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July 10, 2019

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Subject: June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup, PG&E Topock Compressor Station, Needles, California
(Document ID: TPK_Monthly_Progress_Rpt_June_2019_20190710_Final)

Dear Ms. Innis and Mr. Yue:

In compliance with the *1996 Corrective Action Consent Agreement* (CACA) (Attachment 6, Part E, Section 9a and Attachment 7) and the *2013 Remedial Design/Remedial Action Consent Decree* (CD) (§32 and Appendix C, Section 5), and pursuant to the *Construction/ Remedial Action Work Plan* (C/RAWP) (Section 2.6.3.1), this monthly report describes activities taken at Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station during April 2019 as well as activities planned for the next six weeks (July 7 through August 17, 2019), and presents available results from sampling and testing performed in June 2019.

In addition, this report discusses material deviations from the approved design documents and/or the C/RAWP, if any, that PG&E has proposed to the California Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (DOI), or that have been approved by DTSC and DOI. This report also highlights key personnel changes, if any, and summarizes activities performed and activities planned in support of DOI's 2012 Community Involvement Plan and DTSC's 2019 Community Outreach Plan, as well as contacts with the local community, representatives of the press, and/or public interest groups, if any. This report also includes data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection, as required by the Condition of Approval # xi in DTSC's approval letter dated August 24, 2018.

Please note that since activities conducted to comply with the project's Applicable or Relevant and Appropriate Requirement (ARARs) and the Subsequent Environmental Impact Report (SEIR) mitigation measures are currently reported in separate compliance reports, this information is not repeated in the monthly reports.

Monthly progress reports will be submitted to DTSC and DOI by the 10th day of the following month during construction and start-up of the groundwater remedy at the Topock Compressor Station which officially began on October 2, 2018. This is the eighth monthly progress report. Please contact me at (760) 791-5884 if you have any questions or comments regarding this submittal.

Sincerely,

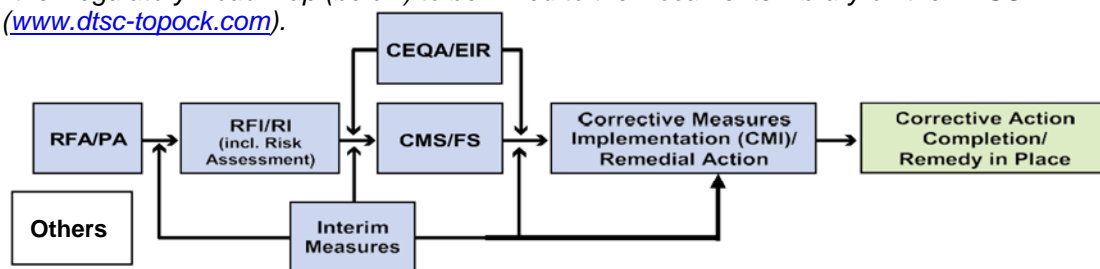
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Topock Project Executive Abstract

<p>Document Title: <i>June 2019 Monthly Progress Report for the Groundwater Remedy Construction and Startup, PG&E Topock Compressor Station, Needles, California</i></p> <p>Submitting Agency: DOI, DTSC</p> <p>Final Document? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Date of Document: 7/10/2019</p> <p>Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E</p>
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<p>Type of Document:</p> <p><input type="checkbox"/> Draft <input checked="" type="checkbox"/> Report <input type="checkbox"/> Letter <input type="checkbox"/> Memo</p> <p><input type="checkbox"/> Other / Explain:</p>	<p>Is this a Regulatory Requirement?</p> <p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>If no, why is the document needed?</p>
<p>What does this information pertain to?</p> <p><input type="checkbox"/> Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)</p> <p><input type="checkbox"/> RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)</p> <p><input type="checkbox"/> Corrective Measures Study (CMS)/Feasibility Study (FS)</p> <p><input checked="" type="checkbox"/> Corrective Measures Implementation (CMI)/ Remedial Action(RA)</p> <p><input type="checkbox"/> California Environmental Quality Act (CEQA)/ Environmental Impact Report (EIR)</p> <p><input type="checkbox"/> Interim Measures</p> <p><input type="checkbox"/> Other / Explain:</p>	<p>Is this a Regulatory Requirement?</p> <p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>If no, why is the document needed?</p>
<p>What is the consequence of NOT doing this item? What is the consequence of DOING this item?</p> <p>The consequence for not doing this item is PG&E will be out of compliance with the 1996 Corrective Action Consent Agreement (CACA) and the 2013 Remedial Design/ Remedial Action Consent Decree (CD), as well as the Construction/Remedial Action Work Plan (C/RAWP).</p>	<p>Other Justification/s:</p> <p><input type="checkbox"/> Permit <input type="checkbox"/> Other / Explain:</p>
<p>Brief Summary of attached document:</p> <p>This monthly report describes activities taken during June 2019 and activities planned for the next six weeks (July 7 through August 17, 2019) and presents available results from sampling and testing in June 2019. In addition, this report discusses material deviations from the approved design documents and/or the <i>Construction/ Remedial Action Work Plan (C/RAWP)</i>, if any, that PG&E has proposed to the California Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (DOI) or that have been approved by DTSC and DOI. This report also highlights key personnel changes, if any, and summarizes activities performed and activities planned at the Topock Compressor Station in support of DOI's 2012 Community Involvement Plan and DTSC's 2019 Community Outreach Plan, as well as contacts with local community, representatives of the press, and/or public interest groups, if any.</p> <p>Written by: Pacific Gas and Electric Company</p>	
<p>Recommendations:</p> <p>Provide input to PG&E.</p>	
<p>How is this information related to the Final Remedy or Regulatory Requirements:</p> <p>This submittal is required in compliance with the CACA, CD, and pursuant to the C/RAWP.</p>	
<p>Other requirements of this information?</p> <p>None.</p>	

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



June 2019
Monthly Progress Report for the
Final Groundwater Remedy Construction and Startup

