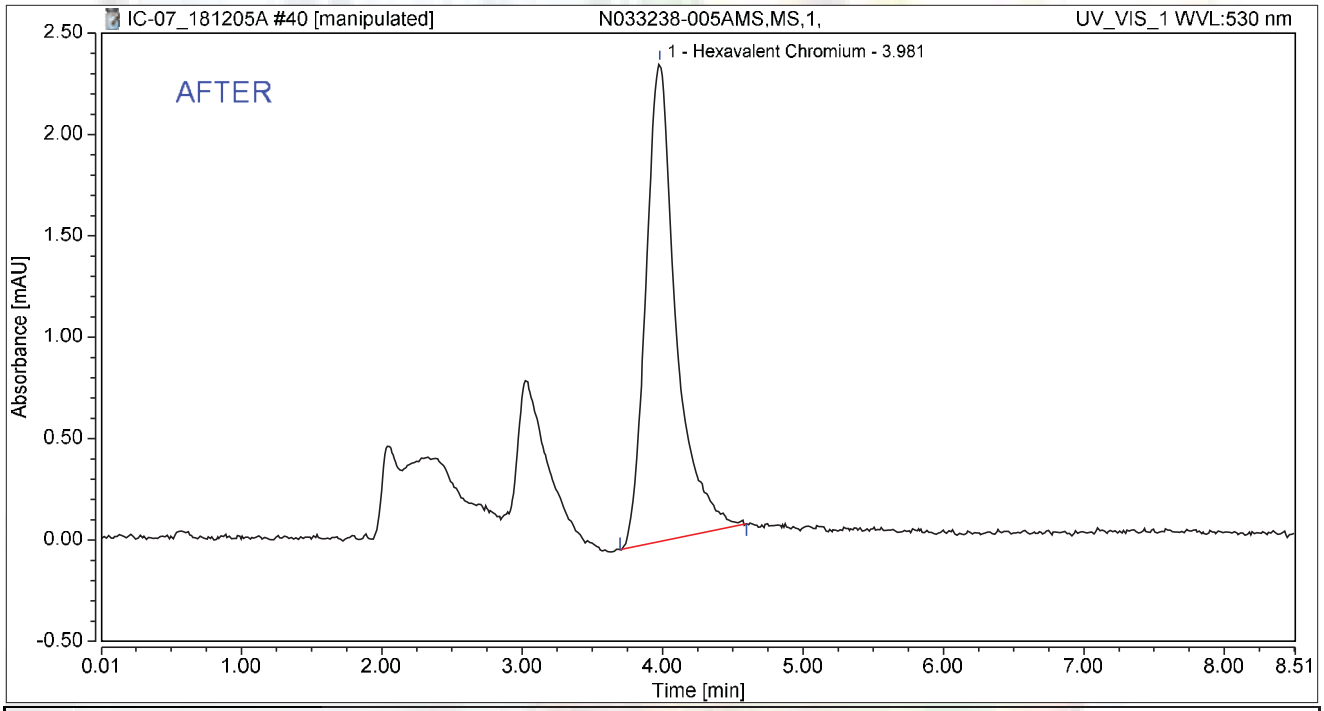
Chromatogram and Results

Injection Details

Injection Name:	**N033238-005AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 13:50**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.586	2.360	100.00	100.00	2.3176
Total:			**0.586**	**2.360**	**100.00**	**100.00**	

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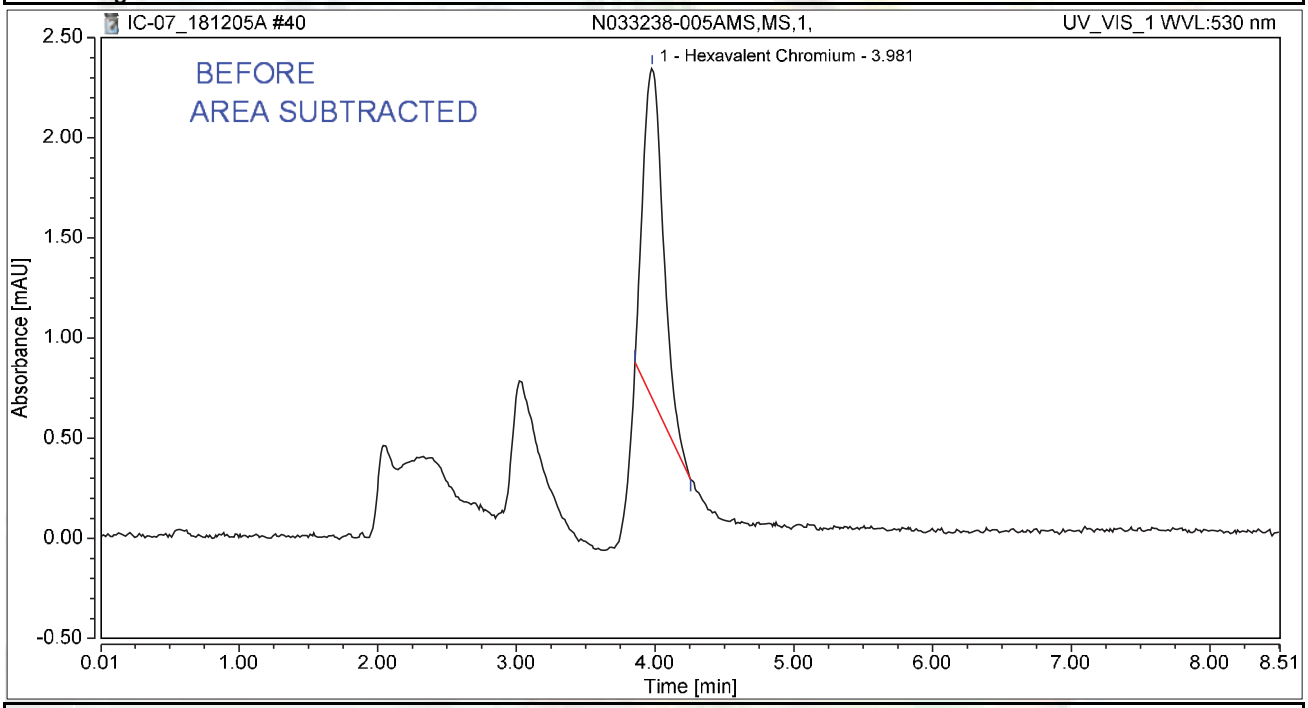
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-005AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 13:50**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.281	1.656	100.00	100.00	1.1098
Total:			**0.281**	**1.656**	**100.00**	**100.00**	

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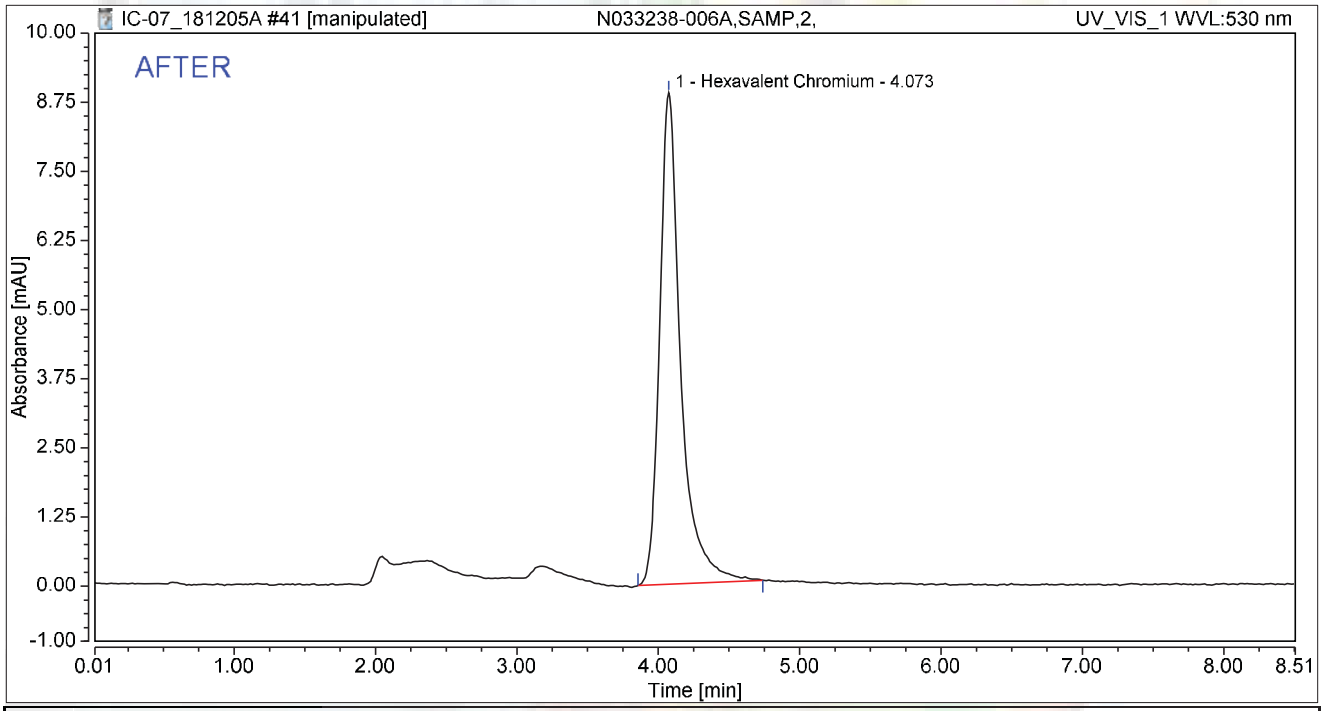
Chromatogram and Results

Injection Details

Injection Name:	**N033238-006A,SAMP,2,**	*Run Time (min):*	**8.49**
Vial Number:	**4**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:00**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.073	1.535	8.889	100.00	100.00	6.0701
Total:			**1.535**	**8.889**	**100.00**	**100.00**	

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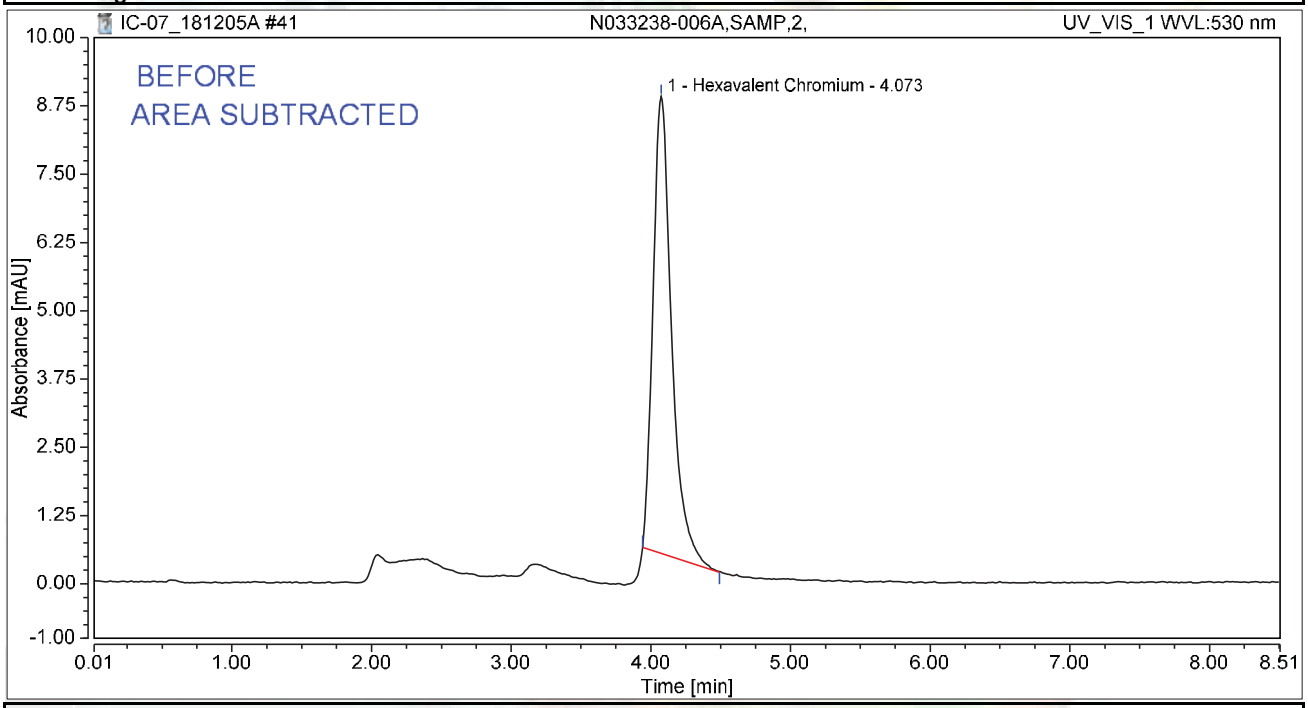
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-006A,SAMP,2,**	*Run Time (min):*	**8.49**
Vial Number:	**4**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:00**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.073	1.288	8.362	100.00	100.00	5.0934
Total:			**1.288**	**8.362**	**100.00**	**100.00**	

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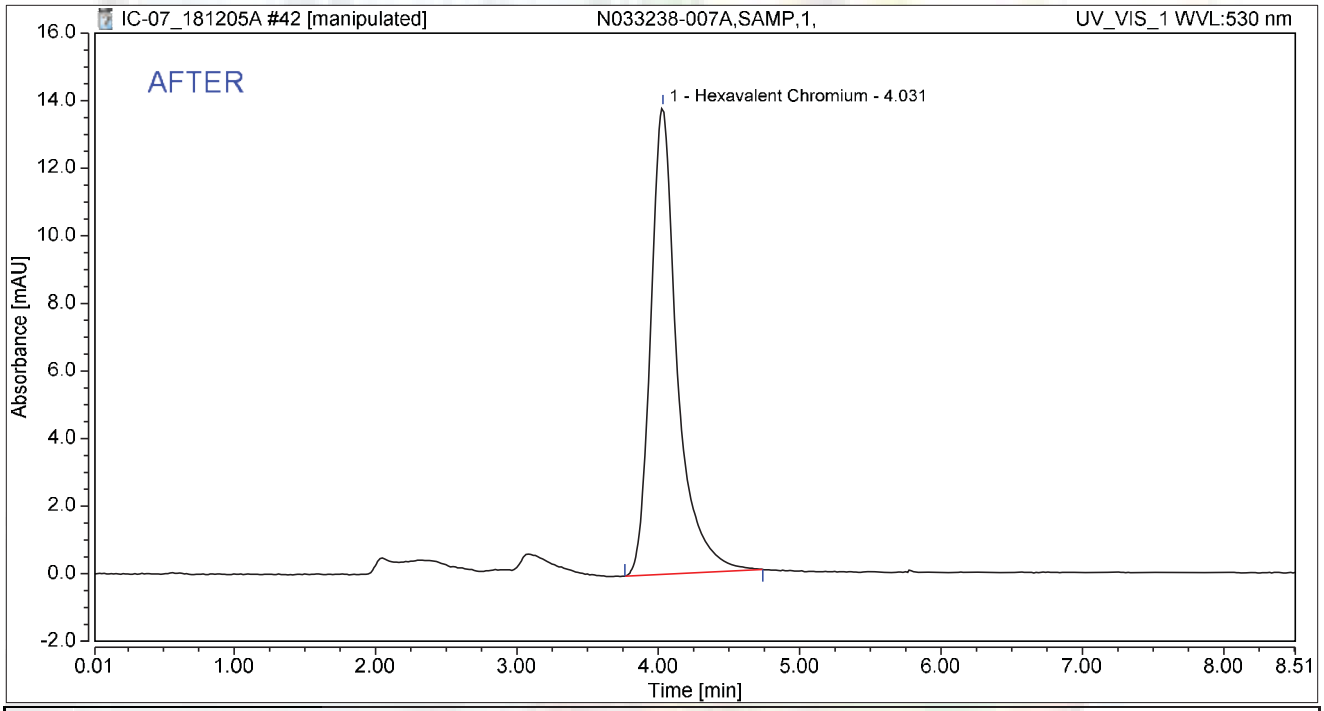
Chromatogram and Results

Injection Details

Injection Name:	**N033238-007A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:09**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.031	2.997	13.823	100.00	100.00	11.8493
Total:			**2.997**	**13.823**	**100.00**	**100.00**	

rba 12/9/2018

Reviewed by:
Nancy 12/9/2018

My first report/Integration

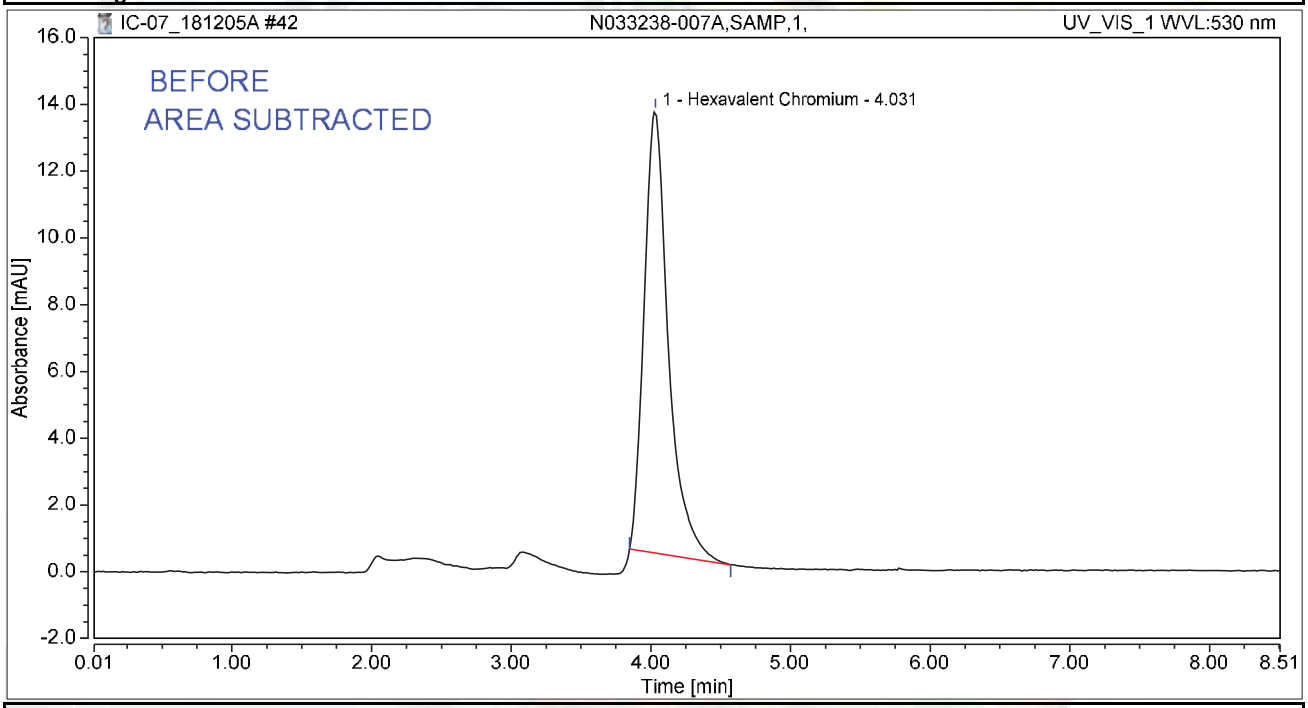
Chromeleon (c) Dionex
Version 7.1.1.1127

Chromatogram and Results

Injection Details

Injection Name:	**N033238-007A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:09**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.031	2.667	13.249	100.00	100.00	10.5449
Total:			**2.667**	**13.249**	**100.00**	**100.00**	

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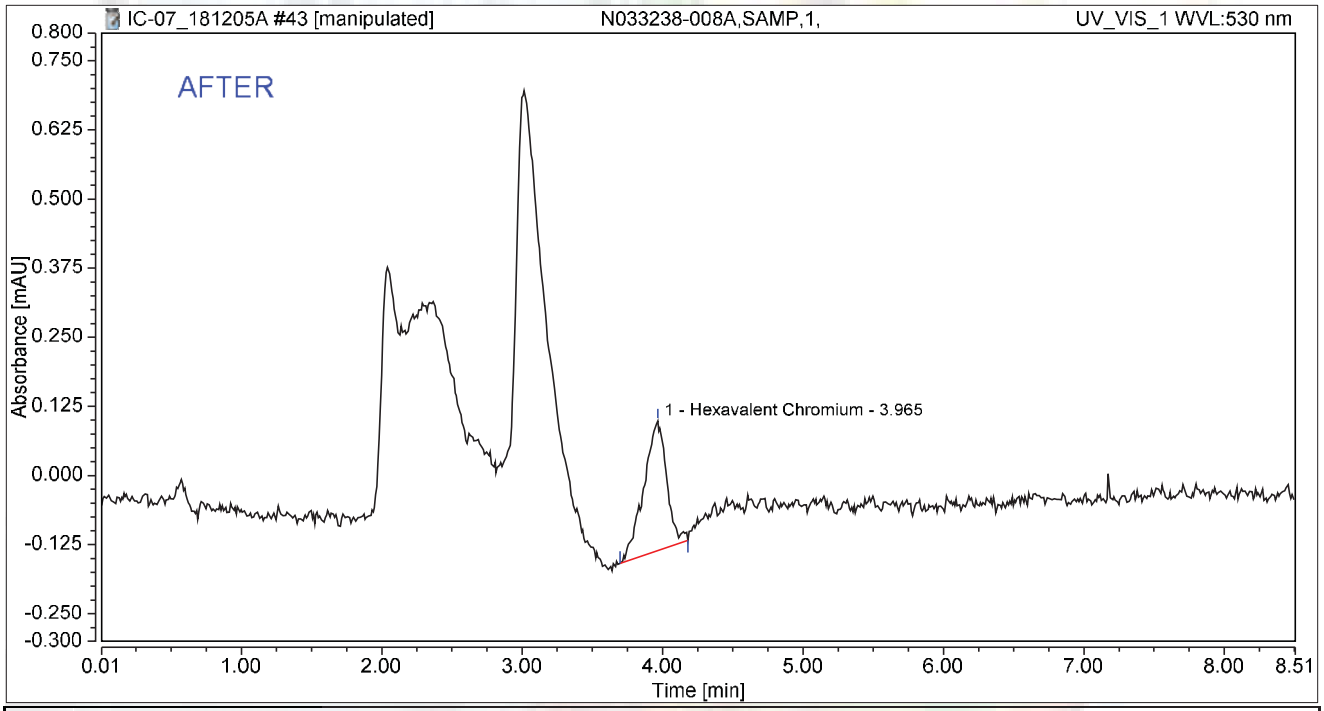
Chromatogram and Results

Injection Details

Injection Name:	**N033238-008A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**6**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:19**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.965	0.044	0.234	100.00	100.00	0.1746
Total:			**0.044**	**0.234**	**100.00**	**100.00**	

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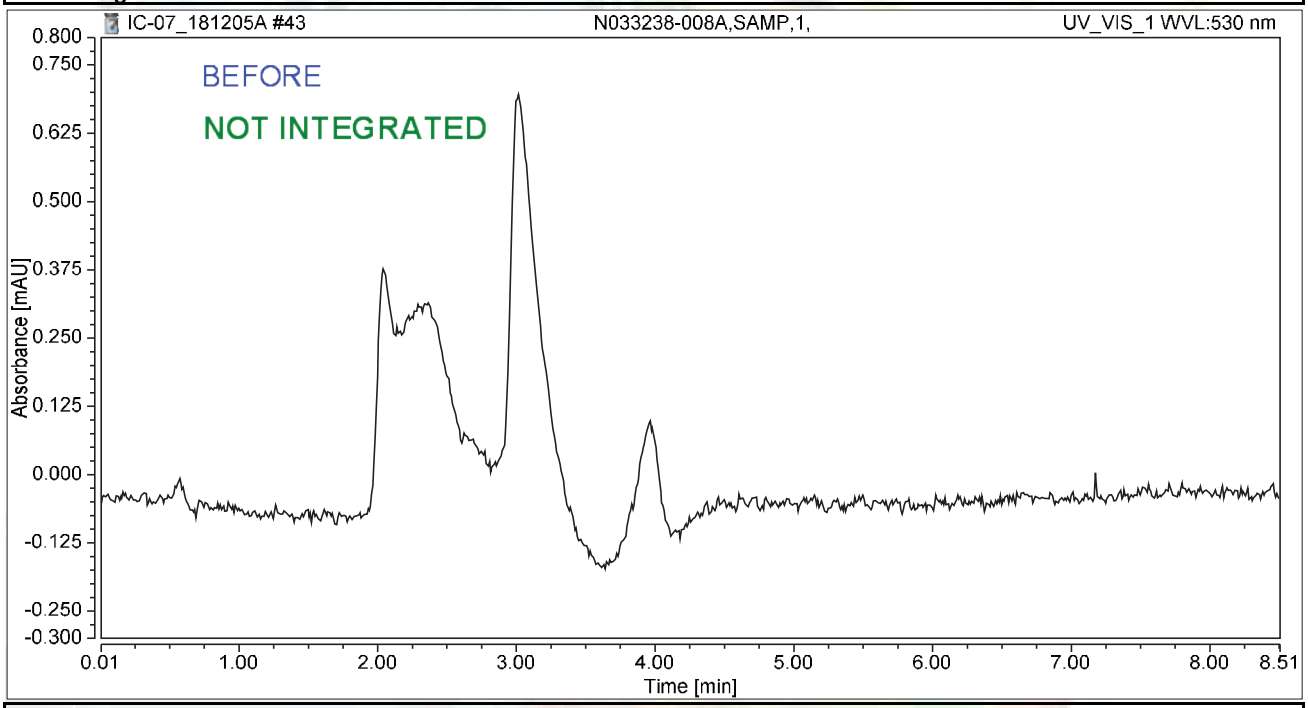
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-008A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**6**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:19**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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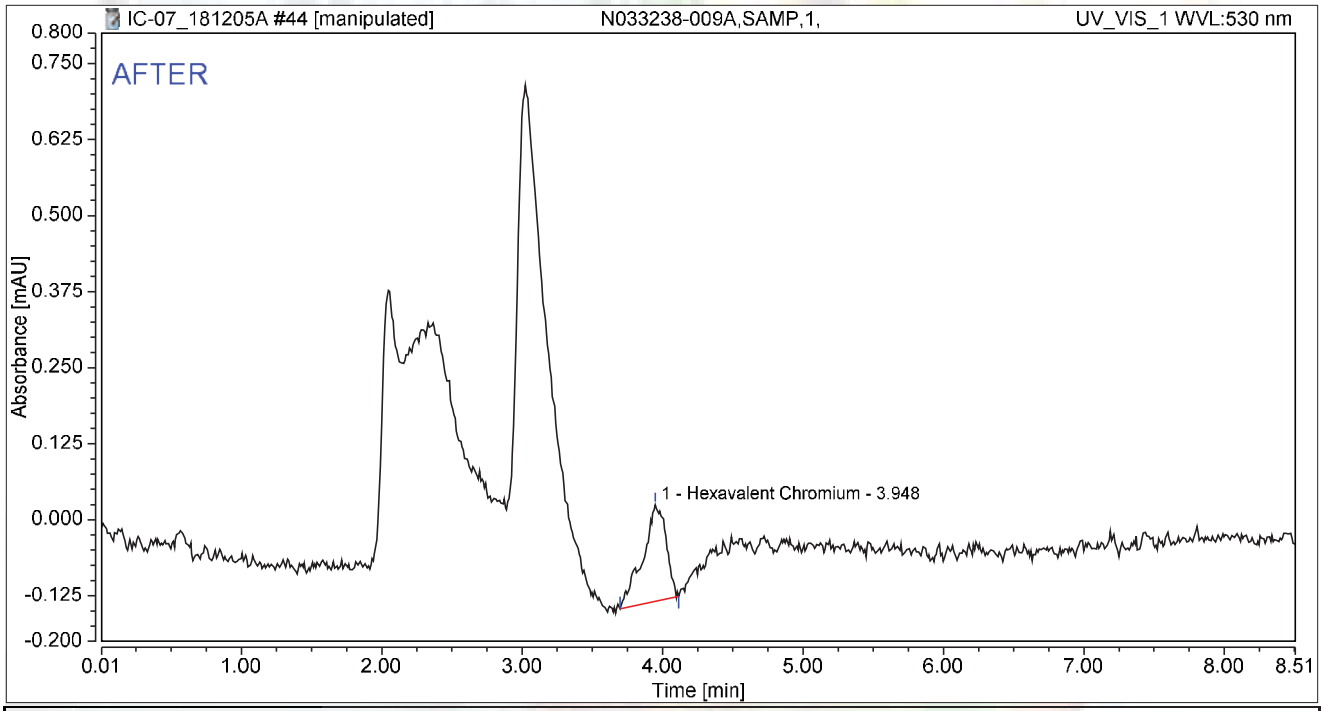
Chromatogram and Results

