Pacific Gas and Electric Company

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January 12, 2018

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Colorado River Basin Region
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Palm Desert, CA 92260

Subject: Topock IM-3 Combined Fourth Quarter 2017 Monitoring, Semiannual July – December 2017 and Annual January - December 2017 Operation and Maintenance Report
PG&E Topock Compressor Station, Needles, California
Interim Measure No. 3 Groundwater Treatment System
(Document ID: PGE20180112A)

Dear Ms. Innis and Mr. Cortez:

Enclosed is the Fourth Quarter 2017 Monitoring, Semiannual July – December 2017 and Annual January – December 2017 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 826,937,770 gallons of water and removed approximately 7,290 pounds of total chromium from August 1, 2005 through December 31, 2017.

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 2017 Monitoring, Semiannual July - December 2017, and Annual January - December 2017 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 2017 Monitoring, Semiannual July - December 2017 and Annual January – December 2017 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 12, 2018 Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E Document ID Number: PGE20180112A
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:

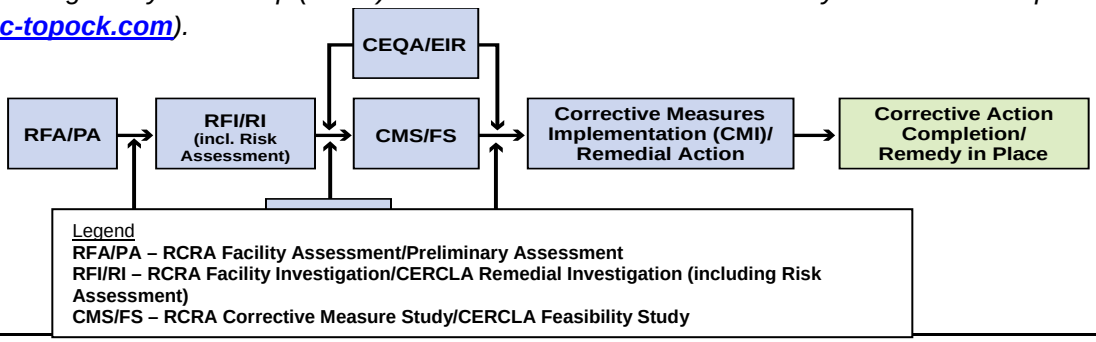
This report covers the Interim Measure No. 3 (IM-3) groundwater treatment system monitoring activities during the Fourth Quarter 2017 period, and the operation and maintenance activities during the July 1, 2017 to December 31, 2017 semiannual and the January 1, 2017 to December 31, 2017 annual periods. 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 2017 Monitoring, Semiannual July - December 2017 and Annual January – December 2017 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**

Version 9

Combined Fourth Quarter 2017 Monitoring, Semiannual July – December 2017 and Annual January – December 2017 Operation and Maintenance Report
Interim Measure No. 3 Groundwater Treatment System

Document ID: PGE20180112A

PG&E Topock Compressor Station
Needles, California

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

January 12, 2018

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Combined Fourth Quarter 2017 Monitoring, Semiannual July – December 2017, and Annual January – December 2017 Operation and Maintenance Report for Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Prepared for

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

on behalf of

Pacific Gas and Electric Company

January 12, 2018

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

Dennis Fink, P.E.
Project Engineer

Contents

Section Page

Appendixes

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

SECTION 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 2017 and the operation and maintenance (O&M) activities during the July 1, 2017 to December 31, 2017 semiannual period and the January 1, 2017 to December 31, 2017 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.

SECTION 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.

SECTION 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 2017 monitoring activities and the July 1, 2017 through December 31, 2017 (Third and Fourth Quarters) O&M activities related to the IM-3 groundwater treatment system. It also serves as the Annual January – December 2017 O&M Report for IM-3. IM-3 monitoring activities from January 1, 2017 through September 30, 2017 (First, Second and Third Quarters) were presented in the following monitoring and O&M reports:

- Topock IM-3 First Quarter 2017 Monitoring Report, submitted to the DOI and Regional Water Board April 15, 2017
- Topock IM-3 Second Quarter 2017 Monitoring and Semi-annual January 1, 2017 through June 30, 2017 Operation and Maintenance Report, submitted to the DOI and Regional Water Board July 15, 2017
- Topock IM-3 Third Quarter 2017 Monitoring Report, submitted to the DOI and Regional Water Board October 15, 2017

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 2017

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 2017) 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 2017 through September 2017 were originally reported in the *Third Quarter 2017 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, CA*, published October 15, 2017, 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 2017, extraction wells TW-3D, TW-2D and PE-1 operated with a target pumping rate of 135 gallons per minute (gpm), excluding periods of planned and unplanned downtime. Extraction well TW-2S was operated for a brief time for annual sampling. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 96.8 percent during October 2017
- 98.0 percent during November 2017
- 98.5 percent during December 2017

The Fourth Quarter 2017 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 17,421,276 gallons of extracted groundwater during Fourth Quarter 2017.

In addition to extracted groundwater, during Fourth Quarter 2017 the IM-3 facility treated 7,255 gallons of water generated from the groundwater monitoring program and 25,200 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 17,208,232 gallons of treatment system effluent during Fourth Quarter 2017. 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 136,640 gallons of RO concentrate during Fourth Quarter 2017. The monthly average RO concentrate flow rate is shown in Table 2.

The sludge flow rate is measured by the size and weight of containers shipped offsite. Four sludge containers were shipped offsite from the IM-3 facility during Fourth Quarter 2017. 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 2017 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.

SECTION 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 2017:

- The January 1, 2017 through March 31, 2017 results were included in the First Quarter 2017 Monitoring Report submitted to the DOI and Regional Water Board on April 15, 2017.
- The April 1, 2017 through June 30, 2017 results were included in the Second Quarter 2017 Monitoring Report submitted to the DOI and Regional Water Board on July 15, 2017.
- The July 1, 2017 through September 30, 2017 results were included in the Third Quarter 2017 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2017.

Laboratory reports for samples collected in Fourth Quarter 2017 were prepared by certified analytical laboratories, and are presented in Appendix D. The Fourth Quarter 2017 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 results are presented in Table 7.

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

SECTION 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, 2017 through December 31, 2017.

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[a]	FIT-101	6C036F16000	1/15/2016	6/1/2016
Extraction well TW-2S[a]	FIT-100	6A022116000	9/20/2014	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

Notes:

[a] TW-2D and TW-2S are backup extraction wells only operated for brief testing and sampling periods.

5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between July 1, 2017 and December 31, 2017 are provided in Appendix B. The daily volumes of groundwater treated from January 1, 2017 through June 30, 2017 were reported in the Second Quarter 2017 Monitoring Report and Semiannual January 1- June 30, 2017 Operation and Maintenance Report submitted on July 15, 2017.

Approximately 34,286,786 gallons of groundwater were extracted and treated between July 1, 2017 and December 31, 2017. Treatment of this water at the IM-3 facility is being performed in accordance with the conditions of ARARs.

Additionally, approximately 7,745 gallons of well purge water (generated during monitoring well sampling), as well as 51,650 gallons of injection well re-development water, were treated at the IM-3 facility during the July 1, 2017 through December 31, 2017 semiannual period.

A total of approximately 33,929,377 gallons of treated groundwater were injected back into the Alluvial Aquifer between July 1, 2017 and December 31, 2017.

5.3 Residual Solids Generated (Sludge)

During the July 1, 2017 through December 31, 2017 reporting period, ten 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, 2017 through December 31, 2017 reporting period is provided below.

Date Sludge Bin Removed from Site	Approximate Quantity from Waste Manifests (cubic yards)	Type of Shipment
7/12/2017	8	Non-RCRA hazardous waste
7/12/2017	8	Non-RCRA hazardous waste
8/9/2017	8	Non-RCRA hazardous waste
8/9/2017	8	Non-RCRA hazardous waste
9/28/2017	8	Non-RCRA hazardous waste
9/28/2017	8	Non-RCRA hazardous waste
11/8/2017	8	Non-RCRA hazardous waste
11/8/2017	8	Non-RCRA hazardous waste
12/19/2017	8	Non-RCRA hazardous waste
12/19/2017	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, 2017 through December 31, 2017, approximately 290,700 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, 2017 through December 31, 2017 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, 2017 through December 31, 2017 semiannual reporting period.

Activities during the Third and Fourth Quarters 2017 included one extended shutdown: the extraction well system was offline from 6:14 a.m. on August 21, 2017 to 9:50 a.m. on August 24, 2017 for semiannual scheduled maintenance. Extraction system downtime was 3 days, 1 hour, 22 minutes.

PG&E notified DOI, DTSC, the San Bernardino County Fire Department (the CUPA), the State Office of Emergency Service (OES), the Colorado River Regional Water Quality Control Board, and the Fort Mojave Indian Tribe on October 3, 2017 of a small release of IM-3 influent water to the soil outside of a pipeline vault along the access road to IM-3. The release was identified late on the afternoon of October 3, 2017, and all affected soil was removed and replaced with clean soil. More specific information on the release includes:

- Date and time: Tuesday, 10/3/2017, at 4:00 p.m.
- Estimated quantity of release: A total of approximately 5 gallons to the nearby gravel surface
- Location: At the pipeline vault along the access road between the MW-20 Bench and the IM-3 treatment plant, near the tight bend in the road
- IM-3 influent water, 0.337 mg/l hexavalent chromium

A site worker noticed the water on the ground adjacent to the vault and notified the IM-3 operator. The operator investigated the situation, identified the problem as an air release valve failure, and shut down the extraction well system to stop the release. The operator then initiated response actions, including pumping the standing water from the vault into a tank. The crew then removed all the wetted soil and replaced it with clean, dry soil. The failed air release valve was replaced and the system was re-started. The old air release valve was dismantled and sand was discovered in the valve body, which had prevented the valve from automatically reseating (as designed).

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, 2017 through December 31, 2017 semiannual period.

SECTION 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.

SECTION 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 12, 2018

Tables

Table 1. Sampling Station Descriptions

Fourth Quarter 2017 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 2017 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 2017 Average Monthly Flowrate	130.2	127.5	1.2
November 2017 Average Monthly Flowrate	131.9	130.6	0.9
December 2017 Average Monthly Flowrate	132.4	131.5	0.9

Notes:

gpm: gallons per minute

[a] Extraction wells TW-3D, TW-2D and PE-1 were operated during the Fourth Quarter 2017. Extraction well TW-2S was operated for a brief time for annual sampling.

[b] The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Fourth Quarter 2017 is approximately 0.48 percent.

Table 3. Sample Collection Dates

Fourth Quarter 2017 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	Sample Collection Dates	Results
Influent	October 3, 2017 November 7, 2017 December 5, 2017	See Table 4
Effluent	October 3, 2017 November 7, 2017 December 5, 2017	See Table 5
Reverse Osmosis Concentrate	October 3, 2017	See Table 6
Sludge[a]	Composite sample sent to lab October 3, 2017	See Table 7

Note:

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

TABLE 4
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Influent Monitoring Results [a]
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Monthly						Quarterly															
Sample ID	Date / 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	---	0.0960	3.30	2.70	0.0111	0.0310	0.0250	0.0700	0.0380	0.260	0.0320	0.0370	0.0560	0.0390	0.0400	0.110	1.10	1.80	0.270
SC-100B-WDR-565	**10/3/2017**	**4300**	**0.150**	**7400**	**7.2**	**580**	**550**	**ND (50.0)**	**0.0681**	**ND (0.500)**	**3.00**	**29.0**	**1.10**	**ND (1.00)**	**2.70**	**ND (1.00)**	**6.80**	**21.0**	**ND (1.00)**	**3.00**	**500**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	5.00	20.0	50.0	0.0500	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-566	**11/7/2017**	**4300**	**0.290**	**7700**	**7.0**	**600**	**540**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**7.70**	**---**	**---**	**---**	**---**	**---**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---
SC-100B-WDR-567	**12/5/2017**	**4400**	**0.460**	**7500**	**7.0**	**530**	**540**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**7.60**	**---**	**---**	**---**	**---**	**---**	**ND (10.0)**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	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
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
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Effluent Monitoring Results[a]
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Effluent Limits[b]	Ave. Monthly	NA	NA	NA	6.5-8.4	25	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Max Daily	NA	NA	NA	6.5-8.4	50	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Frequency		**Monthly**																						
Analytes		TDS	Turbidity	Specific Conductance	Field pH[e]	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[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	---	0.0190	0.0330	2.70	0.0111	0.0310	0.0250	0.0700	0.0380	0.260	0.0320	0.0370	0.0560	0.0390	0.0400	0.110	1.10	1.80	0.270
Sample ID	**Date**																							
SC-700B-WDR-565	**10/3/2017**	**4100**	**0.240**	**7300**	**7.8**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.0500)**	**ND (0.500)**	**0.120 J**	**14.0**	**1.10**	**ND (1.00)**	**2.60**	**ND (1.00)**	**6.40**	**19.0**	**ND (1.00)**	**2.70**	**460**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.0500	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-566	**11/7/2017**	**4100**	**0.150**	**7500**	**6.9**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**0.120**	**14.0**	**0.950**	**ND (1.00)**	**2.40**	**ND (1.00)**	**2.80**	**20.0**	**ND (1.00)**	**2.60**	**470**	**40.0 J**	**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-567	**12/5/2017**	**4200**	**0.450**	**7200**	**7.0**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.200)**	**ND (0.500)**	**0.160**	**16.0**	**1.10**	**ND (1.00)**	**2.30**	**ND (5.00)**	**2.50**	**20.0**	**1.30**	**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	5.00	0.500	0.500	1.00	0.250	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
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Reverse Osmosis Concentrate Monitoring Results [a]
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																					
Analytes		TDS	Specific Conductance	Field pH [c]	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units [b]		mg/L	µmhos/cm	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MDL		500	0.100	---	0.000096	0.00083	0.00016	0.00012	0.00035	0.0011	0.00024	0.00013	0.0013	0.130	0.00092	0.00097	0.000087	0.00020	0.00014	0.0015	0.00074	0.00011	0.0013
Sample ID	Date																						
SC-701-WDR-565	**10/3/2017**	**40000**	**57000**	**8.4**	**0.00580**	**ND (0.0050)**	**ND (0.0025)**	**0.00270**	**0.150**	**ND (0.0120)**	**ND (0.0025)**	**ND (0.0025)**	**ND (0.0050)**	**26.0**	**ND (0.0250)**	**0.230**	**ND (0.00020)**	**0.0100**	**0.0440**	**ND (0.0120)**	**ND (0.0120)**	**0.00640**	**ND (0.0500)**
RL		500	0.100	---	0.0050	0.0050	0.0025	0.00050	0.0050	0.0120	0.0025	0.0025	0.0050	2.00	0.0250	0.0120	0.00020	0.0050	0.0025	0.0120	0.0120	0.0050	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.

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

TABLE 7
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Sludge Monitoring Results[a]
Fourth Quarter 2017 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		0.0740	0.540	0.340	0.400	0.0780	0.0700	0.0670	0.0670	0.0740	0.130	0.0740	0.0650	0.0220	0.0770	0.280	0.0750	0.300	0.0670	0.120
Sample ID	Date																			
Phase Separator-565-Sludge	**10/3/2017**	**2400**	**19.0 J**	**14.0**	**12.0**	**52.0**	**ND (1.80)**	**2.30**	**3.10**	**110 J**	**17.0**	**ND (1.80)**	**ND (1.80)**	**ND (0.180)**	**24.0**	**ND (1.80)J**	**ND (1.80)**	**4.60**	**31.0**	**46.0**
RL		1.80	1.80	3.70	1.80	1.80	1.80	1.80	1.80	3.70	1.90	1.80	1.80	0.180	1.80	1.80	1.80	3.70	1.80	1.80

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
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-565	George Gloria	10/3/2017	12:48:00 PM	ASSET	EPA 120.1	SC	10/4/2017	Lilia Ramit
					ASSET	EPA 200.7	AL	10/14/2017	Claire Ignacio
					ASSET	EPA 200.7	B	10/14/2017	Claire Ignacio
					ASSET	EPA 200.7	FE	10/14/2017	Claire Ignacio
					ASSET	EPA 200.8	AS	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	BA	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CR	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MO	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	NI	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	PB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	SB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/17/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/4/2017	Ria Abes
					ASSET	EPA 300.0	FL	10/4/2017	Ryan Balilu
					ASSET	EPA 300.0	SO4	10/4/2017	Ryan Balilu
					ASSET	SM 2540C	TDS	10/4/2017	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/7/2017	Quennie Manimtim
					ASSET	SM2130B	TRB	10/4/2017	Lilia Ramit
					TLI	SM4500NH3D	NH3N	10/12/2017	Quennie Manimtim
				12:52:00 PM	Field	HACH	PH	10/3/2017	G. Gloria
SC-100B	SC-100B-WDR-566	Ryan Phelps	11/7/2017	10:20:00 AM	ASSET	EPA 120.1	SC	11/8/2017	Lilia Ramit
					ASSET	EPA 200.8	CR	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	11/20/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/8/2017	Ria Abes
					Field	HACH	PH	11/7/2017	Ryan Phelps
					ASSET	SM 2540C	TDS	11/8/2017	Lilia Ramit
					ASSET	SM2130B	TRB	11/8/2017	Lilia Ramit
SC-100B	SC-100B-WDR-567	Ronnie Phelps	12/5/2017	1:40:00 PM	ASSET	EPA 120.1	SC	12/6/2017	Lilia Ramit
					ASSET	EPA 200.8	CR	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	12/11/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/6/2017	Ria Abes
					Field	HACH	PH	12/5/2017	Ryan Phelps

TABLE 8
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-567	Ronnie Phelps	12/5/2017	1:40:00 PM	ASSET	SM 2540C	TDS	12/6/2017	Lilia Ramit
					ASSET	SM2130B	TRB	12/6/2017	Lilia Ramit
SC-700B	SC-700B-WDR-565	George Gloria	10/3/2017	12:40:00 PM	ASSET	EPA 120.1	SC	10/4/2017	Lilia Ramit
					ASSET	EPA 200.7	AL	10/14/2017	Claire Ignacio
					ASSET	EPA 200.7	B	10/14/2017	Claire Ignacio
					ASSET	EPA 200.7	FE	10/14/2017	Claire Ignacio
					ASSET	EPA 200.8	AS	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	BA	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CR	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MO	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	NI	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	PB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	SB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/17/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/4/2017	Ria Abes
					ASSET	EPA 300.0	FL	10/4/2017	Ryan Balilu
					ASSET	EPA 300.0	SO4	10/4/2017	Ryan Balilu
					Field	HACH	PH	10/3/2017	G. Gloria
					ASSET	SM 2540C	TDS	10/4/2017	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/7/2017	Quennie Manimtim
					ASSET	SM2130B	TRB	10/4/2017	Lilia Ramit
					TLI	SM4500NH3D	NH3N	10/12/2017	Quennie Manimtim
SC-700B	SC-700B-WDR-566	Ryan Phelps	11/7/2017	10:24:00 AM	ASSET	EPA 120.1	SC	11/8/2017	Lilia Ramit
					ASSET	EPA 200.7	AL	11/21/2017	Claire Ignacio
					ASSET	EPA 200.7	B	11/21/2017	Claire Ignacio
					ASSET	EPA 200.7	FE	11/21/2017	Claire Ignacio
					ASSET	EPA 200.8	AS	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	BA	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	CR	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	CU	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	MO	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	NI	11/20/2017	Claire Ignacio

TABLE 8
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-566	Ryan Phelps	11/7/2017	10:24:00 AM	ASSET	EPA 200.8	PB	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	SB	11/20/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	11/20/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/8/2017	Ria Abes
					ASSET	EPA 300.0	FL	11/8/2017	Ria Abes
					ASSET	EPA 300.0	SO4	11/8/2017	Ria Abes
					Field	HACH	PH	11/7/2017	Ryan Phelps
					ASSET	SM 2540C	TDS	11/8/2017	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	11/11/2017	Quennie Manimtim
					ASSET	SM2130B	TRB	11/8/2017	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	11/27/2017	Quennie Manimtim
SC-700B	SC-700B-WDR-567	Ronnie Phelps	12/5/2017	1:42:00 PM	ASSET	EPA 120.1	SC	12/6/2017	Lilia Ramit
					ASSET	EPA 200.7	AL	12/13/2017	Claire Ignacio
					ASSET	EPA 200.7	B	12/13/2017	Claire Ignacio
					ASSET	EPA 200.7	FE	12/13/2017	Claire Ignacio
					ASSET	EPA 200.8	AS	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	BA	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	CR	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	CU	12/12/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	MO	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	NI	12/12/2017	Claire Ignacio
					ASSET	EPA 200.8	PB	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	SB	12/11/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	12/11/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/6/2017	Ria Abes
					ASSET	EPA 300.0	FL	12/6/2017	Ria Abes
					ASSET	EPA 300.0	SO4	12/7/2017	Ria Abes
					Field	HACH	PH	12/5/2017	Ryan Phelps
					ASSET	SM 2540C	TDS	12/6/2017	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	12/11/2017	Quennie Manimtim
					ASSET	SM2130B	TRB	12/6/2017	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	12/11/2017	Quennie Manimtim
SC-701	SC-701-WDR-565	George Gloria	10/3/2017	12:30:00 PM	ASSET	EPA 120.1	SC	10/4/2017	Lilia Ramit
					ASSET	EPA 200.8	AG	10/17/2017	Claire Ignacio

TABLE 8
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-701	SC-701-WDR-565	George Gloria	10/3/2017	12:30:00 PM	ASSET	EPA 200.8	AS	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	BA	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	BE	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CD	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CO	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CR	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	CU	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MN	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	MO	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	NI	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	PB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	SB	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	SE	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	TL	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	V	10/17/2017	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/17/2017	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/4/2017	Ria Abes
					ASSET	EPA 245.1	HG	10/9/2017	Claire Ignacio
					ASSET	EPA 300.0	FL	10/4/2017	Ryan Balilu
					ASSET	SM 2540C	TDS	10/4/2017	Lilia Ramit
				12:32:00 PM	Field	HACH	PH	10/3/2017	G. Gloria
Phase Separator	Phase Separator-565-Sludge	George Gloria	10/3/2017	1:15:00 PM	ASSET	EPA 300.0	FL	10/9/2017	Ria Abes
					ASSET	EPA 6010B	AG	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	AS	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	BA	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	BE	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	CD	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	CO	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	CR	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	CU	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	MN	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	MO	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	NI	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	PB	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	SB	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	SE	10/7/2017	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2017 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
Phase Separator	Phase Separator-565-Sludge	George Gloria	10/3/2017	1:15:00 PM	ASSET	EPA 6010B	TL	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	V	10/7/2017	Claire Ignacio
					ASSET	EPA 6010B	ZN	10/7/2017	Claire Ignacio
					ASSET	EPA 7471A	HG	10/5/2017	Mark Gesmundo
					ASSET	SW 7199	CR6	10/4/2017	Ria Abes