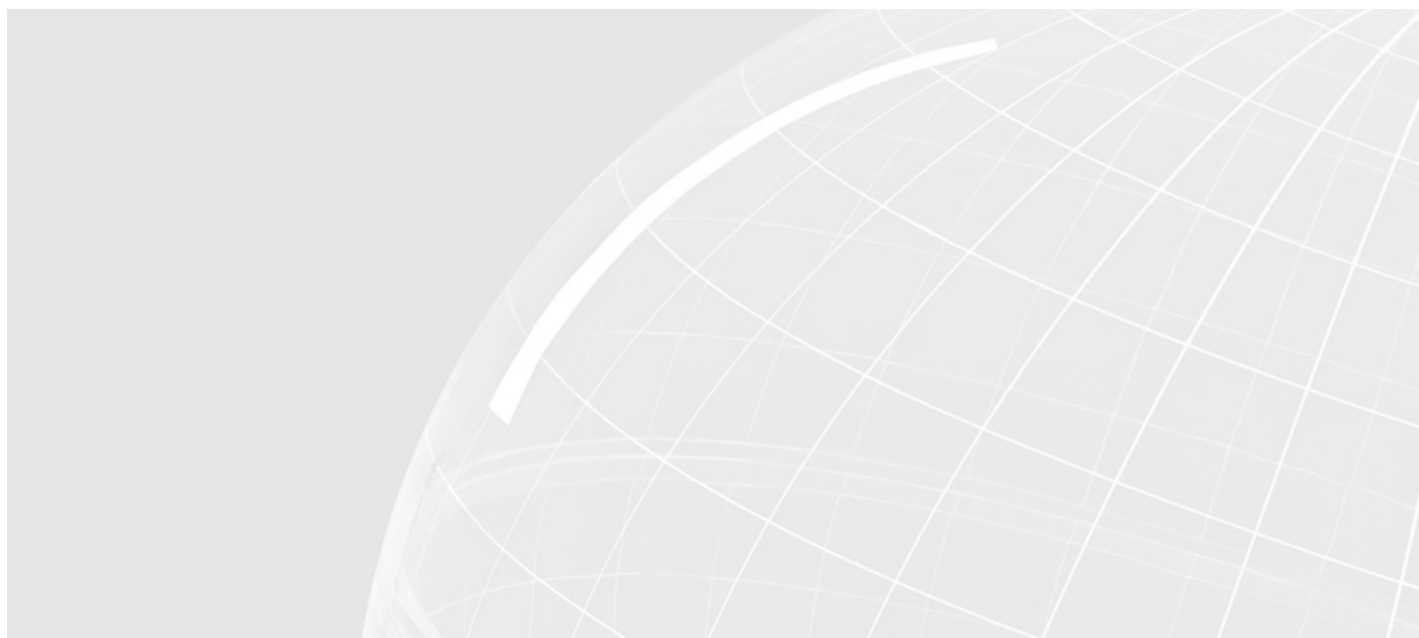
PG&E Topock Compressor Station
Needles, California

Document ID: TPK_Monthly_Progress_Rpt_June_20190710_Final

July 2019

Prepared for
U.S. Department of the Interior and California Department of Toxic Substances Control

On Behalf of
Pacific Gas and Electric Company



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Acronyms and Abbreviations

µg/m ³	micrograms per cubic meter
AOC	Area of Concern
APE	Area of Potential Effect
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMP	best management practice
CACA	Corrective Action Consent Agreement
C/RAWP	Construction/Remedial Action Work Plan
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M	CH2M HILL, Inc.
CHQ	Construction Headquarters
DOI	United States Department of the Interior
DTSC	California Department of Toxic Substances Control
ERTC	Environmental Release to Construct
FCR	field contact representative
LOC	level of concern
NTH	National Trails Highway
PBA	Programmatic Biological Agreement
PG&E	Pacific Gas and Electric Company
RCRA	Resource Conservation and Recovery Act
SEIR	Subsequent Environmental Impact Report
SPY	Soil Processing Yard
SWPPP	Stormwater Pollution Prevention Plan
TCS	Topock Compressor Station
TRC	Technical Review Committee
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WEAT	Worker Environmental Awareness Training
WVR	Work Variance Request

1. Introduction

Pacific Gas and Electric Company (PG&E) is implementing the final groundwater remedy to address chromium in groundwater near the PG&E Topock Compressor Station (TCS), located in eastern San Bernardino County 15 miles southeast of the city of Needles, California.

The U.S. Department of the Interior (DOI) is the lead federal agency overseeing remedial actions at the TCS. PG&E and the United States executed a Remedial Design/Remedial Action Consent Decree (CD), on behalf of the DOI, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 2012, which was approved by the U.S. District Court for the Central District of California in November 2013 (DOI, 2013). Paragraph 32 and Appendix C (Section 5) of the CD requires PG&E to submit to DOI electronic progress reports during construction of the remedial action and on a quarterly basis after the selected remedy has been implemented and demonstrated to be operating as intended.

The California Department of Toxic Substances Control (DTSC) is the lead state agency overseeing corrective actions at the TCS. Remedial activities are being performed in conformance with the requirements of the Resource Conservation and Recovery Act (RCRA) Corrective Action pursuant to a Corrective Action Consent Agreement (CACA) entered into by PG&E and the DTSC in February 1996 (DTSC, 1996). Attachment 6, Part E, Section 9a and Attachment 7 of the CACA require PG&E to provide certain information in monthly progress reports during construction of the corrective action.

In compliance with the above CACA and CD requirements, PG&E proposed a template for the monthly progress reports in Exhibit 2.6-2 of the Construction/Remedial Action Work Plan (C/RAWP) (CH2M HILL, Inc. [CH2M], 2015b). The C/RAWP was approved by DOI on April 3, 2018 (DOI, 2018) and DTSC on April 24, 2018 (DTSC, 2018a).

This is the ninth of the monthly progress reports that will be submitted to DOI and DOI for the duration of the remedy construction and startup. This monthly progress report documents activities during June 2019, and follows the content and format described in Exhibit 2.6-2 of the approved C/RAWP. The report is organized as follows:

- **Section 2.1** describes completed construction activities; data collected, generated or received; nature and volume of waste generated; waste handling/disposal; issues encountered; actions taken to rectify problems/issues; personnel changes; and Work Variance Requests (WVRs; i.e., material deviations from the design documents, the C/RAWP, or other approved work plans), if any, as well as agencies' actions on those requests, and potential schedule impacts.
- **Section 2.2** summarizes contacts with representatives of the press, local community, or public interest groups during the reporting period, other activities provided to assist DTSC and/or DOI in support of the Community Outreach Plan (DTSC, 2019) and/or Community Involvement Plan (DOI, 2012), respectively, and anticipated near-term (approximately next six weeks) activities in support of the Community Outreach and Community Involvement Plans.
- **Section 2.3** describes the planned activities for the next six weeks (construction activities, sampling and monitoring events, etc.).
- **Section 2.4** provides information relating to the construction schedule progress, sequencing of activities, information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule, and a description of efforts made to mitigate those delays or anticipated delays, if any.
- **Section 3** lists the references cited in this report.

Please note that since activities conducted to comply with the project's Applicable or Relevant and Appropriate Requirement (ARARs) and the Subsequent Environmental Impact Report (SEIR; DTSC, 2018b) mitigation measures are currently reported in separate compliance reports, the same information is not repeated in the monthly reports.

2. Monthly Update

2.1 Description of Activities and Work Completed

2.1.1 Work Completed

Highlights of key activities related to the construction of the groundwater remedy completed during June 2019 include the following (in chronological order):