Injection Details

Injection Name:	**N033238-009A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:28**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.948	0.030	0.159	100.00	100.00	0.1203
Total:			**0.030**	**0.159**	**100.00**	**100.00**	

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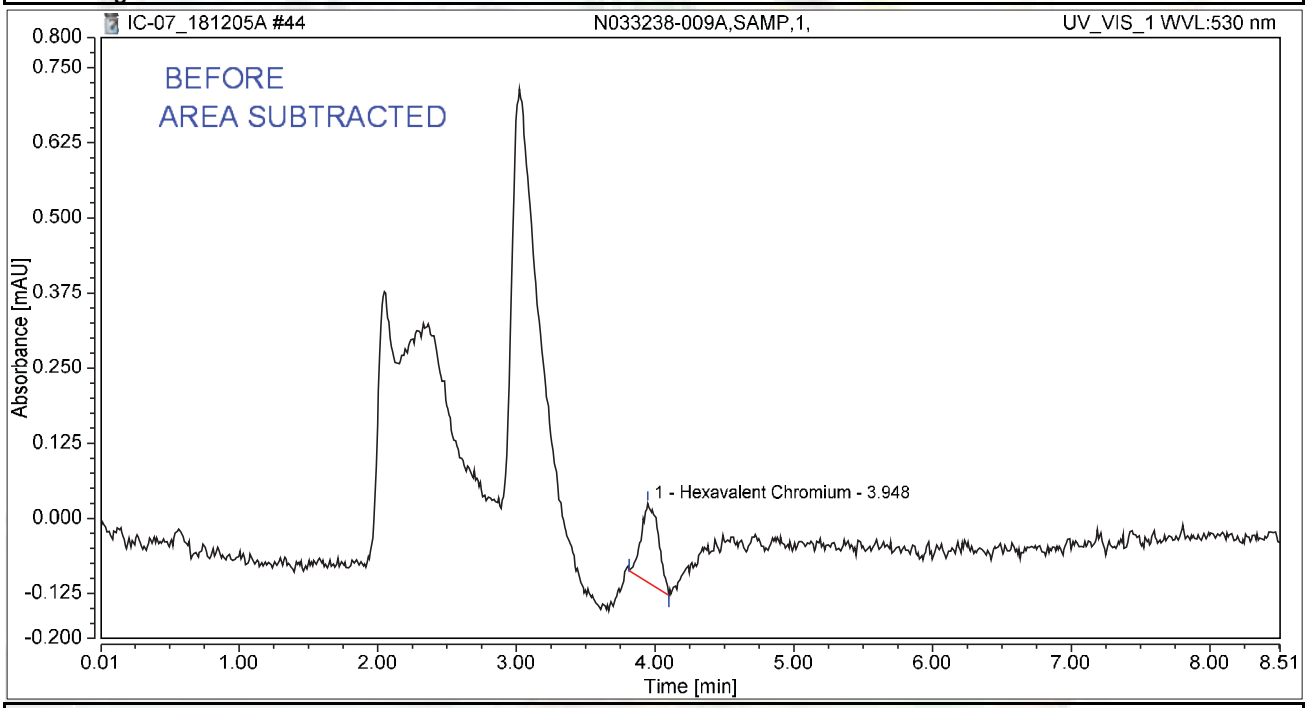
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-009A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:28**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.948	0.019	0.131	100.00	100.00	0.0754
Total:			**0.019**	**0.131**	**100.00**	**100.00**	

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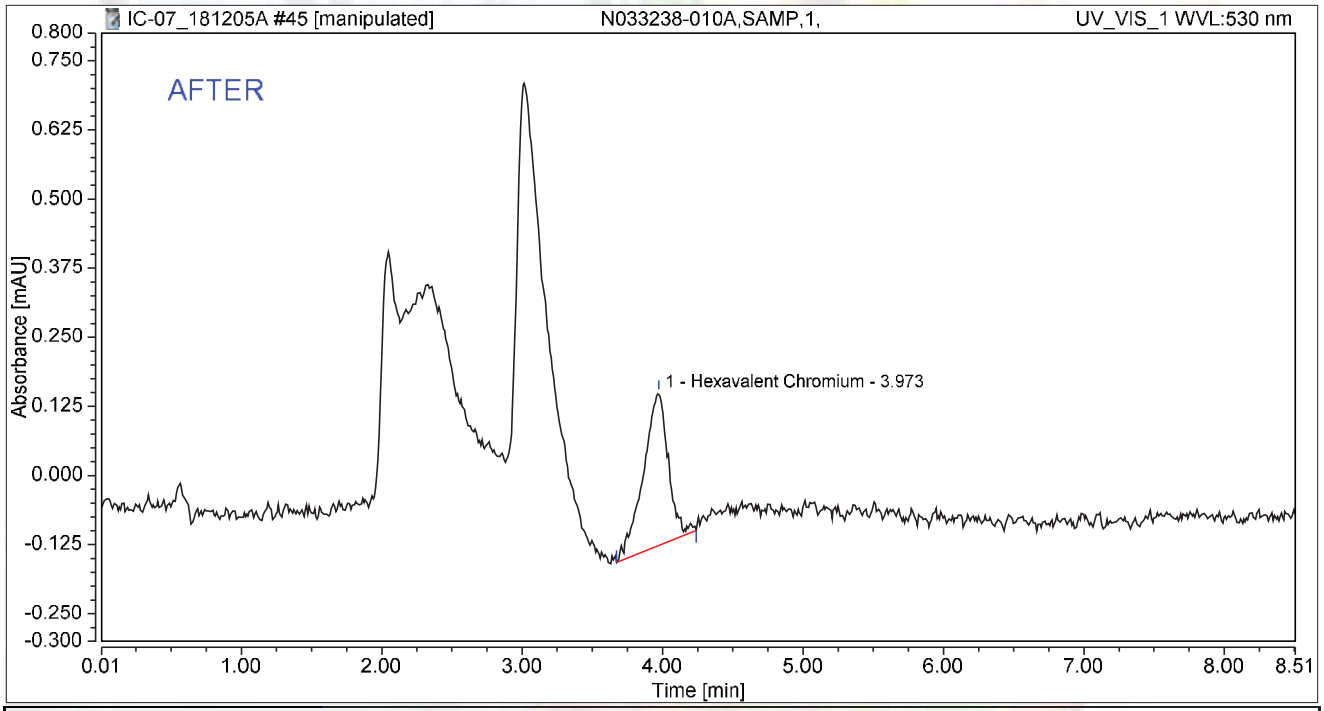
Chromatogram and Results

Injection Details

Injection Name:	**N033238-010A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:38**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.057	0.277	100.00	100.00	0.2248
Total:			**0.057**	**0.277**	**100.00**	**100.00**	

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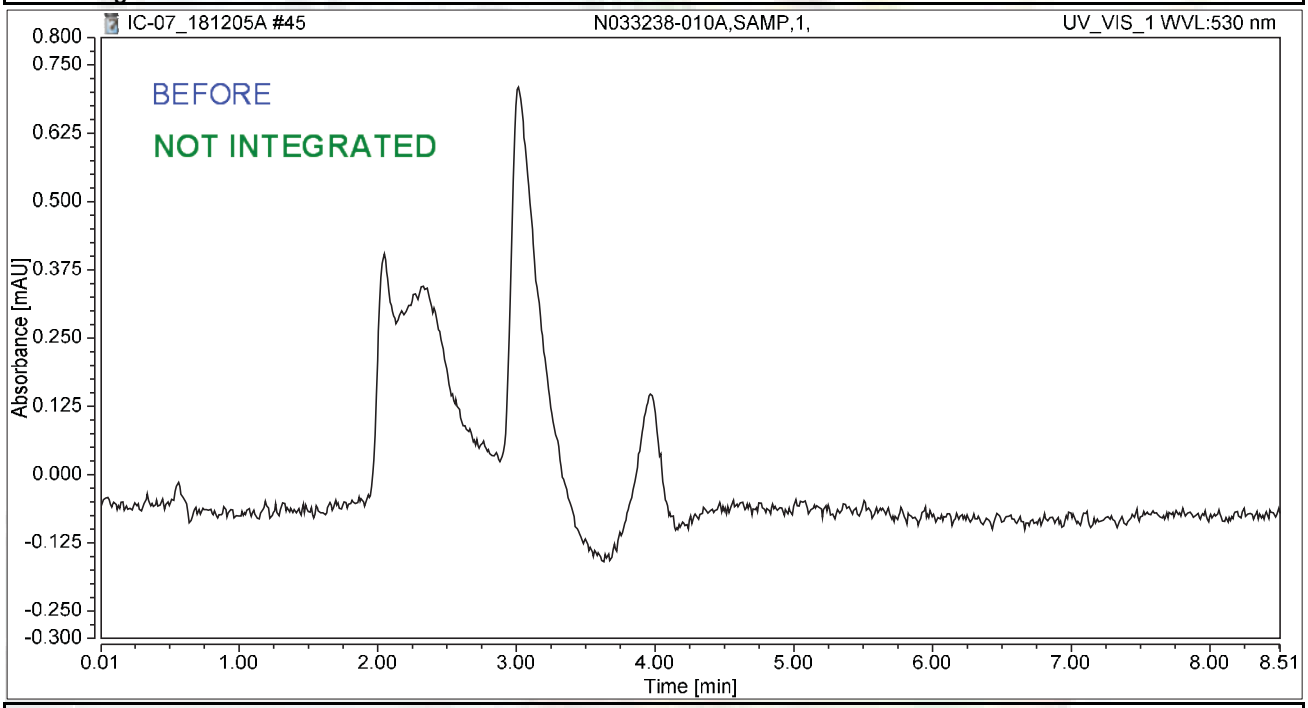
Chromatogram and Results

Injection Details

Injection Name:	**N033238-010A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:38**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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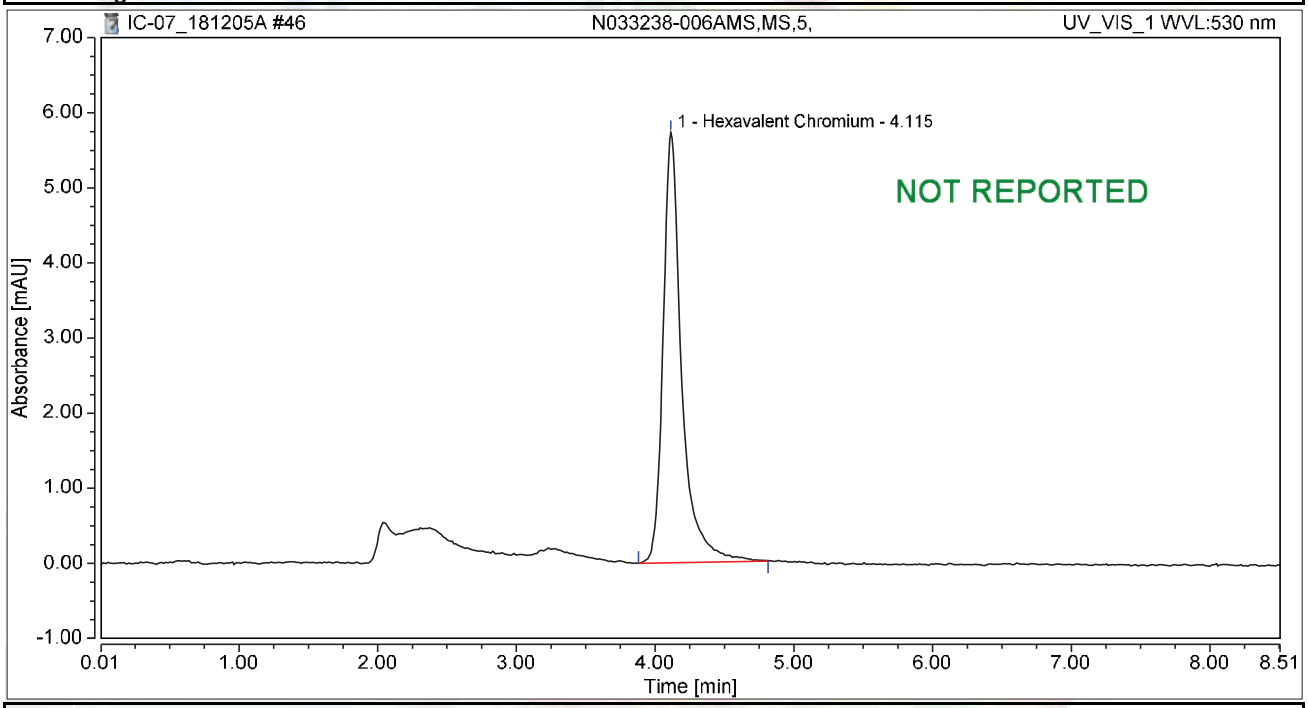
Chromatogram and Results

Injection Details

Injection Name:	**N033238-006AMS,MS,5,**	*Run Time (min):*	**8.50**
Vial Number:	**9**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:47**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

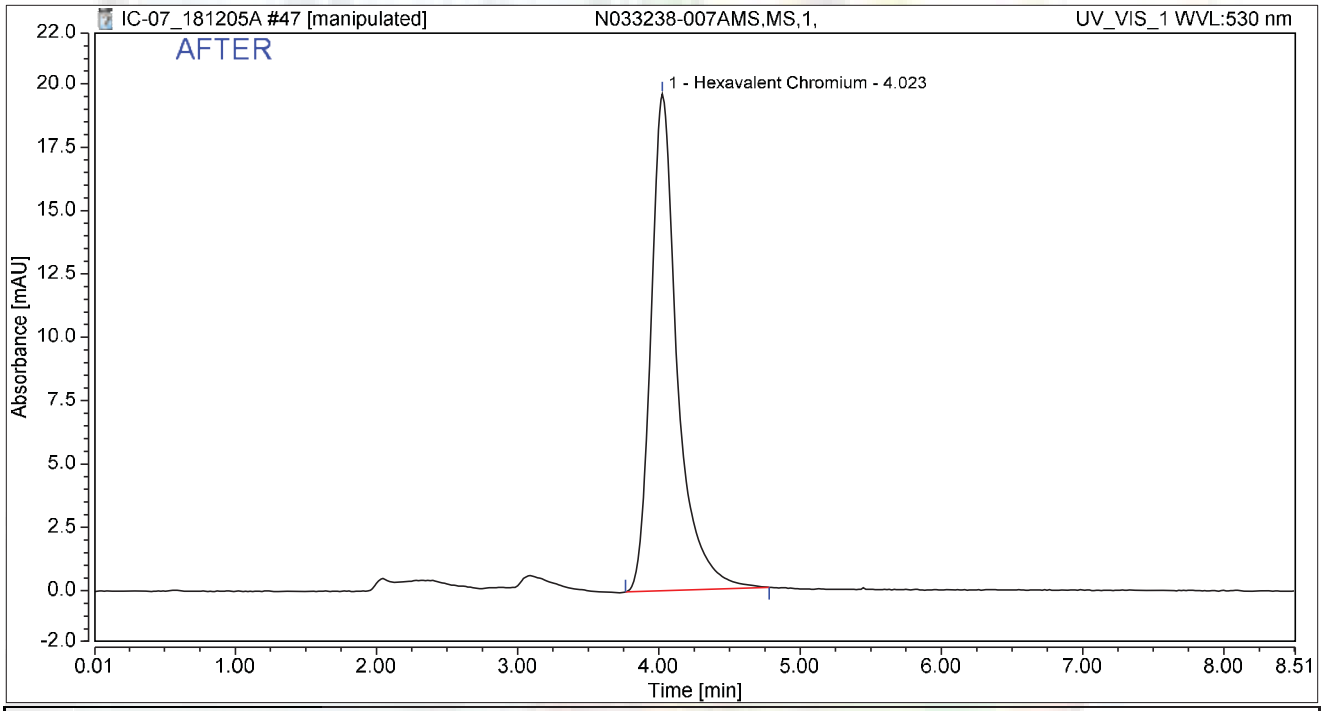
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	0.890	5.726	100.00	100.00	3.5194
Total:			**0.890**	**5.726**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-007AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**10**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:57**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.023	4.247	19.596	100.00	100.00	16.7935
Total:			**4.247**	**19.596**	**100.00**	**100.00**	

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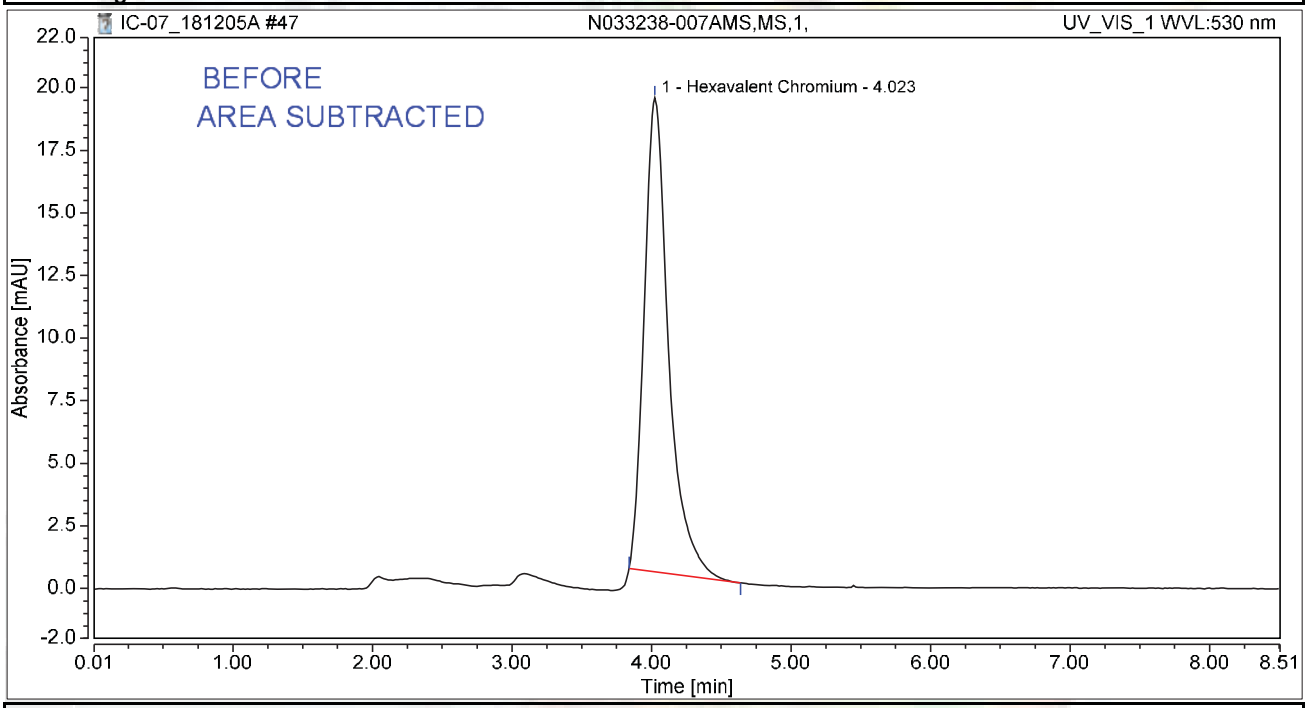
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-007AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**10**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 14:57**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.023	3.848	18.929	100.00	100.00	15.2127
Total:			**3.848**	**18.929**	**100.00**	**100.00**	

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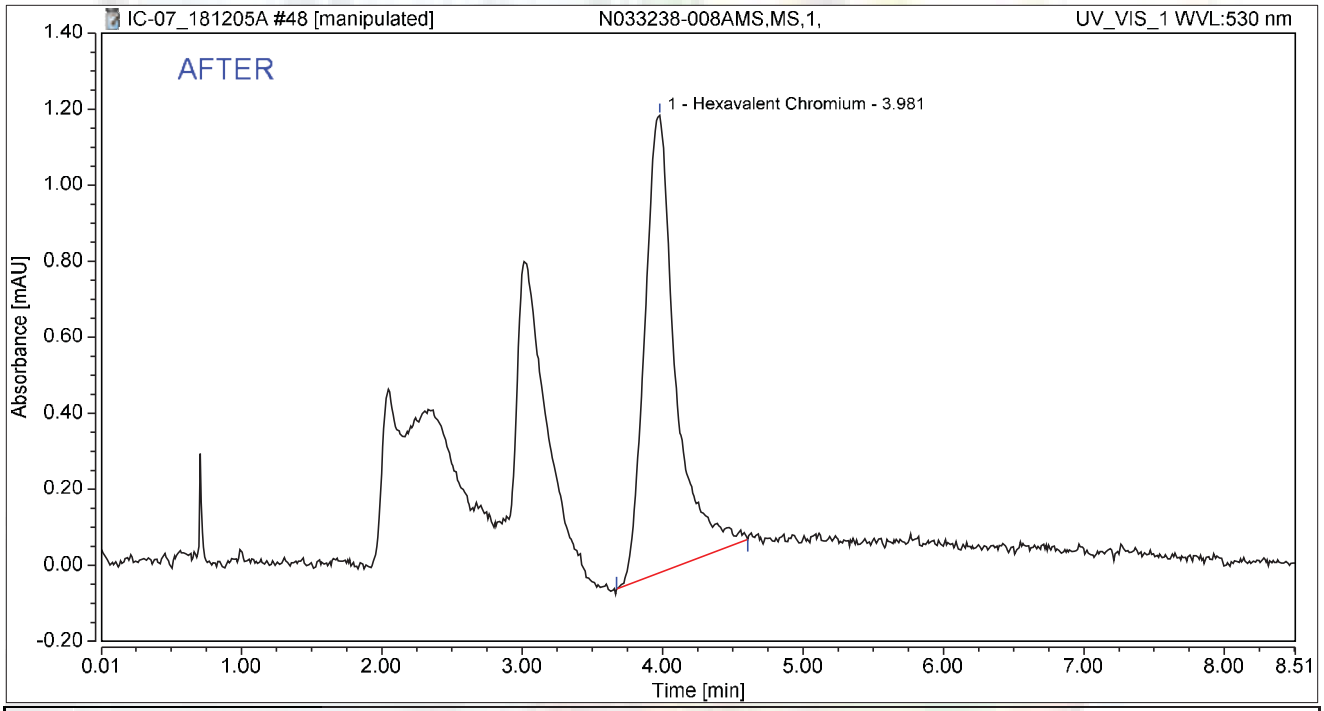
Chromatogram and Results

Injection Details

Injection Name:	**N033238-008AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**11**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:06**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.306	1.202	100.00	100.00	1.2083
Total:			**0.306**	**1.202**	**100.00**	**100.00**	

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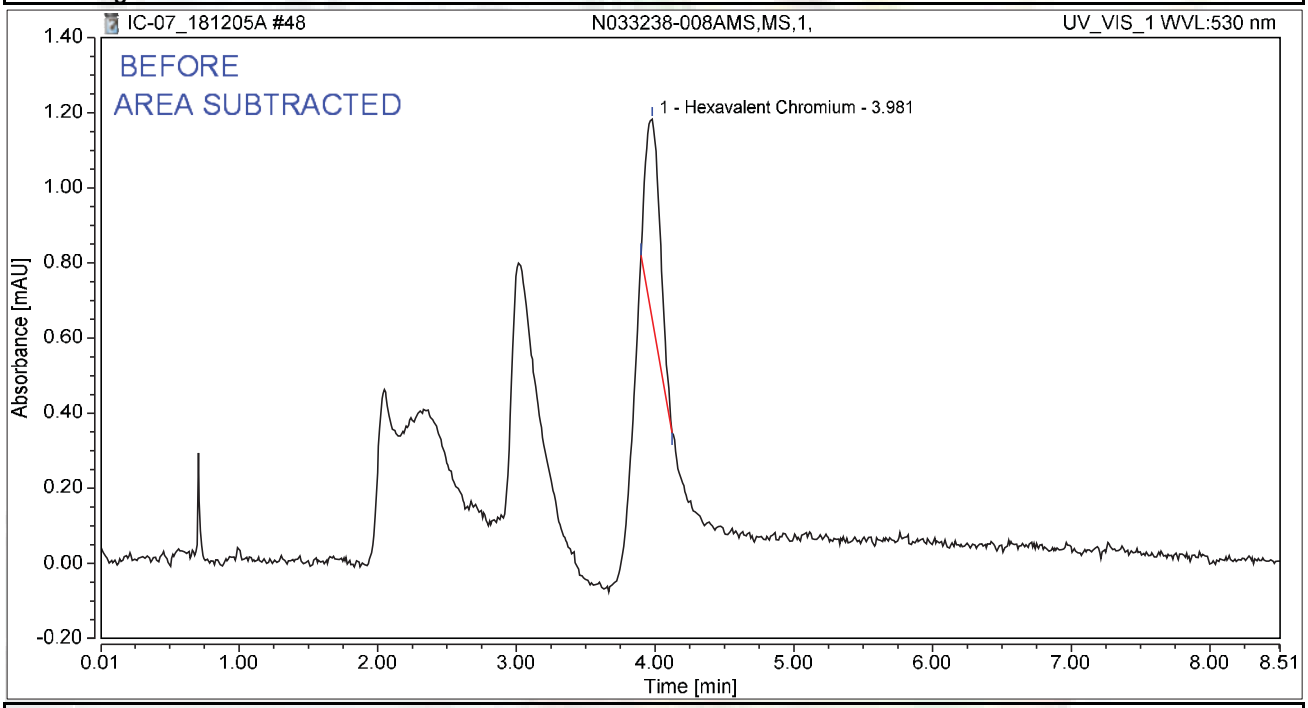
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-008AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**11**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:06**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.066	0.538	100.00	100.00	0.2594
Total:			**0.066**	**0.538**	**100.00**	**100.00**	