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

Figures

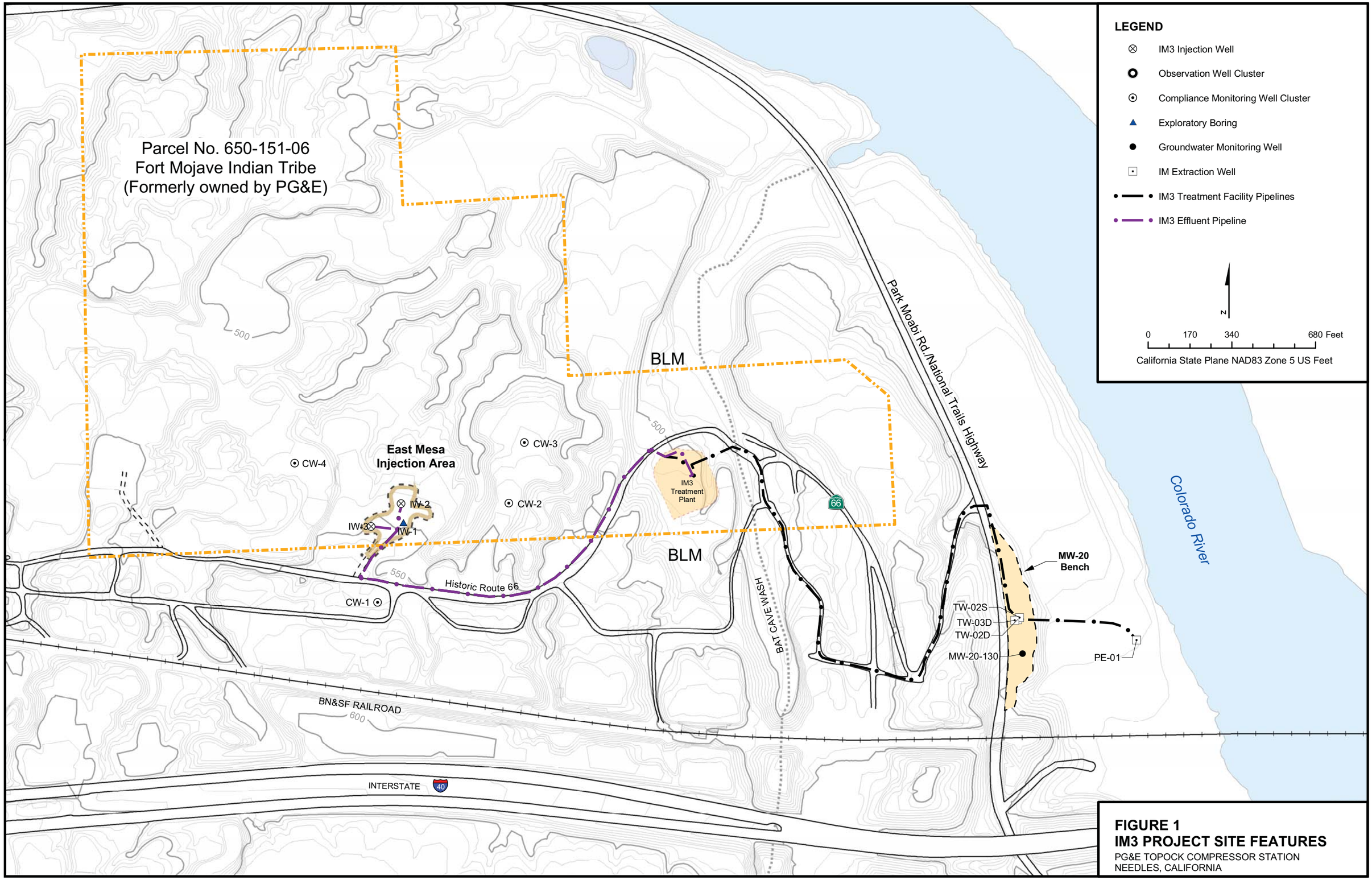
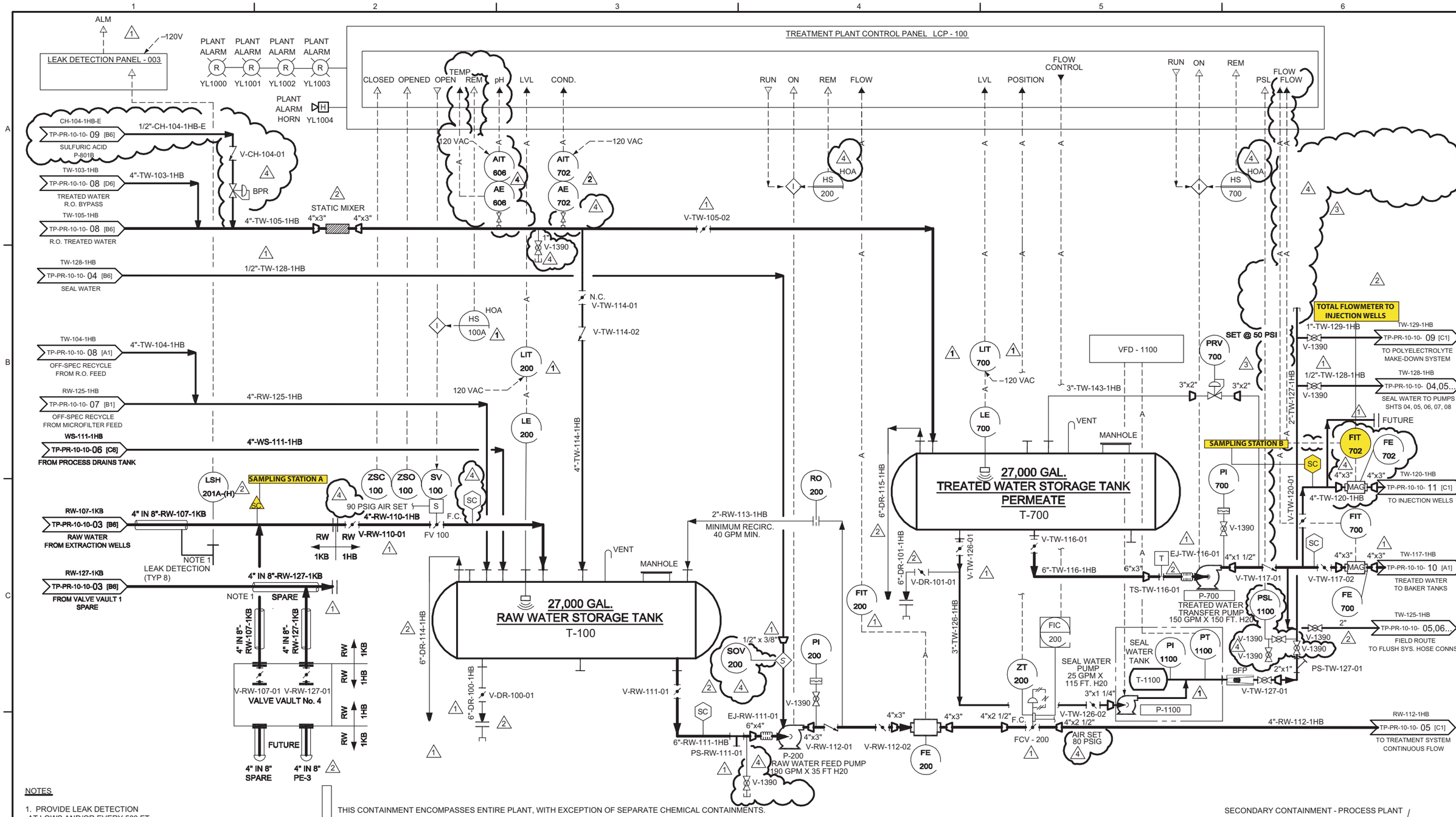


FIGURE 1
IM3 PROJECT SITE FEATURES
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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



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

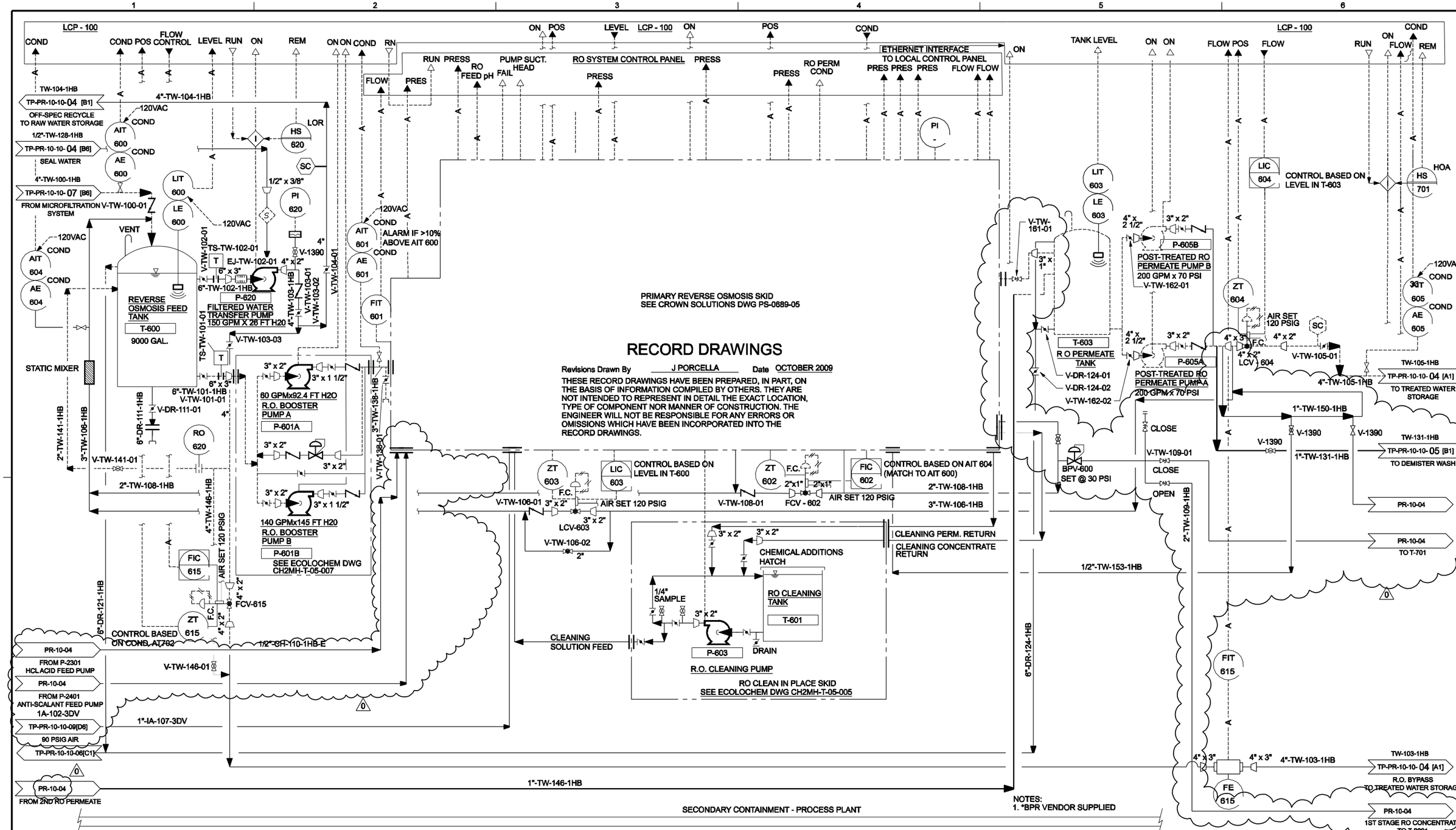
CH2MHILL

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:



**
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

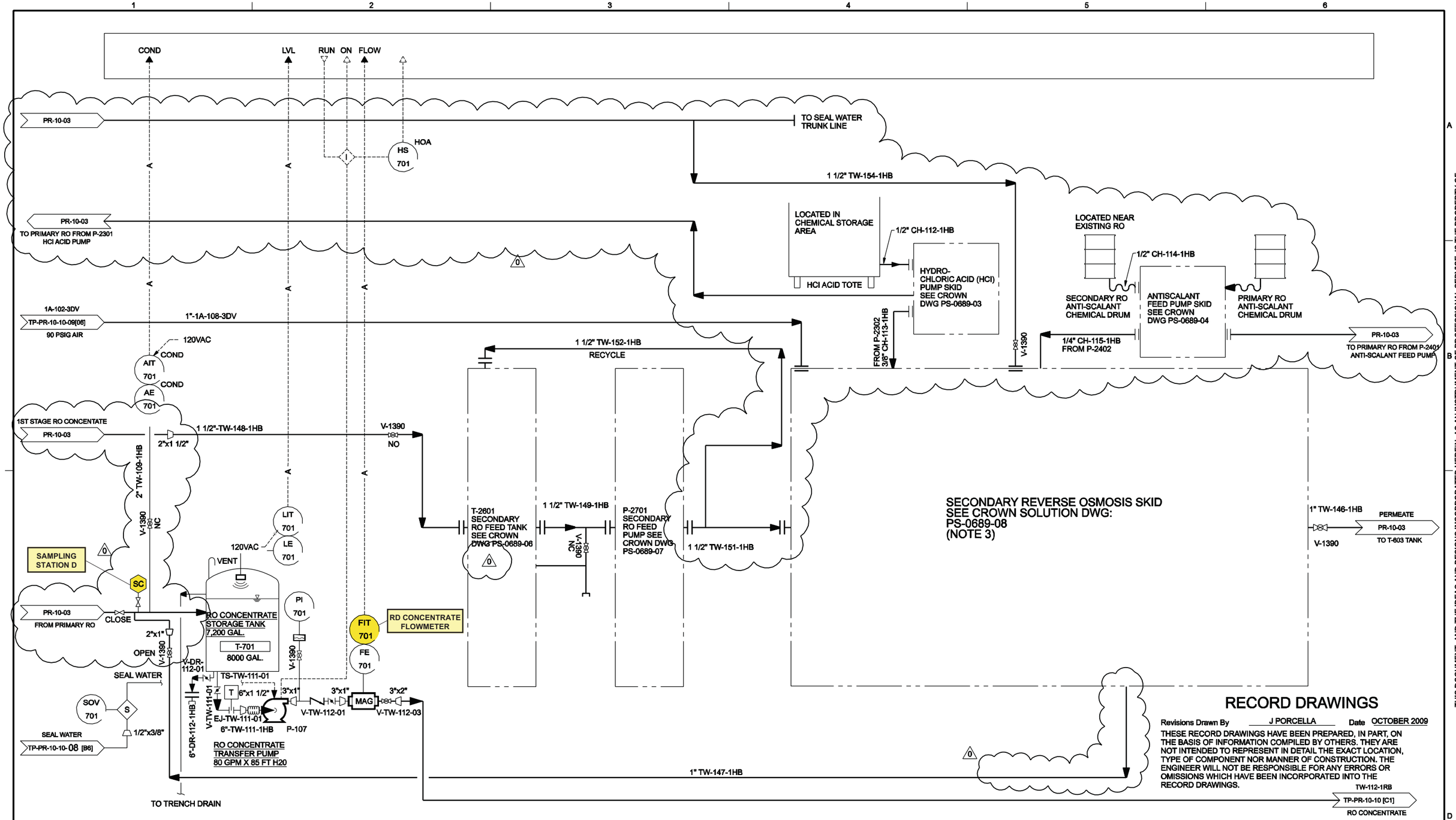
CH2MHILL

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.
0 1"

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



RECORD DRAWINGS

Revisions Drawn By J PORCELLA Date OCTOBER 2009

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

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

RESPONSIBLE ENGINEER: John Porcella 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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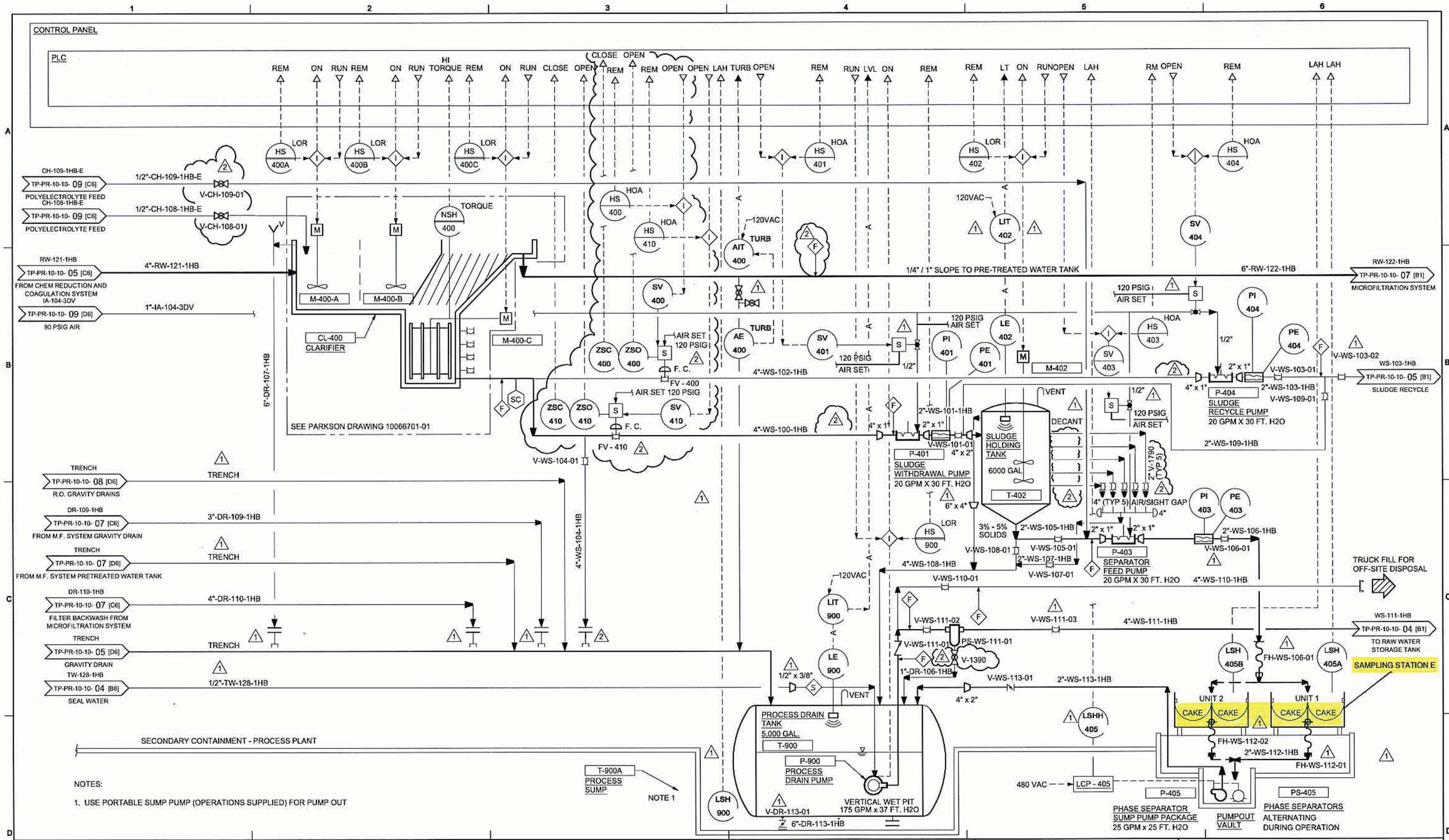

NOTES:

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

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 06
CLARIFICATION AND SLUDGE REMOVAL

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

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

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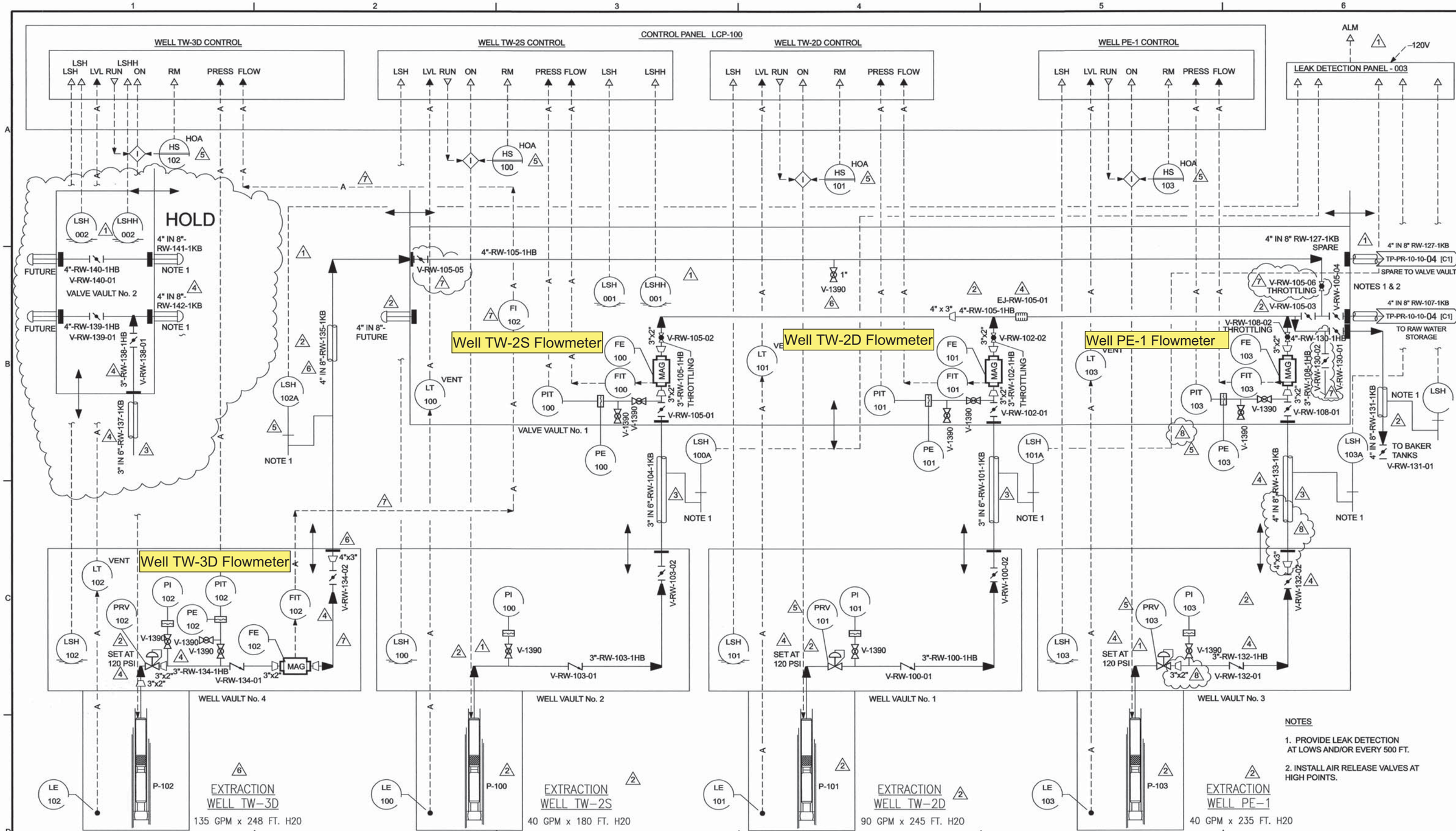

NOTES

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

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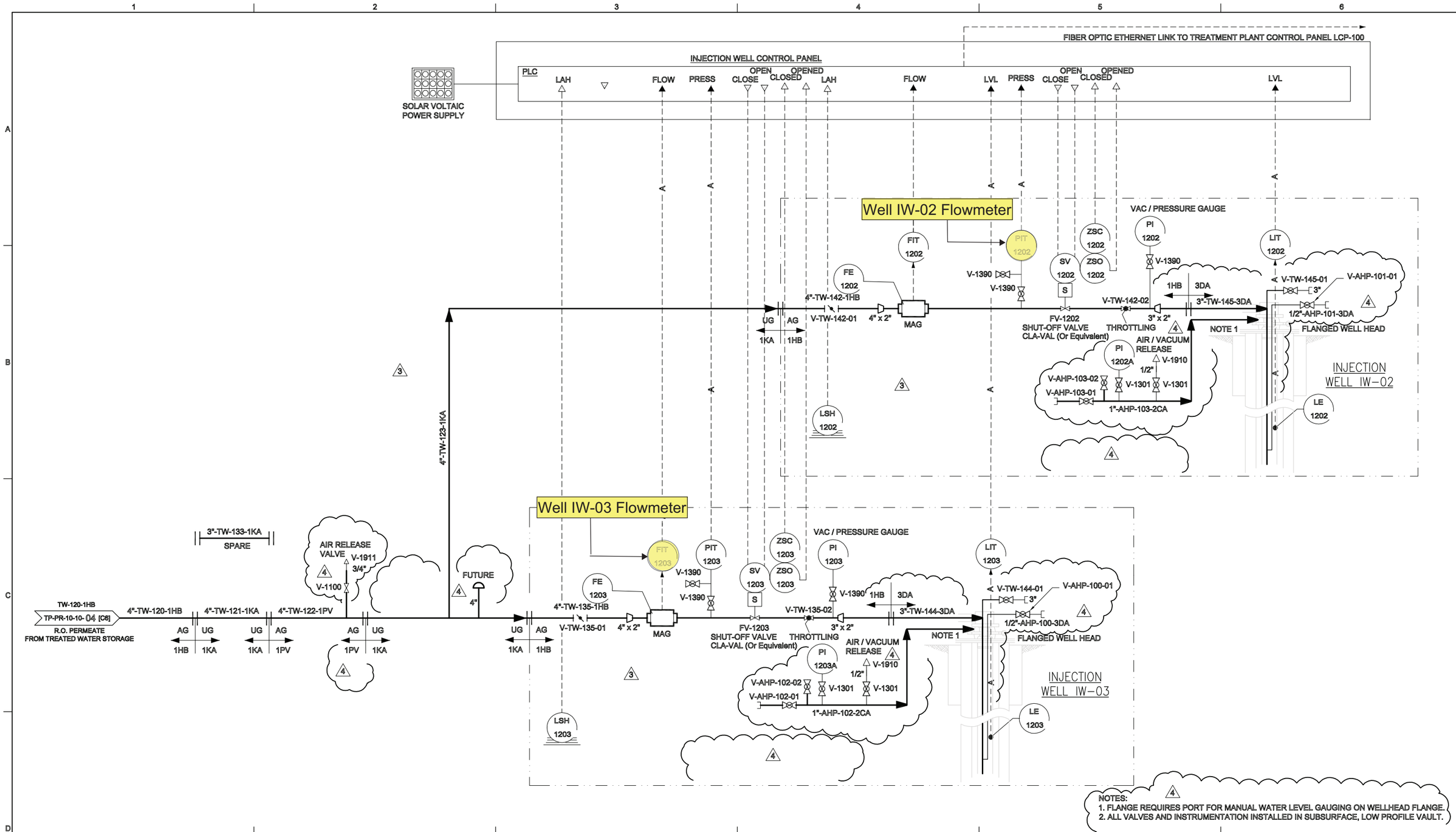
FILENAME: tppr101003.dwg PLOT DATE: 19-OCT-2005 PLOT TIME:



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

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 11
INJECTION WELLS

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

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

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

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

APPENDIX A

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

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 2017

During July 2017, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gallons per minute (gpm) excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during July 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 99.0 percent during the July 2017 reporting period.