- On July 13, 2018, PG&E sent via email the first weekly six-week look-ahead schedule for the remedy construction field work. The weekly emails provide highlights of field activities in the previous week, field activities scheduled for the next week, and planned activities for the next six weeks. Recipients of the weekly emails are DOI, DTSC, the U.S. Fish and Wildlife Service (USFWS), Tribes, and the Technical Review Committee (TRC). PG&E continues to send these weekly emails to date. As of June 30, 2019, a total of 51 six-week look-ahead schedule emails have been sent. **Of those, five six-week look-ahead schedule emails were sent in June 2019 (on June 1, 9, 16, 23, and 30, 2019).**
- On August 10, 2018, PG&E issued the first Environmental Release to Construct (ERTC) to contractors. As of June 30, 2019, a total of 46 ERTCs were issued for mobilization and construction activities (see Table 2-1). **Of those, one ERTC was issued in June 2019.**
- Starting on October 4, 2018, PG&E has published a daily construction activities list and discussed the list at the morning tailboards with Tribes and agency representatives. This daily list is intended to inform and facilitate observation by Tribes and agency representatives on site on that day. PG&E continues to publish these daily lists and discuss the list at the daily morning tailboards to date. **In June 2019, a total of 25 daily construction activities lists were published and discussed at the morning tailboards.**
- In June 2019, PG&E completed the following construction activities (see Figures 2-1 and 2-2 for locations of key areas and wells, as well as select photos in **Attachment A**):
 - **Non-Well Construction Activities:**
 - a) Completed hydrostatic testing of Pipeline C Segments C3, C4, C5 in the floodplain. Repaired a leak in the dual containment pipe in Segment C5 and re-tested.
 - b) Installed concrete skirts along Pipeline C Segments C3-C5 cleanouts, valve boxes, and leak detection.
 - c) Placed surface material (crushed rocks) and installed fence posts/fence fabric/barbed wire at the Construction Headquarters (CHQ).
 - d) Installed V-ditch at the CHQ. Placed K-rail at one location along the southern fence line of the CHQ to prevent potential damage if large rocks/boulders from adjacent hillside were to run onto the CHQ.
 - e) Potholed along remedy pipeline alignments B, C Segment C6 (on the MW-20 Bench), and F in preparation for pipeline installation.
 - **Pilot Boring/Well Installation Activities (Rotasonic drilling):**
 - a) Complete site preparation for MW-X and MW-Y' in Arizona, including installation of exclusionary fencing at MW-Y'.
 - b) Completed well installation at MW-M, MW-O, and MW-R.
 - c) Completed development at MW-M.
 - **Remedy Well Installation Activities (Dual Rotary drilling):**
 - a) Completed vegetation clearance to facilitate access for dual rotary rig to RB-5.
 - b) Complete improvement of access road to RB-2.

- c) Completed remedy well installation at IRZ-23.
- d) Completed development at IRZ-20.
- e) See **Attachment B** for available information such as boring logs and water analytical results.
- **Baseline/Opportunistic Soil Sampling Activities:**
 - Pursuant to the Baseline Soil Sampling and Analysis Plan (Appendix A of the Soil Management Plan [which is Appendix L of the C/RAWP]), one soil sample was collected at approximately 1 foot below ground surface (bgs) at MW-X (sampled on June 11, 2019), MW-Y' (sampled on June 12, 2019), and MW-C and MW-H (both sampled on June 15, 2019).
 - See **Attachment C** for information about soil sampling locations and soil analytical results that are available at this time.
- **Perimeter Air Sampling Activities:**
 - a) Dust monitoring/observation was conducted through June 30, 2019 at the perimeter of select work areas.
 - b) Perimeter air sampling for hexavalent chromium is performed at the perimeter of the work areas (outside of the exclusion zone) that are inside Areas of Concern (AOCs) within the construction footprint where hexavalent chromium concentrations in soil have been historically reported. In June 2019, two air sampling events occurred during the installation of IRZ-23 (on MW-20 Bench) by dual rotary drilling on June 17 and 18, 2019.
 - c) See **Attachment D** for information about previous air sampling locations and air analytical results.
- **Noise Monitoring Activities:**
 - a) Noise monitoring is conducted at pre-approved locations closest to the construction activities. Through June 30, 2019, noise monitoring was conducted at the following pre-approved locations:
 - Location west of the mobile home park at Moabi Regional Park,
 - Location Maze B Combined Area 1/2,
 - Location Maze C Area 1, and
 - Location mobile home park at Topock Marina.
 - b) See **Attachment E** for information about pre-approved noise monitoring locations and a summary of noise monitoring data available to date.

2.1.2 Work Already Underway and During Implementation

As of June 30, 2019, PG&E has started and will continue to perform the following activities:

- Continue to install electrical pull boxes along Pipeline C Segments C3-C5.
- Continue to install the aggregate base access road in the floodplain.
- Continue to drill and install well at MW-C, MW-X, and RB-5.
- Complete site preparation for drilling at MW-H in the floodplain.
- Complete sonic drilling of pilot hole at RB-2.
- Continue to develop MW-B and MW-R.
- Continue to test at IRZ-20.
- Continue to install temporary service water and wastewater pipelines for dual rotary drilling at RB well locations.

- Continue to conduct noise and dust monitoring and inspection of Stormwater Pollution Prevention Plan (SWPPP) Best Management Practices (BMPs).
- Continue to track and manage waste generated.
- Continue to manage displaced soil per the approved Soil Management Plan (Appendix L of the C/RAWP).

2.1.3 Freshwater Usage, Waste Generation and Management

As of June 30, 2019, the volumes of freshwater used for remedy construction and waste streams generated from remedy construction (starting on October 2, 2018) are as follows:

Freshwater Usage and Wastewater Management

- An approximate total of 2,235,550 gallons (6.86 acre-feet) of freshwater was used, of which an approximate 3.6 percent was for pilot boring/well installation and general construction, 1.4 percent for hydrostatic testing of pipeline, and 95 percent was for fugitive dust suppression. Of this amount, 690,350 gallons of freshwater was used in June 2019.
- An approximate total of 45,600 gallons of hydrostatic testing water was discharged to land. Of this amount, 1,100 gallons were discharged in June 2019. The discharge complies with the substantive requirements of State Water Resources Control Board (SWRCB) Water Quality Order 2003-0003-DWQ. See **Attachment F** for approximate volume at each approved discharge location and date of each discharge.
- An approximate total of 124,946 gallons of wastewater generated from drilling operations were discharged to Compressor Station evaporation pond #4. In June 2019, a total of 19 truck loads of wastewater was discharged to pond #4. The discharge complies with the Waste Discharge Requirements (WDRs) of the California Regional Water Quality Control Board (CRWQCB), Colorado River Basin Region, Order No. R7-2018-0022.

At each sonic drilling location, the wastewater is initially stored in a holding tank in the primary work zone, and is transferred from the primary work zone, as needed, to 20,000-gallon frac tanks located at the MW-20 Bench. Each transfer load is tracked. At each dual rotary drilling location, freshwater and wastewater are conveyed between the frac tanks and the drilling location via pipes. Once a frac tank is full, its contents is characterized and managed in accordance with the approved Waste Management Plan (Appendix R of the C/RAWP).

Displaced Materials/Soils/Clay

- Approximately 248.3 cubic yards of drill cuttings were generated from well drilling and geotechnical investigation. Of those, approximately 1.3 cubic yards are clay from Pipeline F geotechnical investigation (using hollow stem auger). Drill cuttings are typically stored in roll-off bins with closed tops. Samples are collected from the bins for characterization and analyzed in accordance with the Soil Management Plan.
 - The clay collected from the Pipeline F geotechnical investigation is stockpiled at the SPY, separate from the other clean soil, in accordance with the revised clay handling protocol in Addendum to the Soil Management Plan (dated May 28, 2019).
- During sonic drilling of MW-O, fat clay with sand (CH) was encountered at 26.8 to 27.8 feet below ground. The clay material retrieved from drill cores was put in a zip lock bag and stored in a sample cooler at the SPY. The clay will be characterized in accordance with the Soil Management Plan.
- Approximately 20 cubic yards of displaced soil was generated from the potholing activities along remedy pipeline alignments to pre-characterize soil in preparation for pipeline installation. Samples were collected for characterization in accordance with the Soil Management Plan. These soils are currently stored in bins at the SPY. A decision on the final disposition of these soils is forthcoming.
- Approximately 100 cubic yards of displaced soil was generated from excavation for the brine tanks containment upgrade at the MW-20 Bench. Samples were collected for characterization and analyzed

in accordance with the Soil Management Plan. This soil is currently stockpiled on a plastic liner at the SPY. A decision on the final disposition of this soil is forthcoming.