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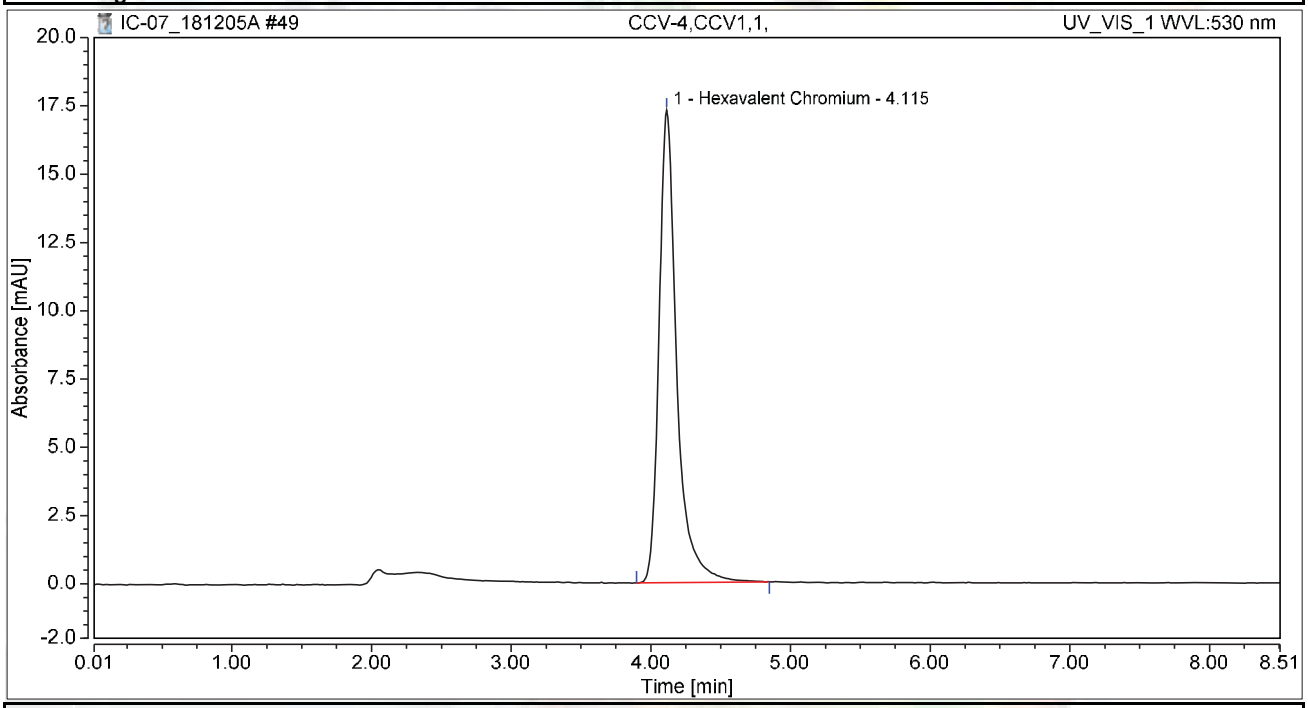
Chromatogram and Results

Injection Details

Injection Name:	**CCV-4,CCV1,1,**	*Run Time (min):*	**8.49**
Vial Number:	**12**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:16**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

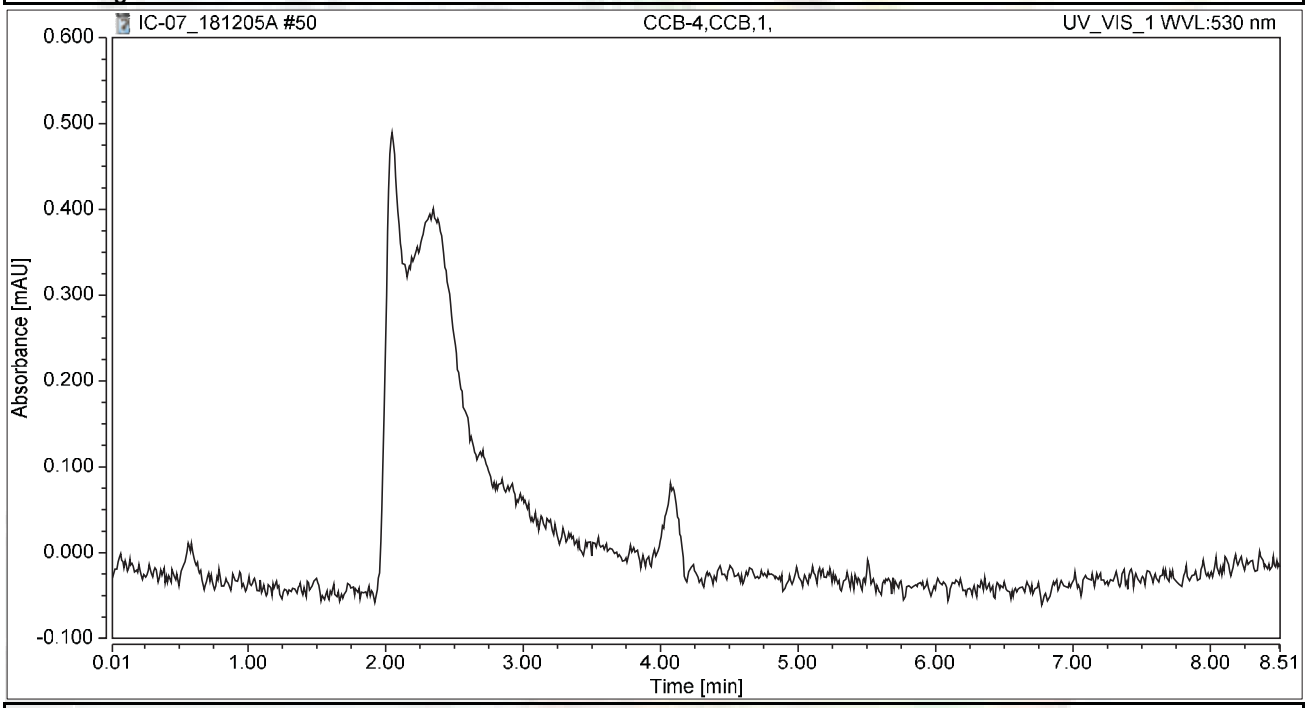
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	2.548	17.310	100.00	100.00	10.0756
Total:			**2.548**	**17.310**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-4,CCB,1,**	*Run Time (min):*	**8.49**
Vial Number:	**13**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:25**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

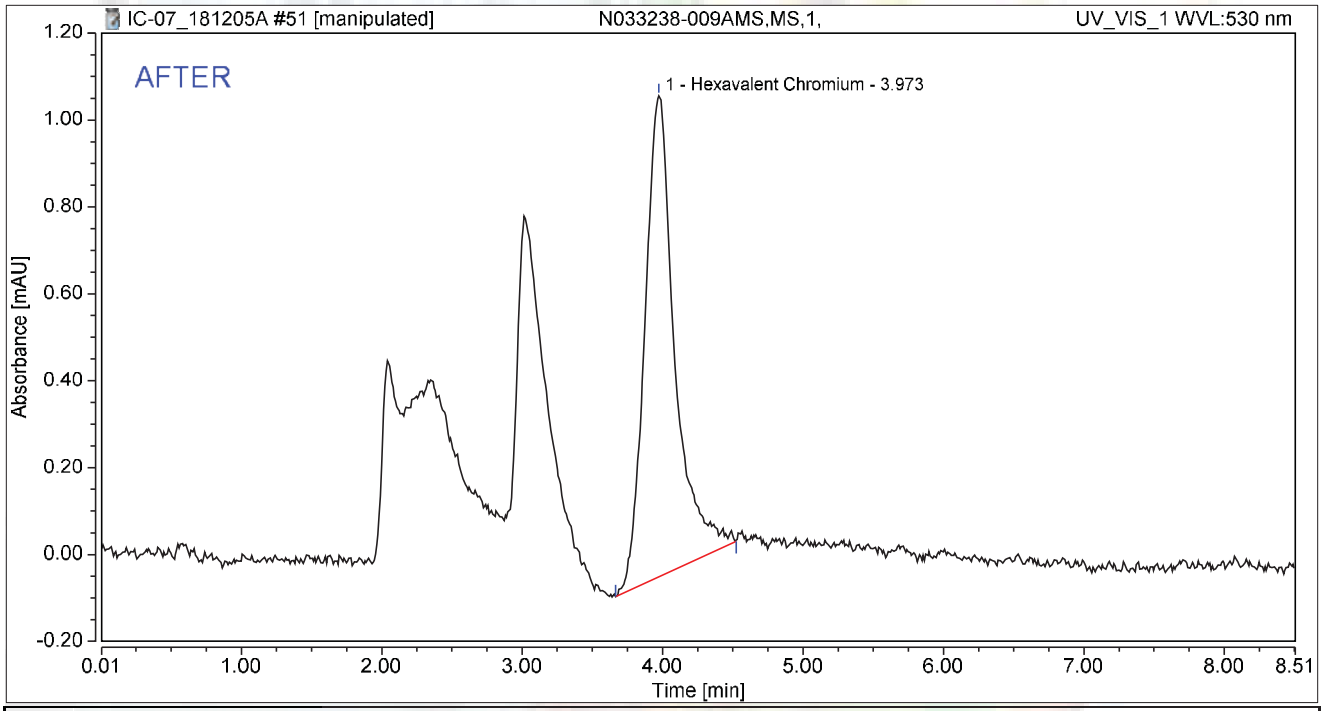
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-009AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**14**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:35**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.274	1.108	100.00	100.00	1.0827
Total:			**0.274**	**1.108**	**100.00**	**100.00**	

rba 12/9/2018

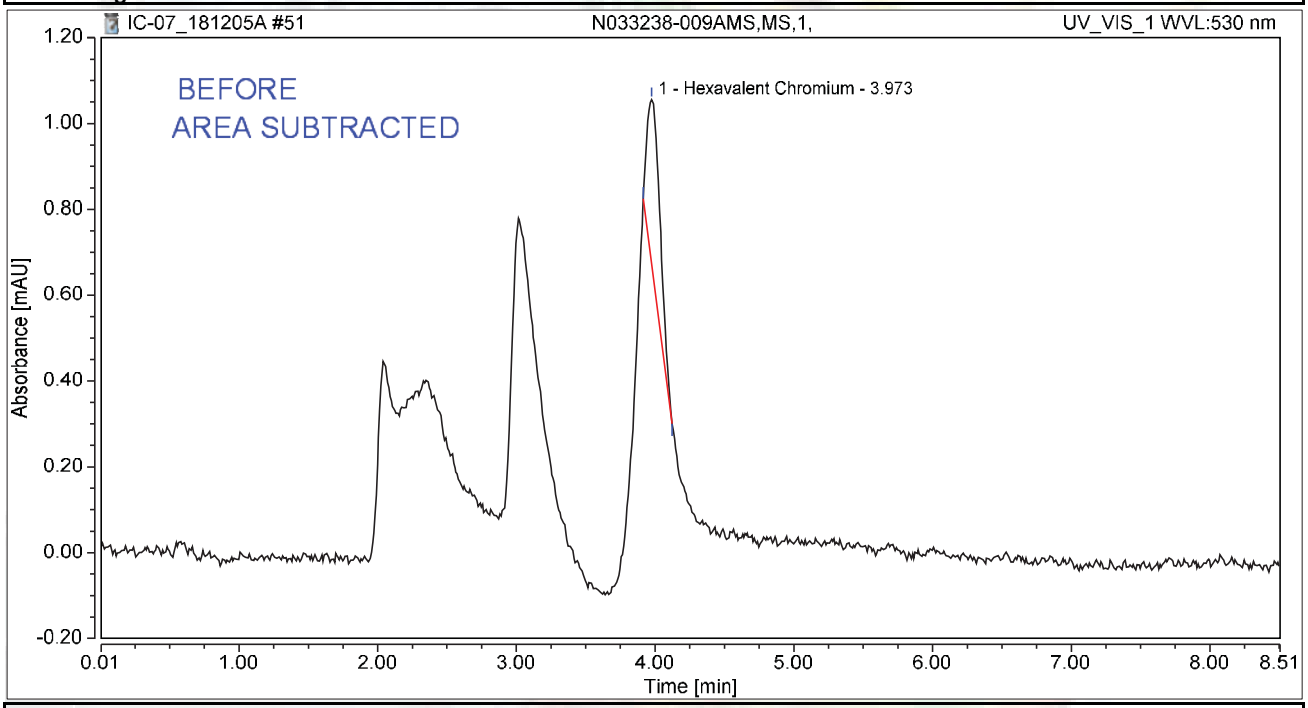
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-009AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**14**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:35**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.043	0.378	100.00	100.00	0.1709
Total:			**0.043**	**0.378**	**100.00**	**100.00**	

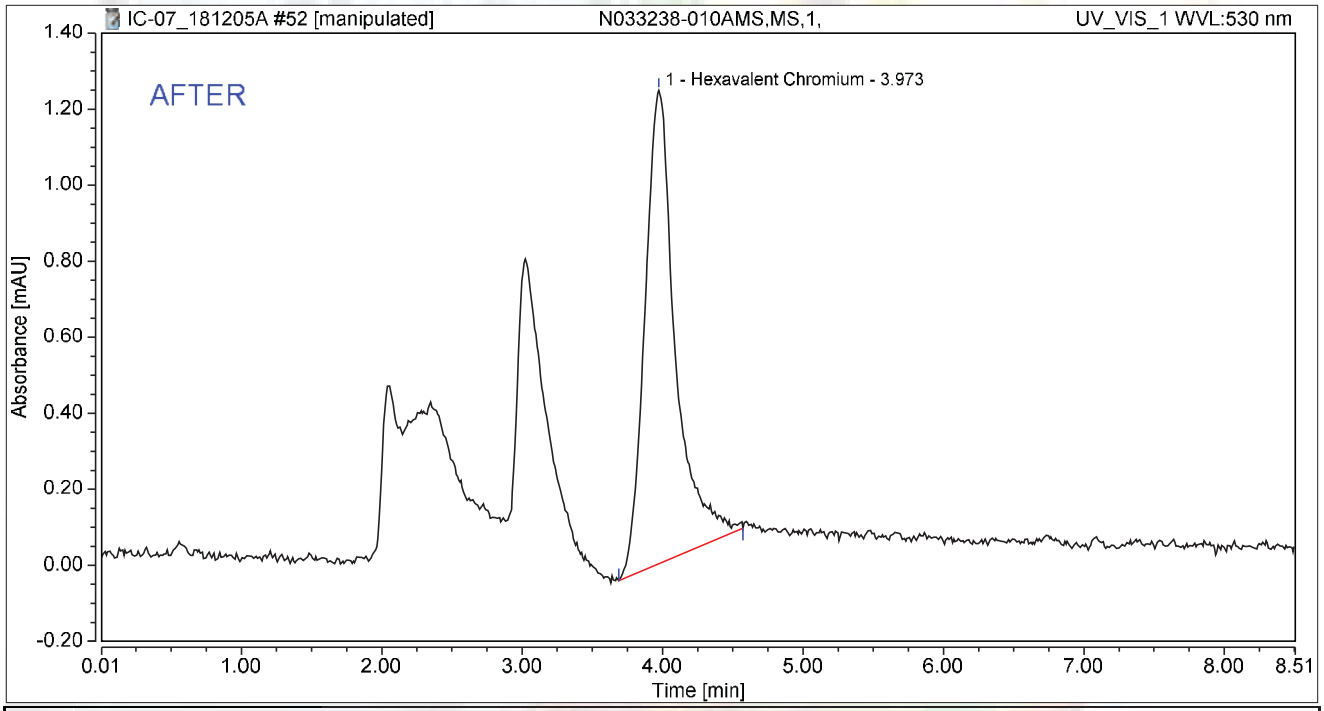
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-010AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**15**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:44**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.314	1.245	100.00	100.00	1.2429
Total:			**0.314**	**1.245**	**100.00**	**100.00**	

rba 12/9/2018

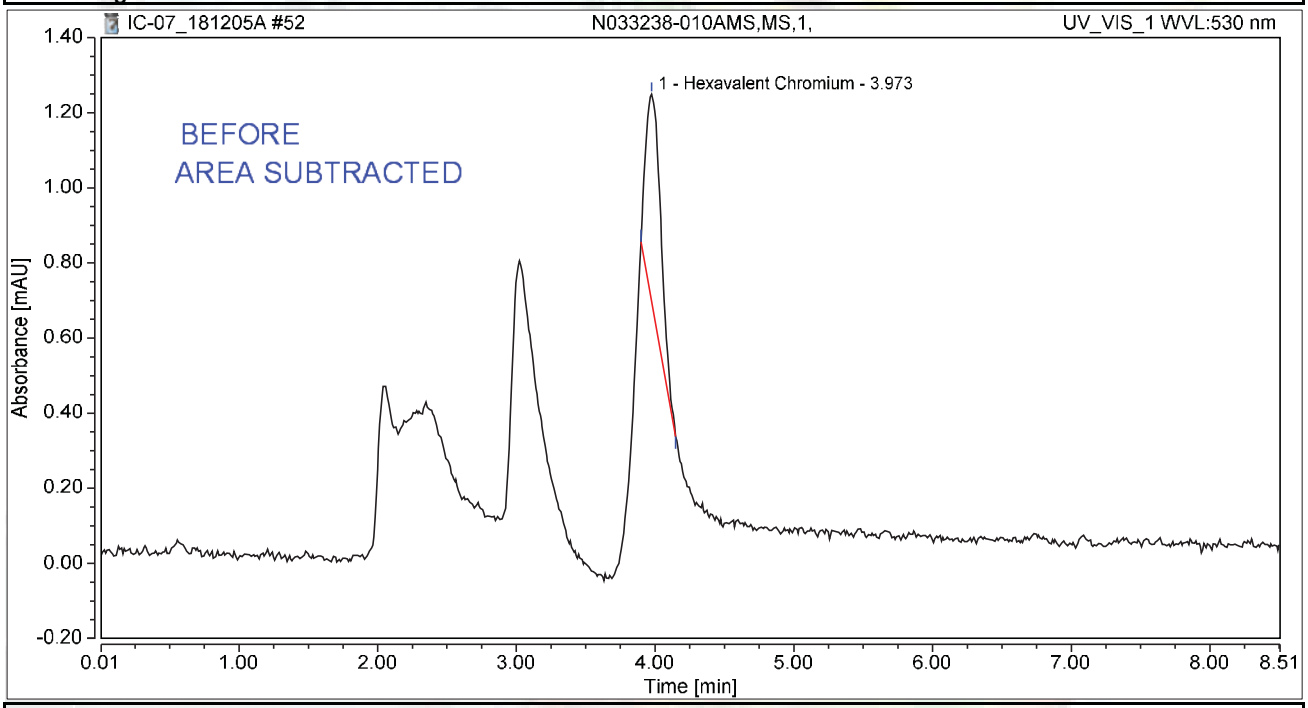
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-010AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**15**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:44**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.070	0.548	100.00	100.00	0.2786
Total:			**0.070**	**0.548**	**100.00**	**100.00**	

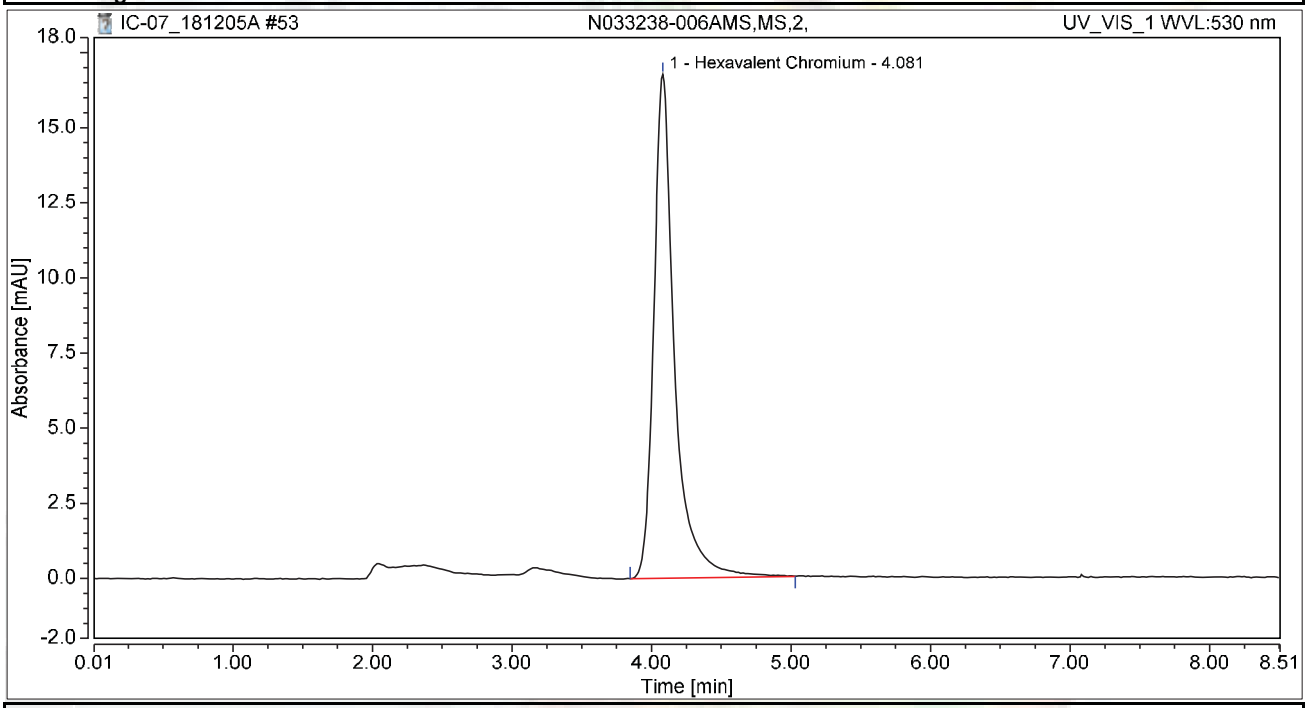
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-006AMS,MS,2,**	*Run Time (min):*	**8.50**
Vial Number:	**16**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 15:54**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