The IM-3 facility treated approximately 5,932,172 gallons of extracted groundwater during July 2017. Two containers of solids from the IM-3 facility were transported offsite during July 2017.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 1.0 percent downtime during July 2017) are summarized below.

- **July 6, 2017 (planned):** The extraction well system was offline from 6:52 a.m. to 8:14 a.m. due to testing of the pipeline critical alarms and leak detection system and to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the plugged modules with clean ones. Extraction system downtime was 1 hour 22 minutes.
- **July 7, 2017 (unplanned):** The extraction well system was offline from 12:54 p.m. to 1:00 p.m. due to the voltage coming into the plant being too low. The plant power was switched from City of Needles power to the generator. Extraction system downtime was 6 minutes.
- **July 7, 2017 (unplanned):** The extraction well system was offline from 2:26 p.m. to 2:30 p.m. to switch the plant power back to City of Needles power. Extraction system downtime was 4 minutes.
- **July 8, 2017 (unplanned):** The extraction well system was offline from 7:06 p.m. to 7:12 p.m. due to bad weather. There were high winds and lightning. The plant power was switched to the generator. Extraction system downtime was 6 minutes.
- **July 22, 2017 (unplanned):** The extraction well system was offline from 12:26 a.m. to 12:36 a.m. due to loss of power from the City of Needles. Extraction system downtime was 10 minutes.
- **July 21, 2017 (unplanned):** The extraction well system was offline from 12:28 p.m. to 12:42 p.m. due to a high voltage reading on the incoming power from “line C.” The plant was shut down to switch to generator power. The City of Needles Electric Department was called and the plant remained on the generator until the power issue was resolved. Extraction system downtime was 14 minutes.
- **July 24, 2017 (unplanned):** The extraction well system was offline from 8:22 p.m. to 9:38 p.m. due to extraction well TW-3D failing to run or start. The plant was shut down while the issue was investigated and the electric panel reset. Extraction system downtime was 1 hour 16 minutes.

- **July 25, 2017 (unplanned):** The extraction well system was offline from 11:56 a.m. to 11:58 a.m. due to loss of power from the City of Needles. Extraction system downtime was 2 minutes.
- **July 25, 2017 (unplanned):** The extraction well system was offline from 1:26 p.m. to 2:46 p.m. due to a “low flow ferrous” alarm. The plant was shut down while the ferrous chemical pump was cleaned and re-primed. Extraction system downtime was 1 hour 20 minutes.
- **July 26, 2017 (unplanned):** The extraction well system was offline from 5:38 a.m. to 8:10 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the plugged modules with clean ones. Extraction system downtime was 2 hours 32 minutes.
- **July 28, 2017 (unplanned):** The extraction well system was offline from 9:56 a.m. to 9:58 a.m., from 10:10 a.m. to 10:40 a.m., and from 12:50 p.m. to 12:52 p.m. due to loss of power from the City of Needles. Extraction system downtime was 34 minutes.

August 2017

During August 2017, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during August 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 88.0 percent during the August 2017 reporting period.

The IM-3 facility treated approximately 5,274,842 gallons of extracted groundwater during August 2017. The IM-3 facility treated 26,450 gallons of water from injection well backwashing/re-development from Groundwater Partners. Two containers of solids from the IM-3 facility were transported offsite during August 2017.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 12.0 percent downtime during August 2017) are summarized below.

- **August 3, 2017 (unplanned):** The extraction well system was offline from 12:18 a.m. to 12:22 a.m. due to a programmable logic controller (PLC) and human-machine interface (HMI) connectivity issue. Extraction system downtime was 4 minutes.
- **August 3, 2017 (unplanned):** The extraction well system was offline from 10:28 a.m. to 11:56 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules in the east bank with clean ones. Extraction system downtime was 1 hour 28 minutes.
- **August 7, 2017 (planned):** The extraction well system was offline from 8:40 a.m. to 9:08 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 28 minutes.
- **August 14, 2017 (unplanned):** The extraction well system was offline from 10:50 a.m. to 12:54 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules in the west bank with clean ones. Extraction system downtime was 2 hours 4 minutes.
- **August 21 - 24, 2017 (planned):** The extraction well system was offline from 6:14 a.m. on August 21, 2017 to 9:50 a.m. on August 24, 2017 for semiannual scheduled maintenance. Extraction system downtime was 3 days, 1 hour, 22 minutes.
- **August 24, 2017 (unplanned):** The extraction well system was offline from 6:54 p.m. to 7:34 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down

to replace the fouled modules in the west bank with clean ones. Extraction system downtime was 40 minutes.

- **August 24, 2017 (unplanned):** The extraction well system was offline from 7:38 p.m. to 7:46 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 8 minutes.
- **August 25, 2017 (unplanned):** The extraction well system was offline from 8:00 a.m. to 8:04 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 4 minutes.
- **August 25, 2017 (unplanned):** The extraction well system was offline from 1:32 p.m. to 1:52 p.m. due to loss of power from the City of Needles. Extraction system downtime was 20 minutes.
- **August 25, 2017 (unplanned):** The extraction well system was offline from 3:16 p.m. to 3:28 p.m. due to loss of power from the City of Needles. Extraction system downtime was 12 minutes.
- **August 26, 2017 (unplanned):** The extraction well system was offline from 8:06 a.m. to 8:10 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 4 minutes.
- **August 26, 2017 (planned):** The extraction well system was offline from 9:18 a.m. to 10:38 a.m. to maintain appropriate levels in the Raw Water Storage Tank (T-100) due to the large amount of injection well backwashing water produced during the Aquagard cleaning process performed by Groundwater Partners. Extraction system downtime was 1 hour 20 minutes.
- **August 27, 2017 (unplanned):** The extraction well system was offline from 6:50 a.m. to 8:46 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules in the east bank with clean ones. Extraction system downtime was 1 hour 56 minutes.
- **August 27, 2017 (planned):** The extraction well system was offline from 12:20 p.m. to 12:34 p.m. to maintain appropriate levels in the Raw Water Storage Tank (T-100) due to the large amount of injection well backwashing water produced during the Aquagard cleaning process performed by Groundwater Partners. Extraction system downtime was 14 minutes.
- **August 29, 2017 (unplanned):** The extraction well system was offline from 2:42 p.m. to 2:56 p.m. due to loss of power from the City of Needles. The plant power was switched to the generator. Extraction system downtime was 14 minutes.
- **August 29, 2017 (unplanned):** The extraction well system was offline from 4:02 p.m. to 4:04 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **August 29, 2017 (unplanned):** The extraction well system was offline from 4:58 p.m. to 6:58 p.m. due to loss of power from the City of Needles and a failure of the Clarifier Feed Pump VFD (P-400). Extraction system downtime was 2 hours.
- **August 31, 2017 (unplanned):** The extraction well system was offline from 6:54 a.m. to 9:32 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. The plant was also offline due to a PLC and HMI connectivity issue. Extraction system downtime was 2 hours 38 minutes.

September 2017

During September 2017, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during September 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 97.9 percent during the September 2017 reporting period.

The IM-3 facility treated approximately 5,658,496 gallons of extracted groundwater during September 2017. The IM-3 facility treated 4,560 gallons of purge water from groundwater well sampling. Two containers of solids from the IM-3 facility were transported offsite during September 2017.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 2.1 percent downtime during September 2017) are summarized below.

- **September 1, 2017 (unplanned):** The extraction well system was offline from 7:32 a.m. to 8:04 a.m. due a leaking seal at the Chemical Mixing Pump (P-201). Extraction system downtime was 32 minutes.
- **September 2, 2017 (unplanned):** The extraction well system was offline from 4:06 p.m. to 5:54 p.m. due to a high temperature condition at the air compressor (CMP-1001). Extraction system downtime was 1 hour 48 minutes.
- **September 5, 2017 (unplanned):** The extraction well system was offline from 6:52 p.m. to 9:00 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean membranes. Extraction system downtime was 2 hours 8 minutes.
- **September 7, 2017 (unplanned):** The extraction well system was offline from 4:26 a.m. to 4:36 a.m. due to loss of power from the City of Needles. Extraction system downtime was 10 minutes.
- **September 8, 2017 (planned):** The extraction well system was offline from 12:14 p.m. to 12:32 p.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 18 minutes.
- **September 13, 2017 (unplanned):** The extraction well system was offline from 8:54 a.m. to 9:32 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean ones. Extraction system downtime was 38 minutes.
- **September 13, 2017 (unplanned):** The extraction well system was offline from 10:30 a.m. to 11:02 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean ones. Extraction system downtime was 32 minutes.
- **September 13-14, 2017 (unplanned):** The extraction well system was offline during five separate periods: on September 13 from 1:48 p.m. to 3:04 p.m., 6:52 p.m. to 7:48 p.m., and 9:14 p.m. to 10:08 p.m.; from 11:26 p.m. on September 13 to 12:32 a.m. on September 14; and from 1:12 a.m. to 1:26 a.m. on September 14. A current monitoring sensor in the Motor Control Center shut down the TW-3D well pump due to high heat caused by failure of the control building air conditioner. After troubleshooting, the set point of the sensor was adjusted so this will not happen in the future. Extraction system downtime was 4 hours 26 minutes.
- **September 19, 2017 (unplanned):** The extraction well system was offline from 11:00 a.m. to 1:02 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean ones. Extraction system downtime was 2 hours 2 minutes.
- **September 26, 2017 (planned):** The extraction well system was offline from 4:50 a.m. to 5:50 a.m. because the Raw Water Storage Tank (T-100) was full and needed to have the water level lowered. Extraction system downtime was 1 hour.

- **September 27, 2017 (unplanned):** The extraction well system was offline from 9:36 a.m. to 11:14 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean ones. Extraction system downtime was 1 hour 38 minutes.

October 2017

During October 2017, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during October 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 96.8 percent during the October 2017 reporting period.

The IM-3 facility treated approximately 5,811,842 gallons of extracted groundwater during October 2017. The IM-3 facility treated 1,080 gallons of purge water from groundwater well sampling.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 3.2 percent downtime during October 2017) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **October 3, 2017 (unplanned):** The extraction well system was offline from 3:10 p.m. to 6:22 p.m. due to a failure of an air release valve and replacing it with a new one. The plant was also offline from 6: 24 p.m. to 6:36 p.m. and from 6:44 p.m. to 6:58 p.m. to test the new air release valve. Extraction system downtime was 3 hours 38 minutes.

- **October 4, 2017 (unplanned):** The extraction system was offline from 9:04 a.m. to 9:28 a.m. and from 8:24 p.m. to 8:34 p.m. and from 11:20 p.m. 11:34 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 48 minutes.

- **October 5, 2017 (planned):** The extraction well system was offline from 6:06 a.m. to 8:30 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 2 hours 24 minutes.

- **October 7, 2017 (unplanned):** The extraction well system was offline from 1:54 p.m. to 2:34 p.m. for tank level management. The water level in Raw Water Storage Tank (T-100) caused a high water-level shutdown. Extraction system downtime was 40 minutes.

- **October 8, 2017 (unplanned):** The extraction well system was offline from 2:06 p.m. to 3:24 p.m. due to scale build-up at the Clarifier Feed Pump (P-400) and associated static mixer, which were restricting flow resulting in high water levels in T-100. The extraction wells were shut down to lower the water level in T-100. Extraction system downtime was 1 hour 18 minutes.

- **October 9, 2017 (unplanned):** The extraction well system was offline from 6:18 a.m. to 10:28 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean membranes. Extraction system downtime was 4 hours 10 minutes.

- **October 9, 2017 (unplanned):** The extraction system was offline from 10:30 a.m. to 10:38 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 8 minutes.

- **October 10, 2017 (unplanned):** The extraction well system was offline from 12:26 p.m. to 1:38 p.m. due to the scale build-up at the Clarifier Feed Pump (P-400) and associated static mixer, which were restricting flow resulting in high water levels in T-100. The extraction wells were shut down to lower the level at T-100. Extraction system downtime was 1 hour 12 minutes.

- **October 12, 2017 (unplanned):** The extraction well system was offline from 4:04 p.m. to 4:16 p.m. due to loss of power from the City of Needles. Extraction system downtime was 12 minutes.
- **October 13, 2017 (unplanned):** The extraction well system was offline from 2:30 a.m. to 3:04 a.m. and from 4:28 a.m. to 4:40 a.m. due to loss of power from the City of Needles. Extraction system downtime was 46 minutes.
- **October 14, 2017 (unplanned):** The extraction well system was offline from 7:04 p.m. to 8:30 p.m. because the T-100 was full and needed to have the water level lowered. Extraction system downtime was 1 hour 26 minutes.
- **October 18, 2017 (unplanned):** The extraction system was offline from 9:46 a.m. to 9:48 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **October 21, 2017 (unplanned):** The extraction well system was offline from 9:04 a.m. to 10:16 a.m. due to the scale build-up at Clarifier Feed Pump (P-400) and associated static mixer, which was restricting flow resulting in high water levels in T-100. The extraction wells were shut down to lower the level at T-100. Extraction system downtime was 1 hour 12 minutes.
- **October 23, 2017 (unplanned):** The extraction well system was offline from 5:26 p.m. to 6:26 p.m. because T-100 was full and needed to have the water level lowered. Extraction system downtime was 1 hour.
- **October 24, 2017 (unplanned):** The extraction well system was offline from 10:32 a.m. to 12:58 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean membranes. Extraction system downtime was 2 hours 26 minutes.
- **October 31, 2017 (unplanned):** The extraction well system was offline from 10:06 a.m. to 12:30 p.m. to service the Clarifier Feed Pump (P-400) and the Pre-treated Water Transfer Pump (P-500). Extraction system downtime was 2 hours 24 minutes.
- **October 31, 2017 (unplanned):** The extraction well system was offline from 7:32 p.m. to 7:52 p.m. due to loss of power from the City of Needles. Extraction system downtime was 20 minutes.

November 2017

During November 2017, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during November 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 98.0 percent during the November 2017 reporting period.

The IM-3 facility treated approximately 5,698,953 gallons of extracted groundwater during November 2017. The IM-3 facility treated 25,200 gallons of water from injection well backwashing/re-development from Groundwater Partners. Two containers of solids from the IM No. 3 facility were transported offsite during November 2017.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 2.0 percent downtime during November 2017) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **November 8, 2017 (unplanned):** The extraction well system was offline from 8:20 a.m. to 8:28 a.m. due to loss of power from the City of Needles. Extraction system downtime was 8 minutes.

- **November 8, 2017 (unplanned):** The extraction system was offline from 2:06 p.m. to 2:08 p.m. and from 5:40 p.m. to 5:44 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 6 minutes.
- **November 9, 2017 (planned):** The extraction well system was offline from 6:04 a.m. to 6:36 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 32 minutes.
- **November 9, 2017 (planned):** The extraction well system was offline from 8:58 a.m. to 10:42 a.m. to change out the microfilter modules due to high transmembrane pressure and installing a new Clarifier Feed Pump (P-400). Extraction system downtime was 1 hour 44 minutes.
- **November 9, 2017 (unplanned):** The extraction well system was offline from 11:42 a.m. to 11:58 a.m. and from 2:02 p.m. to 3:50 p.m. due to a high level at Iron Oxidation Reactor Number 3 (T-301C). A blockage was discovered at the inline mixer at the discharge of Clarifier Feed Pump (P-400) and cleared. Extraction system downtime was 2 hours 4 minutes.
- **November 9, 2017 (unplanned):** The extraction system was offline from 3:54 p.m. to 4:06 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 12 minutes.
- **November 10, 2017 (unplanned):** The extraction system was offline from 2:32 a.m. to 3:24 a.m. due to a high pH reading at the Treated Water Storage Tank (T-700). Lab meters were recalibrated and the pH at T-700 was rechecked and found to be in compliance. Extraction system downtime was 52 minutes.
- **November 16, 2017 (planned):** The extraction system was offline from 12:44 p.m. to 1:04 p.m. to measure the total depth of extraction well TW-3D. Extraction system downtime was 20 minutes.
- **November 18, 2017 (unplanned):** The extraction system was offline from 11:34 a.m. to 11:50 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 16 minutes.
- **November 18, 2017 (planned):** The extraction well system was offline from 11:54 a.m. to 12:56 p.m. to maintain appropriate levels in the Raw Water Storage Tank (T-100) due to the large volume of injection well backwashing water produced during the Aquagard injection well cleaning process. Extraction system downtime was 1 hour 2 minutes.
- **November 21, 2017 (unplanned):** The extraction well system was offline from 11:38 a.m. to 1:58 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled membranes with clean membranes. Extraction system downtime was 2 hours 20 minutes.
- **November 22, 2017 (unplanned):** The extraction well system was offline from 5:54 a.m. to 10:40 a.m. due to a high water level in Iron Oxidation Reactor Number 1 (T-301A). Scale build-up on the valve was discovered restricting flow. The scale was removed from the valve. Extraction system downtime was 4 hours 46 minutes.
- **November 30, 2017 (planned):** The extraction well system was offline from 1:30 p.m. to 1:38 p.m. due to testing of the spare pipeline critical alarms and leak detection system probes 7 and 8. Extraction system downtime was 8 minutes.

December 2017

During December 2017, extraction wells TW-2S, TW-2D, TW-3D, and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S, TW-2D, and PE-01 were only operated to collect a sample during December 2017. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 98.5 percent during the December 2017 reporting period.

The IM-3 facility treated approximately 5,909,308 gallons of extracted groundwater during December 2017. The IM-3 facility treated 6,175 gallons of purge water during May 2017. Two containers of solids from the IM No. 3 facility were transported offsite during December 2017.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 1.5 percent downtime during December 2017) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **December 1, 2017 (planned):** The extraction system was offline from 7:50 a.m. to 8:00 a.m., from 8:02 a.m. to 8:14 a.m. and from 8:18 a.m. to 8:22 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 26 minutes.
- **December 1, 2017 (planned):** The extraction well system was offline from 9:46 a.m. to 10:36 a.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 50 minutes.
- **December 4, 2017 (unplanned):** The extraction system was offline from 5:50 a.m. to 6:02 a.m. and from 1:10 p.m. to 1:24 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 26 minutes.
- **December 4, 2017 (unplanned):** The extraction system was offline from 10:36 p.m. to 11:22 p.m. to lower the water level in Raw Water Storage Tank (T-100). See last bullet below describing December 21 outage for cleaning. Extraction system downtime was 46 minutes.
- **December 6, 2017 (unplanned):** The extraction system was offline from 3:32 a.m. to 4:34 a.m. to lower the water level in Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 2 minutes.
- **December 8, 2017 (planned):** The extraction well system was offline from 9:20 a.m. to 10:12 a.m. to change out the microfilter modules due to high transmembrane pressure and to repair the Iron Oxidation Reactor No. 1 (T-301A) high level alarm. Corrosion formed on the level sensor at T-301A causing it to stay in constant alarm. The sensor was cleaned and returned to service. Extraction system downtime was 52 minutes.
- **December 18, 2017 (planned):** The extraction well system was offline from 9:38 a.m. to 11:48 a.m. to change out primary Reverse Osmosis membranes due to fouling. Extraction system downtime was 2 hours 10 minutes.
- **December 19, 2017 (planned):** The extraction well system was offline from 7:16 a.m. to 10:40 a.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 3 hours 24 minutes.
- **December 21, 2017 (unplanned):** The extraction system was offline from 2:16 p.m. to 2:32 p.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 16 minutes.
- **December 21, 2017 (unplanned):** The extraction system was offline from 2:36 p.m. to 3:48 p.m. to lower the water level in Raw Water Storage Tank (T-100). There was a flow restriction at the discharge of the Chromium Reduction Reactor (T-300). Personnel had to wait for a man lift to arrive due to the height of the restriction. Extraction system downtime was 1 hour 12 minutes.

Appendix B
Daily Volumes of Groundwater Treated

July 2017 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	2017	--	--	193,044	0	193,044	0	190,065	190,065	3,846
July	2	2017	--	--	192,851	0	192,851	0	189,283	189,283	0
July	3	2017	--	--	192,631	0	192,631	0	188,608	188,608	6,164
July	4	2017	--	--	192,429	0	192,429	0	189,176	189,176	2,000
July	5	2017	--	--	192,446	0	192,446	0	188,535	188,535	3,166
July	6	2017	--	--	180,986	0	180,986	0	175,897	175,897	0
July	7	2017	--	--	191,205	0	191,205	0	189,905	189,905	3,297
July	8	2017	--	--	192,134	0	192,134	0	194,873	194,873	0
July	9	2017	--	--	192,977	0	192,977	0	193,717	193,717	3,127
July	10	2017	--	--	192,381	0	192,381	0	187,137	187,137	3,196
July	11	2017	--	--	192,068	0	192,068	0	188,470	188,470	0
July	12	2017	--	--	191,827	0	191,827	0	191,755	191,755	4,720
July	13	2017	--	--	191,737	0	191,737	0	186,945	186,945	0
July	14	2017	--	--	191,442	0	191,442	0	189,880	189,880	3,790
July	15	2017	--	--	191,158	0	191,158	0	189,371	189,371	0
July	16	2017	--	--	192,947	0	192,947	0	190,065	190,065	4,588
July	17	2017	--	--	195,076	0	195,076	0	190,650	190,650	2,480
July	18	2017	--	--	194,134	309	194,443	0	191,012	191,012	0
July	19	2017	--	--	194,167	0	194,167	0	191,425	191,425	3,482
July	20	2017	--	--	193,888	0	193,888	0	191,467	191,467	0
July	21	2017	--	--	193,505	0	193,505	0	191,739	191,739	4,179
July	22	2017	--	--	192,216	0	192,216	0	191,705	191,705	0
July	23	2017	--	--	195,584	0	195,584	0	193,509	193,509	4,462
July	24	2017	--	--	184,920	0	184,920	0	194,441	194,441	2,714
July	25	2017	--	--	184,858	0	184,858	0	189,276	189,276	0
July	26	2017	--	--	175,202	0	175,202	0	152,741	152,741	5,333
July	27	2017	--	--	188,145	6,707	194,852	0	194,338	194,338	0
July	28	2017	--	--	189,766	0	189,766	0	195,729	195,729	0
July	29	2017	--	--	175,388	18,463	193,851	0	195,080	195,080	0
July	30	2017	--	--	158,450	34,697	193,147	0	186,103	186,103	4,643
July	31	2017	--	--	158,271	34,161	192,432	0	191,265	191,265	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,837,836**	**94,336**	**5,932,172**	**0**	**5,864,163**	**5,864,163**	**65,186**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**130.8**	**2.1**	**132.9**	**0.0**	**131.4**	**131.4**	**1.5**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during July 2017 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 2017.