- Approximately 20 cubic yards of displaced soil was generated from potholing activities to a) daylight the Frontier telecom line along Pipeline C on NTH and b) pre-characterize soil in preparation for construction activities at the MW-20 Bench. Samples were collected for characterization and analyzed in accordance with the Soil Management Plan. This soil is currently stored in bins at the SPY. A decision on the final disposition of this soil is forthcoming.

General Construction Waste, Sanitary Waste, and Recyclables

- In June 2019, approximately 72 cubic yards of general construction waste and 5.8 tons of green waste/construction debris (e.g., concrete from wash outs) were generated and transported to Republic Services in Lake Havasu City for disposal and management.
- Sanitary waste from construction trailers/portable toilets is hauled offsite as needed.

2.1.4 Worker Training and Education

- PG&E continues to provide the mandatory Site Health and Safety Training for its employees and contractors on a daily basis. As of June 30, 2019, a total of 86 health and safety training sessions were held and 317 employees and contractors received the training. **Of those, in June 2019, five sessions were conducted and 13 employees/contractors were trained.** After the training, the attendees signed the training roster.
- PG&E continues to provide the mandatory Worker Environmental Awareness Training (WEAT) to its employees and contractors that will be involved in the remedy construction project. The training is offered regularly on Mondays and Thursdays, and more frequently as needed. As of June 30, 2019, a total of 91 WEAT sessions were conducted and 363 employees and contractors received the training. **Of those, in June 2019, 8 sessions were conducted (on 6/3, 6/5, 6/6, 6/18, 6/20, 6/25 (twice), 6/27) and 15 employees/contractors were trained.** Educational brochures are made available to attendees of the training; they are designed to reinforce the key topics and highlight the take-aways discussed during the classroom training. After the training, the attendees signed a WEAT completion form.
- PG&E's onsite biologist also trained Field Contact Representatives (FCRs), who will be responsible for compliance with biological avoidance and mitigation measures. As of June 30, 2019, a total of 10 FCR training sessions were conducted and 54 employees and contractors received the training. **No FCR training was conducted in June 2019.**
- Training records are kept electronically and at the temporary construction trailers at the SPY. The records are available upon request.

2.1.5 Status of Work Variance Requests (WVRs)

PG&E did not propose any new work variance in June 2019. See Table 2-2 for information regarding activities related to previously proposed WVRs (i.e., material deviations from the design documents, the C/RAWP, or other approved work plans), and agencies' actions on those requests.

2.1.6 Use of Future Activity Allowance

There was no proposed use of Future Activity Allowance (FAA) to date.

2.1.7 Issues Encountered and Actions Taken to Rectify Issues/Problems

- On June 26, 2019, a passerine bird nest with one egg was identified in the floodplain near the aggregate-based access road along Pipeline C Segment C5, south of the steps from the MW-20 bench to the floodplain. The birds were identified as black-tailed gnatcatchers. A buffer between the nest and the access road was immediately established and agencies were informed. The buffer was maintained until June 28, 2019, when a biologist determined that the bird nest was abandoned.

- On June 14, 2019, the sonic rig at MW-M was taken off-site for repairs. The rig returned onsite on June 24, 2019.
- On May 31, 2019, PG&E conducted a video log of the well casings in the deep well cluster at MW-B (MW-B-267 and MW-B-337). Results for the video log indicate that solid materials were encountered in both casings, with approximately 70 to 78 feet of materials. There were no direct observations of a crack in either of the casings. On June 25-26, 2019, PG&E developed the deep well MW-B-337 and bailed out the solids. A video log was performed of the cleaned out well to assess if there is damage to the screen or casing and if solid material is re-entering the well. PG&E will discuss and propose potential next steps with the agencies.
- A portion of a tremie pipe was lost in the casing during installation of MW-R. PG&E is evaluating the field information and will provide further details in the July Monthly Progress Report.
- While filling the dual containment pipeline for hydrostatic testing on May 24, 2019, a leak was observed within the inner carrier pipe which prohibited filling and testing of the line. The leak was located on May 31, 2019 and the associated HDPE weld was removed. The affected pipeline segment was replaced and re-tested on June 5, 2019. The dual containment pipeline passed the hydrostatic test on June 5, 2019.
- PG&E continues to work with Frontier to resolve the conflict between their telecom line and Pipeline C segments C13, C15, and C16, in the shoulder of NTH.
- PG&E continues to work with Kinder Morgan to resolve the conflict between their gas pipeline and Pipeline C segment C17, north of the Transwestern Bench.
- PG&E is working with potential subcontractors on the details of an installation plan for the jack-and-bore under NTH.
- PG&E is evaluating options to dewater during installation of Pipeline C8 in the floodplain, south of BNSF bridge.

2.1.8 Key Personnel Changes

There was no change to key PG&E project personnel in June 2019.

2.2 Communication with the Public

PG&E did not have any key communications with the public in June 2019:

2.3 Planned Activities for Next Six Weeks

The planned activities for next six weeks (July 7 through August 17, 2019) include the following:

- Well installation activities:
 - Complete installation of wells MW-C, MW-D, MW-H, MW-X, IRZ-21, RB-4, and RB-5.
 - Start well installation at RB-3.
 - Complete drilling of pilot borings at RB-2 and IRZ-19.
 - Start drilling well MW-Y' and MW-S.
 - Conduct well testing at IRZ-20, IRZ-21, and IRZ-25.
 - Complete well development at MW-O and MW-C.
 - Drilling of pilot boring at IRZ-37 did not occur as forecasted in the May 2019 Monthly Progress Report due to the availability of spider rig. This activity will be added to a six-week look ahead schedule when rig availability is known.

- Non-well construction activities:
 - Complete CHQ fence installation.
 - Complete surface installation of pull boxes at Pipeline C Segments C3, C4, and C5.
 - Complete installation of access road in the floodplain.
 - Start installation of Pipeline C Segment C6 (from floodplain to MW-20 Bench).
 - Start site preparation and pipeline B installation.
 - Conduct conduit testing in floodplain.
 - Conduct dewatering test at C8-Alt in the floodplain (tentative).
 - Continue to conduct noise and dust monitoring and inspection of SWPPP BMPs.
 - Continue to log and manage waste generated.
 - Continue to manage displaced soil per the approved Soil Management Plan.

Attachment G contains the six-week look-ahead schedule available at this time. Any adjustments to the schedule will occur as needed via the weekly emails (sent at the end of each week) and/or the daily list of construction activities (published daily and discussed with agency and Tribal representatives on site on that day).

2.4 Construction Schedule Review

Phase 1 of the groundwater remedy construction started on October 2, 2018. Table 2-3 presents a summary of the percent completeness for key construction activities as of June 30, 2019. PG&E continues to evaluate and optimize the construction schedule.