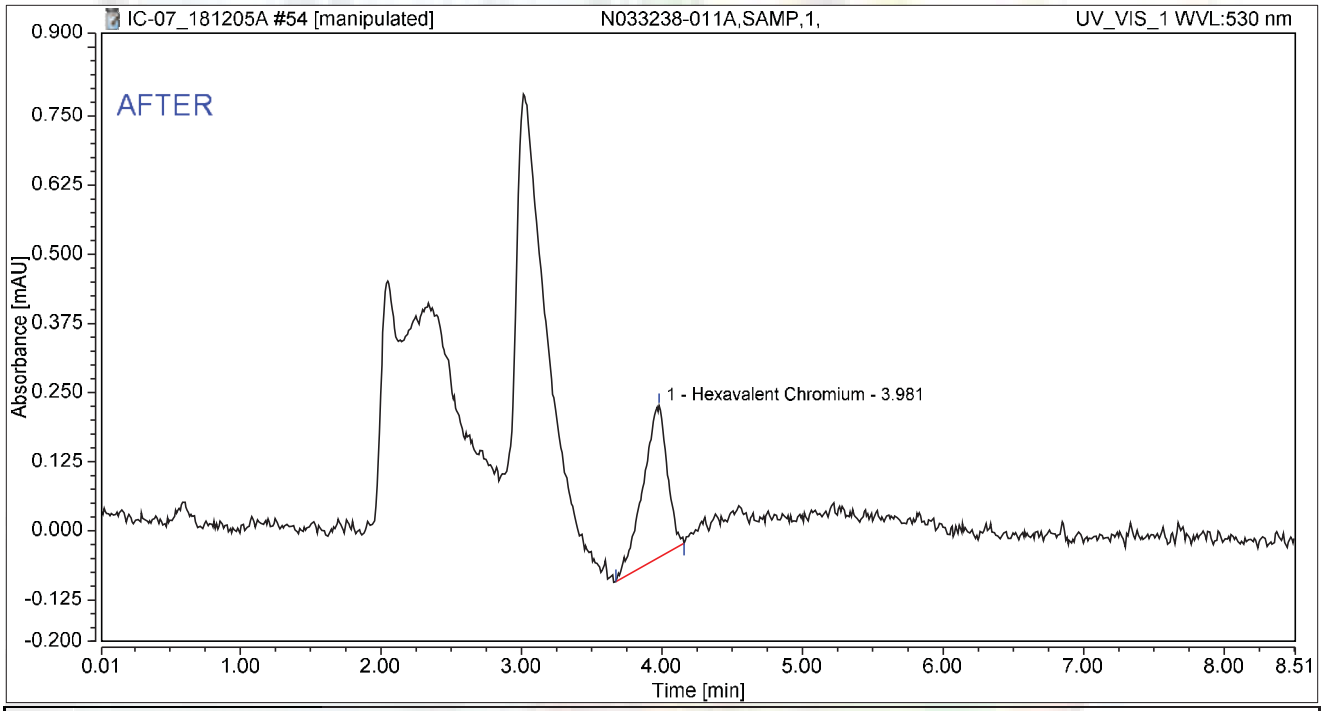
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.081	2.888	16.771	100.00	100.00	11.4199
Total:			**2.888**	**16.771**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-011A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**17**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:03**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.055	0.274	100.00	100.00	0.2185
Total:			**0.055**	**0.274**	**100.00**	**100.00**	

rba 12/9/2018

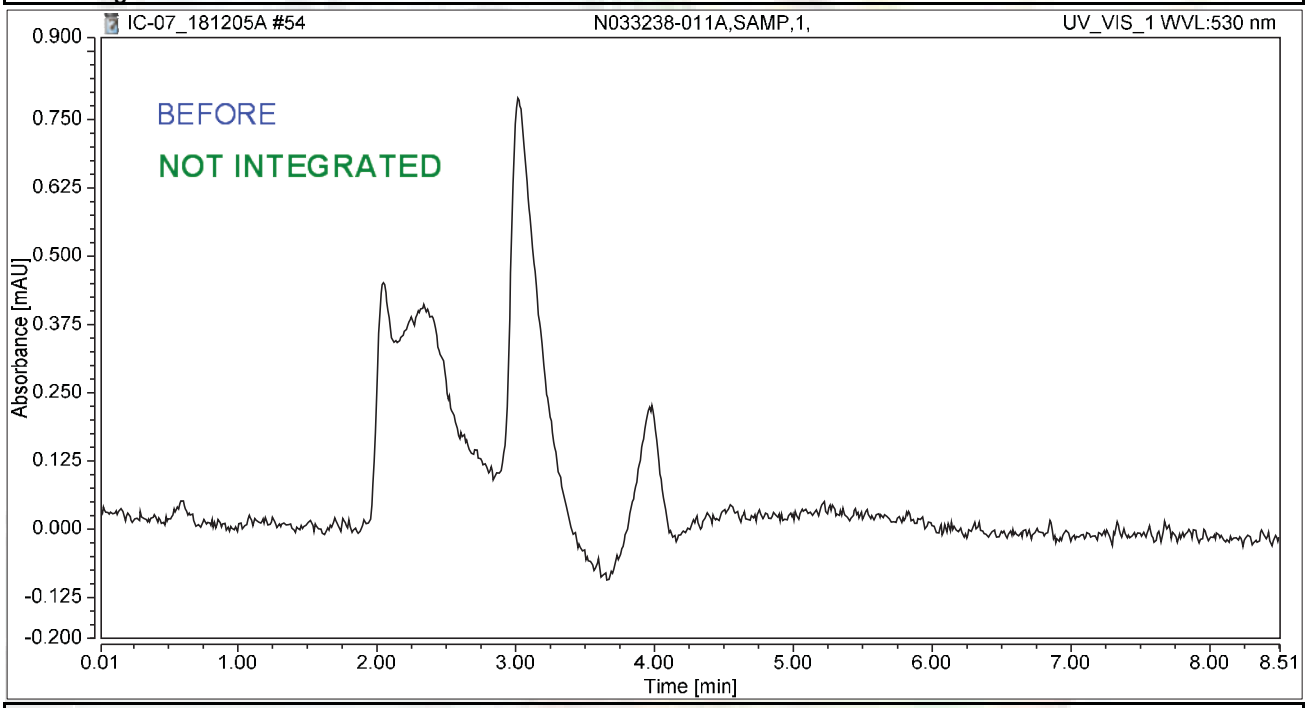
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-011A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**17**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:03**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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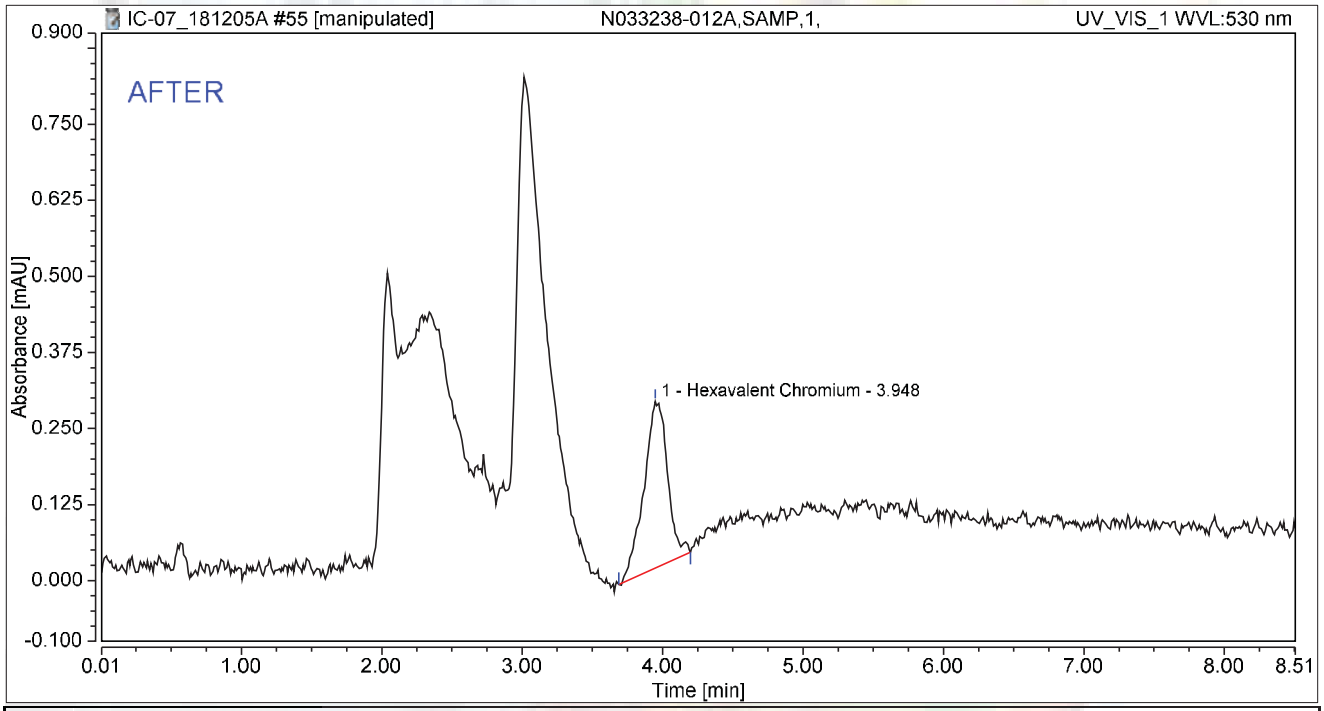
Chromatogram and Results

Injection Details

Injection Name:	**N033238-012A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**18**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:12**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.948	0.053	0.274	100.00	100.00	0.2108
Total:			**0.053**	**0.274**	**100.00**	**100.00**	

rba 12/9/2018

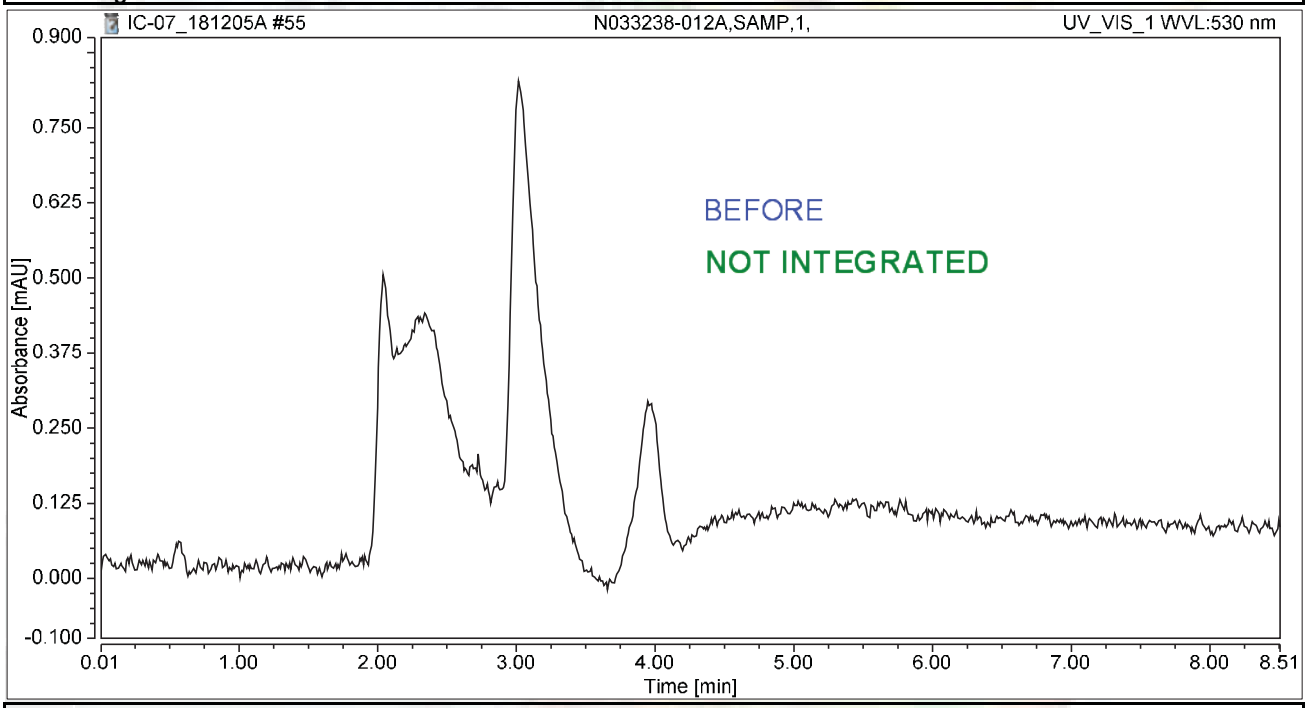
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-012A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**18**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:12**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

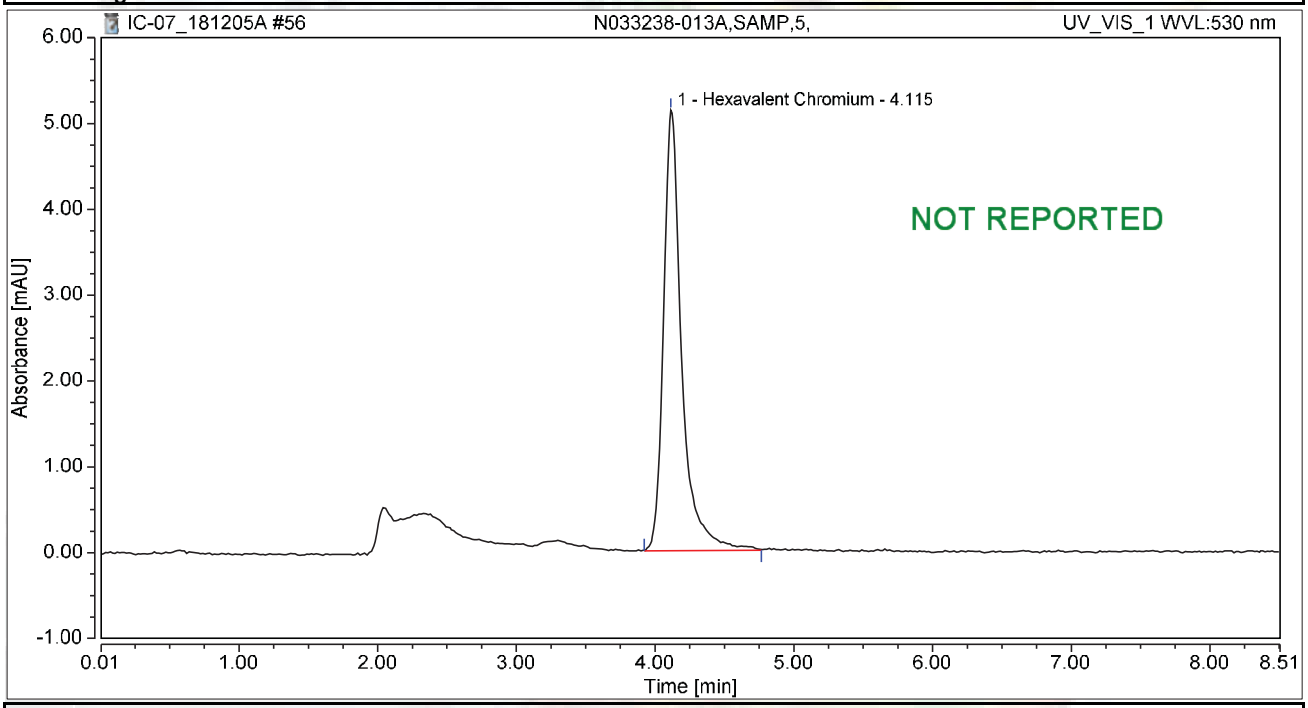
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-013A,SAMP,5,**	*Run Time (min):*	**8.50**
Vial Number:	**19**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:22**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

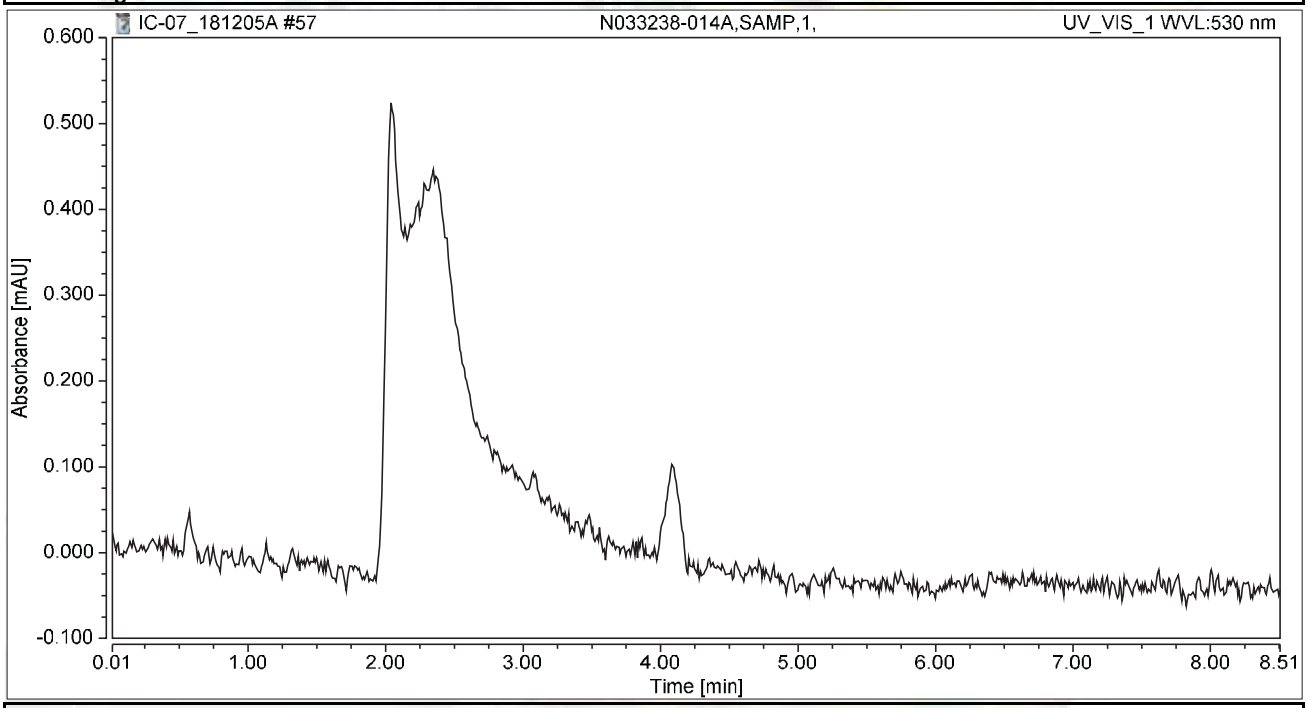
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	0.779	5.130	100.00	100.00	3.0782
Total:			**0.779**	**5.130**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-014A,SAMP,1,**	*Run Time (min):*	**8.49**
Vial Number:	**20**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:31**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

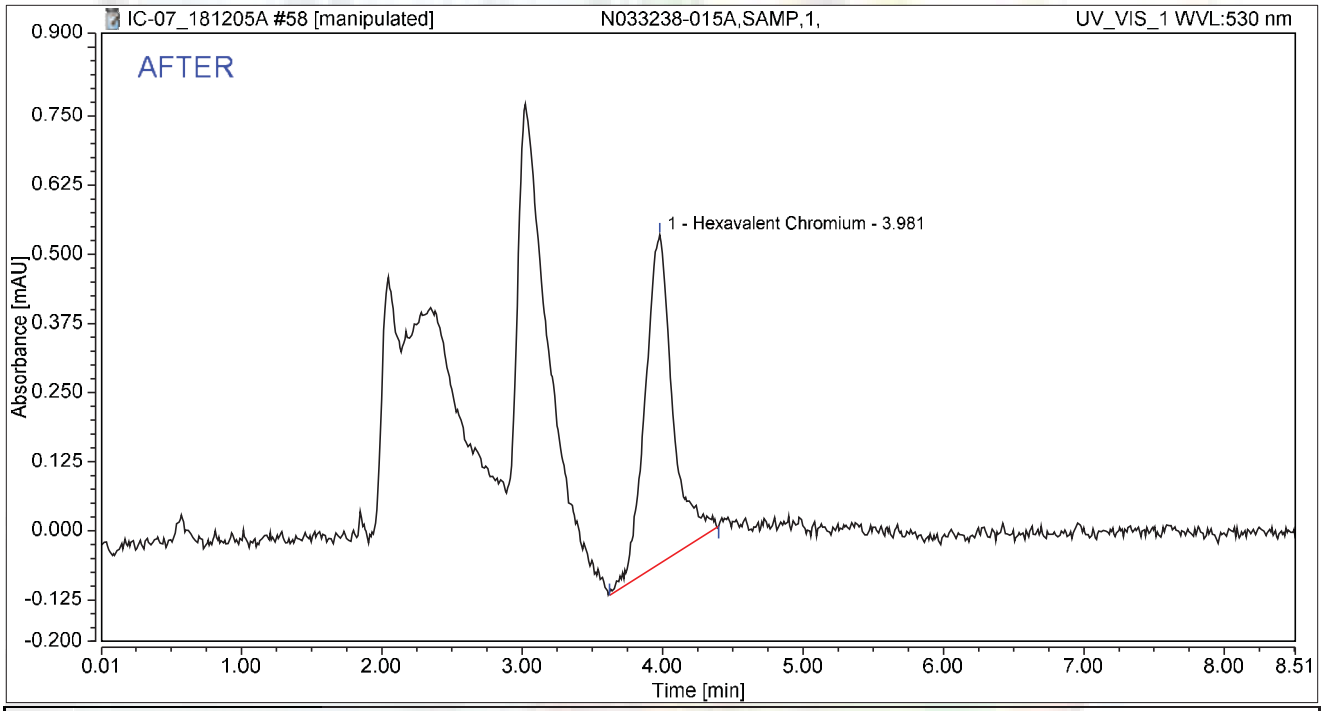
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-015A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**21**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:41**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.981	0.136	0.594	100.00	100.00	0.5378
Total:			**0.136**	**0.594**	**100.00**	**100.00**	

rba 12/9/2018

Reviewed by:
My first report/Integration 12/9/2018

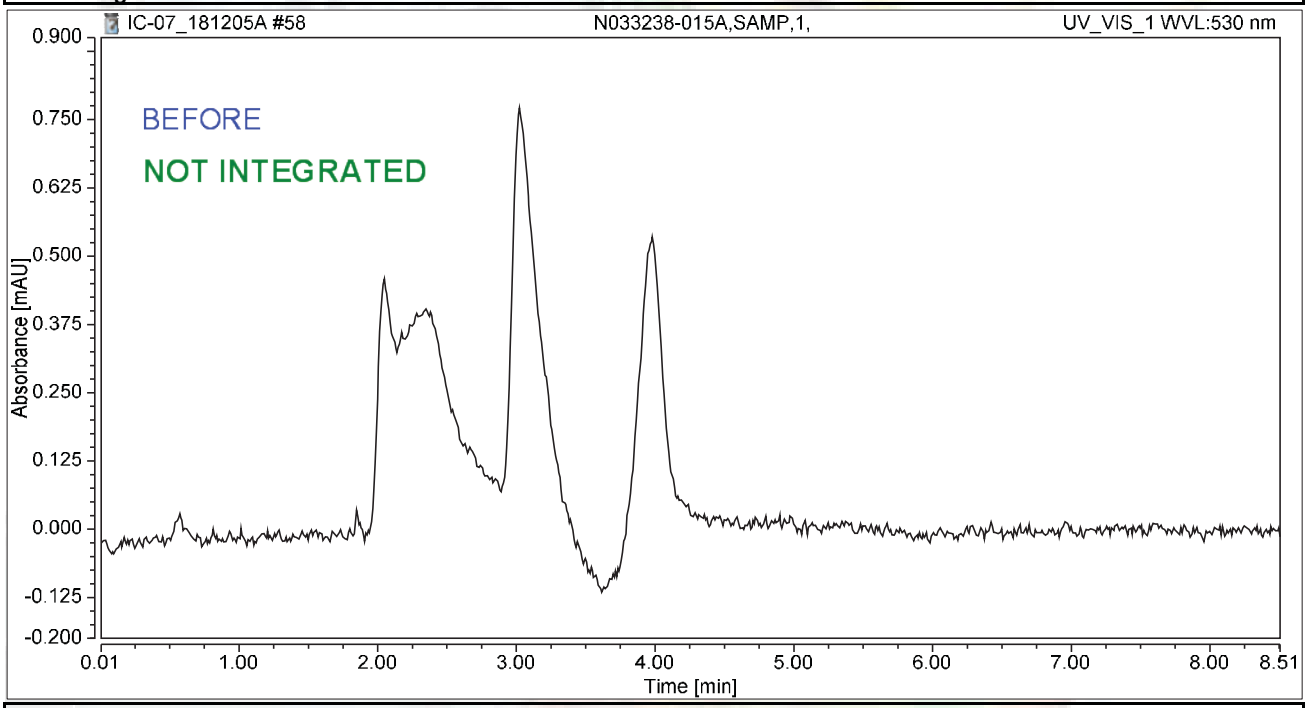
Chromeleon (c) Dionex
Version 7.1.1.1127

Chromatogram and Results

Injection Details

Injection Name:	**N033238-015A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**21**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:41**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

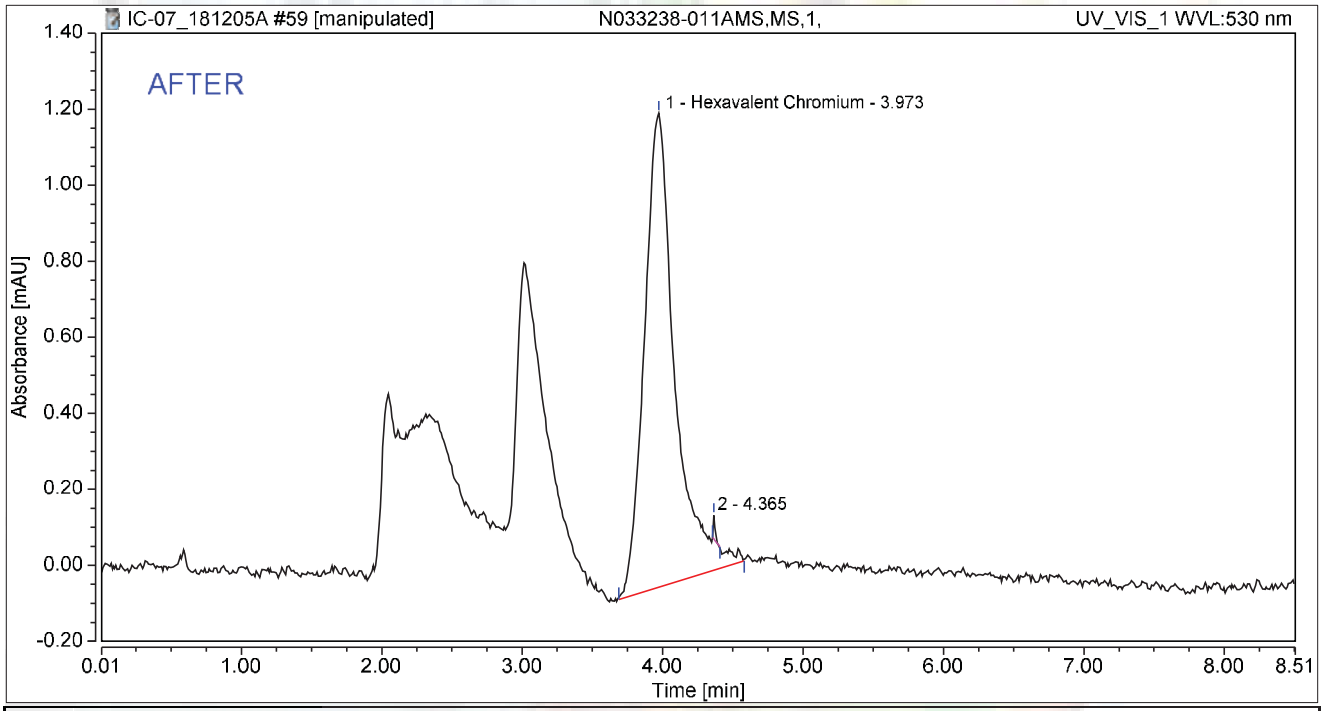
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-011AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**22**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:50**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.313	1.247	99.70	95.22	1.2390
2		4.365	0.001	0.063	0.30	4.78	n.a.
Total:			**0.314**	**1.309**	**100.00**	**100.00**	

rba 12/9/2018

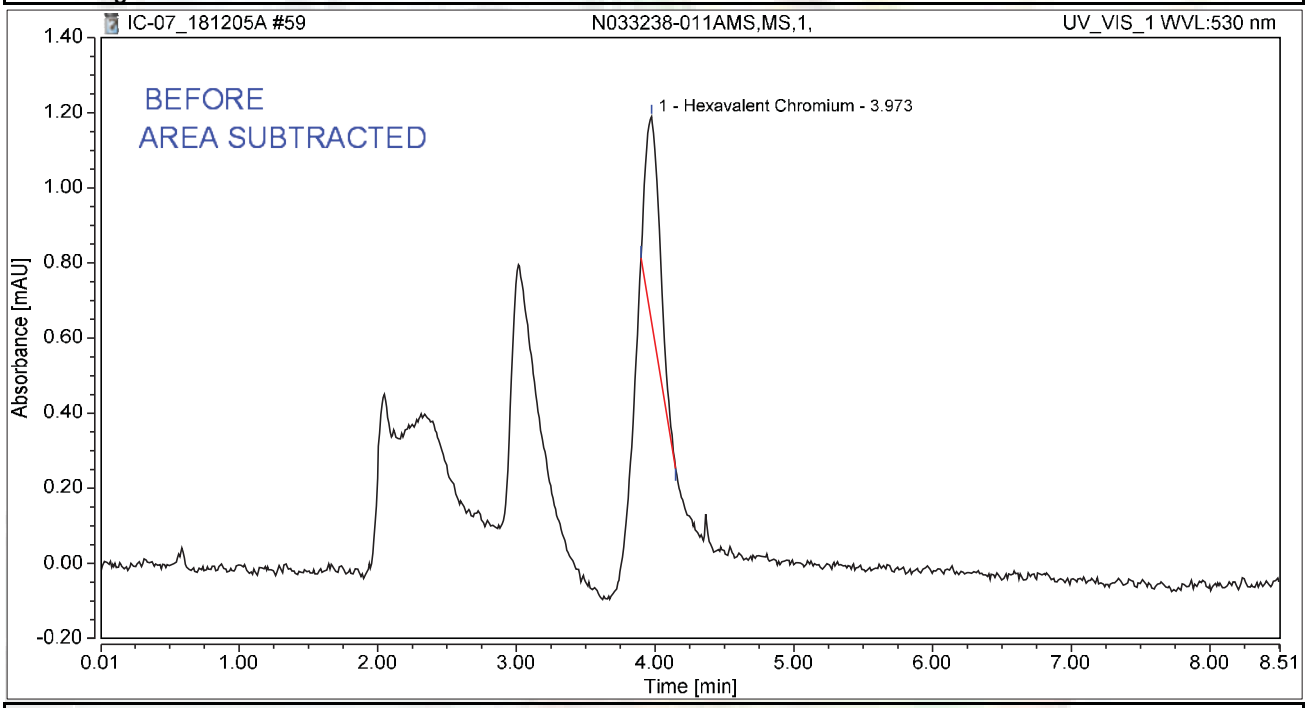
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-011AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**22**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 16:50**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.067	0.544	100.00	100.00	0.2641
Total:			**0.067**	**0.544**	**100.00**	**100.00**	