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 2017 is approximately 0.05 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 2017 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	2017	--	--	177,377	16,960	194,337	0	193,382	193,382	0
August	2	2017	--	--	185,657	10,895	196,551	0	191,488	191,488	0
August	3	2017	--	--	147,158	33,118	180,275	0	177,668	177,668	0
August	4	2017	--	--	157,362	33,277	190,639	0	190,772	190,772	0
August	5	2017	--	--	157,435	32,580	190,015	0	193,069	193,069	0
August	6	2017	--	--	157,547	32,359	189,906	0	196,180	196,180	0
August	7	2017	--	--	154,653	32,293	186,946	0	191,048	191,048	0
August	8	2017	--	--	157,927	32,735	190,662	0	184,448	184,448	0
August	9	2017	--	--	180,851	12,597	193,447	0	188,837	188,837	0
August	10	2017	--	--	195,643	0	195,643	0	189,744	189,744	0
August	11	2017	--	--	195,298	0	195,298	0	190,605	190,605	4,763
August	12	2017	--	--	194,733	0	194,733	0	195,410	195,410	0
August	13	2017	--	--	194,560	0	194,560	0	196,094	196,094	4,076
August	14	2017	--	--	177,723	0	177,723	0	166,910	166,910	0
August	15	2017	--	--	194,158	0	194,158	119,143	79,766	198,909	3,872
August	16	2017	--	--	193,801	0	193,801	195,496	0	195,496	0
August	17	2017	--	--	194,050	0	194,050	196,202	0	196,202	3,975
August	18	2017	--	--	193,665	0	193,665	195,643	0	195,643	0
August	19	2017	--	--	192,665	0	192,665	194,879	0	194,879	3,898
August	20	2017	--	--	192,303	0	192,303	188,988	0	188,988	0
August	21	2017	--	--	49,994	0	49,994	67,285	0	67,285	0
August	22	2017	--	--	0	0	0	0	0	0	0
August	23	2017	--	--	0	0	0	0	0	0	0
August	24	2017	--	--	107,479	0	107,479	67,720	37,844	105,564	4,961
August	25	2017	--	--	189,192	0	189,192	125,173	64,351	189,524	0
August	26	2017	--	--	162,720	21,936	184,657	0	198,714	198,714	0
August	27	2017	--	--	147,696	32,224	179,919	70,598	112,041	182,639	2,985
August	28	2017	--	--	145,538	39,974	185,512	191,653	0	191,653	0
August	29	2017	--	--	135,074	41,524	176,598	177,582	0	177,582	685
August	30	2017	--	--	149,864	45,633	195,497	191,140	0	191,140	0
August	31	2017	--	--	133,930	40,686	174,615	183,420	0	183,420	0
Total Monthly Volumes (gallons)			**0**	**0**	**4,816,052**	**458,790**	**5,274,842**	**2,164,924**	**3,138,372**	**5,303,296**	**29,215**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**107.9**	**10.3**	**118.2**	**48.5**	**70.3**	**118.8**	**0.7**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during August 2017 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 2017.

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 August 2017 is approximately 1.09 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 2017 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	2017	--	--	176,012	14,442	190,454	185,119	0	185,119	1,068
September	2	2017	--	--	179,627	0	179,627	185,051	0	185,051	0
September	3	2017	--	--	194,294	0	194,294	190,132	0	190,132	173
September	4	2017	--	--	194,619	0	194,619	182,902	0	182,902	3,648
September	5	2017	--	--	177,094	0	177,094	176,938	0	176,938	4,693
September	6	2017	--	--	194,512	0	194,512	186,294	0	186,294	0
September	7	2017	--	--	193,251	346	193,597	189,492	0	189,492	5,317
September	8	2017	--	--	192,542	0	192,542	188,656	0	188,656	0
September	9	2017	--	--	194,532	0	194,532	186,546	0	186,546	0
September	10	2017	--	--	193,000	0	193,000	193,764	0	193,764	3,671
September	11	2017	--	--	192,707	0	192,707	196,426	0	196,426	0
September	12	2017	--	--	192,474	0	192,474	187,177	0	187,177	4,816
September	13	2017	--	--	153,207	0	153,207	161,865	0	161,865	0
September	14	2017	--	--	185,504	0	185,504	169,284	0	169,284	2,912
September	15	2017	--	--	191,378	0	191,378	192,585	0	192,585	0
September	16	2017	--	--	191,068	0	191,068	186,960	0	186,960	4,642
September	17	2017	--	--	190,999	0	190,999	186,630	0	186,630	0
September	18	2017	--	--	190,882	0	190,882	181,305	0	181,305	3,753
September	19	2017	--	--	174,706	0	174,706	175,069	0	175,069	0
September	20	2017	--	--	190,776	0	190,776	182,792	0	182,792	3,922
September	21	2017	--	--	190,504	0	190,504	190,962	0	190,962	0
September	22	2017	--	--	190,253	0	190,253	177,269	0	177,269	3,846
September	23	2017	--	--	190,032	0	190,032	195,062	0	195,062	0
September	24	2017	--	--	192,403	0	192,403	187,122	0	187,122	4,079
September	25	2017	--	--	193,139	0	193,139	179,839	0	179,839	0
September	26	2017	--	--	185,164	0	185,164	189,504	0	189,504	3,957
September	27	2017	--	--	179,986	0	179,986	177,800	0	177,800	5,085
September	28	2017	--	--	193,295	0	193,295	190,734	0	190,734	0
September	29	2017	--	--	193,026	0	193,026	190,667	0	190,667	0
September	30	2017	--	--	192,724	0	192,724	189,743	0	189,743	4,078
Total Monthly Volumes (gallons)			**0**	**0**	**5,643,708**	**14,788**	**5,658,496**	**5,553,687**	**0**	**5,553,687**	**59,659**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**130.6**	**0.3**	**131.0**	**128.6**	**0.0**	**128.6**	**1.4**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during September 2017 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 2017.

b. Effluent was discharged into injection well IW-02.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during September 2017 is approximately 0.8 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 2017 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	2017	--	--	192,724	0	192,724	185,697	0	185,697	0
October	2	2017	--	--	192,667	0	192,667	188,440	0	188,440	3,897
October	3	2017	--	--	163,429	1,172	164,602	157,799	0	157,799	0
October	4	2017	--	--	187,868	0	187,868	184,938	0	184,938	3,641
October	5	2017	--	--	175,141	0	175,141	178,033	0	178,033	1,390
October	6	2017	--	--	194,649	0	194,649	185,450	0	185,450	0
October	7	2017	--	--	189,073	0	189,073	186,916	0	186,916	4,218
October	8	2017	--	--	183,987	0	183,987	182,755	0	182,755	0
October	9	2017	--	--	162,179	0	162,179	160,201	0	160,201	0
October	10	2017	--	--	186,098	0	186,098	181,656	0	181,656	4,117
October	11	2017	--	--	195,562	0	195,562	183,504	0	183,504	0
October	12	2017	--	--	193,792	0	193,792	184,268	0	184,268	4,484
October	13	2017	--	--	189,294	0	189,294	189,166	0	189,166	0
October	14	2017	--	--	181,852	0	181,852	186,676	0	186,676	3,829
October	15	2017	--	--	193,494	0	193,494	189,831	0	189,831	0
October	16	2017	--	--	193,396	0	193,396	189,408	0	189,408	4,779
October	17	2017	--	--	193,291	0	193,291	189,302	0	189,302	0
October	18	2017	--	--	192,924	0	192,924	189,260	0	189,260	0
October	19	2017	--	--	193,220	0	193,220	188,895	0	188,895	3,956
October	20	2017	--	--	193,156	0	193,156	188,521	0	188,521	0
October	21	2017	--	--	183,442	0	183,442	178,590	0	178,590	4,002
October	22	2017	--	--	193,200	0	193,200	187,632	0	187,632	0
October	23	2017	--	--	184,670	0	184,670	185,225	0	185,225	3,886
October	24	2017	--	--	173,365	0	173,365	168,442	0	168,442	0
October	25	2017	--	--	193,143	0	193,143	186,212	0	186,212	0
October	26	2017	--	--	192,732	0	192,732	186,727	0	186,727	4,008
October	27	2017	--	--	192,420	0	192,420	186,728	0	186,728	0
October	28	2017	--	--	192,089	0	192,089	186,700	0	186,700	0
October	29	2017	--	--	192,049	0	192,049	197,020	0	197,020	4,044
October	30	2017	--	--	194,188	0	194,188	187,417	0	187,417	0
October	31	2017	--	--	172,747	0	172,747	171,528	0	171,528	4,008
Total Monthly Volumes (gallons)			**0**	**0**	**5,811,842**	**1,172**	**5,813,015**	**5,692,934**	**0**	**5,692,934**	**54,259**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**130.2**	**0.0**	**130.2**	**127.5**	**0.0**	**127.5**	**1.2**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during October 2017 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 2017.

b. Effluent was discharged into injection well IW-02.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during October 2017 is approximately 1.13 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 2017 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	2017	--	--	195,102	0	195,102	186,992	0	186,992	0
November	2	2017	--	--	194,541	532	195,074	187,756	0	187,756	0
November	3	2017	--	--	194,315	0	194,315	188,879	0	188,879	4,007
November	4	2017	--	--	193,789	0	193,789	187,784	0	187,784	0
November	5	2017	--	--	193,407	0	193,407	188,386	0	188,386	0
November	6	2017	--	--	193,138	0	193,138	192,167	0	192,167	4,002
November	7	2017	--	--	192,859	0	192,859	193,456	0	193,456	0
November	8	2017	--	--	191,728	0	191,728	199,211	0	199,211	0
November	9	2017	--	--	156,976	0	156,976	154,938	0	154,938	5,279
November	10	2017	--	--	187,541	0	187,541	184,442	0	184,442	0
November	11	2017	--	--	194,654	0	194,654	188,452	0	188,452	0
November	12	2017	--	--	194,674	0	194,674	191,002	0	191,002	0
November	13	2017	--	--	194,608	0	194,608	194,272	0	194,272	4,064
November	14	2017	--	--	194,588	0	194,588	193,687	0	193,687	0
November	15	2017	--	--	194,471	0	194,471	193,753	0	193,753	3,879
November	16	2017	--	--	191,543	0	191,543	182,600	6,069	188,669	0
November	17	2017	--	--	194,290	0	194,290	117,728	76,494	194,222	0
November	18	2017	--	--	183,718	0	183,718	0	193,903	193,903	3,686
November	19	2017	--	--	194,560	0	194,560	0	194,232	194,232	0
November	20	2017	--	--	194,315	0	194,315	0	193,516	193,516	0
November	21	2017	--	--	175,221	0	175,221	0	178,710	178,710	3,956
November	22	2017	--	--	155,574	0	155,574	0	140,415	140,415	0
November	23	2017	--	--	194,098	0	194,098	0	194,354	194,354	0
November	24	2017	--	--	193,726	0	193,726	0	191,170	191,170	4,042
November	25	2017	--	--	193,450	0	193,450	0	191,820	191,820	0
November	26	2017	--	--	193,238	0	193,238	0	193,072	193,072	0
November	27	2017	--	--	193,060	0	193,060	0	194,032	194,032	3,888
November	28	2017	--	--	192,596	0	192,596	0	190,317	190,317	0
November	29	2017	--	--	192,094	0	192,094	0	189,940	189,940	0
November	30	2017	--	--	190,546	0	190,546	0	190,412	190,412	4,026
Total Monthly Volumes (gallons)			**0**	**0**	**5,698,421**	**532**	**5,698,953**	**3,125,507**	**2,518,456**	**5,643,963**	**40,830**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**131.9**	**0.0**	**131.9**	**72.3**	**58.3**	**130.6**	**0.9**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during November 2017 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 2017.

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 November 2017 is approximately 0.25 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

December 2017 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	2017	--	--	185,484	0	185,484	0	185,869	185,869	0
December	2	2017	--	--	198,702	0	198,702	0	193,377	193,377	3,597
December	3	2017	--	--	198,820	0	198,820	0	192,610	192,610	0
December	4	2017	--	--	187,528	0	187,528	0	187,355	187,355	0
December	5	2017	--	--	196,417	0	196,417	0	186,355	186,355	3,804
December	6	2017	--	--	188,131	0	188,131	0	185,938	185,938	0
December	7	2017	581	188	194,473	618	195,859	0	180,340	180,340	0
December	8	2017	--	--	187,746	0	187,746	0	184,512	184,512	3,344
December	9	2017	--	--	194,874	0	194,874	0	187,717	187,717	0
December	10	2017	--	--	194,664	0	194,664	0	184,479	184,479	0
December	11	2017	--	--	194,460	0	194,460	0	195,818	195,818	3,783
December	12	2017	--	--	194,065	0	194,065	0	181,242	181,242	0
December	13	2017	--	--	193,696	0	193,696	0	188,767	188,767	0
December	14	2017	--	--	193,376	0	193,376	0	197,333	197,333	4,013
December	15	2017	--	--	192,985	0	192,985	0	195,517	195,517	0
December	16	2017	--	--	192,443	0	192,443	0	190,618	190,618	0
December	17	2017	--	--	192,008	0	192,008	0	191,794	191,794	4,005
December	18	2017	--	--	174,410	0	174,410	0	176,815	176,815	0
December	19	2017	--	--	164,711	0	164,711	0	165,979	165,979	0
December	20	2017	--	--	191,996	0	191,996	0	189,529	189,529	3,885
December	21	2017	--	--	180,004	0	180,004	0	190,216	190,216	0
December	22	2017	--	--	191,968	0	191,968	0	190,786	190,786	0
December	23	2017	--	--	191,913	0	191,913	0	194,554	194,554	3,657
December	24	2017	--	--	191,798	0	191,798	0	194,207	194,207	0
December	25	2017	--	--	191,745	0	191,745	0	194,157	194,157	0
December	26	2017	--	--	191,504	0	191,504	0	194,298	194,298	3,861
December	27	2017	--	--	191,156	0	191,156	0	194,429	194,429	0
December	28	2017	--	--	191,279	0	191,279	0	194,335	194,335	0
December	29	2017	--	--	191,894	0	191,894	0	194,086	194,086	3,929
December	30	2017	--	--	191,885	0	191,885	0	194,264	194,264	0
December	31	2017	--	--	191,787	0	191,787	0	194,042	194,042	3,671
Total Monthly Volumes (gallons)			**581**	**188**	**5,907,921**	**618**	**5,909,308**	**0**	**5,871,334**	**5,871,334**	**41,550**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**132.3**	**0.0**	**132.4**	**0.0**	**131.5**	**131.5**	**0.9**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during December 2017 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were operated during December 2017.

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

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during December 2017 is approximately 0.06 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.

Appendix C
Flowmeter Calibration Records

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

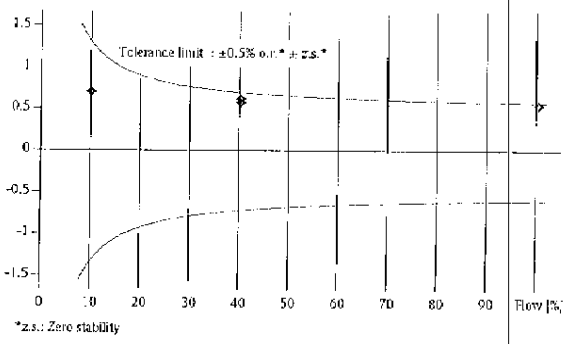
92009494-1275190

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

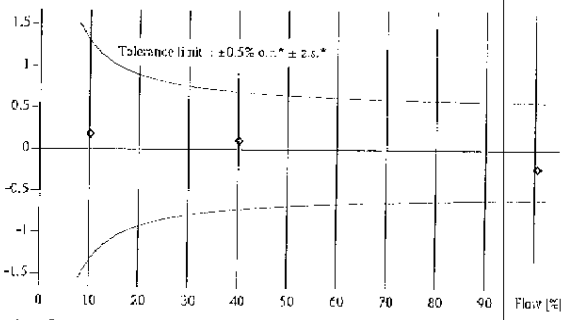
92009500-1304797

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.
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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

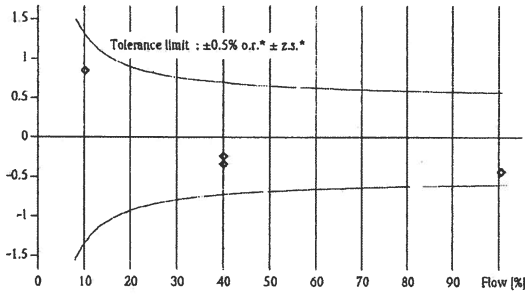
92010359-1304705

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

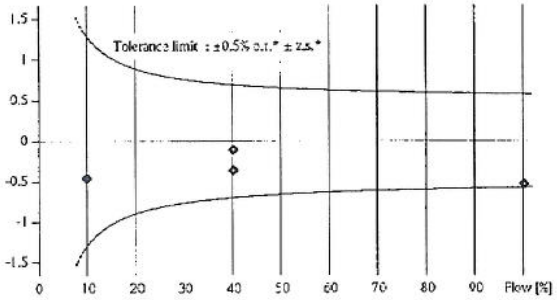
92004350-1275192

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

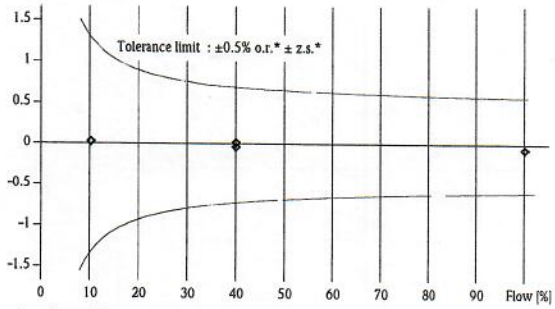
92010358-1304709

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

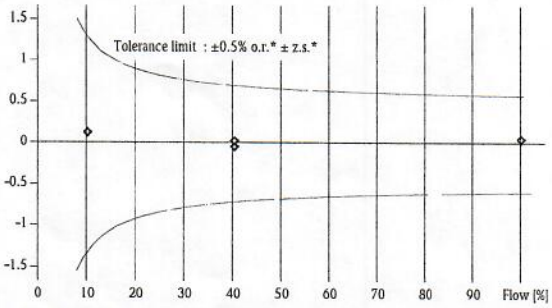
92013941-1385272

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

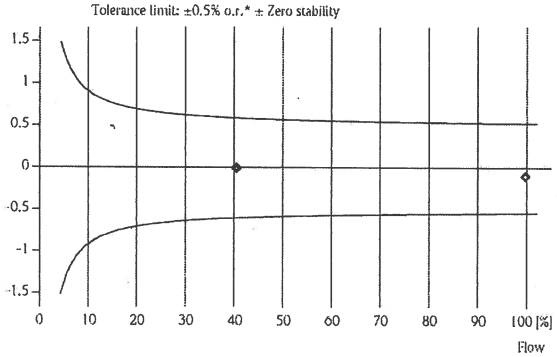
Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
40.2	160.154	65.1	173.658	173.655	0.00	10.43
40.2	160.198	65.1	173.705	173.717	0.01	10.43
99.6	396.900	65.1	430.394	430.000	-0.09	19.93
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-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

*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

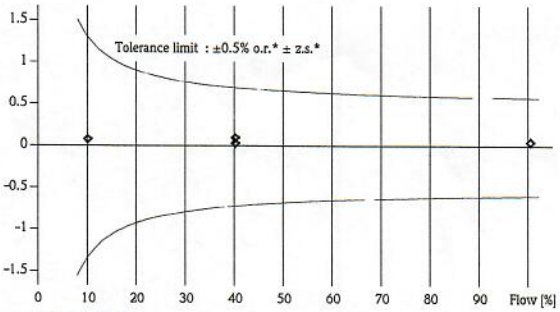
WWRA-018498-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601535048-200 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9227 Calibration factor
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 2017
Laboratory Analytical Reports

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-WDR 566	11-7-17	10:20	11-7-17	10:26	HQ440D	11-7-17	0030	-52.94	Ron Phelps	7.04
Notes:											
2	SC-700B-WDR 566	11-7-17	10:24	11-7-17	10:28	HQ440D	11-7-17	0030	-52.94	Ron Phelps	6.95
Notes:											
3	SC-100B-WDR 567	12-5-17	13:40	12-5-17	1345	HQ440D	12-5-17	0030	-52.96	Ron Phelps	7.03
Notes:											
4	SC-700B-WDR 567	12-5-17	1342	12-5-17	1346	HQ440D	12-5-17	0030	-52.96	Ron Phelps	7.01
Notes:											
5											
Notes:											
6											
Notes:											
7											
Notes:											

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

Analytical Bench Log Book

WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

	Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1	SC-700BWDR563	8-24-17	1345	8-24-17	1352	HQ440D	8-24-17	1202	-54.53	Josh R	7.12
Notes:											
2	SC-700B-WDR564	9-5-17	10:00	9-5-17	10:10	HQ440D	9-5-17	0030	-55.39	Ron Phelps	6.89
Notes:											
3	SC-100B-WDR564	9-5-17	10:05	9-5-17	10:12	HQ440D	9-5-17	0030	-55.39	Ron Phelps	7.11
Notes:											
4	SC-701-WDR565	10-3-17	~~10-3-17~~ 1232	10-3-17	1236	HQ440D	10-3-17	0030	-54.01	G. Gloria	8.49
Notes:											
5	SC-700B-WDR-565	10-3-17	1240	10-3-17	1245	HQ440D	10-3-17	0030	-54.01	G. Gloria	7.86
Notes:											
6	SC-100B-WDR-565	10-3-17	1252	10-3-17	1259	HQ440D	10-3-17	0030	-54.01	G. Gloria	7.25
Notes:											
7											
Notes:											

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING
Established 1931
3337 MICHELSON DRIVE, SUITE CN 750
IRVINE, CA 92612
(714) 730-6239 • FAX (714) 730-6462
www.truesdail.com

REPORT

Client: **Advanced Technology Laboratories-NV**
3151 W Post Rd
Las Vegas, NV 89118
Attention: Marlon Cartin
Project Name: ATL-NV

Work Order No.: 17J0123
Printed: 11/28/2017

CASE NARRATIVE

Truesdail Laboratories, Inc. is pleased to submit this report summarizing the Ammonia analyses. A summary table for this laboratory number is included in Section 2. Complete laboratory reports, wet chemistry raw data, quality control data and chain of custody forms for sampling period are included in Sections 3 and 4. Analytical raw data are under Section 5.

The samples were received and delivered with the chain of custody on October 5th, 2017, intact and in chilled condition. The samples will be kept in a locked refrigerator for 30 days; thereafter will be kept in warm storage for additional 2 months before disposal.

If you have any questions or require additional information, please contact me at (714) 730-6239 ext. 203.

SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
N026257-001A / SC-100B-WDR-565	17J0123-01	Water		10/03/2017 12:48	10/05/2017 08:30
N026257-002A / SC-700B-WDR-565	17J0123-02	Water		10/03/2017 12:40	10/05/2017 08:30

DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Shelly Brady
Customer Service Manager

N026257-001A / SC-100B-WDR-565

17J0123-01 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	**0.0681**	0.0500	mg/L	1	1710313	10/12/2017 16:34	Alexander Luna	SM 4500-NH3 D M	

N026257-002A / SC-700B-WDR-565

17J0123-02 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	ND	0.0500	mg/L	1	1710313	10/12/2017 16:36	Alexander Luna	SM 4500-NH3 D M	

TRUESDAIL LABORATORIES, INC.