2.5 Available Sitewide Groundwater Monitoring Data (DTSC Condition of Approval xi)

Pursuant to Condition of Approval # xi in DTSC's approval letter dated August 24, 2018 (DTSC, 2018a), PG&E is required to report data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection. In compliance with this requirement, PG&E submitted validated data to DTSC via monthly emails. For ease of recordkeeping and to minimize the number of ad-hoc compliance reports/emails, PG&E has included validated data in each monthly progress report starting with the November 2018 report (see **Attachment H**).

3. References

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Tables

Table 2-1 Summary of Environmental Release-To-Constructions (ERTCs) Issued to Contractors

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup

PG&E Topock Compressor Station, Needles, California

ERTC No.	Brief Description of Covered Areas and Scope of Authorized Activities	Issue Date
Non-Well ERTCs		
1	Initial mobilization activities at the Construction Headquarters (CHQ), Soil Processing Yard (SPY), and three staging areas (#9 Parking area off I-40, #18 MW-20 Bench, and #23 Transwestern Bench). Scope included installation of temporary construction trailers, portable generators, SWPPP BMPs, construction signages, and temporary construction fencing, as well as equipment staging and truck inspections.	August 10, 2018
Addendum 1 to ERTC #1	Scope included setup of wastewater and freshwater storage tanks at MW-20 Bench, improvement of the access road at the CHQ, installation of perimeter fence at the SPY, and grading at SPY.	September 21, 2018
Addendum 2 to ERTC #1	Scope included grading for drill rig setup at IRZ-20.	October 4, 2018
Addendum 3 to ERTC #1	Scope included geotechnical investigation in the footprint of the future Carbon Amendment building at the MW-20 Bench.	October 9, 2018
Addendum 4 to ERTC #1	Scope included the installation of a temporary handrail along the walkway from the MW-20 Bench to the floodplain.	December 28, 2018
2	Scope included the installation of the temporary construction water system and construction water tanks at Area #25 Route 66 Welcome Sign.	September 28, 2018
3	Scope included the installation of the Public Information Trailer, a fugitive dust sign, an information kiosk, and a construction delivery sign at the northwest corner of Park Moabi Road and National Trails Highway (NTH).	September 4, 2018
4	Scope included the installation of a truck containment pad at the TCS evaporation ponds and maintenance of the access road to the ponds.	September 24, 2018
6	Scope included the geotechnical investigation along Pipeline F alignment (on the Compressor Station entrance road).	October 3, 2018
7	Scope included the installation of traffic control along the southern end of NTH per the Traffic Control Plan.	September 17, 2018
9	Scope included the transplantation and planting of sensitive plants.	November 9, 2018
10	Scope included potholing activities along approved pipeline alignments and in building footprints, that are also in AOCs/SMWUs. The purpose is to pre-characterize soil in preparation for construction.	March 29, 2019
11	Scope included preparation of temporary staging areas, vegetation clearance, placement of stabilization mats, potholing in select locations, and installation of Pipeline C segments C1 through C6 in the floodplain.	January 3, 2019
11a	Scope included preparation of temporary staging areas, vegetation clearance, placement of stabilization mats, potholing in select locations, and installation of Pipeline C segments C7-C10, and C17 in the floodplain.	February 11, 2019
11b	Scope included installation of Pipelines B, F, and J.	May 31, 2019
12	Scope included non-intrusive site preparation work for the brine tanks containment upgrade on the MW-20 Bench (per Work Variance Request #1, see Table 2-2). A forthcoming addendum to this ERTC will be issued to include the actual upgrade activities.	January 10, 2019
12a	Scope included the actual brine tanks containment upgrade activities which include intrusive work on the MW-20 Bench (per Work Variance Request #1, see Table 2-2).	February 6, 2019
Well ERTCs		
5a	Scope included the site setup, drilling, testing, and demobilization at MW-L.	September 27, 2018
5b	Scope included the placement of soil stabilization mats in the floodplain, setup of a temporary staging area near the north end of the access route in the floodplain, rig setup, installation of snow fence to protect plants, drilling, testing, and demobilization at IRZ-15.	October 12, 2018
5c	Scope included the site setup, drilling, testing, and demobilization at IRZ-20 on the MW-20 Bench.	October 15, 2018

Table 2-1 Summary of Environmental Release-To-Constructions (ERTCs) Issued to Contractors

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

ERTC No.	Brief Description of Covered Areas and Scope of Authorized Activities	Issue Date
5d	Scope included the site setup, drilling, testing, and demobilization at MW-E on the MW-20 Bench.	October 29, 2018
5e	Scope included the site setup, drilling, testing, and demobilization at MW-N in the upland.	November 15, 2018
5f	Scope included the site setup, drilling, testing, and demobilization at IRZ-13 in the floodplain.	November 7, 2018
5g	Scope included the site setup, drilling, testing, and demobilization at IRZ-23 on the MW-20 Bench.	November 8, 2018
5h	Scope included the site setup, drilling, testing, and demobilization at MW-M in the upland.	January 15, 2019
5i	Scope included the site setup, drilling, testing, and demobilization at IRZ-9 in the floodplain.	November 28, 2018
5j	Scope included the site setup, drilling, testing, and demobilization at IRZ-25 on the MW-20 Bench.	December 3, 2018
5k	Scope included the site setup, drilling, testing, and demobilization at IRZ-21 on the MW-20 Bench.	December 9, 2018
5l	Scope included the site setup, drilling, testing, and demobilization at MW-B in the floodplain.	December 10, 2018
Addendum to ERTC #5l	Scope included the setup of an additional temporary equipment and material staging area in the floodplain.	December 13, 2018
5m	Scope included the site setup, drilling, testing, and demobilization at MW-F along NTH.	December 17, 2018
5n	Scope included the site setup, drilling, testing, and demobilization at IRZ-11 in the floodplain.	December 17, 2018
5o	Scope included the site setup, drilling, testing, and demobilization at MW-X and MW-Y' in Arizona.	April 23, 2019
5p	Scope included the site setup, drilling, testing, and demobilization at MW-G along NTH.	January 14, 2019
5q	Scope included the site setup, drilling, testing, and demobilization at IRZ-16 and IRZ-17 in the floodplain.	February 14, 2019
5r	Scope included the site setup, drilling, testing, and demobilization at IRZ-27 and IRZ-29 along NTH. Also included in the scope are potholing activities along Pipeline C Segments C13, C15, and C16 and on the MW-20 Bench.	March 9, 2019
Addendum #1 to ERTC #5r	Scope included the potholing to locate Transwestern Gas Pipeline within NTH (in support of Pipeline C installation).	April 24, 2019
5s	Scope included the site setup, drilling, testing, and demobilization at IRZ-39 in the low area, north of the Transwestern Bench.	March 12, 2019
5t	Scope included the site setup, drilling, testing, and demobilization at IRZ-27 along NTH.	March 19, 2019
5u	Scope included the site setup, drilling, testing, and demobilization at MW-U in I-40 median.	March 22, 2019
5v	Scope included the site setup, drilling, testing, and demobilization at MW-10D in Bat Cave Wash.	March 27, 2019
5w	Scope included the site setup, drilling, testing, and demobilization at MW-W in the floodplain.	March 22, 2019
5x	Scope included the site setup, drilling, testing, and demobilization at RB-1 through 5 wells and MW-O in the floodplain.	March 30, 2019
5y	Scope included the site setup, drilling, testing, and demobilization at MW-S on the access road to Bat Cave Wash.	April 12, 2019
5z	Scope included the site setup, drilling, testing, and demobilization at MW-R in the Upland.	May 8, 2019
5aa	Scope included the site setup, drilling, testing, and demobilization at MW-C, MW-D, and MW-H in the floodplain	June 6, 2019

Note:
ERTC 8 (Wastewater Management) is under development.