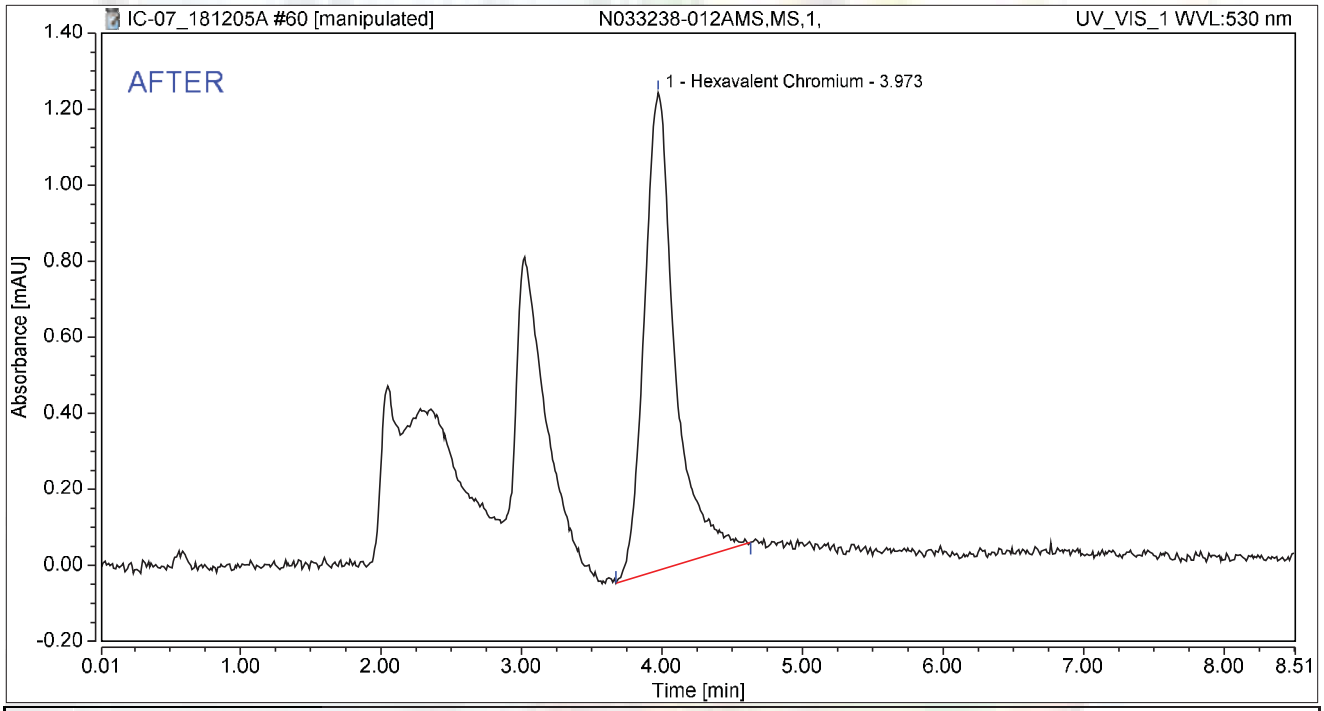
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-012AMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**23**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:00**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.317	1.257	100.00	100.00	1.2521
Total:			**0.317**	**1.257**	**100.00**	**100.00**	

rba 12/9/2018

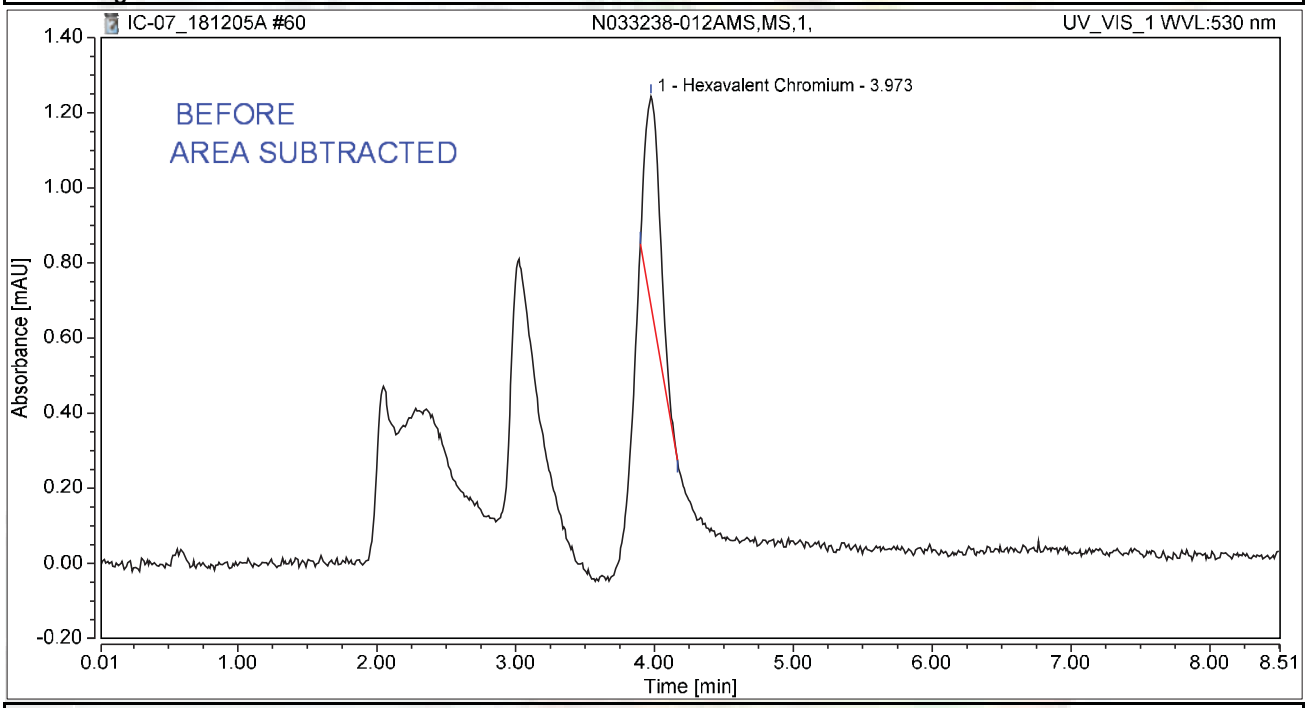
Reviewed by: Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-012AMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**23**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:00**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.072	0.555	100.00	100.00	0.2843
Total:			**0.072**	**0.555**	**100.00**	**100.00**	

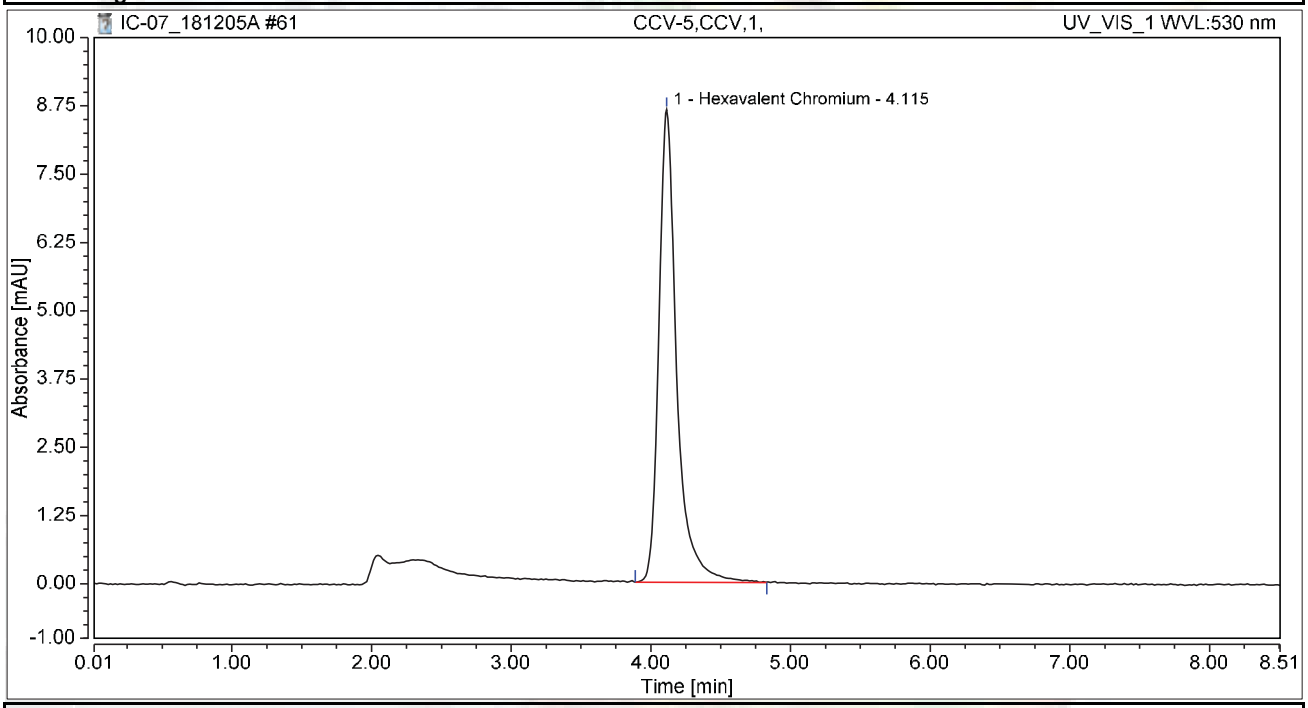
rba 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**CCV-5,CCV,1,**	*Run Time (min):*	**8.49**
Vial Number:	**24**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:09**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

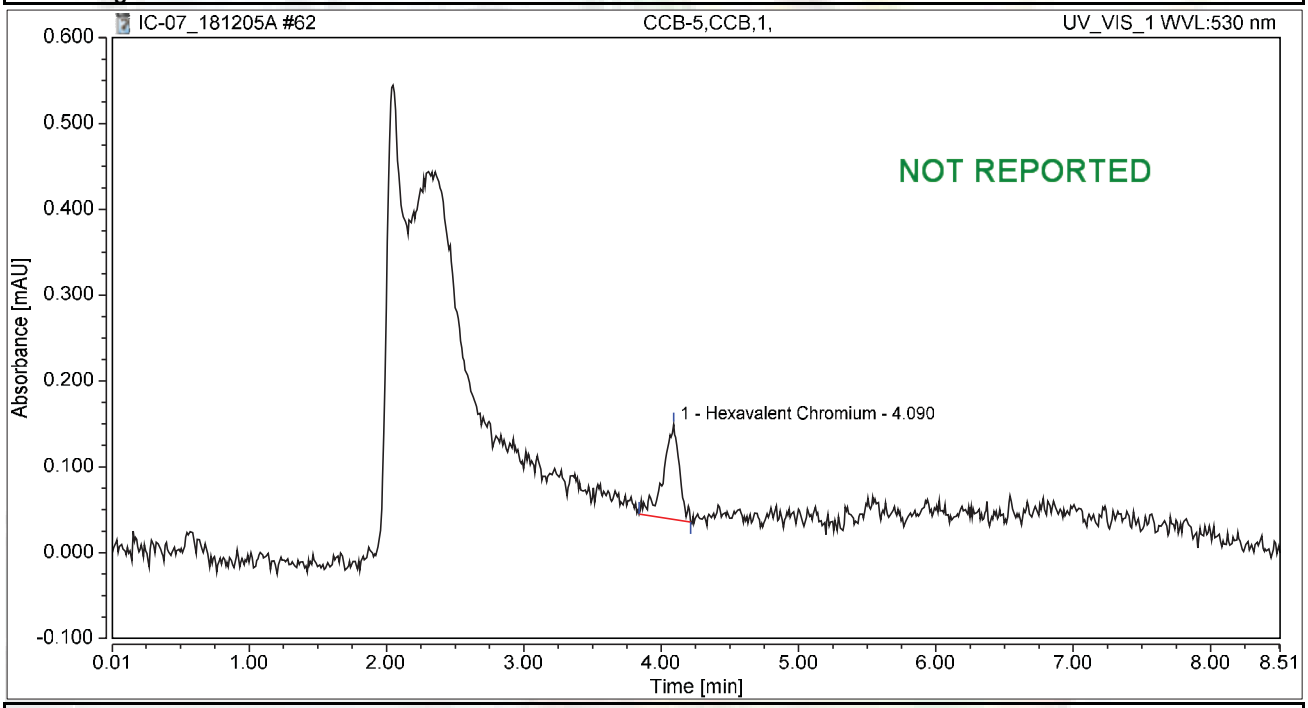
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	1.285	8.651	100.00	100.00	5.0792
Total:			**1.285**	**8.651**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-5,CCB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**25**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:19**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

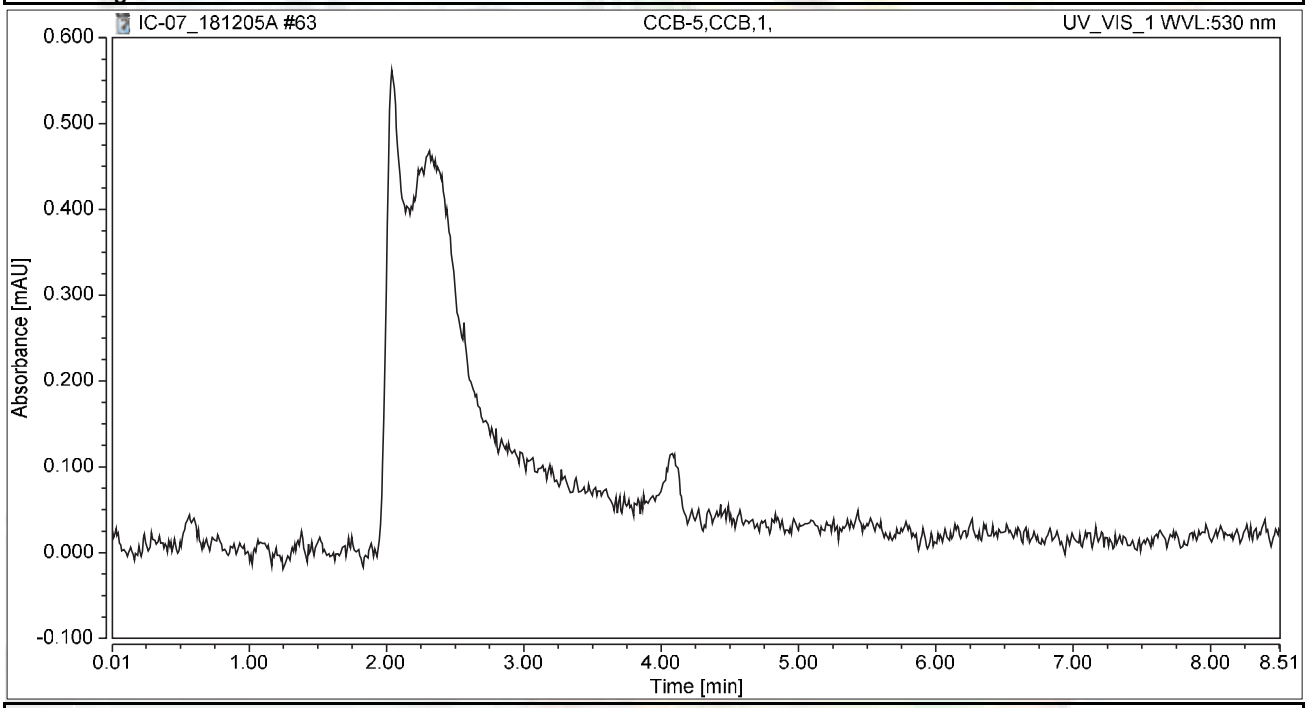
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.090	0.015	0.110	100.00	100.00	0.0597
Total:			**0.015**	**0.110**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-5,CCB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**25**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:36**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

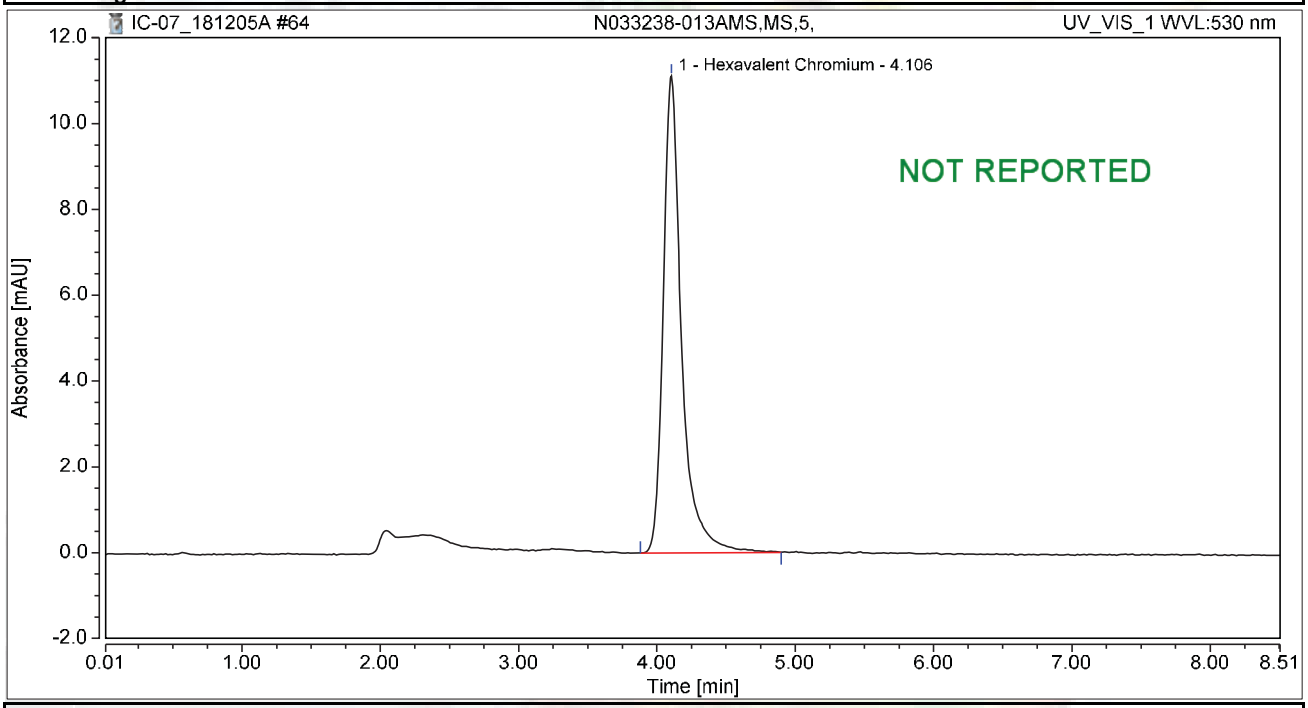
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-013AMS,MS,5,**	*Run Time (min):*	**8.49**
Vial Number:	**26**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:47**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

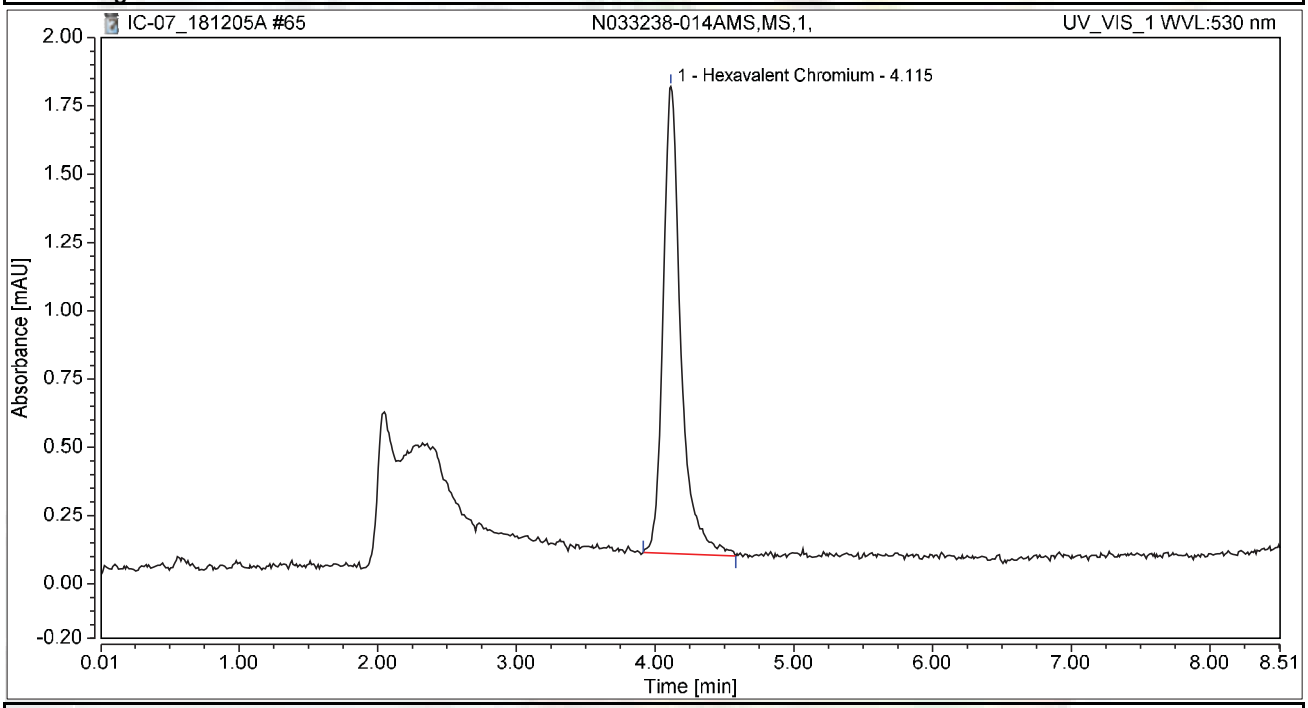
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	1.708	11.110	100.00	100.00	6.7549
Total:			**1.708**	**11.110**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-014AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**27**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 17:56**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

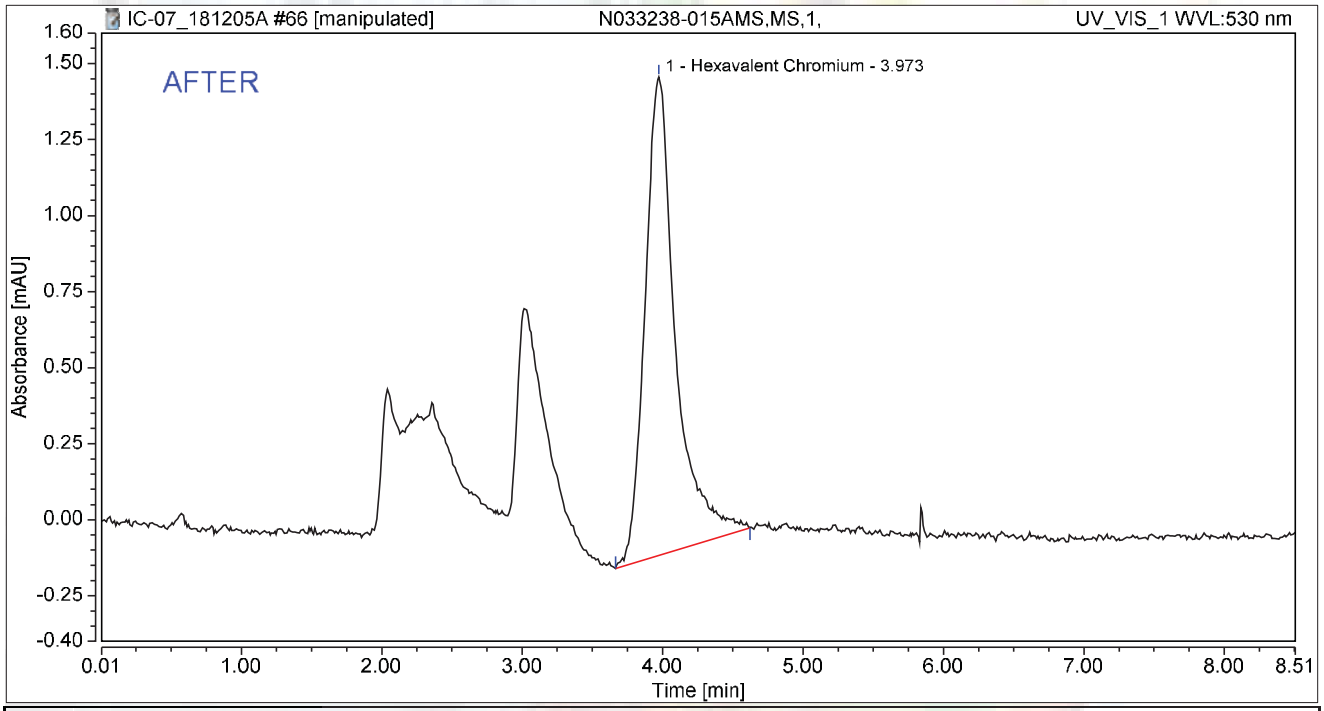
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	0.254	1.710	100.00	100.00	1.0052
Total:			**0.254**	**1.710**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033238-015AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**28**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:06**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.397	1.573	100.00	100.00	1.5690
Total:			**0.397**	**1.573**	**100.00**	**100.00**	