Client: Advanced Technology Laboratories-N Project Name: ATL-NV
Project Number: [none]

Printed: 11/28/2017

QUALITY CONTROL

Wet Chemistry

Truesdail Laboratories, Inc

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	% Rec Limits	RPD	RPD Limit	Note
Batch: 1710313 - SM 4500-NH3 D M										
Blank (1710313-BLK1)				Prepared & Analyzed: 10/12/2017						
Ammonia	ND	0.0500	mg/L							
LCS (1710313-BS1)				Prepared & Analyzed: 10/12/2017						
Ammonia	0.422	0.0500	mg/L	0.400		105	90-110			
Duplicate (1710313-DUP1)		**Source: 17J0235-01**		Prepared & Analyzed: 10/12/2017						
Ammonia	24.1	2.50	mg/L		24.8			3	20	
Matrix Spike (1710313-MS1)		**Source: 17J0010-03**		Prepared & Analyzed: 10/12/2017						
Ammonia	0.436	0.0500	mg/L	0.400	0.0380	99	75-125			
Matrix Spike Dup (1710313-MSD1)		**Source: 17J0010-03**		Prepared & Analyzed: 10/12/2017						
Ammonia	0.443	0.0500	mg/L	0.400	0.0380	101	75-125	2	20	

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N026257-001A / SC-100B-WDR-565**
Lab Sample ID: **17J0123-01**
Project: **ATL-NV**

Date Sampled: 10/03/17 12:48 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	0.0681	0.0111	0.0500	1		AxL	10/12/17 16:34	SM 4500-NH3 D M

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N026257-002A / SC-700B-WDR-565**
Lab Sample ID: **17J0123-02**
Project: **ATL-NV**

Date Sampled: 10/03/17 12:40 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	ND	0.0111	0.0500	1		AxL	10/12/17 16:36	SM 4500-NH3 D M

METHOD BLANK DATA SHEET

SM 4500-NH3 D M

Client: Advanced Technology Laboratories-NV

Project: ATL-NV
Laboratory ID: 1710313-BLK1

Prepared:	10/12/17 14:30	Preparation:	SM 4500-NH3 D M	Matrix:	Water
Analyzed:	10/12/17 16:13	Instrument:	TOC01	File ID:	7J12002-023
Batch:	1710313	Sequence:	7J12002		

CAS NO.	COMPOUND	CONC. (mg/L)	MDL	RL	Q
7664-41-7	Ammonia	ND	0.0111	0.0500	

LCS / LCS DUPLICATE RECOVERY

SM 4500-NH3 D M

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **17J0123**

Matrix: Water
Prep Method: SM 4500-NH3 D M
Prep Batch: 1710313
Lab Sample ID: 1710313-BS1

ANALYTE	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC.	QC LIMITS REC.
Ammonia	0.400	0.422	105	90 - 110

* Values outside of QC limits

DUPLICATES

Duplicate

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**

Matrix:	Water	Laboratory ID:	1710313-DUP1
Prep Batch:	1710313	Initial/Final:	1 mL / 50 mL
Prep Method:	SM 4500-NH3 D M	Analysis:	SM 4500-NH3 D M

ANALYTE	SAMPLE CONCENTRATION (mg/L)	DUPLICATE CONCENTRATION (mg/L)	RPD %	Q	CONTROL LIMIT
Ammonia	24.8	24.1	3		20

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **17J0123**

Matrix: Water
Prep Batch: 1710313

Analysis Method: SM 4500-NH3 D M
Prep Method: SM 4500-NH3 D M
Laboratory ID: 1710313-MS1
Source Sample ID: 17J0010-03

ANALYTE	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC.	QC LIMITS REC.
Ammonia	0.400	0.0380	0.436	99	75 - 125

ANALYTE	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC. #	% RPD	QC LIMITS RPD	QC LIMITS REC.
Ammonia	0.400	0.443	101	2	20	75 - 125

* Values outside of QC limits

17J0123

CHAIN-OF-CUSTODY RECORD

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

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

04-Oct-17

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N026257-001A / SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	32OZP	1		
N026257-002A / SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	32OZP	1		

ALERT !!
Level IV QC

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

Please use PO#:N26257A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill samples. EDD Requirement Labspec7 edata.

5.0 °C

GSO #: 537863257

		Date/Time			Date/Time
Relinquished by:	[illegible]	10/4/2017 17:00	**Received by:**	[illegible]	10-5-17 8:30
Relinquished by:			**Received by:**		

Log-in check list
For level III data package

Client: ATL Lab Number: 17J0123

Received Date: 10-5-17

Sample receiving review	Yes	No	N/A	Comment
Was special login form received by login personnel?	✓			
Was COC received and signed by client and login personnel?	✓			
Were all sampls temperature measured and recorded on COC?	✓			
Did you measure and record the pH on all metals samples on COC?			✓	
Has sample integrity and analysis discrepancy form been filled out completely?	✓			
Were all interacompany yellow forms generated and stamped with **" alert level III QC"** note?	✓			
Have check -in and check out lists been filled out and attached to appropriate form?	✓			
Were sample containers labeled with TLI numbers, date, and time sampled?	✓			
Did you notify analyst or group leader about short holding time?			✓	
Was a copy of COC attached to all yellow intracompany form?	✓			
For special clients, have all their samples been logged into the internal COC book?	✓			
Were samples locked in fridge or special storage area?	✓			
Was temperature recorded in the log book?	✓			

Sample receiving Signature: J Brown

ALERT !!
Level IV QC

WORK ORDER

Printed: 10/5/17 9:11:03AM

17J0123

Truesdail Laboratories, Inc

Client: Advanced Technology Laboratories-NV
Project: ATL-NV

Project Manager: Shelly Brady
Project Number: [none]

Report To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone: (702) 307-2659
Fax: (702) 307-2691

Invoice To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone :(702) 307-2659
Fax: (702) 307-2691

Date Due: 10/16/2017 16:30 (7 day TAT)

Received By: Jacqueline Brown
Date Received: 10/05/2017 08:30

Logged In By: Jacqueline Brown
Date Logged In: 10/05/2017 09:00

Samples Received at: 5°C

Chain of Custody rece	Yes	Samples intact?	Yes
Letter (if sent) matche	No	Custody seals (if any)	No
Requested analyses ac	Yes	Analyses within hold t	Yes
Samples received in a	Yes		

Analysis	Due	TAT	Expires	Comments
17J0123-01 N026257-001A / SC-100B-WDR-565 [Water] Sampled 10/03/2017 12:48 (GMT-08:00) Pacific Time (US &				
Ammonia E	10/16/2017 08:00	7	10/31/2017 12:48	
17J0123-02 N026257-002A / SC-700B-WDR-565 [Water] Sampled 10/03/2017 12:40 (GMT-08:00) Pacific Time (US &				
Ammonia E	10/16/2017 08:00	7	10/31/2017 12:40	

Reviewed By

10/05/17
Date

PREPARATION BATCH SUMMARY

SM 4500-NH3 D M

Laboratory: Truesdail Laboratories, Inc

Client: Advanced Technology Laboratories-NV Project: ATL-NV

Batch: 1710313 Batch Matrix: Water Preparation: SM 4500-NH3 D M

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	1710313-BLK1	10/12/17 14:30	50.00	50.00
LCS	1710313-BS1	10/12/17 14:30	50.00	50.00
Duplicate	1710313-DUP1	10/12/17 14:30	1.00	50.00
Matrix Spike	1710313-MS1	10/12/17 14:30	50.00	50.00
Matrix Spike Dup	1710313-MSD1	10/12/17 14:30	50.00	50.00
N026257-001A / SC-100B-WDR-5	17J0123-01	10/12/17 14:30	50.00	50.00
N026257-002A / SC-700B-WDR-5	17J0123-02	10/12/17 14:30	50.00	50.00

October 18, 2017

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

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

Workorder No.: N026257

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 03, 2017 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 Lilucas for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N026257

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to Truesdail-Irvine,CA.

Analytical Comments for EPA 200.8:

Dilution was necessary on some analytes for sample N026257-003 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.

Analytical Comments for EPA 218.6:

Dilution was necessary for sample N026257-003 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.

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EPA ID CA01638
NEVADA | P:702.307.2659 F:702.307.2691
3151 W. Post Rd., Las Vegas, NV 89118
ELAP Cert 2676 | NV Cert NV00922
ORELAP/NELAP Cert 4046

ASSET Laboratories

Date: *18-Oct-17*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N026257
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N026257-001A	SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	10/3/2017	10/18/2017
N026257-001B	SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	10/3/2017	10/18/2017
N026257-001C	SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	10/3/2017	10/18/2017
N026257-001D	SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	10/3/2017	10/18/2017
N026257-001E	SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	10/3/2017	10/18/2017
N026257-002A	SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	10/3/2017	10/18/2017
N026257-002B	SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	10/3/2017	10/18/2017
N026257-002C	SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	10/3/2017	10/18/2017
N026257-002D	SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	10/3/2017	10/18/2017
N026257-002E	SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	10/3/2017	10/18/2017
N026257-003A	SC-701-WDR-565	Water	10/3/2017 12:30:00 PM	10/3/2017	10/18/2017
N026257-003B	SC-701-WDR-565	Water	10/3/2017 12:30:00 PM	10/3/2017	10/18/2017
N026257-003C	SC-701-WDR-565	Water	10/3/2017 12:30:00 PM	10/3/2017	10/18/2017

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ELAP Cert 2676 | NV Cert NV00922
ORELAP/NELAP Cert 4046

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ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_171004A**	QC Batch: **R118287**			PrepDate			Analyst: **LR**
Specific Conductance	7400	0.10	0.10		umhos/cm	1	10/4/2017 09:25 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_171004A**	QC Batch: **R118287**			PrepDate			Analyst: **LR**
Specific Conductance	7300	0.10	0.10		umhos/cm	1	10/4/2017 09:25 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:30:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_171004A** QC Batch: **R118287** PrepDate Analyst: **LR**							
Specific Conductance	57000	0.10	0.10		umhos/cm	1	10/4/2017 09:25 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: *18-Oct-17*

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N026257-003ADUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **118287**
Client ID: **ZZZZZZ** Batch ID: **R118287** TestNo: **EPA 120.1** Analysis Date: **10/4/2017** SeqNo: **2780498**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	56800.000	0.10						57000	0.351	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_171004F** QC Batch: **64041** PrepDate **10/4/2017** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4300	50	50		mg/L	1	10/4/2017 01:15 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_171004F**	QC Batch: **64041**				PrepDate	**10/4/2017**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4100	50	50		mg/L	1	10/4/2017 01:15 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:30:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_171004F**	QC Batch: **64041**				PrepDate	**10/4/2017**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	40000	500	500		mg/L	1	10/4/2017 01:15 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		

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	LCS-64041	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/4/2017	RunNo:	118292
Client ID:	LCSW	Batch ID:	64041	TestNo:	SM2540C			Analysis Date:	10/4/2017	SeqNo:	2783384

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	985.000	10	1000	0	98.5	80	120				

Sample ID	MB-64041	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/4/2017	RunNo:	118292
Client ID:	PBW	Batch ID:	64041	TestNo:	SM2540C			Analysis Date:	10/4/2017	SeqNo:	2783385

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	N026257-003ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	10/4/2017	RunNo:	118292
Client ID:	ZZZZZZ	Batch ID:	64041	TestNo:	SM2540C			Analysis Date:	10/4/2017	SeqNo:	2783393

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	41800.000	500						40300	3.65	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_171014B** QC Batch: **64146** PrepDate **10/11/2017** Analyst: **CEI**							
Aluminum	ND	2.7	50		µg/L	1	10/14/2017 08:32 AM
Boron	1100	38	100		µg/L	1	10/14/2017 08:32 AM
Iron	ND	1.8	20		µg/L	1	10/14/2017 08:32 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_171014B** QC Batch: **64146** PrepDate **10/11/2017** Analyst: **CEI**							
Aluminum	ND	2.7	50		µg/L	1	10/14/2017 08:38 AM
Boron	1100	38	100		µg/L	1	10/14/2017 08:38 AM
Iron	ND	1.8	20		µg/L	1	10/14/2017 08:38 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: *18-Oct-17*

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-64146** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118580**
Client ID: **PBW** Batch ID: **64146** TestNo: **EPA 200.7** Analysis Date: **10/14/2017** SeqNo: **2794913**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									
Boron	ND	100									
Iron	6.591	20									

Sample ID **LCS1-64146** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118580**
Client ID: **LCSW** Batch ID: **64146** TestNo: **EPA 200.7** Analysis Date: **10/14/2017** SeqNo: **2794914**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10137.960	50	10000	0	101	85	115				
Boron	4946.288	100	5000	0	98.9	85	115				
Iron	109.428	20	100.0	0	109	85	115				

Sample ID **N026256-001B-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118580**
Client ID: **ZZZZZZ** Batch ID: **64146** TestNo: **EPA 200.7** Analysis Date: **10/14/2017** SeqNo: **2794918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9505.824	50	10000	0	95.1	75	125				
Boron	5322.905	100	5000	500.8	96.4	75	125				
Iron	387.553	20	100.0	293.2	94.3	75	125				

Sample ID **N026256-001B-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118580**
Client ID: **ZZZZZZ** Batch ID: **64146** TestNo: **EPA 200.7** Analysis Date: **10/14/2017** SeqNo: **2794919**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9570.181	50	10000	0	95.7	75	125	9506	0.675	20	
Boron	5332.272	100	5000	500.8	96.6	75	125	5323	0.176	20	
Iron	390.353	20	100.0	293.2	97.1	75	125	387.6	0.720	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136** PrepDate **10/11/2017** Analyst: **CEI**							
Antimony	ND	0.031	0.50		µg/L	1	10/17/2017 01:23 PM
Arsenic	3.0	0.025	0.10		µg/L	1	10/17/2017 01:23 PM
Barium	29	0.070	1.0		µg/L	1	10/17/2017 01:23 PM
Copper	ND	0.26	1.0		µg/L	1	10/17/2017 01:23 PM
Lead	ND	0.037	1.0		µg/L	1	10/17/2017 01:23 PM
Manganese	6.8	0.056	0.50		µg/L	1	10/17/2017 01:23 PM
Molybdenum	21	0.039	0.50		µg/L	1	10/17/2017 01:23 PM
Nickel	ND	0.040	1.0		µg/L	1	10/17/2017 01:23 PM
Zinc	ND	0.27	10		µg/L	1	10/17/2017 01:23 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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136**				PrepDate	**10/11/2017**		Analyst: **CEI**
Antimony	ND	0.031	0.50		µg/L	1	10/17/2017 01:34 PM
Arsenic	0.12	0.025	0.10		µg/L	1	10/17/2017 01:34 PM
Barium	14	0.070	1.0		µg/L	1	10/17/2017 01:34 PM
Copper	ND	0.26	1.0		µg/L	1	10/17/2017 01:34 PM
Lead	ND	0.037	1.0		µg/L	1	10/17/2017 01:34 PM
Manganese	6.4	0.056	0.50		µg/L	1	10/17/2017 01:34 PM
Molybdenum	19	0.039	0.50		µg/L	1	10/17/2017 01:34 PM
Nickel	ND	0.040	1.0		µg/L	1	10/17/2017 01:34 PM
Zinc	ND	0.27	10		µg/L	1	10/17/2017 01:34 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

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT: CH2M HILL
Lab Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00
Lab ID: N026257-003

Client Sample ID: SC-701-WDR-565
Collection Date: 10/3/2017 12:30:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136** PrepDate **10/11/2017** Analyst: **CEI**							
Antimony	ND	0.16	2.5		µg/L	5	10/17/2017 01:51 PM
Arsenic	2.7	0.12	0.50		µg/L	5	10/17/2017 01:51 PM
Barium	150	0.35	5.0		µg/L	5	10/17/2017 01:51 PM
Beryllium	ND	1.1	12		µg/L	25	10/17/2017 01:56 PM
Cadmium	ND	0.24	2.5		µg/L	5	10/17/2017 01:51 PM
Cobalt	ND	0.13	2.5		µg/L	5	10/17/2017 01:51 PM
Copper	ND	1.3	5.0		µg/L	5	10/17/2017 01:51 PM
Lead	ND	0.92	25		µg/L	25	10/17/2017 01:56 PM
Manganese	6.1	0.28	2.5		µg/L	5	10/17/2017 01:51 PM
Molybdenum	230	0.97	12		µg/L	25	10/17/2017 01:56 PM
Nickel	10	0.20	5.0		µg/L	5	10/17/2017 01:51 PM
Selenium	44	0.14	2.5		µg/L	5	10/17/2017 01:51 PM
Silver	ND	1.5	12		µg/L	25	10/17/2017 01:56 PM
Thallium	ND	0.74	12		µg/L	25	10/17/2017 01:56 PM
Vanadium	6.4	0.11	5.0		µg/L	5	10/17/2017 01:51 PM
Zinc	ND	1.3	50		µg/L	5	10/17/2017 01:51 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

Date: *18-Oct-17*

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-64136** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **PBW** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2795999**

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									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Selenium	ND	0.50									
Silver	0.159	0.50									
Thallium	ND	0.50									
Vanadium	0.030	1.0									
Zinc	ND	10									

Sample ID **LCS-64136** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **LCSW** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796002**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.947	0.50	10.00	0	99.5	85	115				
Arsenic	10.040	0.10	10.00	0	100	85	115				
Barium	10.053	1.0	10.00	0	101	85	115				
Beryllium	10.064	0.50	10.00	0	101	85	115				
Cadmium	10.286	0.50	10.00	0	103	85	115				
Cobalt	9.696	0.50	10.00	0	97.0	85	115				
Copper	10.140	1.0	10.00	0	101	85	115				

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **LCS-64136** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **LCSW** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796002**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	9.973	1.0	10.00	0	99.7	85	115				
Manganese	101.700	0.50	100.0	0	102	85	115				
Molybdenum	9.933	0.50	10.00	0	99.3	85	115				
Nickel	10.165	1.0	10.00	0	102	85	115				
Selenium	10.069	0.50	10.00	0	101	85	115				
Silver	10.160	0.50	10.00	0	102	85	115				
Thallium	10.283	0.50	10.00	0	103	85	115				
Vanadium	10.231	1.0	10.00	0	102	85	115				
Zinc	102.087	10	100.0	0	102	85	115				

Sample ID **N026256-001B-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.561	0.50	10.00	0.04643	105	75	125				
Arsenic	13.405	0.10	10.00	2.744	107	75	125				
Barium	39.100	1.0	10.00	30.45	86.5	75	125				
Beryllium	11.042	0.50	10.00	0	110	75	125				
Cadmium	9.981	0.50	10.00	0	99.8	75	125				
Cobalt	9.208	0.50	10.00	0.1106	91.0	75	125				
Copper	10.146	1.0	10.00	0.6533	94.9	75	125				
Lead	10.539	1.0	10.00	0	105	75	125				
Molybdenum	23.812	0.50	10.00	12.76	111	75	125				
Nickel	11.253	1.0	10.00	1.399	98.5	75	125				
Selenium	9.956	0.50	10.00	0.09273	98.6	75	125				
Silver	9.432	0.50	10.00	0	94.3	75	125				
Thallium	10.096	0.50	10.00	0.2701	98.3	75	125				
Vanadium	12.588	1.0	10.00	2.409	102	75	125				
Zinc	97.049	10	100.0	1.910	95.1	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: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N026256-001B-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796009**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	411.399	2.5	100.0	325.5	85.9	75	125				

Sample ID **N026256-001B-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.272	0.50	10.00	0.04643	102	75	125	10.56	2.77	20	
Arsenic	13.132	0.10	10.00	2.744	104	75	125	13.41	2.06	20	
Barium	38.526	1.0	10.00	30.45	80.7	75	125	39.10	1.48	20	
Beryllium	10.853	0.50	10.00	0	109	75	125	11.04	1.73	20	
Cadmium	9.815	0.50	10.00	0	98.1	75	125	9.981	1.68	20	
Cobalt	9.256	0.50	10.00	0.1106	91.5	75	125	9.208	0.513	20	
Copper	9.969	1.0	10.00	0.6533	93.2	75	125	10.15	1.77	20	
Lead	10.372	1.0	10.00	0	104	75	125	10.54	1.59	20	
Molybdenum	23.306	0.50	10.00	12.76	105	75	125	23.81	2.15	20	
Nickel	11.243	1.0	10.00	1.399	98.4	75	125	11.25	0.0896	20	
Selenium	9.842	0.50	10.00	0.09273	97.5	75	125	9.956	1.16	20	
Silver	9.234	0.50	10.00	0	92.3	75	125	9.432	2.12	20	
Thallium	9.920	0.50	10.00	0.2701	96.5	75	125	10.10	1.75	20	
Vanadium	12.656	1.0	10.00	2.409	102	75	125	12.59	0.532	20	
Zinc	95.570	10	100.0	1.910	93.7	75	125	97.05	1.54	20	

Sample ID **N026256-001B-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2796011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	408.957	2.5	100.0	325.5	83.4	75	125	411.4	0.595	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171004A** QC Batch: **R118286** PrepDate							Analyst: **RAB**
Hexavalent Chromium	550	3.3	20		µg/L	100	10/4/2017 10:54 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136** PrepDate **10/11/2017**							Analyst: **CEI**
Chromium	580	0.096	5.0		µg/L	5	10/17/2017 01:29 PM

Qualifiers:

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171004A** QC Batch: **R118286** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	10/4/2017 11:12 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136** PrepDate **10/11/2017**							Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	10/17/2017 01:34 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

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:30:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171004A** QC Batch: **R118286** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.83	5.0		µg/L	25	10/4/2017 03:28 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171017C** QC Batch: **64136** PrepDate **10/11/2017**							Analyst: **CEI**
Chromium	5.8	0.096	5.0		µg/L	5	10/17/2017 01:51 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		

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-64136** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **PBW** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2795947**

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

Sample ID **LCS-64136** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **LCSW** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2795950**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.099	1.0	10.00	0	101	85	115				

Sample ID **N026256-001B-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2795956**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.865	1.0	10.00	0	98.6	75	125				

Sample ID **N026256-001B-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **10/11/2017** RunNo: **118600**
Client ID: **ZZZZZZ** Batch ID: **64136** TestNo: **EPA 200.8** Analysis Date: **10/17/2017** SeqNo: **2795958**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.943	1.0	10.00	0	99.4	75	125	9.865	0.792	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: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R118286** SampType: **MBLK** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **PBW** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781860**

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-R118286** SampType: **LCS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **LCSW** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781861**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	4.985	0.20	5.000	0	99.7	90	110				

Sample ID **N026253-001ADUP** SampType: **DUP** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781863**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.817	0.20						1.820	0.148	20	

Sample ID **N026256-002AMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781866**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1057.940	20	500.0	562.7	99.1	90	110				

Sample ID **N026256-002AMSD** SampType: **MSD** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781867**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1052.550	20	500.0	562.7	98.0	90	110	1058	0.511	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: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N026257-001CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781872**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1064.120	20	500.0	554.4	102	90	110				

Sample ID **N026257-002CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781874**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.125	0.20	1.000	0.08210	104	90	110				

Sample ID **N026257-003BMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **118286**
Client ID: **ZZZZZZ** Batch ID: **R118286** TestNo: **EPA 218.6** Analysis Date: **10/4/2017** SeqNo: **2781897**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	28.680	5.0	25.00	2.505	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171004C**	QC Batch: **R118289**			PrepDate			Analyst: **LR**
Turbidity	0.15	0.10	0.10		NTU	1	10/4/2017 09:40 AM

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171004C**	QC Batch: **R118289**			PrepDate			Analyst: **LR**
Turbidity	0.24	0.10	0.10		NTU	1	10/4/2017 09:40 AM

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

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID **MB-R118289** SampType: **MBLK** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **118289**
Client ID: **PBW** Batch ID: **R118289** TestNo: **SM 2130B** Analysis Date: **10/4/2017** SeqNo: **2780507**

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

Sample ID **N026257-001BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **118289**
Client ID: **ZZZZZZ** Batch ID: **R118289** TestNo: **SM 2130B** Analysis Date: **10/4/2017** SeqNo: **2780509**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.150	0.10						0.1500	0	30	

Sample ID **N026257-002BDUP** SampType: **DUP** TestCode: **2130_W** Units: **NTU** Prep Date: RunNo: **118289**
Client ID: **ZZZZZZ** Batch ID: **R118289** TestNo: **SM 2130B** Analysis Date: **10/4/2017** SeqNo: **2780511**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.210	0.10						0.2400	13.3	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:30:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 245.1							
RunID: **NV00922-AA1_171009D**	QC Batch: **64052**				PrepDate	**10/5/2017**	Analyst: **CEI**
Mercury	ND	0.087	0.20		µg/L	1	10/9/2017 11:16 AM

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID **MB-64052** SampType: **MBLK** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2017** RunNo: **118408**
Client ID: **PBW** Batch ID: **64052** TestNo: **EPA 245.1** Analysis Date: **10/9/2017** SeqNo: **2785832**

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

Sample ID **LCS-64052** SampType: **LCS** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2017** RunNo: **118408**
Client ID: **LCSW** Batch ID: **64052** TestNo: **EPA 245.1** Analysis Date: **10/9/2017** SeqNo: **2785833**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.596	0.20	5.000	0	91.9	85	115				