Table 2-2 Summary of Work Variance Requests (WVRs)

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

WVR No.	Brief Description of Work Variance Request	Approval Dates
1	<p>This WVR addressed PG&E's proposed modification to the brine tanks containment for use by the remedy, specifically:</p> <ul style="list-style-type: none"> • Upgrade the existing lined containment to concrete - The original synthetic liner material has degraded from exposure to UV light, heat, and abrasion and must be replaced. PG&E proposed to replace the synthetic-lined containment (including K-rails) with a concrete containment to support the groundwater remedy. The concrete color will be desert tan, and information on this proposed concrete color will be submitted to the agencies for review. The proposed concrete material will be similar to the material of the truck lane in the final remedy design (see Appendix E of the Final Basis of Design Report (CH2M, 2015a),* Section 033 00, Cast-In-Place Concrete). • Shorten the length of the containment - This containment will have the same height as the existing containment, but with a slightly smaller footprint (the length is 5 feet shorter). This smaller footprint still meets the required volume for a secondary containment and allows for more space for remedy construction at the tight MW-20 bench. 	<p>DOI approved WVR #1 on June 22, 2018</p> <p>DTSC approved WVR #1 on July 5, 2018</p>
2	<p>PG&E proposed to relocate the tie-in point for remedy construction water to an aboveground location inside TCS and below the TCS Water Storage Tanks. This is to eliminate the risk of damaging the existing pressurized 6-inch water line and to avoid any interference with PG&E Gas Operations control of the Station's water supply. The WVR addressed this relocation, specifically:</p> <ul style="list-style-type: none"> • Relocate the construction water tie-in point to an aboveground location below the TCS Water Storage Tanks, inside TCS – The final design calls for the temporary construction water line to hot-tap into the existing 6-inch steel water line just as the line turns southwest to continue to TCS. PG&E proposed to move the tie-in point to an aboveground valve manifold, located below the TCS Water Storage Tanks in the boneyard area. • Extend the temporary construction water line to the new tie-in point, along Pipeline 300A access road – The planned 4-inch high-density polyethylene (HDPE) temporary construction water line will be extended, following the route of the Pipeline 300A access road, to the new tie-in point inside TCS. This pipeline extension is approximately 1,950 feet and is also made of 4-inch HDPE. The pipe will be laid on ground surface and to the south of the 6-inch water line where possible. At the crossing with the SoCal Gas pipeline access road, the pipeline will be at grade with fill to allow for vehicle crossing. 	<p>DOI/DTSC approved WVR #2 on August 29, 2018</p>
3	<p>PG&E proposed changes within the CHQ fence line to avoid/minimize the overall amount of soil disturbance during construction, reduce the number of truck trips to haul wastewater, and allow for additional working space within the yard. There are no proposed changes to the CHQ footprint nor its fence line. The specifics are described below:</p> <ul style="list-style-type: none"> • Relocate the decontamination pad from the western fence to the northern fence (near the western corner). Based on recent survey data collected during construction, the difference in ground elevation between northern and southern end of the pad is about 4 feet. Moving the pad to the northern fence would eliminate the difference in ground elevation and reduce the amount of soil disturbance by at least 80 cubic yards. • Bring the remedy-produced wastewater tank from belowground to aboveground, increase the tank volume from 1,000 to 2,500 gallons, and place the aboveground, double-walled tank adjacent to the decontamination pad. The change from belowground to aboveground reduces the amount of soil disturbance by at least 50 cubic yards. The change to a bigger tank will reduce the amount of truck trips needed to haul wastewater. The placement of the tank adjacent to the decontamination pad allows for the pad to function as a secondary containment for the haul truck during off-loading of the wastewater. • Defer construction of the underground sewage tanks. Deferral of the underground tanks reduces the overall amount of soil disturbance by at least 800 cubic yards. All sanitary wastes will be managed in aboveground sewage tanks (similar to the ones currently used for the SPY trailers) or portable toilets. • Swap the location of the construction trailers and the sunshade and change the configuration of the sunshade from a rectangle to a square. This change will allow for more working space within the CHQ. All functions that would occur in the Workshop/Sampling Processing building will be conducted in the construction trailers. 	<p>DOI/DTSC approved WVR #3 on January 4, 2019</p>
4	<p>PG&E proposed to revise a segment of Pipeline C near the I-40 bridge, to meet the permit requirement in Caltrans Encroachment Permit No. 08-18-6-MW-0533. The revision involves</p>	<p>DOI/DTSC approved</p>

Table 2-2 Summary of Work Variance Requests (WVRs)

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

WVR No.	Brief Description of Work Variance Request	Approval Dates
	relocating a small segment of Pipeline C to within National Trails Highway to meet a minimum distance of 10 feet from current and future I-40 bridge footings. The treatment measure specified for Segment X of National Trails Highway in the Cultural and Historic Property Management Plan will be implemented during installation of this pipeline segment.	WVR #4 on May 14, 2019
5	PG&E proposed to phase the remedy produced water conditioning system within the approved footprint inside TCS.	Pending
6	<p>In early October 2018, PG&E conducted a geotechnical investigation along the Pipeline F alignment on the entrance road to the Topock Compressor Station (TCS) and the adjacent hill side. Based on the geotechnical results, the construction contractor (PIVOX) indicated that soldier piles and lagging would be required for temporary shoring. Over 40 soldier piles would be installed by drilling using a 330-sized excavator or larger. A 330-sized excavator has a general width of 11 feet, and counter weight clearance of approximately 4 feet. During operation, this rig would occupy a minimum 15 to 16 feet width of the TCS entrance road for about 12 days. The paved width of the road is between 22 to 24 feet in the area of shoring (per review of the location via Google Earth).</p> <p>Assuming a minimum clearance of 1 foot (which is still less than the recommended clearance) from any operating equipment, there will be approximately 5 to 8 feet of available lane width for access by TCS traffic. Large vehicles (tractor-trailers, delivery trucks, construction equipment) will likely not be able to pass by the active operation, and passenger vehicles may also not be able to pass the active operation in locations where the road narrows. Also, the excavator cannot be repositioned while soldier piles are being drilled. In sum, access to TCS will be severely restricted for about 12 days. This is not acceptable for Compressor Station operations.</p> <p>Therefore, PG&E proposed to realign Pipeline F (starting from segment F3) along the approved alignment of Pipelines B and J. Construction of Pipelines F, B, and J would occur in the same alignment and at the same time.</p>	DOI and DTSC approved WVR #6 on May 21 and May 22, 2019, respectively.