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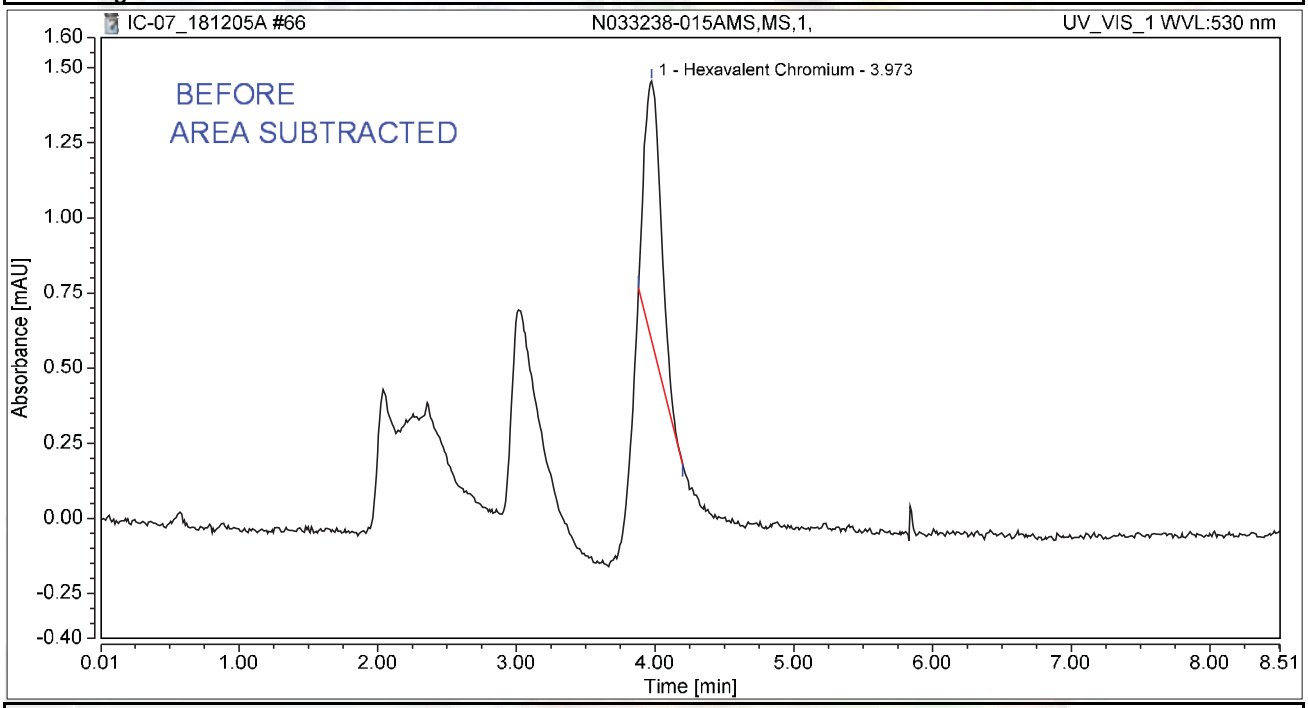
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033238-015AMS,MS,1,**	*Run Time (min):*	**8.50**
Vial Number:	**28**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:06**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.973	0.122	0.859	100.00	100.00	0.4822
Total:			**0.122**	**0.859**	**100.00**	**100.00**	

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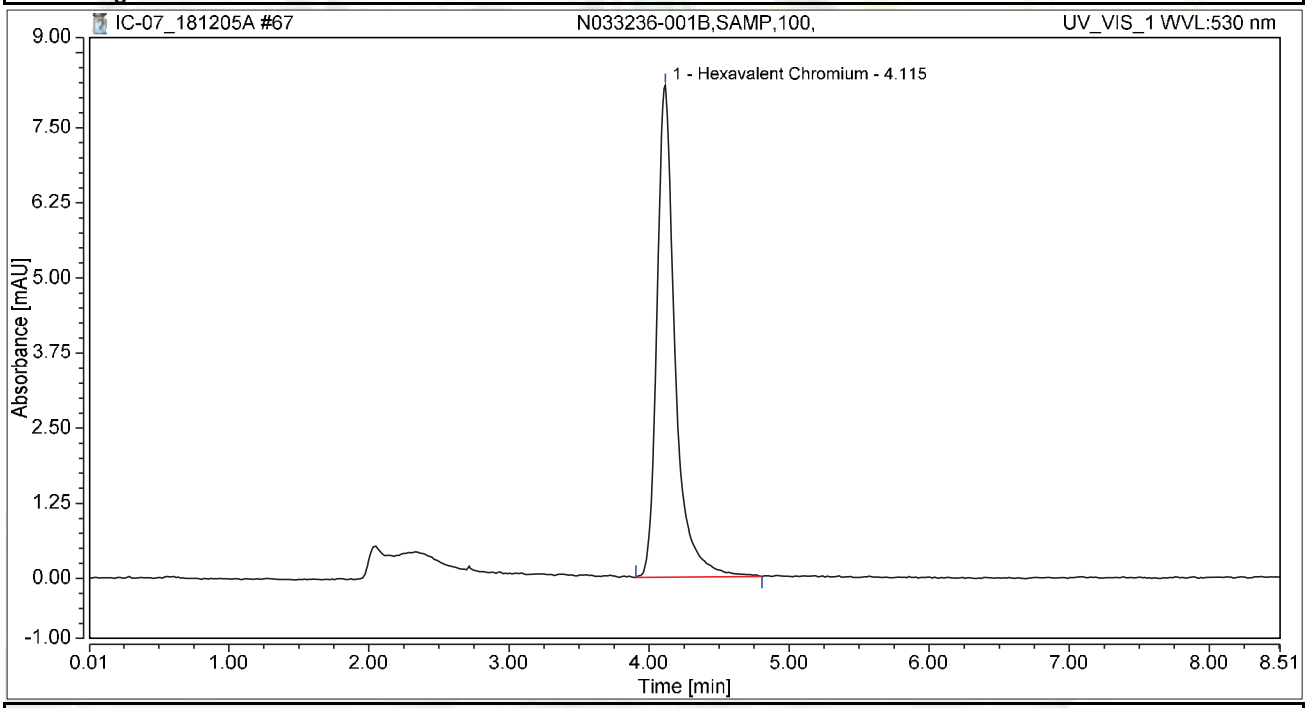
Chromatogram and Results

Injection Details

Injection Name:	**N033236-001B,SAMP,100,**	*Run Time (min):*	**8.50**
Vial Number:	**29**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:15**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

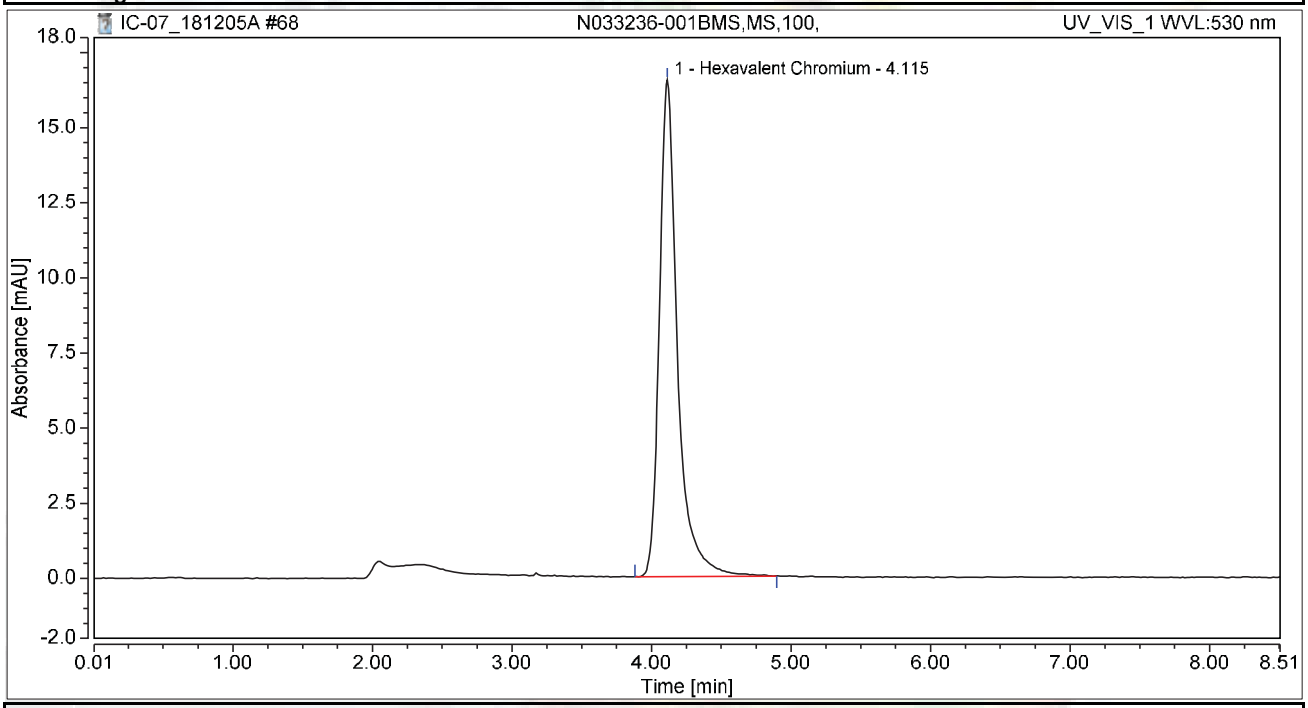
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	1.229	8.187	100.00	100.00	4.8581
Total:			**1.229**	**8.187**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033236-001BMS,MS,100,**	*Run Time (min):*	**8.50**
Vial Number:	**1**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:38**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

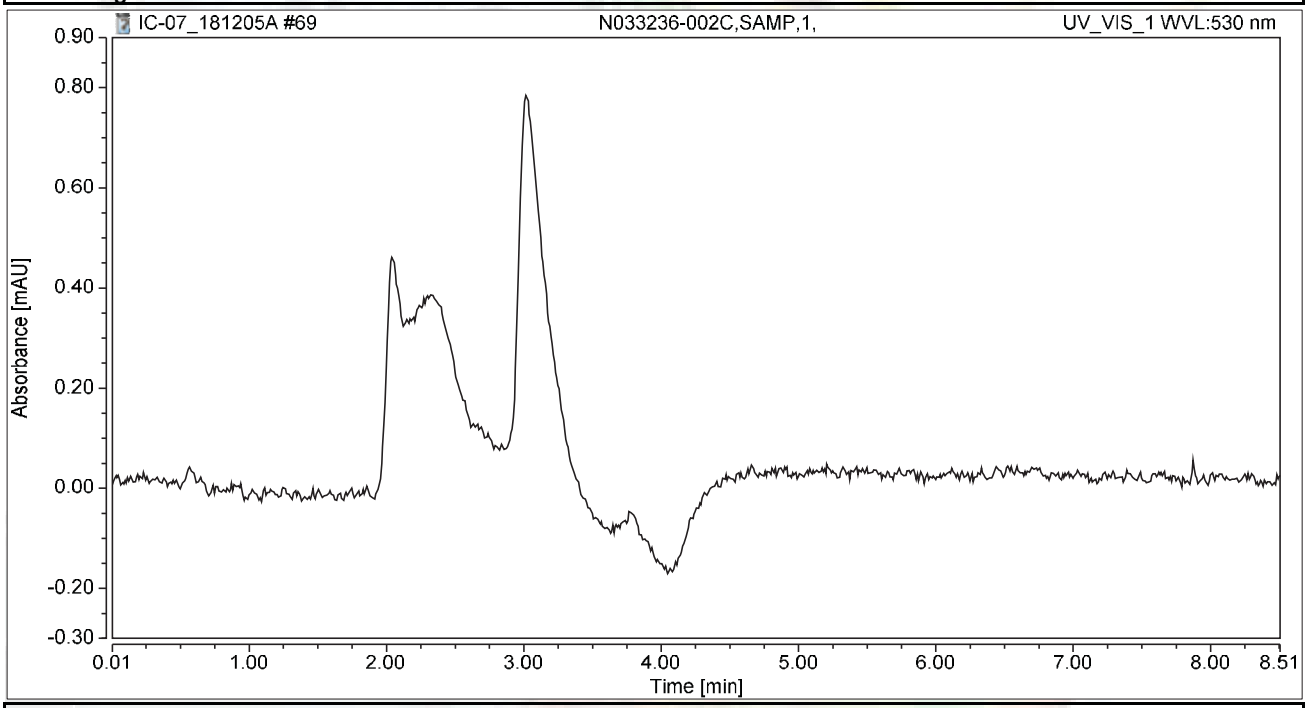
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	2.480	16.540	100.00	100.00	9.8050
Total:			**2.480**	**16.540**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033236-002C,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**2**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:49**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

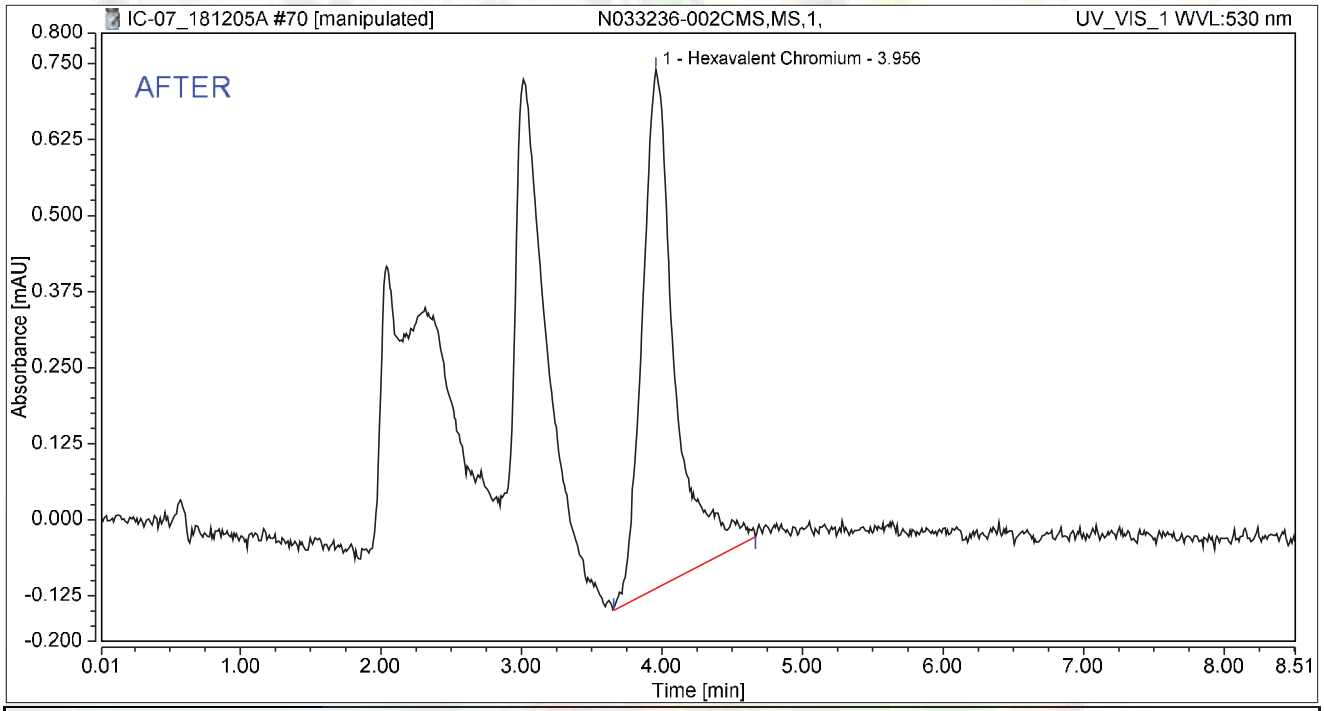
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

Chromatogram and Results

Injection Details

Injection Name:	**N033236-002CMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	3.956	0.229	0.853	100.00	100.00	0.9060
Total:			**0.229**	**0.853**	**100.00**	**100.00**	

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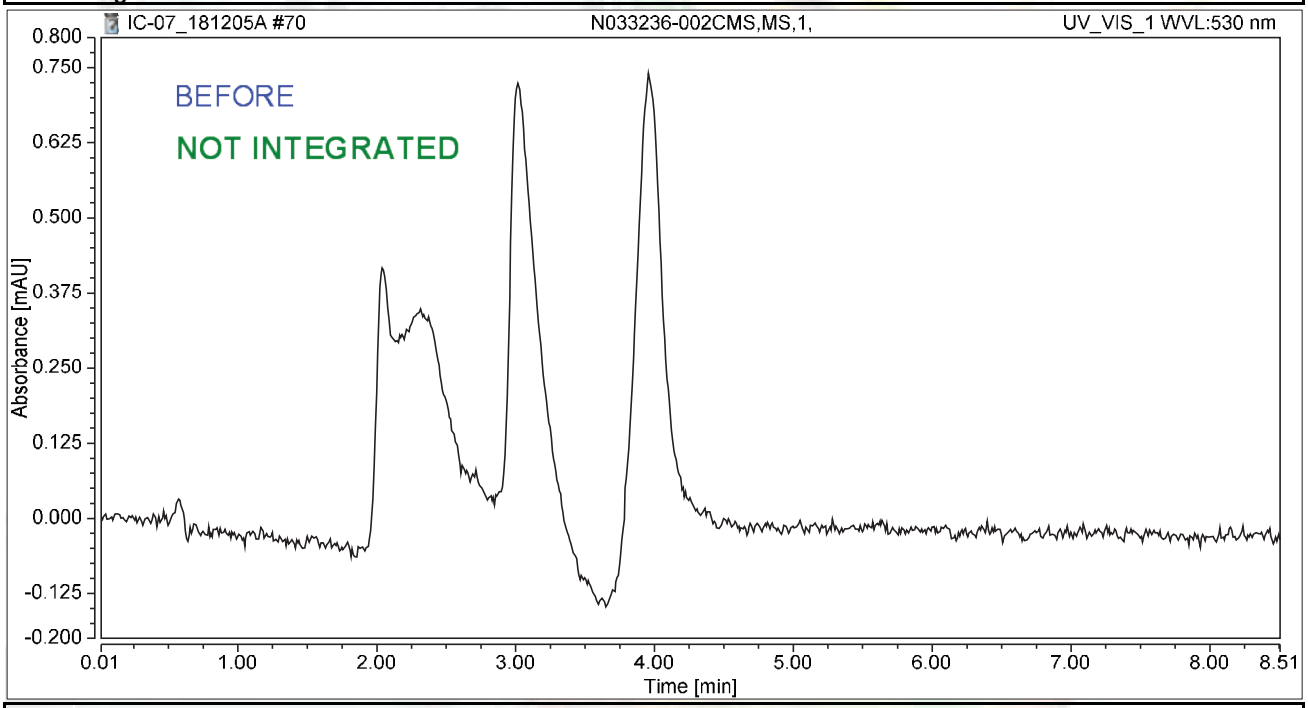
Reviewed by:
Nancy 12/9/2018

Chromatogram and Results

Injection Details

Injection Name:	**N033236-002CMS,MS,1,**	*Run Time (min):*	**8.49**
Vial Number:	**3**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 18:58**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

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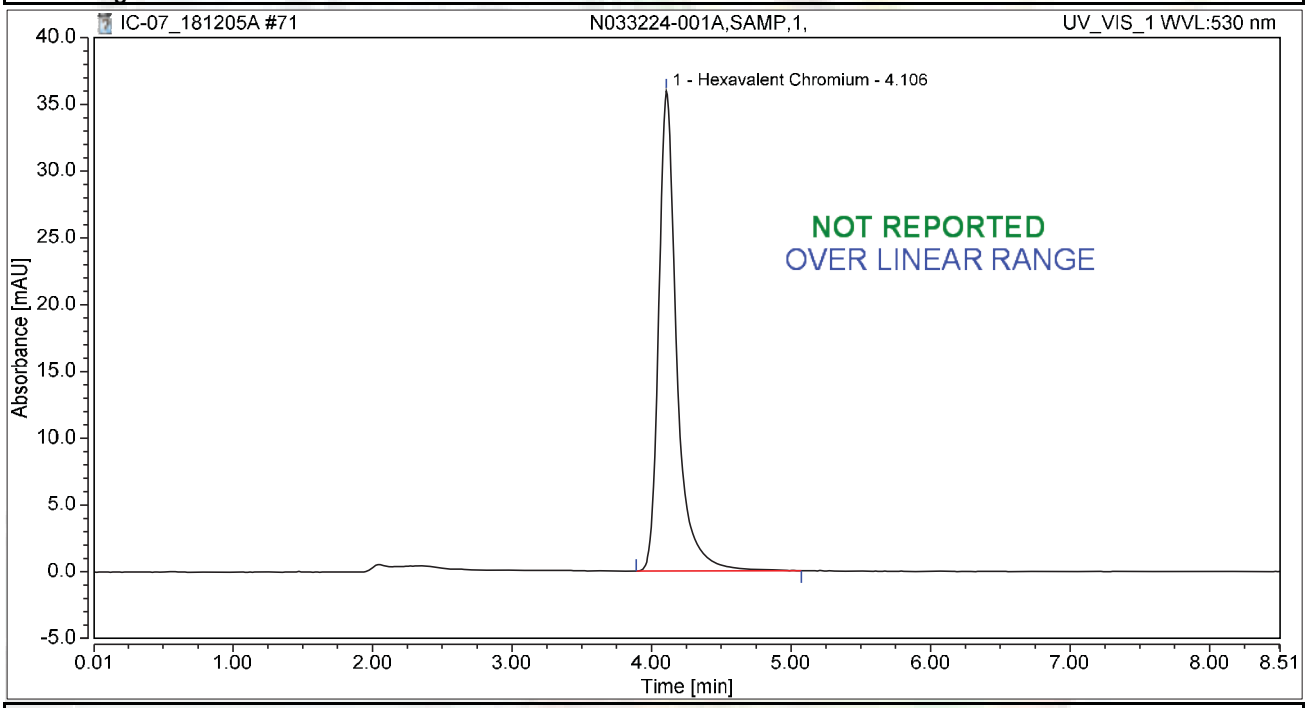
Chromatogram and Results

Injection Details

Injection Name:	**N033224-001A,SAMP,1,**	*Run Time (min):*	**8.50**
Vial Number:	**4**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:07**	*Sample Weight:*	**1.0000**

Chromatogram



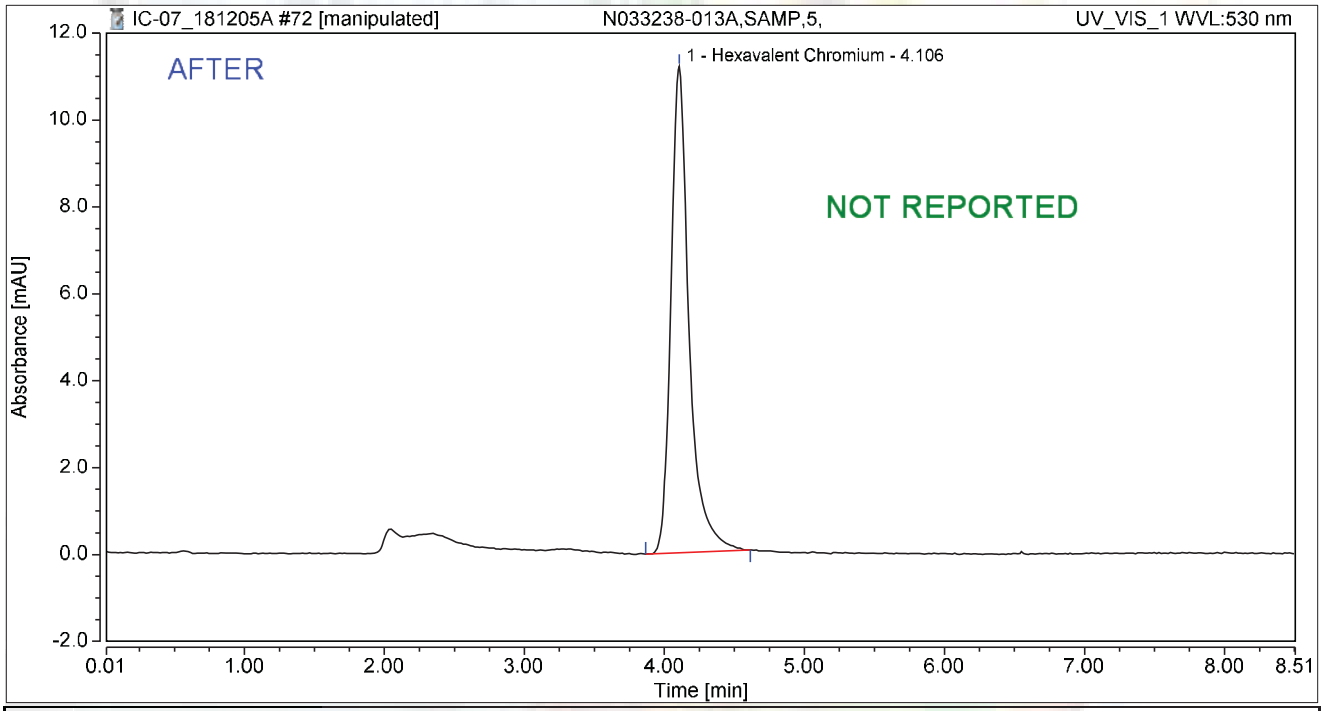
Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	5.394	35.958	100.00	100.00	21.3277
Total:			**5.394**	**35.958**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details	N033238-013AMS,MS,5		
Injection Name:	~~N033238-013A,SAMP,5,~~	*Run Time (min):*	**8.49**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:17**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	1.685	11.188	100.00	100.00	6.6622
Total:			**1.685**	**11.188**	**100.00**	**100.00**	