Sample ID **N026261-002A-MS** SampType: **MS** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2017** RunNo: **118408**
Client ID: **ZZZZZZ** Batch ID: **64052** TestNo: **EPA 245.1** Analysis Date: **10/9/2017** SeqNo: **2785834**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.793	0.20	5.000	0	95.9	75	125				

Sample ID **N026261-002A-MSD** SampType: **MSD** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2017** RunNo: **118408**
Client ID: **ZZZZZZ** Batch ID: **64052** TestNo: **EPA 245.1** Analysis Date: **10/9/2017** SeqNo: **2785835**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.715	0.20	5.000	0	94.3	75	125	4.793	1.64	20	

Sample ID **N026257-003C-MS** SampType: **MS** TestCode: **245.1_W** Units: **µg/L** Prep Date: **10/5/2017** RunNo: **118408**
Client ID: **ZZZZZZ** Batch ID: **64052** TestNo: **EPA 245.1** Analysis Date: **10/9/2017** SeqNo: **2785840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	5.262	0.20	5.000	0	105	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171004A** QC Batch: **R118312** PrepDate							Analyst: **RAB**
Fluoride	2.7	0.032	0.50		mg/L	5	10/4/2017 08:22 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171004A** QC Batch: **R118312** PrepDate							Analyst: **RAB**
Sulfate	500	1.1	25		mg/L	50	10/4/2017 07:21 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

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171004A** QC Batch: **R118312** PrepDate							Analyst: **RAB**
Fluoride	2.6	0.032	0.50		mg/L	5	10/4/2017 09:23 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171004A** QC Batch: **R118312** PrepDate							Analyst: **RAB**
Sulfate	460	1.1	25		mg/L	50	10/4/2017 07:36 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:30:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171004A** QC Batch: **R118312** PrepDate							Analyst: **RAB**
Fluoride	26	0.13	2.0		mg/L	20	10/4/2017 09:39 PM

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

ASSET Laboratories

Date: *18-Oct-17*

CLIENT: CH2M HILL
Work Order: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R118312_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **118312**
Client ID: **PBW** Batch ID: **R118312** TestNo: **EPA 300.0** Analysis Date: **10/4/2017** SeqNo: **2781423**

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

Sample ID **LCS-R118312_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **118312**
Client ID: **LCSW** Batch ID: **R118312** TestNo: **EPA 300.0** Analysis Date: **10/4/2017** SeqNo: **2781424**

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 **N026257-001BDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **118312**
Client ID: **ZZZZZZ** Batch ID: **R118312** TestNo: **EPA 300.0** Analysis Date: **10/4/2017** SeqNo: **2781438**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.941	0.50						2.732	7.35	20	

Sample ID **N026257-001BMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **118312**
Client ID: **ZZZZZZ** Batch ID: **R118312** TestNo: **EPA 300.0** Analysis Date: **10/4/2017** SeqNo: **2781439**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.688	0.50	6.250	2.732	95.3	80	120				

Sample ID **N026257-001BMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **118312**
Client ID: **ZZZZZZ** Batch ID: **R118312** TestNo: **EPA 300.0** Analysis Date: **10/4/2017** SeqNo: **2781440**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.790	0.50	6.250	2.732	96.9	80	120	8.688	1.16	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: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R118312_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	118312
Client ID:	PBW	Batch ID:	R118312	TestNo:	EPA 300.0			Analysis Date:	10/4/2017	SeqNo:	2781507

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

Sample ID	LCS-R118312_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	118312
Client ID:	LCSW	Batch ID:	R118312	TestNo:	EPA 300.0			Analysis Date:	10/4/2017	SeqNo:	2781508

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.923	0.50	4.000	0	98.1	90	110				

Sample ID	N026256-002CDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	118312
Client ID:	ZZZZZZ	Batch ID:	R118312	TestNo:	EPA 300.0			Analysis Date:	10/4/2017	SeqNo:	2781518

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	497.215	25						503.1	1.17	20	

Sample ID	N026256-002CMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	118312
Client ID:	ZZZZZZ	Batch ID:	R118312	TestNo:	EPA 300.0			Analysis Date:	10/4/2017	SeqNo:	2781519

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	696.445	25	200.0	503.1	96.7	80	120				

Sample ID	N026256-002CMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	118312
Client ID:	ZZZZZZ	Batch ID:	R118312	TestNo:	EPA 300.0			Analysis Date:	10/4/2017	SeqNo:	2781520

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	700.340	25	200.0	503.1	98.6	80	120	696.4	0.558	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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:48:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_171007A** QC Batch: **R118390** PrepDate Analyst: **QBM**							
Nitrate/Nitrite as N	3.0	0.11	0.25		mg/L	5	10/7/2017

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: *18-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-565
Lab Order:	N026257	**Collection Date:**	10/3/2017 12:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026257-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_171007A** QC Batch: **R118390** PrepDate Analyst: **QBM**							
Nitrate/Nitrite as N	2.7	0.11	0.25		mg/L	5	10/7/2017

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: N026257
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R118390** SampType: **MBLK** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **118390**
Client ID: **PBW** Batch ID: **R118390** TestNo: **SM4500-NO3** Analysis Date: **10/7/2017** SeqNo: **2785147**

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-R118390** SampType: **LCS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **118390**
Client ID: **LCSW** Batch ID: **R118390** TestNo: **SM4500-NO3** Analysis Date: **10/7/2017** SeqNo: **2785148**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.527	0.050	0.5000	0	105	85	115				

Sample ID **N026134-002CDUP** SampType: **DUP** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **118390**
Client ID: **ZZZZZZ** Batch ID: **R118390** TestNo: **SM4500-NO3** Analysis Date: **10/7/2017** SeqNo: **2785152**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	ND	0.050						0.03340	0	20	

Sample ID **N026134-003CMS** SampType: **MS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **118390**
Client ID: **ZZZZZZ** Batch ID: **R118390** TestNo: **SM4500-NO3** Analysis Date: **10/7/2017** SeqNo: **2785154**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.735	0.25	2.500	3.209	101	75	125				

Sample ID **N026134-003CMSD** SampType: **MSD** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **118390**
Client ID: **ZZZZZZ** Batch ID: **R118390** TestNo: **SM4500-NO3** Analysis Date: **10/7/2017** SeqNo: **2785155**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.759	0.25	2.500	3.209	102	75	125	5.735	0.418	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		

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-565
Turnaround Time 10 Days
Shipping Date:
COC Number: 565

			Container:	1 Liter Poly	1 Liter Poly	1 Liter Poly	1 Liter Poly	250 ml Poly	1 Liter Poly	1 Liter Poly	500 ml Poly	500 ml Poly	500 ml Poly	1 Liter Poly			
			Preservatives:	4°C Lab H2SO4	4°C	4°C	4°C	4°C	4°C Lab H2SO4	4°C	4°C	4°C	4°C	4°C			
			Filtered:	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
			Holding Time:	28	7	7	7	1	28	7	180	180	180	7			
				AMMONIA (SM4500NH3D)	Anions (E300.0) Fl & SO4	Anions (E300.0) Flouride	CONDUCTIVITY (E120.1)	E218.6 Lab Filtered	Nitrate/Nitrite (SM4500NO3-E)	TDS (SM2540C)	Total Metals (E200.8 Mn)	Total Metals(E200.7 and E200.8)	Total Title22Metals	Turbidity (SM2130)		Number of Containers	COMMENTS
	DATE	TIME	Matrix														
SC-100B-WDR-565	10-3-17	1240	Water	X	X		X	X	X	X		X		X	N026257 - 01	4	
SC-700B-WDR-565	10-3-17	1240	Water	X	X		X	X	X	X		X		X	- 02	4	
SC-701-WDR-565	10-3-17	1230	Water			X	X	X		X	X		X		- 03	3	
															TOTAL NUMBER OF CONTAINERS	11	

	Signatures	Date/Time
Approved by	Scott R O'Donnell	10-3-17 12:00
Sampled by	[illegible]	10-3-17 12:30
Relinquished by	[illegible]	10-3-17 1345
Received by	[illegible]	10/3/17 @1350
Relinquished by	[illegible]	10/3/17 @1947
Received by		

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 5.1°C
Airbill No: 1RH2
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:	10/3/2017	Workorder:	N026257
Rep sample Temp (Deg C):	5.1	IR Gun ID:	2
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	NA	Packing Material Used:	None
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

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

Comments:

Samples for Hex Cr were lab filtered an preserved with Ammonium buffer.
Samples for Metals were lab preserved with HNO3 and for NH3/NO3- with H2SO4, pH adjusted to < 2.

For:

Checklist Completed By: MBC 10/4/2017

Reviewed By: 10/5/2017

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:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

04-Oct-17

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N026257-001A / SC-100B-WDR-565	Water	10/3/2017 12:48:00 PM	32OZP	1		
N026257-002A / SC-700B-WDR-565	Water	10/3/2017 12:40:00 PM	32OZP	1		

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

Please use PO#:N26257A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill samples. EDD Requirement Labspec7 edata.

GSO #: 537863257

		Date/Time			Date/Time
Relinquished by:	10/4/2017	17:00		**Received by:**	
Relinquished by:				**Received by:**	

List of Analysts

ASSET Laboratories Work Order: **N026257**

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

October 17, 2017

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

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

Workorder No.: N026258

RE: PG&E Topock, 680375.02.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 03, 2017 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

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

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

Sincerely,

Nancy Libucao for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N026258

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time.

Analytical Comments for EPA 6010B:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N026258-001B-MS and N026258-001B-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 7199:

Matrix Spike Duplicate (MSD) is outside recovery criteria in QC sample N026258-001A-MSD possibly due to matrix interference. Post Spike was performed and met acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
"Serving Clients with Passion and Professionalism"
CALIFORNIA | P:562.219.7435 F:562.219.7436
11110 Artesia Blvd., Ste B, Cerritos, CA 90703
ELAP Cert 2921
EPA ID CA01638
NEVADA | P:702.307.2659 F:702.307.2691
3151 W. Post Rd., Las Vegas, NV 89118
ELAP Cert 2676 | NV Cert NV00922
ORELAP/NELAP Cert 4046

ASSET Laboratories

Date: *17-Oct-17*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N026258
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N026258-001A	Phase Separator-565-Sludge	Soil	10/3/2017 1:15:00 PM	10/3/2017	10/17/2017
N026258-001B	Phase Separator-565-Sludge	Soil	10/3/2017 1:15:00 PM	10/3/2017	10/17/2017

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *17-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-565-Sludge
Lab Order:	N026258	**Collection Date:**	10/3/2017 1:15:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N026258-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_171009A**	QC Batch: **R118417**			PrepDate			Analyst: **RAB**
Fluoride	17	0.13	1.9		mg/Kg-dry	1	10/9/2017 01:53 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: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID **MB-R118417** SampType: **MBLK** TestCode: **300_S** Units: **mg/Kg** Prep Date: RunNo: **118417**
Client ID: **PBS** Batch ID: **R118417** TestNo: **EPA 300.0** Analysis Date: **10/9/2017** SeqNo: **2786349**

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

Sample ID **LCS-R118417** SampType: **LCS** TestCode: **300_S** Units: **mg/Kg** Prep Date: RunNo: **118417**
Client ID: **LCSS** Batch ID: **R118417** TestNo: **EPA 300.0** Analysis Date: **10/9/2017** SeqNo: **2786350**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	12.194	1.0	12.50	0	97.6	90	110				

Sample ID **N026258-001ADUP** SampType: **DUP** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **118417**
Client ID: **ZZZZZZ** Batch ID: **R118417** TestNo: **EPA 300.0** Analysis Date: **10/9/2017** SeqNo: **2786352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	16.941	1.9						17.11	0.978	20	

Sample ID **N026258-001AMS** SampType: **MS** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **118417**
Client ID: **ZZZZZZ** Batch ID: **R118417** TestNo: **EPA 300.0** Analysis Date: **10/9/2017** SeqNo: **2786353**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	36.195	1.9	23.14	17.11	82.5	80	120				

Sample ID **N026258-001AMSD** SampType: **MSD** TestCode: **300_S** Units: **mg/Kg-dry** Prep Date: RunNo: **118417**
Client ID: **ZZZZZZ** Batch ID: **R118417** TestNo: **EPA 300.0** Analysis Date: **10/9/2017** SeqNo: **2786354**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	36.561	1.9	23.14	17.11	84.1	80	120	36.19	1.01	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: *17-Oct-17*

CLIENT: CH2M HILL
Lab Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N026258-001

Client Sample ID: Phase Separator-565-Sludge
Collection Date: 10/3/2017 1:15:00 PM
Matrix: SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
	EPA 3050B		**EPA 6010B**				
RunID: **NV00922-ICP2_171006B**	QC Batch: **64073**			PrepDate	**10/6/2017**		Analyst: **CEI**
Antimony	14	0.34	3.7		mg/Kg-dry	1	10/7/2017 12:26 AM
Arsenic	12	0.40	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Barium	52	0.078	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Beryllium	ND	0.070	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Cadmium	2.3	0.067	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Chromium	2400	0.074	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Cobalt	3.1	0.067	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Copper	110	0.074	3.7		mg/Kg-dry	1	10/7/2017 12:26 AM
Lead	ND	0.074	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Manganese	360	0.15	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Molybdenum	ND	0.065	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Nickel	24	0.077	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Selenium	ND	0.28	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Silver	ND	0.075	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Thallium	4.6	0.30	3.7		mg/Kg-dry	1	10/7/2017 12:26 AM
Vanadium	31	0.067	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM
Zinc	46	0.12	1.8		mg/Kg-dry	1	10/7/2017 12:26 AM

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	MB-64073	SampType:	MBLK	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/6/2017	RunNo:	118393
Client ID:	PBS	Batch ID:	64073	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/7/2017	SeqNo:	2785113

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	ND	1.0									
Chromium	ND	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	ND	1.0									
Manganese	ND	1.0									
Molybdenum	ND	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	ND	1.0									
Thallium	ND	2.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID	LCS-64073	SampType:	LCS	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/6/2017	RunNo:	118393
Client ID:	LCSS	Batch ID:	64073	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/7/2017	SeqNo:	2785114

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.353	2.0	25.00	0	101	85	115				
Arsenic	25.059	1.0	25.00	0	100	85	115				
Barium	25.435	1.0	25.00	0	102	85	115				
Beryllium	25.118	1.0	25.00	0	100	85	115				
Cadmium	25.200	1.0	25.00	0	101	85	115				
Chromium	25.272	1.0	25.00	0	101	85	115				

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **LCS-64073** SampType: **LCS** TestCode: **6010_SPGE** Units: **mg/Kg** Prep Date: **10/6/2017** RunNo: **118393**
Client ID: **LCSS** Batch ID: **64073** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/7/2017** SeqNo: **2785114**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	24.686	1.0	25.00	0	98.7	85	115				
Copper	25.573	2.0	25.00	0	102	85	115				
Lead	25.555	1.0	25.00	0	102	85	115				
Manganese	49.570	1.0	50.00	0	99.1	85	115				
Molybdenum	25.331	1.0	25.00	0	101	85	115				
Nickel	25.249	1.0	25.00	0	101	85	115				
Selenium	25.042	1.0	25.00	0	100	85	115				
Silver	25.767	1.0	25.00	0	103	85	115				
Thallium	25.191	2.0	25.00	0	101	85	115				
Vanadium	25.493	1.0	25.00	0	102	85	115				
Zinc	24.759	1.0	25.00	0	99.0	85	115				

Sample ID **N026258-001B-MS** SampType: **MS** TestCode: **6010_SPGE** Units: **mg/Kg-dry** Prep Date: **10/6/2017** RunNo: **118393**
Client ID: **ZZZZZZ** Batch ID: **64073** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/7/2017** SeqNo: **2785125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	69.401	3.7	46.16	14.48	119	75	125				
Arsenic	66.731	1.8	46.16	12.10	118	75	125				
Barium	99.593	1.8	46.16	51.99	103	75	125				
Beryllium	49.650	1.8	46.16	0	108	75	125				
Cadmium	49.049	1.8	46.16	2.332	101	75	125				
Chromium	2456.823	1.8	46.16	2411	98.8	75	125				
Cobalt	49.350	1.8	46.16	3.080	100	75	125				
Copper	173.536	3.7	46.16	113.5	130	75	125				S
Lead	41.709	1.8	46.16	0	90.4	75	125				
Manganese	453.269	1.8	92.31	355.3	106	75	125				
Molybdenum	49.535	1.8	46.16	0.8337	106	75	125				
Nickel	72.247	1.8	46.16	24.45	104	75	125				
Selenium	29.981	1.8	46.16	0	65.0	75	125				S
Silver	42.611	1.8	46.16	0	92.3	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: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **N026258-001B-MS** SampType: **MS** TestCode: **6010_SPGE** Units: **mg/Kg-dry** Prep Date: **10/6/2017** RunNo: **118393**
Client ID: **ZZZZZZ** Batch ID: **64073** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/7/2017** SeqNo: **2785125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium	46.268	3.7	46.16	4.592	90.3	75	125				
Vanadium	80.642	1.8	46.16	30.60	108	75	125				
Zinc	89.366	1.8	46.16	46.46	93.0	75	125				

Sample ID **N026258-001B-MSD** SampType: **MSD** TestCode: **6010_SPGE** Units: **mg/Kg-dry** Prep Date: **10/6/2017** RunNo: **118393**
Client ID: **ZZZZZZ** Batch ID: **64073** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **10/7/2017** SeqNo: **2785127**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	70.244	3.7	46.18	14.48	121	75	125	69.40	1.21	20	
Arsenic	67.727	1.8	46.18	12.10	120	75	125	66.73	1.48	20	
Barium	99.900	1.8	46.18	51.99	104	75	125	99.59	0.307	20	
Beryllium	50.199	1.8	46.18	0	109	75	125	49.65	1.10	20	
Cadmium	49.510	1.8	46.18	2.332	102	75	125	49.05	0.936	20	
Chromium	2456.042	1.8	46.18	2411	97.1	75	125	2457	0.0318	20	
Cobalt	49.973	1.8	46.18	3.080	102	75	125	49.35	1.26	20	
Copper	174.643	3.7	46.18	113.5	132	75	125	173.5	0.636	20	S
Lead	42.143	1.8	46.18	0	91.3	75	125	41.71	1.04	20	
Manganese	453.610	1.8	92.36	355.3	106	75	125	453.3	0.0753	20	
Molybdenum	50.195	1.8	46.18	0.8337	107	75	125	49.53	1.32	20	
Nickel	72.818	1.8	46.18	24.45	105	75	125	72.25	0.786	20	
Selenium	31.492	1.8	46.18	0	68.2	75	125	29.98	4.92	20	S
Silver	43.061	1.8	46.18	0	93.2	75	125	42.61	1.05	20	
Thallium	46.660	3.7	46.18	4.592	91.1	75	125	46.27	0.843	20	
Vanadium	81.315	1.8	46.18	30.60	110	75	125	80.64	0.831	20	
Zinc	89.606	1.8	46.18	46.46	93.4	75	125	89.37	0.268	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: *17-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-565-Sludge
Lab Order:	N026258	**Collection Date:**	10/3/2017 1:15:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N026258-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 3060A			**EPA 7199**				
RunID: **NV00922-IC6_171004A**	QC Batch: **64031**			PrepDate	**10/4/2017**		Analyst: **RAB**
Hexavalent Chromium	19	0.54	1.8		mg/Kg-dry	5	10/4/2017 05:58 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: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID **MB-64031** SampType: **MBLK** TestCode: **7199_S_PGE** Units: **mg/Kg** Prep Date: **10/4/2017** RunNo: **118330**
Client ID: **PBS** Batch ID: **64031** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2017** SeqNo: **2782303**

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-64031** SampType: **LCS** TestCode: **7199_S_PGE** Units: **mg/Kg** Prep Date: **10/4/2017** RunNo: **118330**
Client ID: **LCSS** Batch ID: **64031** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2017** SeqNo: **2782304**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	3.963	0.20	4.000	0	99.1	80	120				

Sample ID **N026258-001A-REP** SampType: **DUP** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/4/2017** RunNo: **118330**
Client ID: **ZZZZZZ** Batch ID: **64031** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2017** SeqNo: **2782306**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	19.409	1.8						19.33	0.428	20	

Sample ID **N026258-001A-DUP** SampType: **DUP** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/4/2017** RunNo: **118330**
Client ID: **ZZZZZZ** Batch ID: **64031** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2017** SeqNo: **2782307**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	18.025	1.8						19.33	6.97	20	

Sample ID **N026258-001A-MS** SampType: **MS** TestCode: **7199_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/4/2017** RunNo: **118330**
Client ID: **ZZZZZZ** Batch ID: **64031** TestNo: **EPA 7199** **EPA 3060A** Analysis Date: **10/4/2017** SeqNo: **2782308**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	25.701	1.8	7.392	19.33	86.2	75	125				

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	N026258-001A-MSD	SampType:	MSD	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/4/2017	RunNo:	118330
Client ID:	ZZZZZZ	Batch ID:	64031	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2017	SeqNo:	2782309

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	28.780	1.8	7.395	19.33	128	75	125	25.70	11.3	20	S

Sample ID	N026258-001A-MS I	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/4/2017	RunNo:	118330
Client ID:	ZZZZZZ	Batch ID:	64031	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2017	SeqNo:	2782310

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1200.993	18	1200	19.33	98.5	75	125				

Sample ID	N026258-001A-PS	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:		RunNo:	118330
Client ID:	ZZZZZZ	Batch ID:	64031	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/4/2017	SeqNo:	2782332

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	56.402	1.8	36.99	19.33	100	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: *17-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-565-Sludge
Lab Order:	N026258	**Collection Date:**	10/3/2017 1:15:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N026258-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 7471A							
RunID: **NV00922-AA1_171005B** QC Batch: **64048** PrepDate **10/5/2017** Analyst: **MG**							
Mercury	ND	0.022	0.18		mg/Kg-dry	1	10/5/2017 10:50 AM

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S_PGE

Sample ID **MB-64048** SampType: **MBLK** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/5/2017** RunNo: **118340**
Client ID: **PBS** Batch ID: **64048** TestNo: **EPA 7471A** Analysis Date: **10/5/2017** SeqNo: **2782796**

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

Sample ID **LCS-64048** SampType: **LCS** TestCode: **7471_S_PGE** Units: **mg/Kg** Prep Date: **10/5/2017** RunNo: **118340**
Client ID: **LCSS** Batch ID: **64048** TestNo: **EPA 7471A** Analysis Date: **10/5/2017** SeqNo: **2782797**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.390	0.10	0.4167	0	93.7	75	125				

Sample ID **N026258-001B-MS** SampType: **MS** TestCode: **7471_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/5/2017** RunNo: **118340**
Client ID: **ZZZZZZ** Batch ID: **64048** TestNo: **EPA 7471A** Analysis Date: **10/5/2017** SeqNo: **2782798**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.767	0.18	0.7624	0.08402	89.6	75	125				

Sample ID **N026258-001B-MSD** SampType: **MSD** TestCode: **7471_S_PGE** Units: **mg/Kg-dry** Prep Date: **10/5/2017** RunNo: **118340**
Client ID: **ZZZZZZ** Batch ID: **64048** TestNo: **EPA 7471A** Analysis Date: **10/5/2017** SeqNo: **2782799**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.844	0.18	0.7611	0.08402	99.9	75	125	0.7674	9.52	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: *17-Oct-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-565-Sludge
Lab Order:	N026258	**Collection Date:**	10/3/2017 1:15:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N026258-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE							
			D2216				
RunID: **NV00922-WC_171004D**	QC Batch: **R118290**			PrepDate			Analyst: **LR**
Percent Moisture	45.97	0.1000	0.1000		wt%	1	10/4/2017 09:30 AM

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

CLIENT: CH2M HILL
Work Order: N026258
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: PMOIST

Sample ID	MB-R118290	SampType:	MBLK	TestCode:	PMOIST	Units:	wt%	Prep Date:		RunNo:	118290
Client ID:	PBS	Batch ID:	R118290	TestNo:	D2216			Analysis Date:	10/4/2017	SeqNo:	2780512

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

Sample ID	N026258-001BDUP	SampType:	DUP	TestCode:	PMOIST	Units:	wt%	Prep Date:		RunNo:	118290
Client ID:	ZZZZZZ	Batch ID:	R118290	TestNo:	D2216			Analysis Date:	10/4/2017	SeqNo:	2780517

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	45.892	0.1000						45.97	0.175	30	