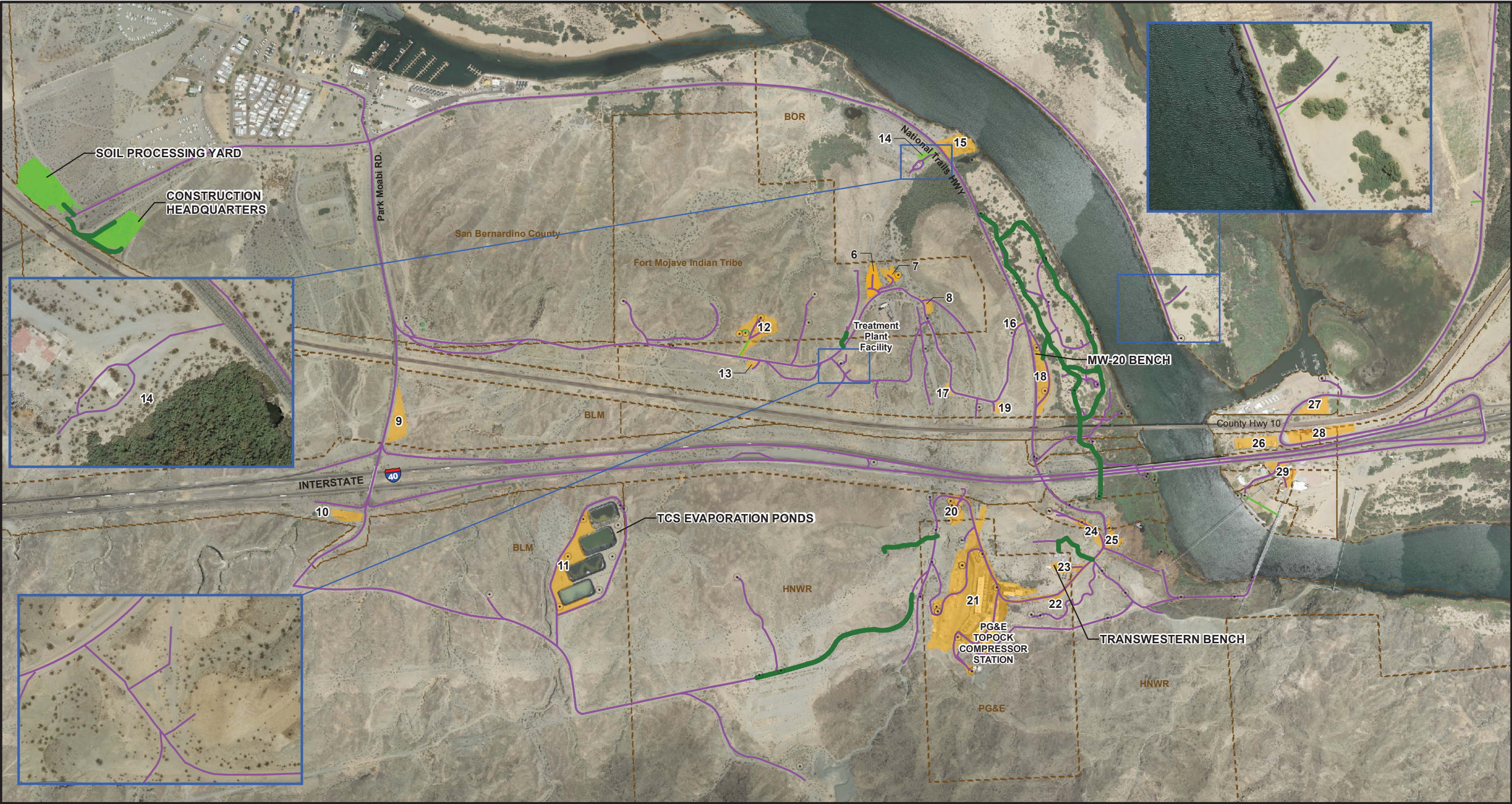
Note:

* CH2M HILL, Inc. (CH2M). 2015a. *Basis of Design Report/Final (100%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California*. November 18.

Table 2-3 Summary of Percent Completeness of Key Construction Activities*June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup**PG&E Topock Compressor Station, Needles, California*

Activity	% Complete	Current Status of Construction Activities (as of May 31, 2019)
Project signage & Public Information Office	100%	Complete.
Staging Area 9 setup	100%	Complete.
Staging Area 23 setup	100%	Complete.
Staging Area 18 setup	100%	Complete.
Temporary construction offices at Soil Processing Yard	100%	Complete.
Soil Processing Yard setup for construction staging	100%	Complete.
National Trails Highway lane closure and traffic control installation	100%	Complete.
Temporary construction water line	100%	Complete.
TCS Ponds concrete containment pad	100%	Complete.
Construction Headquarters (CHQ) access road	100%	Complete.
Aggregate-based access road in floodplain	Not Available	Underway.
CHQ security fence	Not Available	Surface material (crushed rocks) in place. Fence posts/fence fabric/barbed wire complete. Fence gates in July.
MW-L	100%	Complete.
MW-N	100%	Complete.
MW-E	100%	Complete.
MW-W	100%	Complete.
MW-M, MW-O, MW-R, MW-F, MW-G, MW-10D	Not Available	Well construction complete. Surface completion will be scheduled when rig is available.
MW-B	Not Available	Video survey complete in May. Bailed out fill material in deep well MW-B-367 in June. Re-video survey.
RB-5, RB-4, RB-3, IRZ-9, 13, 15, 16, 17, 21, 23, 25, 27, and 39 pilot borings	100%	Complete.
IRZ-20 remedy well	Not Available	Well construction and development complete. Well testing in July.
IRZ-21, IRZ-23, and IRZ-25 remedy wells	Not Available	Well construction complete. Well testing in July.
Pipeline C Segments C3, C4, C5	Not Available	Pipeline and conduit installation complete. Hydrostatic testing complete. Installation of cleanouts, valve boxes, and leak detection complete. Installation of pull boxes underway.
Brine Tanks containment upgrade	100%	Complete.

Figures

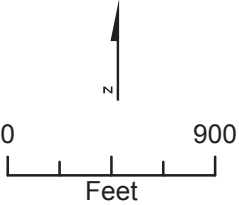


LEGEND

- Existing Access Route (will continue to be used for remedial activities)
- Existing Route (to be used as is for access to remedial activities)
- Roads to be improved or constructed for groundwater remedy
- Soil Processing (Area #5) and Construction Headquarter (Area #4) for Remediation Project
- Staging Areas for Remediation Project

Notes:

- Decontamination pads will be located in Area #4 (Construction Headquarters), Area #21 (Topock Compressor Station), and Area #23 (Transwestern Bench).
- Areas #15, 16, 17, 19, and 20 will not be used as staging areas. Areas #16, 17, and 19 may be part of the primary work zones for remedy infrastructure along the access road.
- Area #20 may be part of the primary work zone for installation of future provisional well IRL-6 (if determined to be needed in the future) and associated piping/concrete/vault.
- Public roadways outside of the EIR project area and the APE can also be used for remedy implementation.