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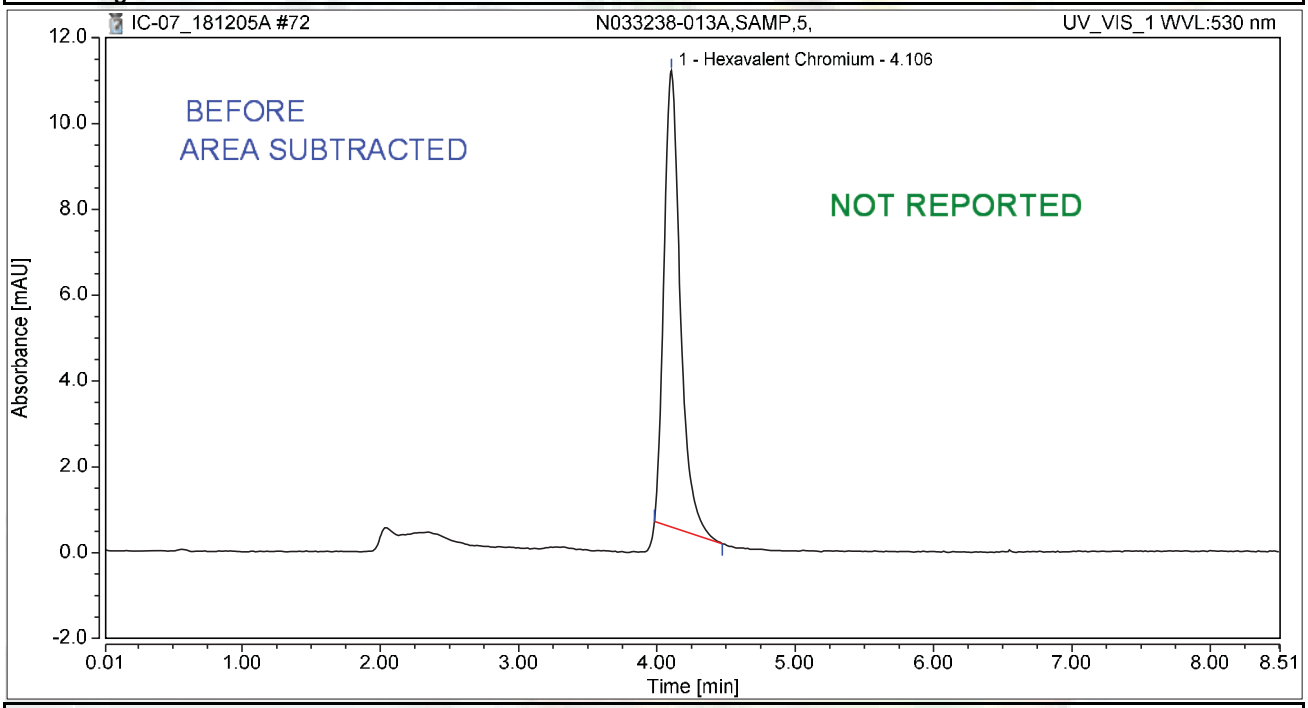
Chromatogram and Results

Injection Details	N033238-013AMS,MS,5		
Injection Name:	~~N033238-013A,SAMP,5,~~	*Run Time (min):*	**8.49**
Vial Number:	**5**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:17**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	1.463	10.636	100.00	100.00	5.7841
Total:			**1.463**	**10.636**	**100.00**	**100.00**	

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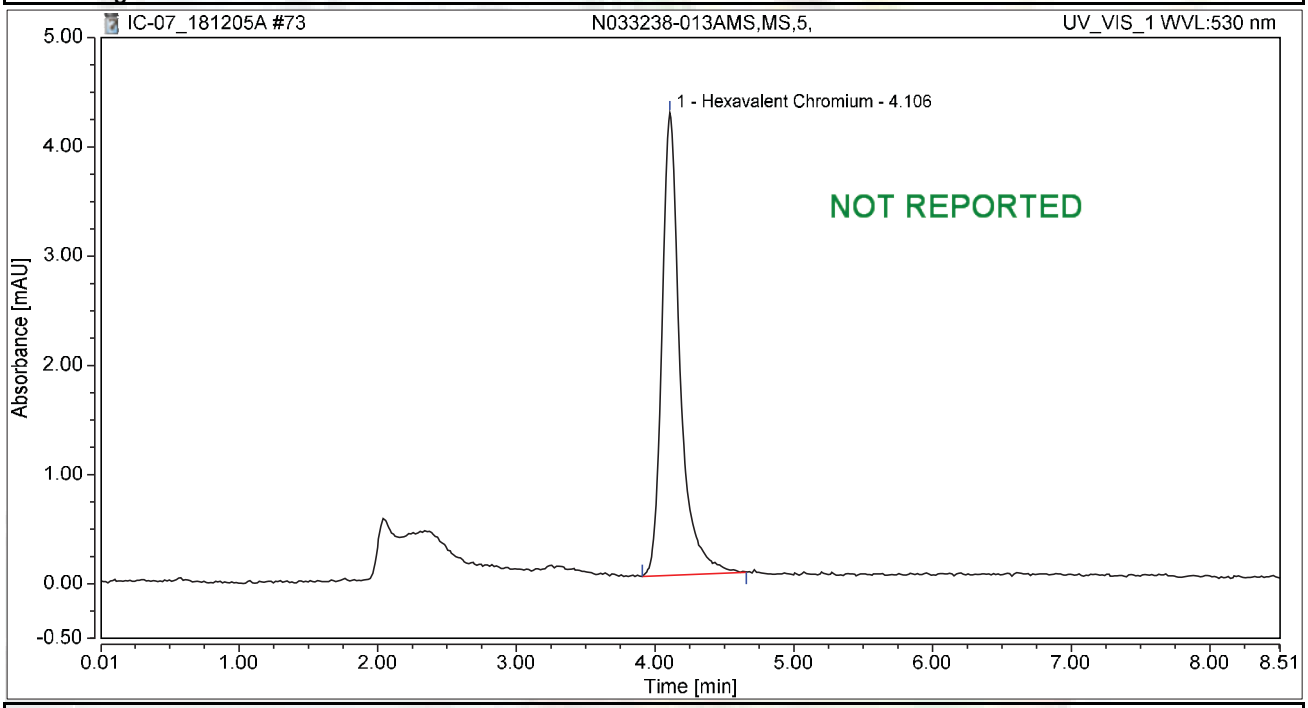
Chromatogram and Results

Injection Details	N033238-013A,SAMP,5		
Injection Name:	~~N033238-013AMS,MS,5,~~	*Run Time (min):*	**8.50**
Vial Number:	**6**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:26**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

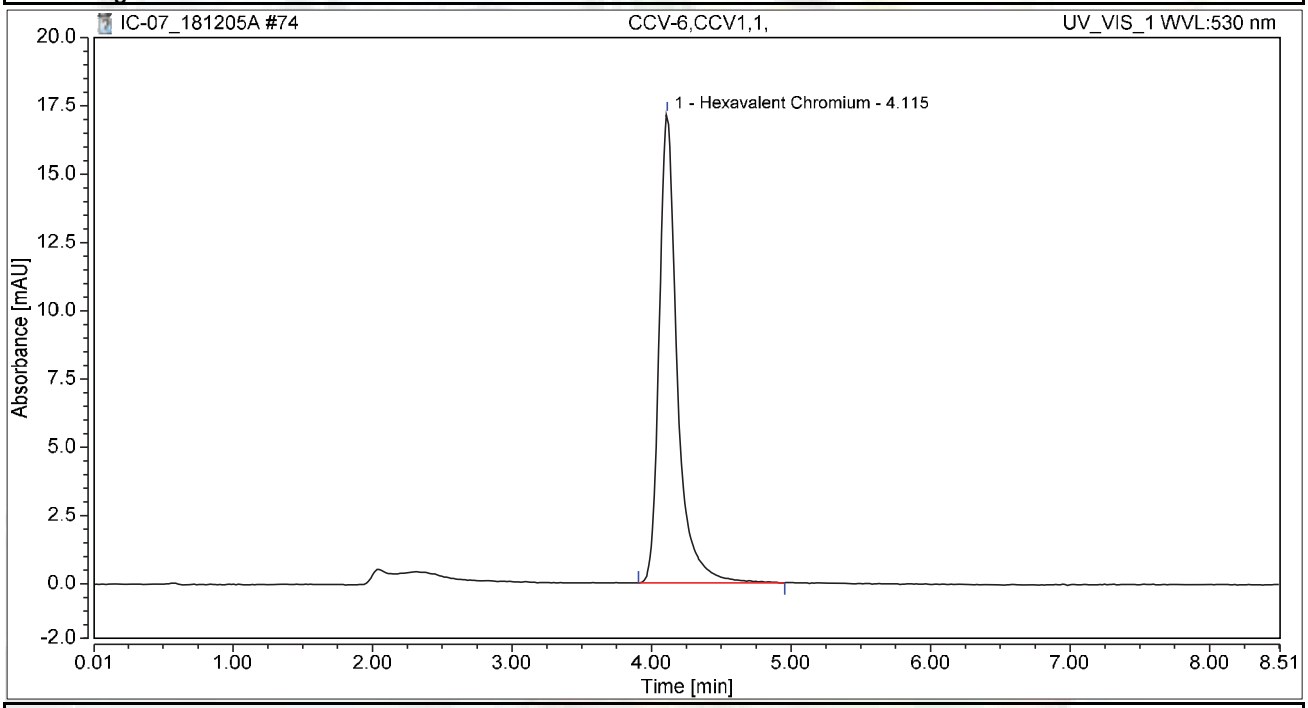
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.106	0.643	4.234	100.00	100.00	2.5428
Total:			**0.643**	**4.234**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCV-6,CCV1,1,**	*Run Time (min):*	**8.50**
Vial Number:	**7**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:36**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

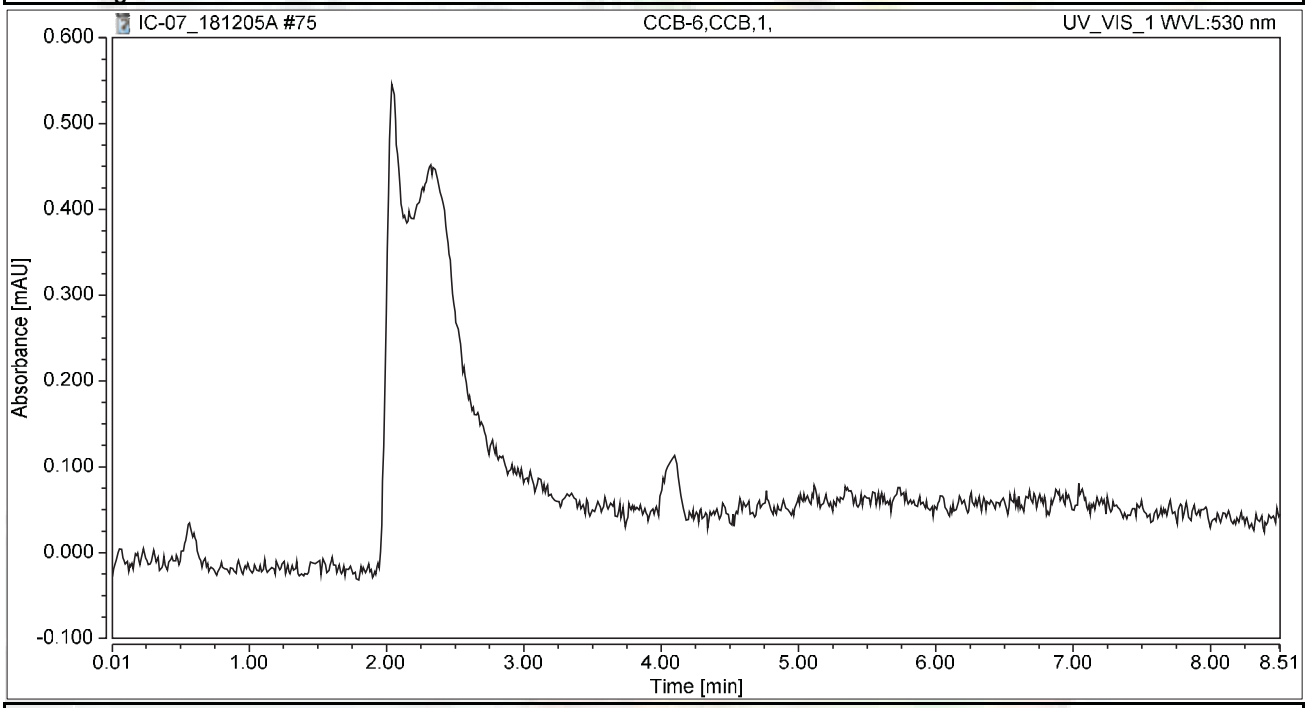
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
1	Hexavalent Chromium	4.115	2.571	17.170	100.00	100.00	10.1666
Total:			**2.571**	**17.170**	**100.00**	**100.00**	

Chromatogram and Results

Injection Details

Injection Name:	**CCB-6,CCB,1,**	*Run Time (min):*	**8.50**
Vial Number:	**8**	*Injection Volume:*	**1000.00**
Injection Type:	**Unknown**	*Channel:*	**UV_VIS_1**
Calibration Level:		*Wavelength:*	**530.0**
Instrument Method:	**Hex Chrom 4 mm**	*Bandwidth:*	**n.a.**
Processing Method:	**181119_IC-07_Cr6_218_6_HIGH**	*Dilution Factor:*	**1.0000**
Injection Date/Time:	**05/Dec/18 19:45**	*Sample Weight:*	**1.0000**

Chromatogram



Integration Results

No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount ug/L
n.a.	Hexavalent Chromium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:			**0.000**	**0.000**	**0.00**	**0.00**	

EPA 300.0

IC CH2M
REV.7.0
071116

IC Technical Batch Review Checklist (CH2MHILL)

ASSET LABORATORIES - LAS VEGAS

QC Batch Number: R130352
ASSET #: N033232 / N033236

Instrument ID: IC-08
Analyst: RBA
Date Analyzed: 12/5/2018

Method:

[X] EPA 300.0
[ ] EPA 7199

[ ] EPA 218.6/EPA 218.7
[ ] EPA 218.6/EPA 218.7 LL
[ ] Others 9056

Initial Calibration and Initial Calibration Verification	Ist Level Review			2nd Level Review		
	Y	N	N/A	Y	N	N/A
1. ICAL before initial sample analysis and is not more than 4 weeks old.	X					
2. Does correlation coefficient,r, meet criteria ?(r = 0.995, r =0.999 (Cr6+))	X					
3. ICV within ± 10% of expected value.	X					
Continuing Calibration						
4. CCV after every 10 injections and at the end of analysis sequence.	X					
5. CCV within ± 10% of expected value. (± 5% for EPA 218.6)	X					
6. Calibration blanks run after ICV and CCV?	X					
7. Is the buffer less than MDL? If not, discontinue analysis. (Cr6+ only)			X			
8. Do all calibration blanks (ICB and CCBs) meet criteria? (<1/2PQL for 300, <0.02 for Cr6+)	X					
9. Is low level check at PQL within ± 20% for 218.6/218.7/7199? ± 30% for 218.6/218.7LL?			X			
Sample Information						
10. All samples are within linear range.	X					
11. All samples pH within 9.3-9.7 when analyzed?	X					
12. Duplicate sample injections for every sample. (7199 only)			X			
13. For Topock, matrix spike protocol performed on all samples? (Cr6+ only)			X			
14. For Hinkley DOM samples, matrix spike protocol performed on all samples ? (Cr6+ only)			X			
15. For samples < 4 ppb, does the Cr result differs with Cr6+ by no more than 0.7 ppb?			X			
16. For samples > 4 ppb, does the Cr result differs with Cr6+ by no more than 20%?			X			
17. For samples that failed Cr vs Cr6+ criteria, is matrix spike protocol performed ?			X			
18. For dilution and MS spike protocol, spike recovery within 90-110%? (Cr6+ only)			X			
19. EPA 3060A digestion performed on solid samples (7199 only)			X			
20. Are all peaks within RT window, ± 0.2 min?	X					
21. Are all samples analyzed within hold time?	X					
22. For Hinkley projects (DOM & ATU only), are samples with result ≤ 0.2 ug/L analyzed by low level method? (Cr6+ only)			X			
QC Items						
23. Method blank values meets criteria. (<1/2 PQL for 300, <0.02 for Cr6+)	X					
24. LCS compounds are within control limits.	X					
25. MS/MSD, RPD's are within control limits.	X					
26. Soluble and Insoluble matrix spike within control limits (7199 solids only)			X			
Raw Data and Miscellaneous Information						
27. Runlog complete and included in package.	X					
28. Extraction log complete and included in package (if applicable)			X			
29. All manual integrations initialed, date and reasons included.	X					
30. Before and after manual integration chromatogram included in the package	X					
31. All samples and QC raw data present in package.	X					
Preliminary Report						
32. Does the raw data match the preliminary report?	X					
33. Are analytical results correct?(Ex. dilutions, calculations.etc.)	X					
34 Is the QC summary report present and complete?	X					

Comments:

SECOND LEVEL REVIEW:

	Y	N	N/A
1. All assigned sample(s) analyzed			
2. Matrix / units correct			
3. Is QC present and complete?			
4. Are analytical results correct? (dilutions,calculations)			
5. Is first level review correct and complete?			

1st Level Reviewer rba Date: 12/9/2018

2nd Level Reviewer Nancy 12/17/2018 Date: —

SAMPLE CALCULATION

Sample Calculation

METHOD: EPA 300
TEST NAME: INORGANIC ANIONS BY IC
MATRIX: GROUNDWATER

FORMULA:

Calculate the Sulfate concentration, in mg/L, in the orignal sample as follows:

Sulfate, mg/L = A * DF

where:

A = mg/L, IC calculated concentration
DF = dilution factor

For **N033236-002B** concentration in mg/L is calculated as follows:

Sulfate, mg/L = 10.0918 * 50

= 504.59

Reporting result in two significant values,

Sulfate, mg/L = 500

ANALYSIS RUN LOG

Sequence: IC-08_181121A
Operator: IC-05
Printed: 11/26/2018 10:26:28 AM

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 27

Created: 11/21/2018 11:23:05 AM by IC-05
Last Update: 11/26/2018 10:26:01 AM by IC-05

No.	Name	Type	Inj. Vol.	Program	Method	Status
1	BLANK,BLANK	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
2	Std - 0	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
3	Std - 1	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
4	Std - 2	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
5	Std - 3	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
6	Std - 4	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
7	Std - 5	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
8	ICV,ICV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
9	ICB,ICB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
10	ICB,ICB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
11	LCS-H2O,LCS,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
12	MB-H2O,MBLK,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
13	N033056-001A,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
14	N033056-001B,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
15	N033056-002A,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
16	N033056-002B,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
17	N033056-003A,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
18	N033056-003B,SAMP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
19	BLANK,BLANK	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
20	CCV-1,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
21	CCB-1,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
22	N033056-001ADUP,DUP,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
23	N033056-002AMS,MS,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
24	N033056-002AMSD,MSD,5	Unknown	1000.0	Anions Default2	EPA 300_0_181121	Finished
25	BLANK,BLANK	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
26	CCV-2,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
27	CCB-2,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished

rba 11/26/2018

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Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 27
Created: 11/21/2018 11:23:05 AM by IC-05
Last Update: 11/26/2018 10:26:01 AM by IC-05

No.	Name	Inj. Date/Time	Comment
1	BLANK,BLANK	11/21/2018 11:24:47 AM	BLANK
2	Std - 0	11/21/2018 11:40:36 AM	BLANK
3	Std - 1	11/21/2018 11:56:23 AM	STD-LOW
4	Std - 2	11/21/2018 12:12:11 PM	STD
5	Std - 3	11/21/2018 12:27:59 PM	STD
6	Std - 4	11/21/2018 12:43:47 PM	STD
7	Std - 5	11/21/2018 12:59:34 PM	STD-HIGH
8	ICV,ICV,1	11/21/2018 1:21:04 PM	ICV
9	ICB,ICB,1	11/21/2018 1:36:52 PM	ICB
10	ICB,ICB,1	11/21/2018 1:52:40 PM	ICB
11	LCS-H2O,LCS,1	11/21/2018 2:08:28 PM	LCS
12	MB-H2O,MBLK,1	11/21/2018 2:38:36 PM	METHOD BLANK
13	N033056-001A,SAMP,5	11/21/2018 2:54:24 PM	SAMP,2>10mL
14	N033056-001B,SAMP,5	11/21/2018 3:16:42 PM	SAMP,2>10mL
15	N033056-002A,SAMP,5	11/21/2018 3:39:00 PM	MSD,10mL
16	N033056-002B,SAMP,5	11/21/2018 4:01:18 PM	SAMP,2>10mL
17	N033056-003A,SAMP,5	11/21/2018 4:23:36 PM	SAMP,2>10mL
18	N033056-003B,SAMP,5	11/21/2018 4:45:53 PM	SAMP,2>10mL
19	BLANK,BLANK	11/21/2018 5:08:11 PM	SAMP,2>10mL
20	CCV-1,CCV,1	11/21/2018 5:23:59 PM	CCV
21	CCB-1,CCB,1	11/21/2018 5:39:47 PM	CCB
22	N033056-001ADUP,DUP,5	11/21/2018 5:55:35 PM	DUP,2>10mL
23	N033056-002AMS,MS,5	11/21/2018 6:17:52 PM	MS,2>10mL
24	N033056-002AMSD,MSD,5	11/21/2018 6:40:10 PM	MSD,2>10mL
25	BLANK,BLANK	11/21/2018 7:02:28 PM	BLANK
26	CCV-2,CCV,1	11/21/2018 7:18:16 PM	CCV
27	CCB-2,CCB,1	11/21/2018 7:34:04 PM	CCB

rba 11/26/2018

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Sequence: IC-08_181205A
Operator: IC-05
Printed: 12/6/2018 6:10:53 AM

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92

Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Type	Inj. Vol.	Program	Method	Status
1	BLANK,BLANK	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
2	Std - 0	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
3	Std - 1	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
4	Std - 2	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
5	Std - 3	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
6	Std - 4	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
7	Std - 5	Standard	1000.0	Anions Default	EPA 300_0_181121	Finished
8	BLANK,BLANK	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
9	CCV-1,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
10	CCB-1,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
11	MB-H2O,MBLK,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
12	LCS-H2O,LCS,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
13	N033222-001D,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
14	N033222-002D,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
15	N033222-001DMS,MS,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
16	N033222-001DMSD,MSD,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
17	N033222-002DDUP,DUP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
18	N033238-009B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
19	N033238-001B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
20	N033238-002B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
21	CCV-2,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
22	CCB-2,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
23	N033238-003B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
24	N033238-004B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
25	N033238-005B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
26	N033238-006B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
27	N033238-007B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
28	N033238-008B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
29	N033238-010B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
30	N033238-011B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
31	N033238-012B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
32	N033238-013B,SAMP,2	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
33	CCV-3,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
34	CCB-3,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
35	N033238-015B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
36	N033236-002B,SAMP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
37	N033238-003BDUP,DUP,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
38	N033238-005BMS,MS,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
39	N033238-005BMSD,MSD,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
40	N033238-008BMS,MS,5	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
41	N033238-002B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished

rba 12/9/2018

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Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92
Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Inj. Date/Time	Comment
1	BLANK,BLANK	11/21/2018 11:24:47 AM	BLANK
2	Std - 0	11/21/2018 11:40:36 AM	BLANK
3	Std - 1	11/21/2018 11:56:23 AM	STD-LOW
4	Std - 2	11/21/2018 12:12:11 PM	STD
5	Std - 3	11/21/2018 12:27:59 PM	STD
6	Std - 4	11/21/2018 12:43:47 PM	STD
7	Std - 5	11/21/2018 12:59:34 PM	STD-HIGH
8	BLANK,BLANK	12/5/2018 7:38:50 AM	BLANK
9	CCV-1,CCV,1	12/5/2018 7:54:38 AM	CCV
10	CCB-1,CCB,1	12/5/2018 8:10:26 AM	CCB
11	MB-H2O,MBLK,1	12/5/2018 8:26:14 AM	METHOD BLANK
12	LCS-H2O,LCS,1	12/5/2018 8:42:02 AM	LCS
13	N033222-001D,SAMP,5	12/5/2018 8:57:50 AM	SAMP,2>10mL
14	N033222-002D,SAMP,5	12/5/2018 9:13:38 AM	SAMP,2>10mL
15	N033222-001DMS,MS,5	12/5/2018 9:32:34 AM	MS,2>10mL
16	N033222-001DMSD,MSD,5	12/5/2018 9:48:22 AM	MSD,2>10mL
17	N033222-002DDUP,DUP,5	12/5/2018 10:04:10 AM	DUP,2>10mL
18	N033238-009B,SAMP,2	12/5/2018 10:25:49 AM	SAMP,5>10mL
19	N033238-001B,SAMP,2	12/5/2018 10:41:38 AM	SAMP,5>10mL
20	N033238-002B,SAMP,2	12/5/2018 10:57:26 AM	SAMP,5>10mL
21	CCV-2,CCV,1	12/5/2018 11:13:14 AM	CCV
22	CCB-2,CCB,1	12/5/2018 11:29:02 AM	CCB
23	N033238-003B,SAMP,5	12/5/2018 11:44:49 AM	SAMP,2>10mL
24	N033238-004B,SAMP,5	12/5/2018 12:00:37 PM	SAMP,2>10mL
25	N033238-005B,SAMP,5	12/5/2018 12:16:25 PM	SAMP,2>10mL
26	N033238-006B,SAMP,5	12/5/2018 12:32:13 PM	SAMP,2>10mL
27	N033238-007B,SAMP,5	12/5/2018 12:48:01 PM	SAMP,2>10mL
28	N033238-008B,SAMP,5	12/5/2018 1:03:48 PM	SAMP,2>10mL
29	N033238-010B,SAMP,2	12/5/2018 1:19:37 PM	SAMP,5>10mL
30	N033238-011B,SAMP,2	12/5/2018 1:35:25 PM	SAMP,2>10mL
31	N033238-012B,SAMP,2	12/5/2018 1:51:13 PM	SAMP,5>10mL
32	N033238-013B,SAMP,2	12/5/2018 2:07:01 PM	SAMP,5>10mL
33	CCV-3,CCV,1	12/5/2018 2:22:49 PM	CCV
34	CCB-3,CCB,1	12/5/2018 2:38:36 PM	CCB
35	N033238-015B,SAMP,5	12/5/2018 2:54:24 PM	SAMP,2>10mL
36	N033236-002B,SAMP,5	12/5/2018 3:10:12 PM	SAMP,2>10mL
37	N033238-003BDUP,DUP,5	12/5/2018 3:26:00 PM	DUP,2>10mL
38	N033238-005BMS,MS,5	12/5/2018 3:41:48 PM	MS,2>10mL
39	N033238-005BMSD,MSD,5	12/5/2018 3:57:36 PM	MSD,2>10mL
40	N033238-008BMS,MS,5	12/5/2018 4:13:24 PM	MS,2>10mL
41	N033238-002B,SAMP,500	12/5/2018 4:29:12 PM	SAMP,0.02>10mL