Qualifiers:

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

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Shawn Duffy

Task Order
Project IM3PLANT-ARAR-WDR-565-SLUDGE
Turnaround Time 10 Days
Shipping Date:
COC Number: 565-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-565-Sludge	10-3-17	1315	Soil	x	x	x	N026258 - 01	5	
							TOTAL NUMBER OF CONTAINERS	5	

	Signatures	Date/Time
Approved by	Scott O'Donnell	10-3-17 12:00
Sampled by	[illegible]	10-3-17 1230
Relinquished by	[illegible]	10-3-17 1345
Received by	[illegible]	10/3/17 @ 1350
Relinquished by	[illegible]	10/3/17 @ 1947
Received by		

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 5.1°C
Airbill No: IR#2
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:

Report Copy to
Doug Scott
(970) 731-0636

ASSET Laboratories

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

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

Cooler Received/Opened On:	10/3/2017	Workorder:	N026258
Rep sample Temp (Deg C):	5.1	IR Gun ID:	2
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	NA	Packing Material Used:	None
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

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

Comments:

For:

Checklist Completed By: MBC 10/12/2017

Reviewed By: 10/16/2017

List of Analysts

ASSET Laboratories Work Order: **N026258**

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

Date of Report: 11/28/2017

Marlon Cartin

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

Client Project:	N026936
BCL Project:	CH2M Hill
BCL Work Order:	1732442
Invoice ID:	B286210

Enclosed are the results of analyses for samples received by the laboratory on 11/14/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval
Client Service Rep

Authorized Signature

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

17-32442

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-17

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N026936-002A / SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	32OZP	1		

CHK BY DISTRIBUTION
SUB-OUT

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

Please use PO#:N26936A Please email Invoices and Account Receivable Statements to AssetAP@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#: 538311037

		Date/Time			Date/Time
Relinquished by:		11/8/2017 17:00	**Received by:**		11.14.17 09:33
Relinquished by:			**Received by:**		

Chain of Custody and Cooler Receipt Form for 1732442 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 17-32442

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: .95 Container: Tape Thermometer ID: 274 Date/Time 11-14-17
Temperature: (A) 2.0 °C / (C) 2.1 °C Analyst Init 09:33

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: JDL Date/Time: 11-14-17 1354 Rev 21 05/23/2016
A = Actual / C = Corrected [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 20]

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

Reported: 11/28/2017 9:20
Project: CH2M Hill
Project Number: N026936
Project Manager: Marlon Cartin

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1732442-01	**COC Number:**	---	**Receive Date:**	11/14/2017 09:33
	Project Number:	---	**Sampling Date:**	11/07/2017 10:24
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	N026936-002A / SC-700B-WDR-566	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water

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

Reported: 11/28/2017 9:20
Project: CH2M Hill
Project Number: N026936
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

BCL Sample ID: 1732442-01 | **Client Sample Name:** N026936-002A / SC-700B-WDR-566, 11/7/2017 10:24:00AM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	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	11/21/17 11:10	11/27/17 07:36	JMH	SC-1	1	B[K2144

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

Reported: 11/28/2017 9:20
Project: CH2M Hill
Project Number: N026936
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: B[K2144						
Ammonia as N (Distilled)	B[K2144-BLK1	ND	mg/L	0.20		

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

Reported: 11/28/2017 9:20
Project: CH2M Hill
Project Number: N026936
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: B[K2144										
Ammonia as N (Distilled)	B[K2144-BS1	LCS	1.0009	1.0000	mg/L	100		85 - 115		

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

Reported: 11/28/2017 9:20
Project: CH2M Hill
Project Number: N026936
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: B[K2144	Used client sample: N										
Ammonia as N (Distilled)	DUP	1732624-03	0.23360	0.24410		mg/L	4.4		20		
	MS	1732624-03	0.23360	1.3257	1.0000	mg/L		109		80 - 120	
	MSD	1732624-03	0.23360	1.3544	1.0000	mg/L	2.1	112	20	80 - 120	

December 27, 2017

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

Workorder No.: N026936

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on November 07, 2017 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.

This is an amended report. Please disregard all previous documentation that corresponds to the page(s) enclosed.

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 Liburcao for

Quennie Manimtim
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N026936

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

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 Iron in QC samples N026936-002E-MS1 and N26936-002E-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 some analytes in QC samples N026936-001C-MS and N026936-001C-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Chromium in QC samples N026936-001C-MS and N026936-001C-MSD since the analyte concentration in the sample is disproportionate to the spike level. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET Laboratories

Date: *28-Nov-17*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N026936
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N026936-001A	SC-100B-WDR-566	Water	11/7/2017 10:20:00 AM	11/7/2017	11/28/2017
N026936-001B	SC-100B-WDR-566	Water	11/7/2017 10:20:00 AM	11/7/2017	11/28/2017
N026936-001C	SC-100B-WDR-566	Water	11/7/2017 10:20:00 AM	11/7/2017	11/28/2017
N026936-002A	SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	11/7/2017	11/28/2017
N026936-002B	SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	11/7/2017	11/28/2017
N026936-002C	SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	11/7/2017	11/28/2017
N026936-002D	SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	11/7/2017	11/28/2017
N026936-002E	SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	11/7/2017	11/28/2017

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:20:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_171108E**	QC Batch: **R119136**			PrepDate			Analyst: **LR**
Specific Conductance	7700	0.10	0.10		umhos/cm	1	11/8/2017 02:10 PM

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_171108E**	QC Batch: **R119136**			PrepDate			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	11/8/2017 02:10 PM

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

ASSET Laboratories

Date: *28-Nov-17*

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N026936-001BDUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **119136**
Client ID: **ZZZZZZ** Batch ID: **R119136** TestNo: **EPA 120.1** Analysis Date: **11/8/2017** SeqNo: **2827634**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7700.000	0.10						7740	0.518	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:20:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_171108G** QC Batch: **64592** PrepDate **11/8/2017** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4300	50	50		mg/L	1	11/8/2017 01:07 PM

Qualifiers:

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_171108G**	QC Batch: **64592**			PrepDate	**11/8/2017**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4100	50	50		mg/L	1	11/8/2017 01:07 PM

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **LCS-64592** SampType: **LCS** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/8/2017** RunNo: **119142**
Client ID: **LCSW** Batch ID: **64592** TestNo: **SM2540C** Analysis Date: **11/8/2017** SeqNo: **2827851**

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-64592** SampType: **MBLK** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/8/2017** RunNo: **119142**
Client ID: **PBW** Batch ID: **64592** TestNo: **SM2540C** Analysis Date: **11/8/2017** SeqNo: **2827852**

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 **N026946-001CDUP** SampType: **DUP** TestCode: **160.1_2540C** Units: **mg/L** Prep Date: **11/8/2017** RunNo: **119142**
Client ID: **ZZZZZZ** Batch ID: **64592** TestNo: **SM2540C** Analysis Date: **11/8/2017** SeqNo: **2827856**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	11410.000	100						10910	4.48	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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_171121A** QC Batch: **65707** PrepDate **11/17/2017** Analyst: **CEI**							
Aluminum	ND	2.7	50		µg/L	1	11/21/2017 11:23 AM
Boron	950	38	100		µg/L	1	11/21/2017 11:23 AM
Iron	40	1.8	20		µg/L	1	11/21/2017 11:23 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		

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-65707** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/17/2017** RunNo: **120365**
Client ID: **PBW** Batch ID: **65707** TestNo: **EPA 200.7** Analysis Date: **11/21/2017** SeqNo: **2839800**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	7.324	50									
Boron	ND	100									
Iron	3.670	20									

Sample ID **LCS1-65707** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/17/2017** RunNo: **120365**
Client ID: **LCSW** Batch ID: **65707** TestNo: **EPA 200.7** Analysis Date: **11/21/2017** SeqNo: **2839801**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10214.522	50	10000	0	102	85	115				
Boron	4912.084	100	5000	0	98.2	85	115				
Iron	110.379	20	100.0	0	110	85	115				

Sample ID **N026936-002E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/17/2017** RunNo: **120365**
Client ID: **ZZZZZZ** Batch ID: **65707** TestNo: **EPA 200.7** Analysis Date: **11/21/2017** SeqNo: **2839805**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9291.888	50	10000	5.037	92.9	75	125				
Boron	5374.161	100	5000	950.5	88.5	75	125				
Iron	109.175	20	100.0	39.64	69.5	75	125				S

Sample ID **N026936-002E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **11/17/2017** RunNo: **120365**
Client ID: **ZZZZZZ** Batch ID: **65707** TestNo: **EPA 200.7** Analysis Date: **11/21/2017** SeqNo: **2839806**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9232.099	50	10000	5.037	92.3	75	125	9292	0.646	20	
Boron	5399.675	100	5000	950.5	89.0	75	125	5374	0.474	20	
Iron	108.789	20	100.0	39.64	69.1	75	125	109.2	0.354	20	S

Qualifiers:

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:20:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171120D** QC Batch: **64641** PrepDate **11/11/2017** Analyst: **CEI**							
Manganese	7.7	0.056	0.50		µg/L	1	11/20/2017 02:31 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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171120D** QC Batch: **64641**				PrepDate	**11/11/2017**		Analyst: **CEI**
Antimony	ND	0.031	0.50		µg/L	1	11/20/2017 03:32 PM
Arsenic	0.12	0.025	0.10		µg/L	1	11/20/2017 03:32 PM
Barium	14	0.070	1.0		µg/L	1	11/20/2017 03:32 PM
Copper	ND	0.26	1.0		µg/L	1	11/20/2017 03:32 PM
Lead	ND	0.037	1.0		µg/L	1	11/20/2017 03:32 PM
Manganese	2.8	0.056	0.50		µg/L	1	11/20/2017 03:32 PM
Molybdenum	20	0.039	0.50		µg/L	1	11/20/2017 03:32 PM
Nickel	ND	0.040	1.0		µg/L	1	11/20/2017 03:32 PM
Zinc	ND	0.27	10		µg/L	1	11/20/2017 03:32 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: *27-Dec-17*

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-64641** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **PBW** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839382**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	0.042	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID **LCS-64641** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **LCSW** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839383**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.160	0.50	10.00	0	91.6	85	115				
Arsenic	9.431	0.10	10.00	0	94.3	85	115				
Barium	9.384	1.0	10.00	0	93.8	85	115				
Copper	9.740	1.0	10.00	0	97.4	85	115				
Lead	9.316	1.0	10.00	0	93.2	85	115				
Manganese	95.659	0.50	100.0	0	95.7	85	115				
Molybdenum	9.267	0.50	10.00	0	92.7	85	115				
Nickel	9.662	1.0	10.00	0	96.6	85	115				
Zinc	100.904	10	100.0	0	101	85	115				

Sample ID **N026936-001C-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **ZZZZZZ** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839389**

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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N026936-001C-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **ZZZZZZ** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839389**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.956	0.50	10.00	0.06557	98.9	75	125				
Arsenic	13.168	0.10	10.00	3.034	101	75	125				
Barium	38.381	1.0	10.00	30.15	82.3	75	125				
Copper	6.646	1.0	10.00	0	66.5	75	125				S
Lead	10.124	1.0	10.00	0	101	75	125				
Manganese	100.526	0.50	100.0	7.677	92.8	75	125				
Molybdenum	30.469	0.50	10.00	20.31	102	75	125				
Nickel	9.635	1.0	10.00	0	96.3	75	125				
Zinc	115.986	10	100.0	0	116	75	125				

Sample ID **N026936-001C-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **ZZZZZZ** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839391**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.970	0.50	10.00	0.06557	99.0	75	125	9.956	0.132	20	
Arsenic	13.176	0.10	10.00	3.034	101	75	125	13.17	0.0622	20	
Barium	38.494	1.0	10.00	30.15	83.4	75	125	38.38	0.294	20	
Copper	6.700	1.0	10.00	0	67.0	75	125	6.646	0.801	20	S
Lead	10.137	1.0	10.00	0	101	75	125	10.12	0.127	20	
Manganese	100.941	0.50	100.0	7.677	93.3	75	125	100.5	0.412	20	
Molybdenum	30.327	0.50	10.00	20.31	100	75	125	30.47	0.468	20	
Nickel	9.608	1.0	10.00	0	96.1	75	125	9.635	0.282	20	
Zinc	115.315	10	100.0	0	115	75	125	116.0	0.580	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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:20:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171108A** QC Batch: **R119139**				PrepDate			Analyst: **RAB**
Hexavalent Chromium	540	3.3	20		µg/L	100	11/8/2017 10:49 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171120D** QC Batch: **64641**				PrepDate	**11/11/2017**		Analyst: **CEI**
Chromium	600	0.096	5.0		µg/L	5	11/20/2017 02:36 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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171108A** QC Batch: **R119139** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	11/8/2017 10:11 AM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171120D** QC Batch: **64641** PrepDate **11/11/2017**							Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	11/20/2017 03:32 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: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-64641** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **PBW** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839518**

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

Sample ID **LCS-64641** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **LCSW** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839519**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.290	1.0	10.00	0	92.9	85	115				

Sample ID **N026936-001C-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **ZZZZZZ** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839526**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	560.600	5.0	10.00	596.5	-359	75	125				S

Sample ID **N026936-001C-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **11/11/2017** RunNo: **120363**
Client ID: **ZZZZZZ** Batch ID: **64641** TestNo: **EPA 200.8** Analysis Date: **11/20/2017** SeqNo: **2839530**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	558.135	5.0	10.00	596.5	-384	75	125	560.6	0.441	20	S

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R119139** SampType: **MBLK** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **119139**
Client ID: **PBW** Batch ID: **R119139** TestNo: **EPA 218.6** Analysis Date: **11/8/2017** SeqNo: **2827816**

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-R119139** SampType: **LCS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **119139**
Client ID: **LCSW** Batch ID: **R119139** TestNo: **EPA 218.6** Analysis Date: **11/8/2017** SeqNo: **2827817**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.093	0.20	5.000	0	102	90	110				

Sample ID **N026936-002CMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **119139**
Client ID: **ZZZZZZ** Batch ID: **R119139** TestNo: **EPA 218.6** Analysis Date: **11/8/2017** SeqNo: **2827827**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.212	0.20	1.000	0.1317	108	90	110				

Sample ID **N026936-001AMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **119139**
Client ID: **ZZZZZZ** Batch ID: **R119139** TestNo: **EPA 218.6** Analysis Date: **11/8/2017** SeqNo: **2827829**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1054.700	20	500.0	537.2	104	90	110				

Sample ID **N026936-001AMSD** SampType: **MSD** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **119139**
Client ID: **ZZZZZZ** Batch ID: **R119139** TestNo: **EPA 218.6** Analysis Date: **11/8/2017** SeqNo: **2827830**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1057.900	20	500.0	537.2	104	90	110	1055	0.303	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: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	**N026937-001ADUP**	SampType:	**DUP**	TestCode:	**218.6_WU_P**	Units:	**µg/L**	Prep Date:			RunNo:	**119139**	
Client ID:	**ZZZZZZ**	Batch ID:	**R119139**	TestNo:	**EPA 218.6**			Analysis Date:	**11/8/2017**		SeqNo:	**2827847**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	9.916	0.20						10.01	0.953	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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:20:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171108F**	QC Batch: **R119137**			PrepDate			Analyst: **LR**
Turbidity	0.29	0.10	0.10		NTU	1	11/8/2017 02:35 PM

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

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171108F**	QC Batch: **R119137**			PrepDate			Analyst: **LR**
Turbidity	0.15	0.10	0.10		NTU	1	11/8/2017 02:35 PM

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

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	MB-R119137	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	119137
Client ID:	PBW	Batch ID:	R119137	TestNo:	SM 2130B			Analysis Date:	11/8/2017	SeqNo:	2827636

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

Sample ID	N026919-001EDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	119137
Client ID:	ZZZZZZ	Batch ID:	R119137	TestNo:	SM 2130B			Analysis Date:	11/8/2017	SeqNo:	2827638

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.300	0.10						0.2800	6.90	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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171108A** QC Batch: **R119127** PrepDate							Analyst: **RAB**
Fluoride	2.4	0.032	0.50		mg/L	5	11/8/2017 07:18 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171108A** QC Batch: **R119127** PrepDate							Analyst: **RAB**
Sulfate	470	1.1	25		mg/L	50	11/8/2017 08:20 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		

CLIENT: CH2M HILL
Work Order: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R119127_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **PBW** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827403**

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

Sample ID **LCS-R119127_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **LCSW** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827404**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.227	0.10	1.250	0	98.1	90	110				

Sample ID **N026936-002BDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827412**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.389	0.50						2.350	1.62	20	

Sample ID **N026936-002BMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827413**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.451	0.50	6.250	2.350	97.6	80	120				

Sample ID **N026936-002BMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827414**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.530	0.50	6.250	2.350	98.9	80	120	8.451	0.930	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: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID **MB-R119127_SO4** SampType: **MBLK** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **PBW** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827509**

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

Sample ID **LCS-R119127_SO4** SampType: **LCS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **LCSW** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827510**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.902	0.50	4.000	0	97.5	90	110				

Sample ID **N026936-002BMS** SampType: **MS** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827518**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	670.715	25	200.0	470.6	100	80	120				

Sample ID **N026936-002BMSD** SampType: **MSD** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827519**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	673.435	25	200.0	470.6	101	80	120	670.7	0.405	20	

Sample ID **N026936-002BDUP** SampType: **DUP** TestCode: **300_W_SO4P** Units: **mg/L** Prep Date: RunNo: **119127**
Client ID: **ZZZZZZ** Batch ID: **R119127** TestNo: **EPA 300.0** Analysis Date: **11/8/2017** SeqNo: **2827522**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	469.715	25						470.6	0.178	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: *28-Nov-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-566
Lab Order:	N026936	**Collection Date:**	11/7/2017 10:24:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N026936-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_171111A**	QC Batch: **R119185**			PrepDate			Analyst: **QBM**
Nitrate/Nitrite as N	2.6	0.11	0.25		mg/L	5	11/11/2017

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: N026936
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R119185** SampType: **MBLK** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **119185**
Client ID: **PBW** Batch ID: **R119185** TestNo: **SM4500-NO3** Analysis Date: **11/11/2017** SeqNo: **2829653**

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-R119185** SampType: **LCS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **119185**
Client ID: **LCSW** Batch ID: **R119185** TestNo: **SM4500-NO3** Analysis Date: **11/11/2017** SeqNo: **2829654**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.519	0.050	0.5000	0	104	85	115				

Sample ID **N026844-001DDUP** SampType: **DUP** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **119185**
Client ID: **ZZZZZZ** Batch ID: **R119185** TestNo: **SM4500-NO3** Analysis Date: **11/11/2017** SeqNo: **2829656**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	ND	0.050						0.02680	0	20	

Sample ID **N026844-002DMS** SampType: **MS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **119185**
Client ID: **ZZZZZZ** Batch ID: **R119185** TestNo: **SM4500-NO3** Analysis Date: **11/11/2017** SeqNo: **2829658**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.052	0.25	2.500	2.982	82.8	75	125				

Sample ID **N026844-002DMSD** SampType: **MSD** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **119185**
Client ID: **ZZZZZZ** Batch ID: **R119185** TestNo: **SM4500-NO3** Analysis Date: **11/11/2017** SeqNo: **2829659**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.515	0.25	2.500	2.982	101	75	125	5.052	8.77	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		

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-566
Turnaround Time 10 Days
Shipping Date:
COC Number: 566

			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-566	11-7-17	10:20	Water			X	X		X		X	X	N026936 -01	3	
SC-700B-WDR-566	11-7-17	10:24	Water	X	X	X	X	X	X	X		X	-02	4	
													TOTAL NUMBER OF CONTAINERS	7	

	Signatures	Date/Time
Approved by		11-7-17 10:30
Sampled by		11-7-17 10:30
Relinquished by		11-7-17 1300
Received by		11/7/17 1300
Relinquished by		11/7/17 1947
Received by		

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 2-1°C IR #1
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:	11/7/2017	Workorder:	N026936
Rep sample Temp (Deg C):	2.1	IR Gun ID:	1
Temp Blank:	☑ Yes ☐ No		
Carrier name:	ASSET		
Last 4 digits of Tracking No.:	NA	Packing Material Used:	None
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

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

Comments:

Samples for Hex Cr were lab filtered an preserved with Ammonium buffer.
Samples for Metals were lab preserved with HNO3 and for NH3/NO3- with H2SO4, pH adjusted to < 2.

Checklist Completed By: YR 11/13/2017

Reviewed By: 11/20/2017

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-17

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N026936-002A / SC-700B-WDR-566	Water	11/7/2017 10:24:00 AM	32OZP	1		

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

Please use PO#:N26936A Please email Invoices and Account Receivable Statements to AssetAP@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#: 538311037

		Date/Time			Date/Time
Relinquished by:		11/8/2017 17:00		**Received by:**	
Relinquished by:				**Received by:**	

List of Analysts

ASSET Laboratories Work Order: N026936

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

December 06, 2017

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

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

Workorder No.: N027346

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on December 05, 2017 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 Liberman for

Quennie Manimtim
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N027346

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time except for pH. pH testing is specified to be performed in the field within 15 minutes of sampling;sample was received and analyzed past the regulatory holding time.

ASSET Laboratories

Date: *06-Dec-17*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N027346
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N027346-001A	SC-100B-WDR-567	Water	12/5/2017 1:40:00 PM	12/5/2017	12/6/2017
N027346-002A	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/6/2017

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *06-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027346	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027346-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PH							
			SM4500-H+B				
RunID: **NV00922-WC_171206A**	QC Batch: **R120607**			PrepDate			Analyst: **LR**
pH	7.3	0.10	0.10	H	pH Units	1	12/6/2017 09:00 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	1	12/6/2017 09:00 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: *06-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027346	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027346-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PH							
			SM4500-H+B				
RunID: **NV00922-WC_171206A**	QC Batch: **R120607**			PrepDate			Analyst: **LR**
pH	7.1	0.10	0.10	H	pH Units	1	12/6/2017 09:00 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	1	12/6/2017 09:00 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		

CLIENT: CH2M HILL
Work Order: N027346
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 150.1_4500H+B_W

Sample ID **N027346-001ADUP** SampType: **DUP** TestCode: **150.1_4500H** Units: **pH Units** Prep Date: RunNo: **120607**
Client ID: **ZZZZZZ** Batch ID: **R120607** TestNo: **SM4500-H+B** Analysis Date: **12/6/2017** SeqNo: **2853239**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.280	0.10						7.260	0.275	10	H
Temp. at time of pH Analysis	25.000	0.10						25.00	0	10	H

Qualifiers:

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

CH2MHILL

CHAIN OF CUSTODY RECORD

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-567
Turnaround Time 1 Days
Shipping Date:
COC Number: 567-IM3

			Container:	250 ml Poly			
			Preservatives:	4°C			
			Filtered:	NA			
			Holding Time:	5 minutes			
	DATE	TIME	Matrix	pH		Number of Containers	COMMENTS
SC-100B-WDR-567	12-5-17	1340	Water	X	N027346-01	1	
SC-700B-WDR-567	12-5-17	1342	Water	X	-02	1	
					TOTAL NUMBER OF CONTAINERS	2	

	Signatures	Date/Time
Approved by		12-5-17 13:30
Sampled by		12-5-17 1342
Relinquished by		12-5-17 1512
Received by		12/5/17 1512
Relinquished by		12/5/17 1512
Received by		12/5/17 1512

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 2.5°C IR #2
Airbill No:
Lab Name: IM3-Plant
Lab Phone:

ATTN:
Sample Custody

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

Report Copy to
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:	12/5/2017	Workorder:	N027346
Rep sample Temp (Deg C):	2.5	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 12/06/2017

Reviewed By: 12/06/2017

List of Analysts

ASSET Laboratories Work Order: N027346

NAME	TEST METHOD
Lilia Ramit	SM 4500-H+B

Date of Report: 12/14/2017

Marlon Cartin

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

Client Project:	N027358
BCL Project:	CH2M Hill
BCL Work Order:	1735041
Invoice ID:	B288291

Enclosed are the results of analyses for samples received by the laboratory on 12/7/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval
Client Service Rep

Authorized Signature

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

1735041

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

06-Dec-17

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N027358-002A / SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	32OZP	1		

CHK BY DISTRIBUTION
SUB-OUT

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

Please use PO#:N27358A 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 #: 538641047

		Date/Time			Date/Time
Relinquished by:		12/06/2017 17:00		Received by:	12/07/17 @ 925
Relinquished by:				Received by:	

Chain of Custody and Cooler Receipt Form for 1735041 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 17-35041

SHIPPING INFORMATION
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐
BC Lab Field Service ☐ Other ☒ (Specify) GLS0

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: 0.95 Container: PE Thermometer ID: TH274 Date/Time 12/08/17
Temperature: (A) 0.3 °C / (C) 0.4 °C Analyst Init

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										
PIA 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: 12/8/17 1140
A = Actual / C = Corrected

Rev 21 05/23/2016
(S:\WPDocs\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 20)

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

Reported: 12/14/2017 17:20
Project: CH2M Hill
Project Number: N027358
Project Manager: Marlon Cartin

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1735041-01	**COC Number:**	---	**Receive Date:**	12/07/2017 09:25
	Project Number:	---	**Sampling Date:**	12/05/2017 13:42
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	N027358-002A / SC-700B-WDR-567	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water

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

Reported: 12/14/2017 17:20
Project: CH2M Hill
Project Number: N027358
Project Manager: Marlon Cartin

Water Analysis (General Chemistry)

BCL Sample ID: 1735041-01 | **Client Sample Name:** N027358-002A / SC-700B-WDR-567, 12/5/2017 1:42:00PM

Constituent	Dry Basis Result	As Recvd Result	Units	As Received PQL	As Received MDL	Method	MB Bias	Lab Quals	Run #
Ammonia as N (Distilled)		0.14	**mg/L**	**0.20**	**0.078**	**SM-4500-NH3G**	ND	**J**	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	SM-4500-NH3G	12/11/17 09:52	12/11/17 14:19	JMH	SC-1	1	B[L0944

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

Reported: 12/14/2017 17:20
Project: CH2M Hill
Project Number: N027358
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: B[L0944						
Ammonia as N (Distilled)	B[L0944-BLK1	ND	mg/L	0.20	0.078	

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

Reported: 12/14/2017 17:20
Project: CH2M Hill
Project Number: N027358
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: B[L0944										
Ammonia as N (Distilled)	B[L0944-BS1	LCS	1.0760	1.0000	mg/L	108		85 - 115		

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

Reported: 12/14/2017 17:20
Project: CH2M Hill
Project Number: N027358
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: B[L0944	Used client sample: N										
Ammonia as N (Distilled)	DUP	**1734832-01**	**0.22610**	**0.15680**		**mg/L**	**36.2**		**20**		**J,A02**
	MS	**1734832-01**	**0.22610**	**1.1834**	**1.0000**	**mg/L**		**95.7**		**80 - 120**	
	MSD	**1734832-01**	**0.22610**	**1.1601**	**1.0000**	**mg/L**	**2.0**	**93.4**	**20**	**80 - 120**	

December 19, 2017

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

Workorder No.: N027358

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on December 05, 2017 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 Liburcao for

Quennie Manimtim
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N027358

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to BC Labs- Bakersfield,CA.