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92
Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Type	Inj. Vol.	Program	Method	Status
42	N033238-002BMS,MS,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
43	N033238-002BMSD,MSD,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
44	N033238-008B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
45	CCV-4,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
46	CCB-4,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
47	N033238-008BMS,MS,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
48	N033238-008BMSD,MSD,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
49	N033238-015B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
50	N033238-015BMS,MS,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
51	N033238-015B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
52	N033238-015BMS,MS,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
53	N033238-005B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
54	N033238-005BDUP,DUP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
55	N033238-005B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
56	N033238-005BDUP,DUP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
57	CCV-5,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
58	CCB-5,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
59	N033238-013B,SAMP,200	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
60	N033238-013B,SAMP,10	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
61	N033238-001B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
62	N033238-001B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
63	N033238-003B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
64	N033238-003B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
65	N033238-004B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
66	N033238-004B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
67	N033238-006B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
68	N033238-006B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
69	CCV-6,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
70	CCB-6,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
71	N033238-007B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
72	N033238-007B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
73	N033238-009B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
74	N033238-009B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
75	N033238-010B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
76	N033238-010B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
77	N033238-011B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
78	N033238-011B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
79	N033238-012B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
80	N033238-012B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
81	CCV-7,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
82	CCB-7,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92
Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Inj. Date/Time	Comment
42	N033238-002BMS,MS,500	12/5/2018 4:44:59 PM	MS,0.02>10mL
43	N033238-002BMSD,MSD,500	12/5/2018 5:00:47 PM	MSD,0.02>10mL
44	N033238-008B,SAMP,50	12/5/2018 5:16:35 PM	SAMP,0.2>10mL
45	CCV-4,CCV,1	12/5/2018 5:32:23 PM	CCV
46	CCB-4,CCB,1	12/5/2018 5:48:11 PM	CCB
47	N033238-008BMS,MS,50	12/5/2018 6:03:59 PM	MS,0.2>10mL
48	N033238-008BMSD,MSD,50	12/5/2018 6:19:46 PM	MSD,0.2>10mL
49	N033238-015B,SAMP,500	12/5/2018 6:35:34 PM	SAMP,0.02>10mL
50	N033238-015BMS,MS,500	12/5/2018 6:51:22 PM	MS,0.02>10mL
51	N033238-015B,SAMP,50	12/5/2018 7:07:10 PM	SAMP,0.2>10mL
52	N033238-015BMS,MS,50	12/5/2018 7:22:57 PM	MS,0.2>10mL
53	N033238-005B,SAMP,500	12/5/2018 7:38:45 PM	SAMP,0.02>10mL
54	N033238-005BDUP,DUP,500	12/5/2018 7:54:33 PM	DUP,0.02>10mL
55	N033238-005B,SAMP,50	12/5/2018 8:10:21 PM	SAMP,0.2>10mL
56	N033238-005BDUP,DUP,50	12/5/2018 8:26:09 PM	DUP,0.2>10mL
57	CCV-5,CCV,1	12/5/2018 8:41:58 PM	CCV
58	CCB-5,CCB,1	12/5/2018 8:57:46 PM	CCB
59	N033238-013B,SAMP,200	12/5/2018 9:13:33 PM	SAMP,0.05>>10mL
60	N033238-013B,SAMP,10	12/5/2018 9:29:21 PM	SAMP,1>10mL
61	N033238-001B,SAMP,500	12/5/2018 9:45:09 PM	SAMP,0.02>10mL
62	N033238-001B,SAMP,50	12/5/2018 10:00:57 PM	SAMP,0.2>10mL
63	N033238-003B,SAMP,500	12/5/2018 10:16:45 PM	SAMP,0.02>10mL
64	N033238-003B,SAMP,50	12/5/2018 10:32:32 PM	SAMP,0.2>10mL
65	N033238-004B,SAMP,500	12/5/2018 10:48:21 PM	SAMP,0.02>10mL
66	N033238-004B,SAMP,50	12/5/2018 11:04:09 PM	SAMP,0.2>10mL
67	N033238-006B,SAMP,500	12/5/2018 11:19:57 PM	SAMP,0.02>10mL
68	N033238-006B,SAMP,50	12/5/2018 11:35:44 PM	SAMP,0.2>10mL
69	CCV-6,CCV,1	12/5/2018 11:51:32 PM	CCV
70	CCB-6,CCB,1	12/6/2018 12:07:20 AM	CCB
71	N033238-007B,SAMP,500	12/6/2018 12:23:08 AM	SAMP,0.02>10mL
72	N033238-007B,SAMP,50	12/6/2018 12:38:56 AM	SAMP,0.2>10mL
73	N033238-009B,SAMP,500	12/6/2018 12:54:44 AM	SAMP,0.02>10mL
74	N033238-009B,SAMP,50	12/6/2018 1:10:32 AM	SAMP,0.2>10mL
75	N033238-010B,SAMP,500	12/6/2018 1:26:20 AM	SAMP,0.02>10mL
76	N033238-010B,SAMP,50	12/6/2018 1:42:08 AM	SAMP,0.2>10mL
77	N033238-011B,SAMP,500	12/6/2018 1:57:56 AM	SAMP,0.02>10mL
78	N033238-011B,SAMP,50	12/6/2018 2:13:43 AM	SAMP,0.2>10mL
79	N033238-012B,SAMP,500	12/6/2018 2:29:31 AM	SAMP,0.02>10mL
80	N033238-012B,SAMP,50	12/6/2018 2:45:19 AM	SAMP,0.2>10mL
81	CCV-7,CCV,1	12/6/2018 3:01:07 AM	CCV
82	CCB-7,CCB,1	12/6/2018 3:16:55 AM	CCB

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92
Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Type	Inj. Vol.	Program	Method	Status
83	N033238-002B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
84	N033238-008B,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
85	N033236-002B,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
86	N033237-001C,SAMP,200	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
87	N033237-001C,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
88	N033237-002C,SAMP,500	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
89	N033237-002C,SAMP,50	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
90	N033232-002C,SAMP,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
91	CCV-8,CCV,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished
92	CCB-8,CCB,1	Unknown	1000.0	Anions Default	EPA 300_0_181121	Finished

rba 12/9/2018

Title:
Datasource: D1NZHKQ1_local
Location: IC-08_ANIONS\2_Data\2018_Anions
Timebase: IC-08_ANIONS
#Samples: 92
Created: 12/5/2018 7:38:23 AM by IC-05
Last Update: 12/5/2018 5:38:13 PM by IC-05

No.	Name	Inj. Date/Time	Comment
83	N033238-002B,SAMP,50	12/6/2018 3:32:43 AM	SAMP,0.2>10mL
84	N033238-008B,SAMP,500	12/6/2018 3:48:31 AM	SAMP,0.02>10mL
85	N033236-002B,SAMP,50	12/6/2018 4:04:19 AM	SAMP,0.2>10mL
86	N033237-001C,SAMP,200	12/6/2018 4:20:07 AM	SAMP,0.05>>10mL
87	N033237-001C,SAMP,50	12/6/2018 4:35:54 AM	SAMP,0.2>10mL
88	N033237-002C,SAMP,500	12/6/2018 4:51:42 AM	SAMP,0.02>10mL
89	N033237-002C,SAMP,50	12/6/2018 5:07:30 AM	SAMP,0.2>10mL
90	N033232-002C,SAMP,1	12/6/2018 5:23:18 AM	SAMP,10mL
91	CCV-8,CCV,1	12/6/2018 5:39:06 AM	CCV
92	CCB-8,CCB,1	12/6/2018 5:54:54 AM	CCB

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INITIAL CALIBRATION DATA SUMMARY

(EPA 300) - INITIAL CALIBRATION

Instrument ID: IC-08
Date Calibrated: 11/21/2018

Initial Calibration:

Fluoride	STD0	STD1	STD2	STD3	STD4	STD5	
COMPOUND, in ug/L	0	0.05	0.25	0.5	1.25	2.5	R^2
Area,mAU*min	0.0000	0.0092	0.0499	0.1019	0.2645	0.5380	1.000

	Stock
Standard Concentration:	1000000 PPB
Standard ID:	ISST-180914A

Calibration Acceptance Criteria: > 0.995 Correlation

* Please note that the instrument printout for Area were represented in three decimal places. The exact values are represented in the ICAL summary for calculation purposes.

(EPA 300) - INITIAL CALIBRATION

Instrument ID: IC-08
Date Calibrated: 11/21/2018

Initial Calibration:

Sulfate	STD0	STD1	STD2	STD3	STD4	STD5	
COMPOUND, in ug/L	0	0.5	2	4	10	20	R^2
Area,mAU*min	0.0000	0.0515	0.2219	0.4490	1.1731	2.4404	1.000

	Stock
Standard Concentration:	1000000 PPB
Standard ID:	ISST-180914G

Calibration Acceptance Criteria: > 0.995 Correlation

* Please note that the instrument printout for Area were represented in three decimal places. The exact values are represented in the ICAL summary for calculation purposes.

INITIAL CALIBRATION AND CONTINUING CALIBRATION VERIFICATION SUMMARY

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **ICV** SampType: **ICV** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **ICV** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **11/21/2018** SeqNo: **3220628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.244	0.10	1.250	0	99.5	90	110				

Sample ID **CCV-1** SampType: **CCV** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **CCV** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220630**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.235	0.10	1.250	0	98.8	90	110				

Sample ID **CCV-2** SampType: **CCV** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **CCV** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220637**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.249	0.10	1.250	0	99.9	90	110				

Sample ID **CCV-3** SampType: **CCV** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **CCV** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220649**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.240	0.10	1.250	0	99.2	90	110				

Sample ID **CCV-4** SampType: **CCV** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **130352**
Client ID: **CCV** Batch ID: **R130352** TestNo: **EPA 300.0** Analysis Date: **12/5/2018** SeqNo: **3220657**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.244	0.10	1.250	0	99.5	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	CCV-5	SampType:	CCV	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220659

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.240	0.10	1.250	0	99.2	90	110				

Sample ID	CCV-6	SampType:	CCV	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220661

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.238	0.10	1.250	0	99.0	90	110				

Sample ID	CCV-7	SampType:	CCV	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220663

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.243	0.10	1.250	0	99.4	90	110				

Sample ID	CCV-8	SampType:	CCV	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220665

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.221	0.10	1.250	0	97.7	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
ICV	**ICV**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **ICV**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **11/21/2018**	SeqNo: **3220708**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.018	0.50	4.000	0	100	90	110				

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCV-1	**CCV**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCV**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220710**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.997	0.50	4.000	0	99.9	90	110				

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCV-2	**CCV**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCV**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220714**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.982	0.50	4.000	0	99.5	90	110				

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCV-3	**CCV**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCV**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220716**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.026	0.50	4.000	0	101	90	110				

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCV-4	**CCV**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCV**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220719**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.002	0.50	4.000	0	100	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
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	CCV-5	SampType:	CCV	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220727

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.018	0.50	4.000	0	100	90	110				

Sample ID	CCV-6	SampType:	CCV	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220734

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.047	0.50	4.000	0	101	90	110				

Sample ID	CCV-7	SampType:	CCV	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220741

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.997	0.50	4.000	0	99.9	90	110				

Sample ID	CCV-8	SampType:	CCV	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCV	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220748

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.949	0.50	4.000	0	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		

SUMMARY OF INSTRUMENT BLANKS

CLIENT: CH2M HILL
Work Order: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
ICB	**ICB**	**300_W_FPG**	**mg/L**		**130352**
Client ID: **ICB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **11/21/2018**	SeqNo: **3220629**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-1	**CCB**	**300_W_FPG**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220631**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-2	**CCB**	**300_W_FPG**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220638**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-3	**CCB**	**300_W_FPG**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220650**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-4	**CCB**	**300_W_FPG**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220658**

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

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	CCB-5	SampType:	CCB	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220660

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

Sample ID	CCB-6	SampType:	CCB	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220662

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

Sample ID	CCB-7	SampType:	CCB	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220664

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

Sample ID	CCB-8	SampType:	CCB	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220666

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

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
ICB	**ICB**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **ICB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **11/21/2018**	SeqNo: **3220709**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-1	**CCB**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220711**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-2	**CCB**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220715**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-3	**CCB**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220717**

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

Sample ID	SampType	TestCode	Units	Prep Date	RunNo
CCB-4	**CCB**	**300_W_SO4P**	**mg/L**		**130352**
Client ID: **CCB**	Batch ID: **R130352**	TestNo: **EPA 300.0**		Analysis Date: **12/5/2018**	SeqNo: **3220720**

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

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: N033236
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	CCB-5	SampType:	CCB	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/5/2018	SeqNo:	3220728

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

Sample ID	CCB-6	SampType:	CCB	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220735

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

Sample ID	CCB-7	SampType:	CCB	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220742

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

Sample ID	CCB-8	SampType:	CCB	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	130352
Client ID:	CCB	Batch ID:	R130352	TestNo:	EPA 300.0			Analysis Date:	12/6/2018	SeqNo:	3220749

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

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		

RETENTION TIME SUMMARY

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-08

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name		Retention Time		Evaluation
ICV	Fluoride	3.197		
CCV-1	Fluoride	3.202		
CCV-2	Fluoride	3.200		
CCV-3	Fluoride	3.200		
CCV-4	Fluoride	3.197		
CCV-5	Fluoride	3.194		
CCV-6	Fluoride	3.194		
CCV-7	Fluoride	3.193		
CCV-8	Fluoride	3.190		
	Average	3.196		
	Applied RT Window	2.996 -	3.396	
MB-R130352_F	Fluoride	N.A.		N.A.
LCS-R130352_F	Fluoride	3.200		PASS
N033236-002B	Fluoride	3.194		PASS
N033238-003BDUP	Fluoride	3.193		PASS
N033238-005BMS	Fluoride	3.194		PASS
N033238-005BMSD	Fluoride	3.190		PASS
N033238-008BMS	Fluoride	3.190		PASS

RETENTION TIME (RT) SUMMARY

Instrument ID: IC-08

Analytical Sequence

Date Analyzed: 12/5/2018

Sample Name		Retention Time	Evaluation
ICV	Sulfate	10.974	
CCV-1	Sulfate	10.922	
CCV-2	Sulfate	10.920	
CCV-3	Sulfate	10.910	
CCV-4	Sulfate	10.900	
CCV-5	Sulfate	10.870	
CCV-6	Sulfate	10.864	
CCV-7	Sulfate	10.850	
CCV-8	Sulfate	10.830	
	Average	10.883	
	Applied RT Window	10.683 - 11.083	
MB-R130352_SO4	Sulfate	N.A.	N.A.
LCS-R130352_SO4	Sulfate	10.910	PASS
N033238-008BMS	Sulfate	10.880	PASS
N033238-008BMSD	Sulfate	10.877	PASS
N033238-015BMS	Sulfate	10.873	PASS
N033238-005BDUP	Sulfate	10.867	PASS
N033236-002B	Sulfate	10.837	PASS

MDL STUDY

METHOD DETECTION LIMIT 2017

Method Name: **INORGANIC IONS by Ion Chromatography**
Method Number: EPA 300.0
Analysis Date(s): 5/23/2017 ; 5/24/2017; 5/25/2017
Analyst/Technician: Ria Abes

Matrix: **WATER**
Unit: mg/L

Instrument Name: **IC-08**

Acceptance Criteria: MDL < spike < 10XMDL

Datafile	170523A D36	170523A D37	170523A D38	170524A D17	170524A D18	170525A D45	170525A D46					
Analyte	**#1**	**#2**	**#3**	**#4**	**#5**	**#6**	**#7**	**Spike Conc., mg/L**	**SD**	**MDL**	**LOD**	**PQL**
Fluoride	0.020	0.022	0.021	0.020	0.023	0.026	0.024	0.020	0.0021	**0.0065**	0.020	0.10
Chloride	0.133	0.136	0.136	0.133	0.141	0.133	0.136	0.025	0.0029	**0.0091**	0.020	0.50
Nitrite	0.030	0.028	0.027	0.028	0.028	0.027	0.027	0.020	0.0010	**0.0030**	0.010	0.05
Bromide	0.037	0.042	0.043	0.038	0.040	0.032	0.025	0.040	0.0062	**0.0196**	0.040	0.20
Nitrate	0.035	0.034	0.033	0.033	0.033	0.031	0.030	0.020	0.0016	**0.0050**	0.010	0.05
Phosphate	0.047	0.051	0.049	0.046	0.052	0.047	0.059	0.040	0.0043	**0.0135**	0.030	0.10
Sulfate	0.213	0.199	0.208	0.216	0.199	0.201	0.198	0.050	0.0073	**0.0229**	0.050	0.50

MDL/LOD & PQL Verification 2018 (1st Quarter)

Method Name: **Inorganic Ions by Ion Chromatography (Low Level)**
Method Number: EPA Method 300.0
Analysis Date(s): 3/29-30/2018
Analyst: Ria B. Abes

Matrix: **WATER**
Unit: mg/L

Instrument Name: **IC-08**

Compound	MDL	LOD Spike Conc., mg/L	LOD Actual Conc., mg/L	PQL Spike Conc., mg/L	PQL Actual Conc., mg/L	%Recovery
Fluoride	**0.0065**	0.020	0.0252	0.10	0.087	**87**
Chloride	**0.0091**	0.020	0.1193	0.50	0.5757	**115**
Nitrite	**0.0030**	0.010	0.0237	0.05	0.0638	**128**
Bromide	**0.0196**	0.040	0.0405	0.20	0.1993	**100**
Nitrate	**0.0050**	0.010	0.0191	0.05	0.0561	**112**
Phosphate	**0.0135**	0.030	0.0415	0.10	0.1216	**122**
Sulfate	**0.0229**	0.050	0.3682	0.50	0.6549	**131**

Month Sept 18

DownTime Log

Date	Pump Stop Time	Pump Start Time	Well Effected	Detailed Reason for Downtime	Initials
~~9-6-18~~	~~WS#2 0634 LP~~	~~WS#2 LP 6:37~~	PE-1 TW-3D IW-2 TW-2D IW-3	~~BLAINE TECH SAMPLING~~	~~LP~~
9-6-18	0649	WS#2 0633	PE-1 TW-3D IW-2 TW-2D IW-3	BLAINE TECH SAMPLING	LP
9-6-18	1906 WS #1	1907 WS#1	PE-1 TW-3D IW-2 TW-2D IW-3	POWER BLIP	JP
9/15/18	#1 8:38	#1 9:55	PE-1 TW-3D IW-2 TW-2D IW-3	CHANGE M/P MODULES 10 EAST	CL
9/22/18	#1 5:38	7:48	PE-1 TW-3D IW-2 TW-2D IW-3	ACID MT.	CL
9-23-18	HMI #2 15:10	HMI 2 16:16	PE-1 TW-3D IW-2 TW-2D IW-3	Change Microfilter Modules	PAP
9/29/18	HMI #1 5:22	620	PE-1 TW-3D IW-2 TW-2D IW-3	CHANGE MICROFILTER MODS.	CL
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		
			PE-1 TW-3D IW-2 TW-2D IW-3		

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-700B-577	8-10-18	23:50	8-10-18	23:58	HQ440D	8-10-18	22:06	-53.49	Brian Terhune	7.76
Notes:											
2	SC-100B-578	9-4-18	10:00	9-4-18	10:08	HQ440D	9-4-18	00:15	-53.88	Ron Phelps	7.56
Notes:											
3	SC-700B-578	9-4-18	10:05	9-4-18	10:10	HQ440D	9-4-18	00:15	-53.88	Ron Phelps	7.36
Notes:											
4	SC-100B-579	10-2-18	0900	10-2-18	0908	HQ440D	10-2-18	0000	-52.66	Ron Phelps	7.51
Notes:											
5	SC-700B-579	10-2-18	0902	10-2-18	0910	HQ440D	10-2-18	0000	-52.66	Ron Phelps	7.19
Notes:											
6											
Notes:											
7											
Notes:											

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

Purge Water Accumulation Log

Date	Time	Gallons	Operator	Notes
5/2/18	13:30	100	CHRIS	BLAINE TECH.
5-2-18	17:00	350	C Stone	Blaine Tech
5-2-18	17:10	100	C Stone	Blaine Tech
5/3/18	1200	100	CHRIS	BLAINE TECH
5/3/18	13:30	200	CHRIS	BLAINE TECH
5-3-18	16:30	300	C Stone	Blaine Tech
5/4/18	1000	30	CHRIS	BLAINE TECH
06-04-18	1600	140	G.GLORIA	BLAINTECH
06-05-18	1130	220	G.GLORIA	BLAINE TECH
9-25-18	15:30	200	Ryan P	Blain Tech
9-26-18	16:00	150	Ryan P	BlainTech
9-27-18	16:30	350	RyanP	BlainTech

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-700B-577	8-10-18	23:50	8-10-18	23:58	HQ440D	8-10-18	22:06	-53.49	Brian Terhune	7.76
Notes:											
2	~~SC-100B~~-778	9-4-18	10:00	9-4-18	10:08	HQ440D	9-4-18	00:15	-53.88	Ryan Phelps	7.56
Notes:											
3	SC-700B-778	9-4-18	10:05	9-4-18	10:10	HQ440D	9-4-18	00:15	-53.88	Ryan Phelps	7.36
Notes:											
4	SC-100B-579	10-2-18	0900	10-2-18	0908	HQ440D	10-2-18	0000	-52.66	Ryan Phelps	7.51
Notes:											
5	SC-700B-579	10-2-18	0902	10-2-18	0910	HQ440D	10-2-18	0000	-52.66	Ryan Phelps	7.19
Notes:											
6	SC-100B-580	11-6-18	17:00	11-6-18	17:12	HQ440D	11-6-18	0015	-53.89	Ryan Phelps	7.89
Notes:											
7	SC-700C-580	11-6-18	17:03	11-6-18	17:11	HQ440D	11-6-18	0015	-53.89	Ryan Phelps	7.63
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-700B-	12-4-18	14:45	12-4-18	14:59	HQ440D	12-4-18	0015	-52.98	Ryan P	7.01
Notes:											
2	SC-100B	12-4-18	14:45	12-4-18	17:00	HQ440D	12-4-18	0015	-52.98	Ryan P	7.22
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

January 14, 2019

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

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

Workorder No.: N033737

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on January 14, 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

Quennie Manimtim
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and ASSET Laboratories - Las Vegas.

ASSET Laboratories **Date:** *14-Jan-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N033737

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.

Sample was analyzed past holding time. pH testing is specified to be performed in the field within 15 minutes of sampling.

This is an addendum for N032326.

ASSET Laboratories

Date: *14-Jan-19*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N033737
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N033737-001A	SC-701-WDR-579	Water	10/2/2018 9:04:00 AM	1/14/2019	1/14/2019

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *14-Jan-19*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-579
Lab Order:	N033737	**Collection Date:**	10/2/2018 9:04:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N033737-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PH							
			SM4500-H+B				
RunID: **NV00922-WC_190114A**	QC Batch: **R131124**			PrepDate			Analyst: **LR**
pH	7.9	0.10	0.10	H	pH Units	1	1/14/2019 01:20 PM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	1	1/14/2019 01:20 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		

ASSET Laboratories

Date: *14-Jan-19*

CLIENT: CH2M HILL
Work Order: N033737
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 150.1_4500H+B_W

Sample ID **N033737-001ADUP** SampType: **DUP** TestCode: **150.1_4500H** Units: **pH Units** Prep Date: RunNo: **131124**
Client ID: **ZZZZZZ** Batch ID: **R131124** TestNo: **SM4500-H+B** Analysis Date: **1/14/2019** SeqNo: **3255361**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.960	0.10						7.940	0.252	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		

Sample Control

From: Marlon B. Cartin <marlon@assetlaboratories.com>
Sent: Monday, January 14, 2019 10:18 AM
To: 'Sample Control'; 'Yoandra Rodriguez'
Subject: FW: An emergency rush please

Forwarding

Thanks,

Marlon B. Cartin
Project Manager
Nevada: 3151 W. Post Road, Las Vegas, NV 89118
P: 702.307.2659 Ext. 410 I F: 702.307.2691 I M: 702.439.0421

-----Original Message-----
From: Scott, Doug/DEN [mailto:Doug.Scott@jacobs.com]
Sent: Monday, January 14, 2019 10:16 AM
To: Contreras, Erlene/RDD; Marlon B. Cartin (marlon@assetlaboratories.com); Nancy Sibucao
Subject: An emergency rush please

Marlon, I have an emergency need today if at all possible, one pH sample.
Can you do this for me please? Can you please see if the lab can analyze the 4Q2018 RO Concentrate sample for pH?
I'm looking at the lab results on the LAN and believe the sample ID is SC-701-WDR-579, collected 10-2-2018, and received by the lab 10-2-2018.

Thanks
Doug

Doug Scott
Project Chemist
Jacobs
D 1 970 731 0636
M 1 720 445 2278
Doug.scott@Jacobs.com
59 Lilac Ct.
Pagosa Springs, Co 81147
www.jacobs.com

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https://www.avast.com/antivirus

ASSET Laboratories

Please review the checklist below. Any NO and/or NA 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.

Change Order Checklist

Client Name: **CH2HI01**

Date / Time Created: **1/14/2019 11:56:17 AM**

Work Order Number: **N033737**

Created by: **YR**

Checklist completed by: YR 1/14/2019
Signature | Date

Reviewed by: Nancy 1/14/2019
Initials | Date

1. All samples within holding time? Yes ☐ No ☑
2. Refrigerator temperature in compliance? Yes ☑ No ☐
3. Change Order documents present? Yes ☑ No ☐

Comments: Past holding time for pH.

ASSET Laboratories

WORK ORDER Summary

14-Jan-19

WorkOrder: N033737

Client ID: CH2HI01

Project: PG&E Topock, 680375.03.IM.OP.00 **QC Level:** Level IV **Date Received:** 1/14/2019

Comments: Addendum WO for N032326

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N033737-001A	SC-701-WDR-579	10/2/2018 9:04:00 AM	1/14/2019	Water	SM4500-H+B	pH	☐	☐	☐	WW
N033737-002A	FOLDER	1/4/2019	1/14/2019		Folder	Folder	☐	☐	☐	LAB

List of Analysts

ASSET Laboratories Work Order: N033737

NAME	TEST METHOD
Lilia Ramit	SM 4500-H+B