Analytical Comments for EPA 200.8:

Dilution was necessary on some analytes for sample N027358-002 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) is outside recovery criteria for some analytes in QC sample N027461-001A-MS possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET Laboratories

Date: *19-Dec-17*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.03.IM.OP.00
Lab Order: N027358
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N027358-001A	SC-100B-WDR-567	Water	12/5/2017 1:40:00 PM	12/5/2017	12/19/2017
N027358-001B	SC-100B-WDR-567	Water	12/5/2017 1:40:00 PM	12/5/2017	12/19/2017
N027358-001C	SC-100B-WDR-567	Water	12/5/2017 1:40:00 PM	12/5/2017	12/19/2017
N027358-002A	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/19/2017
N027358-002B	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/19/2017
N027358-002C	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/19/2017
N027358-002D	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/19/2017
N027358-002E	SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	12/5/2017	12/19/2017

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_171206D**	QC Batch: **R120613**			PrepDate			Analyst: **LR**
Specific Conductance	7500	0.10	0.10		umhos/cm	1	12/6/2017 10:35 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: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
EPA 120.1							
RunID: **NV00922-WC_171206D**	QC Batch: **R120613**			PrepDate			Analyst: **LR**
Specific Conductance	7200	0.10	0.10		umhos/cm	1	12/6/2017 10:35 AM

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

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N027358-001ADUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **120613**
Client ID: **ZZZZZZ** Batch ID: **R120613** TestNo: **EPA 120.1** Analysis Date: **12/6/2017** SeqNo: **2853501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7490.000	0.10						7500	0.133	10	

Sample ID **N027360-004DDUP** SampType: **DUP** TestCode: **120.1_WPGE** Units: **umhos/cm** Prep Date: RunNo: **120613**
Client ID: **ZZZZZZ** Batch ID: **R120613** TestNo: **EPA 120.1** Analysis Date: **12/6/2017** SeqNo: **2853549**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	17040.000	0.10						17070	0.176	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_171206G** QC Batch: **65930** PrepDate **12/6/2017** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4400	50	50		mg/L	1	12/6/2017 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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
SM2540C							
RunID: **NV00922-WC_171206G** QC Batch: **65930** PrepDate **12/6/2017** Analyst: **LR**							
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	12/6/2017 01:16 PM

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	LCS-65930	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/6/2017	RunNo:	120616
Client ID:	LCSW	Batch ID:	65930	TestNo:	SM2540C			Analysis Date:	12/6/2017	SeqNo:	2855021

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	989.000	10	1000	0	98.9	80	120				

Sample ID	MB-65930	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/6/2017	RunNo:	120616
Client ID:	PBW	Batch ID:	65930	TestNo:	SM2540C			Analysis Date:	12/6/2017	SeqNo:	2855022

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	N027358-001ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	12/6/2017	RunNo:	120616
Client ID:	ZZZZZZ	Batch ID:	65930	TestNo:	SM2540C			Analysis Date:	12/6/2017	SeqNo:	2855024

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	4455.000	50						4445	0.225	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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
EPA 200.7							
RunID: **NV00922-ICP2_171213C** QC Batch: **65998** PrepDate **12/11/2017** Analyst: **CEI**							
Aluminum	ND	2.7	50		µg/L	1	12/13/2017 02:14 PM
Boron	1100	38	100		µg/L	1	12/13/2017 02:14 PM
Iron	ND	1.8	20		µg/L	1	12/13/2017 02:14 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		

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-65998** SampType: **MBLK** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120814**
Client ID: **PBW** Batch ID: **65998** TestNo: **EPA 200.7** Analysis Date: **12/13/2017** SeqNo: **2865004**

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 **LCS1-65998** SampType: **LCS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120814**
Client ID: **LCSW** Batch ID: **65998** TestNo: **EPA 200.7** Analysis Date: **12/13/2017** SeqNo: **2865005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10169.630	50	10000	0	102	85	115				
Boron	4943.530	100	5000	0	98.9	85	115				
Iron	105.384	20	100.0	0	105	85	115				

Sample ID **N027358-002E-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120814**
Client ID: **ZZZZZZ** Batch ID: **65998** TestNo: **EPA 200.7** Analysis Date: **12/13/2017** SeqNo: **2865011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9628.224	50	10000	0	96.3	75	125				
Boron	5985.983	100	5000	1086	98.0	75	125				
Iron	112.485	20	100.0	18.80	93.7	75	125				

Sample ID **N027358-002E-MSD** SampType: **MSD** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120814**
Client ID: **ZZZZZZ** Batch ID: **65998** TestNo: **EPA 200.7** Analysis Date: **12/13/2017** SeqNo: **2865012**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9638.418	50	10000	0	96.4	75	125	9628	0.106	20	
Boron	6012.481	100	5000	1086	98.5	75	125	5986	0.442	20	
Iron	112.872	20	100.0	18.80	94.1	75	125	112.5	0.343	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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **N027428-001D-MS1** SampType: **MS** TestCode: **200.7_WPGE** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120814**
Client ID: **ZZZZZZ** Batch ID: **65998** TestNo: **EPA 200.7** Analysis Date: **12/13/2017** SeqNo: **2865027**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	9720.474	50	10000	0	97.2	75	125				
Boron	5328.946	100	5000	344.6	99.7	75	125				
Iron	708.504	20	100.0	625.9	82.6	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		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171211D** QC Batch: **65984** PrepDate **12/11/2017** Analyst: **CEI**							
Manganese	7.6	0.056	0.50		µg/L	1	12/11/2017 11:57 AM
Zinc	ND	0.27	10		µg/L	1	12/11/2017 11:57 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: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171211D** QC Batch: **65984** PrepDate **12/11/2017** Analyst: **CEI**							
Antimony	ND	0.031	0.50		µg/L	1	12/11/2017 12:08 PM
Arsenic	0.16	0.025	0.10		µg/L	1	12/11/2017 12:08 PM
Barium	16	0.070	1.0		µg/L	1	12/11/2017 12:08 PM
Copper	ND	0.26	1.0		µg/L	1	12/12/2017 03:24 PM
Lead	ND	0.18	5.0		µg/L	5	12/11/2017 12:14 PM
Manganese	2.5	0.056	0.50		µg/L	1	12/11/2017 12:08 PM
Molybdenum	20	0.039	0.50		µg/L	1	12/11/2017 12:08 PM
Nickel	1.3	0.040	1.0		µg/L	1	12/12/2017 03:24 PM
Zinc	ND	0.27	10		µg/L	1	12/11/2017 12:08 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: *19-Dec-17*

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-65984** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **PBW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859689**

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									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Zinc	ND	10									

Sample ID **LCS-65984** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **LCSW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859690**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.389	0.50	10.00	0	93.9	85	115				
Arsenic	9.531	0.10	10.00	0	95.3	85	115				
Barium	10.959	1.0	10.00	0	110	85	115				
Lead	9.501	1.0	10.00	0	95.0	85	115				
Manganese	99.537	0.50	100.0	0	99.5	85	115				
Molybdenum	9.624	0.50	10.00	0	96.2	85	115				
Zinc	100.694	10	100.0	0	101	85	115				

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859693**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.095	0.50						0.1057	0	20	
Arsenic	20.055	0.10						20.63	2.81	20	
Barium	81.341	1.0						83.66	2.81	20	
Lead	0.602	1.0						0.6396	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		

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859693**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	ND	0.50						0	0	20	
Molybdenum	2.388	0.50						2.510	4.99	20	

Sample ID **N027461-001A-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859695**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.237	0.50	10.00	0.1057	101	75	125				
Arsenic	30.591	0.10	10.00	20.63	99.6	75	125				
Barium	90.637	1.0	10.00	83.66	69.7	75	125				S
Lead	10.837	1.0	10.00	0.6396	102	75	125				
Manganese	94.207	0.50	100.0	0	94.2	75	125				
Molybdenum	13.679	0.50	10.00	2.510	112	75	125				

Sample ID **N027461-001A-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859696**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.223	0.50	10.00	0.1057	101	75	125	10.24	0.133	20	
Arsenic	30.880	0.10	10.00	20.63	103	75	125	30.59	0.942	20	
Barium	91.171	1.0	10.00	83.66	75.1	75	125	90.64	0.588	20	
Lead	10.946	1.0	10.00	0.6396	103	75	125	10.84	1.00	20	
Manganese	94.913	0.50	100.0	0	94.9	75	125	94.21	0.747	20	
Molybdenum	13.892	0.50	10.00	2.510	114	75	125	13.68	1.54	20	

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859698**

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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859698**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	148.233	50						156.2	5.21	20	

Sample ID **N027461-001A-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859702**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	284.623	50	100.0	156.2	128	75	125				S

Sample ID **N027461-001A-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859703**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	276.655	50	100.0	156.2	120	75	125	284.6	2.84	20	

Sample ID **MB-65984** SampType: **MBLK** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120766**
Client ID: **PBW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/12/2017** SeqNo: **2861729**

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

Sample ID **LCS-65984** SampType: **LCS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120766**
Client ID: **LCSW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/12/2017** SeqNo: **2861730**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	9.272	1.0	10.00	0	92.7	85	115				
Nickel	9.622	1.0	10.00	0	96.2	85	115				

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120766**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/12/2017** SeqNo: **2861733**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	4.215	1.0						4.376	3.75	20	
Nickel	0.054	1.0						0	0	20	

Sample ID **N027461-001A-MS** SampType: **MS** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120766**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/12/2017** SeqNo: **2861735**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	12.274	1.0	10.00	4.376	79.0	75	125				
Nickel	9.077	1.0	10.00	0	90.8	75	125				

Sample ID **N027461-001A-MSD** SampType: **MSD** TestCode: **200.8_W** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120766**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/12/2017** SeqNo: **2861738**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	12.080	1.0	10.00	4.376	77.0	75	125	12.27	1.59	20	
Nickel	8.949	1.0	10.00	0	89.5	75	125	9.077	1.42	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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171206A** QC Batch: **R120679** PrepDate							Analyst: **RAB**
Hexavalent Chromium	540	3.3	20		µg/L	100	12/6/2017 04:42 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171211D** QC Batch: **65984** PrepDate **12/11/2017**							Analyst: **CEI**
Chromium	530	0.096	5.0		µg/L	5	12/11/2017 12:03 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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 218.6							
RunID: **NV00922-IC7_171206A** QC Batch: **R120679** PrepDate							Analyst: **RAB**
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	12/6/2017 05:29 PM
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_171211D** QC Batch: **65984** PrepDate **12/11/2017**							Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	12/11/2017 12:08 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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID **MB-65984** SampType: **MBLK** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **PBW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859624**

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

Sample ID **LCS-65984** SampType: **LCS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **LCSW** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859625**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.780	1.0	10.00	0	97.8	85	115				

Sample ID **N027461-001A-DUP** SampType: **DUP** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.807	1.0						0.7892	0	20	

Sample ID **N027461-001A-MS** SampType: **MS** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859630**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.418	1.0	10.00	0.7892	96.3	75	125				

Sample ID **N027461-001A-MSD** SampType: **MSD** TestCode: **200.8_W_CR** Units: **µg/L** Prep Date: **12/11/2017** RunNo: **120725**
Client ID: **ZZZZZZ** Batch ID: **65984** TestNo: **EPA 200.8** Analysis Date: **12/11/2017** SeqNo: **2859631**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.532	1.0	10.00	0.7892	97.4	75	125	10.42	1.09	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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R120679** SampType: **MBLK** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **120679**
Client ID: **PBW** Batch ID: **R120679** TestNo: **EPA 218.6** Analysis Date: **12/6/2017** SeqNo: **2857145**

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-R120679** SampType: **LCS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **120679**
Client ID: **LCSW** Batch ID: **R120679** TestNo: **EPA 218.6** Analysis Date: **12/6/2017** SeqNo: **2857146**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.129	0.20	5.000	0	103	90	110				

Sample ID **N027361-001AMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **120679**
Client ID: **ZZZZZZ** Batch ID: **R120679** TestNo: **EPA 218.6** Analysis Date: **12/6/2017** SeqNo: **2857159**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	122.249	2.0	50.00	71.04	102	90	110				

Sample ID **N027361-001AMSD** SampType: **MSD** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **120679**
Client ID: **ZZZZZZ** Batch ID: **R120679** TestNo: **EPA 218.6** Analysis Date: **12/6/2017** SeqNo: **2857160**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	120.692	2.0	50.00	71.04	99.3	90	110	122.2	1.28	20	

Sample ID **N027358-001BMS** SampType: **MS** TestCode: **218.6_WU_P** Units: **µg/L** Prep Date: RunNo: **120679**
Client ID: **ZZZZZZ** Batch ID: **R120679** TestNo: **EPA 218.6** Analysis Date: **12/6/2017** SeqNo: **2857182**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1058.490	20	500.0	543.1	103	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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N027358-001BDUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	120679
Client ID:	ZZZZZZ	Batch ID:	R120679	TestNo:	EPA 218.6			Analysis Date:	12/6/2017	SeqNo:	2857185

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	547.980	20						543.1	0.900	20	

Sample ID	N027358-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	120679
Client ID:	ZZZZZZ	Batch ID:	R120679	TestNo:	EPA 218.6			Analysis Date:	12/6/2017	SeqNo:	2857187

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.133	0.20	1.000	0.1099	102	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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:40:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171206B**	QC Batch: **R120611**			PrepDate			Analyst: **LR**
Turbidity	0.46	0.10	0.10		NTU	1	12/6/2017 02:20 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

ANALYTICAL RESULTS

Print Date: *19-Dec-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_171206B**	QC Batch: **R120611**			PrepDate			Analyst: **LR**
Turbidity	0.45	0.10	0.10		NTU	1	12/6/2017 02:20 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		

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	MB-R120611	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	120611
Client ID:	PBW	Batch ID:	R120611	TestNo:	SM 2130B			Analysis Date:	12/6/2017	SeqNo:	2853328

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

Sample ID	N027359-002DDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	120611
Client ID:	ZZZZZZ	Batch ID:	R120611	TestNo:	SM 2130B			Analysis Date:	12/6/2017	SeqNo:	2853333

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	81.700	0.10						83.30	1.94	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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171206A** QC Batch: **R120643** PrepDate							Analyst: **RAB**
Fluoride	2.3	0.032	0.50		mg/L	5	12/6/2017 09:56 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **NV00922-IC8_171207A** QC Batch: **R120699** PrepDate							Analyst: **RAB**
Sulfate	490	1.1	25		mg/L	50	12/7/2017 08:23 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

Date: *19-Dec-17*

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R120643_F** SampType: **MBLK** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **120643**
Client ID: **PBW** Batch ID: **R120643** TestNo: **EPA 300.0** Analysis Date: **12/6/2017** SeqNo: **2854730**

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

Sample ID **LCS-R120643_F** SampType: **LCS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **120643**
Client ID: **LCSW** Batch ID: **R120643** TestNo: **EPA 300.0** Analysis Date: **12/6/2017** SeqNo: **2854731**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.239	0.10	1.250	0	99.1	90	110				

Sample ID **N027359-001DMS** SampType: **MS** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **120643**
Client ID: **ZZZZZZ** Batch ID: **R120643** TestNo: **EPA 300.0** Analysis Date: **12/6/2017** SeqNo: **2854746**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.559	0.50	6.250	2.504	96.9	80	120				

Sample ID **N027359-001DMSD** SampType: **MSD** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **120643**
Client ID: **ZZZZZZ** Batch ID: **R120643** TestNo: **EPA 300.0** Analysis Date: **12/6/2017** SeqNo: **2854747**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.655	0.50	6.250	2.504	98.4	80	120	8.558	1.12	20	

Sample ID **N027359-003DDUP** SampType: **DUP** TestCode: **300_W_FPG** Units: **mg/L** Prep Date: RunNo: **120643**
Client ID: **ZZZZZZ** Batch ID: **R120643** TestNo: **EPA 300.0** Analysis Date: **12/6/2017** SeqNo: **2854748**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.320	0.50						2.276	1.89	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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**N027358-002BMS**	SampType:	**MS**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:			RunNo:	**120643**	
Client ID:	**ZZZZZZ**	Batch ID:	**R120643**	TestNo:	**EPA 300.0**			Analysis Date:	**12/6/2017**		SeqNo:	**2854752**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.712	0.50	6.250	2.310	102	80	120				

Qualifiers:

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

CLIENT: CH2M HILL
Work Order: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R120699_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	120699
Client ID:	PBW	Batch ID:	R120699	TestNo:	EPA 300.0			Analysis Date:	12/7/2017	SeqNo:	2858930

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

Sample ID	LCS-R120699_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	120699
Client ID:	LCSW	Batch ID:	R120699	TestNo:	EPA 300.0			Analysis Date:	12/7/2017	SeqNo:	2858931

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.992	0.50	4.000	0	99.8	90	110				

Sample ID	N027359-001DMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	120699
Client ID:	ZZZZZZ	Batch ID:	R120699	TestNo:	EPA 300.0			Analysis Date:	12/7/2017	SeqNo:	2858942

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	672.705	25	200.0	464.1	104	80	120				

Sample ID	N027360-007CMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	120699
Client ID:	ZZZZZZ	Batch ID:	R120699	TestNo:	EPA 300.0			Analysis Date:	12/7/2017	SeqNo:	2858946

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	292.698	10	80.00	209.6	104	80	120				

Sample ID	N027360-007CMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	120699
Client ID:	ZZZZZZ	Batch ID:	R120699	TestNo:	EPA 300.0			Analysis Date:	12/7/2017	SeqNo:	2858947

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	293.002	10	80.00	209.6	104	80	120	292.7	0.104	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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	**N027360-008DDUP**	SampType:	**DUP**	TestCode:	**300_W_SO4P**	Units:	**mg/L**	Prep Date:			RunNo:	**120699**	
Client ID:	**ZZZZZZ**	Batch ID:	**R120699**	TestNo:	**EPA 300.0**			Analysis Date:	**12/7/2017**		SeqNo:	**2858949**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	215.382	10						215.2	0.0697	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-17*

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-567
Lab Order:	N027358	**Collection Date:**	12/5/2017 1:42:00 PM
Project:	PG&E Topock, 680375.03.IM.OP.00	**Matrix:**	WATER
Lab ID:	N027358-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
SM4500-NO3F							
RunID: **NV00922-WC_171211C** QC Batch: **R120748** PrepDate							Analyst: **QBM**
Nitrate/Nitrite as N	2.7	0.11	0.25		mg/L	5	12/11/2017

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: N027358
Project: PG&E Topock, 680375.03.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R120748** SampType: **MBLK** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **120748**
Client ID: **PBW** Batch ID: **R120748** TestNo: **SM4500-NO3** Analysis Date: **12/11/2017** SeqNo: **2860695**

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-R120748** SampType: **LCS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **120748**
Client ID: **LCSW** Batch ID: **R120748** TestNo: **SM4500-NO3** Analysis Date: **12/11/2017** SeqNo: **2860696**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.471	0.050	0.5000	0	94.1	85	115				

Sample ID **N027321-001CDUP** SampType: **DUP** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **120748**
Client ID: **ZZZZZZ** Batch ID: **R120748** TestNo: **SM4500-NO3** Analysis Date: **12/11/2017** SeqNo: **2860698**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	84.280	5.0						83.79	0.583	20	

Sample ID **N027321-002CMS** SampType: **MS** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **120748**
Client ID: **ZZZZZZ** Batch ID: **R120748** TestNo: **SM4500-NO3** Analysis Date: **12/11/2017** SeqNo: **2860713**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	48.110	2.5	25.00	28.43	78.7	75	125				

Sample ID **N027321-002CMSD** SampType: **MSD** TestCode: **4500N03F_W** Units: **mg/L** Prep Date: RunNo: **120748**
Client ID: **ZZZZZZ** Batch ID: **R120748** TestNo: **SM4500-NO3** Analysis Date: **12/11/2017** SeqNo: **2860714**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	51.705	2.5	25.00	28.43	93.1	75	125	48.11	7.20	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		

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-567
Turnaround Time 10 Days
Shipping Date:
COC Number: 567

			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-567	12-5-17	1340	Water			X	X		X		X	X	N027358-01	3	
SC-700B-WDR-567	12-5-17	1342	Water	X	X	X	X	X	X	X		X	-02	4	
													TOTAL NUMBER OF CONTAINERS	7	

	Signatures	Date/Time
Approved by		12-5-17 13:00
Sampled by		12-5-17 1340
Relinquished by		12-5-17 1512
Received by		12/5/17 1512
Relinquished by		12/5/17 1588
Received by		12/5/17 1588

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 12-5-17 1842
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: 12/5/2017 Workorder: N027358

Rep sample Temp (Deg C): 2.5 IR Gun ID: 2

Temp Blank: ☑ Yes ☐ No

Carrier name: ASSET

Last 4 digits of Tracking No.: 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 Hex Cr were lab filtered an preserved with Ammonium buffer.
Samples for Metals were lab preserved with HNO3 and for NH3/NO3- with H2SO4, pH adjusted to < 2.

Checklist Completed By: YR 12/15/2017 Reviewed By: 12/18/2017

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

06-Dec-17

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N027358-002A / SC-700B-WDR-567	Water	12/5/2017 1:42:00 PM	32OZP	1		

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

Please use PO#:N27358A 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 #: 538641047

		Date/Time			Date/Time
Relinquished by:	12/06/2017	17:00		**Received by:**	
Relinquished by:				**Received by:**	

List of Analysts

ASSET Laboratories Work Order: N027358

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