**FIGURE 2.1-1
CONSTRUCTION SITE PLAN
AND ACCESS ROUTES**
GROUNDWATER REMEDY CONSTRUCTION/
PHASE 1
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA



LEGEND

Property Boundaries

Existing Wells:

- Extraction Well
- Injection Well
- Monitoring Well
- Water Supply Well

Planned Wells:

- Extraction, National Trails Highway (NTH) In-situ Reactive Zone (IRZ)
- Extraction, Riverbank
- Injection, NTH IRZ
- Injection, Topock Compressor Station
- Remedy Monitoring Well
- Recirculation Well

Pipeline Corridor for Remedy

- Aboveground Pipe
- Underground Pipe/Conduit

Remedy Facilities

- Planned Transformer
- Future Provisional Transformer
- Proposed Remedy Structure

Note:

- Note that in compliance with EIR mitigation measure CUL-1a-9, as well as PA and CHPMP mitigation measures, the pipeline along the dirt road west of National Trails Hwy is located in an existing, previously disturbed, access road. In addition, the location of the road and pipeline was field verified and does not create any direct physical impact or effect on the Topock Maze, as it is manifested archaeologically, in compliance with EIR mitigation measure CUL-1a-10, PA, and CHPMP mitigation measures.
- All well and structure locations are approximate.

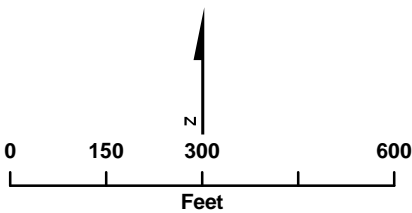


FIGURE 2-2
WELL AND PIPELINE LOCATIONS
GROUNDWATER REMEDY PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Attachment A

Photographs



MW-O Location Next to the Colorado River



MW-R Location in the Upland



**Grading and
Installation of
Exclusionary Fence
at MW-Y' (Arizona)**



**Mats Placement at
MW-Y' (Arizona)**



**MW-X Location
(Arizona)**



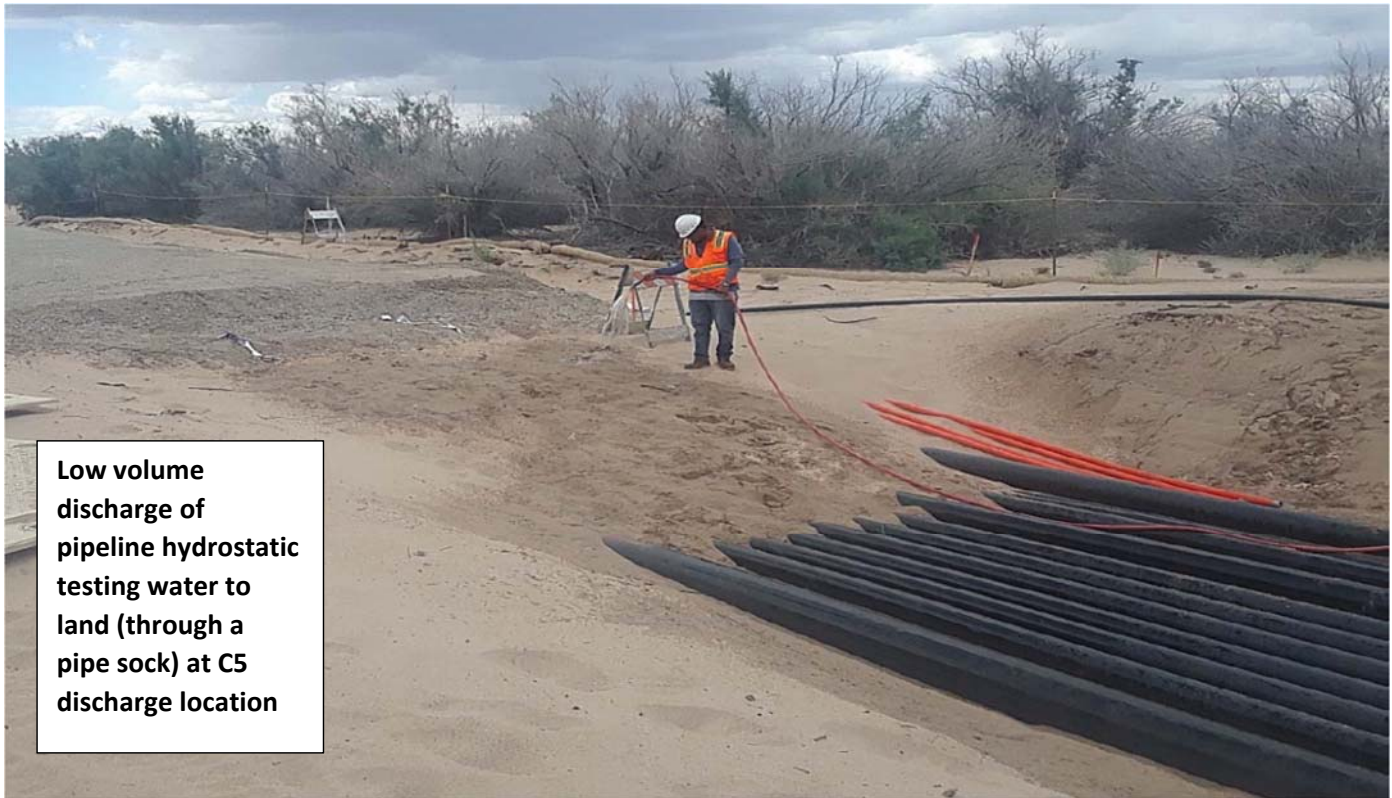
**Installed handhold
pull boxes and 12
KV pull boxes in the
floodplain**



**Check dams and rip
raps installation in
V-ditch at the
Construction
Headquarters**



**Fence posts
installation at the
Construction
Headquarters**



Low volume discharge of pipeline hydrostatic testing water to land (through a pipe sock) at C5 discharge location



Low volume discharge of pipeline flushing water to land (through a pipe sock) at C6 discharge location



Hydrostatic testing fill point at the beginning of Pipeline C Segment C3

Attachment B
Available Boring Logs, Well Construction
Logs, and Groundwater Sample Results
from Well Drilling

Table B-1. Groundwater Sampling Results

*June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California*

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
MW-10D	MW-10D-041119	04/11/19	108 - 123	160	160
MW-10D	MW-10D-VAS-107-112	04/01/19	107 - 112	95	96
MW-10D	MW-10D-VAS-118-123	04/02/19	118 - 123	200	190
MW-B	MW-B-VAS-27-32	01/06/19	27 - 32	5.9 J	7.7J
MW-B	MW-B-VAS-47-52	01/09/19	47 - 52	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-67-72	01/09/19	67 - 72	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-102-107	01/10/19	102 - 107	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-142-147	01/15/19	142 - 147	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-182-187	02/13/19	182 - 187	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-207-212	02/14/19	207 - 212	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-247-252	02/17/19	247 - 252	11 J	< 0.83 U
MW-B	MW-B-VAS-264-269	02/18/19	264 - 269	< 0.13 U	< 0.33 U
MW-B	MW-B-VAS-287-292	02/20/19	287 - 292	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-317-322	02/21/19	317 - 322	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-339-344	02/27/19	339 - 344	< 0.13 U	< 0.33 U
MW-B	MW-B-VAS-352-357	02/28/19	352 - 357	0.603 J	< 0.33 U
MW-B	MW-B-117-033019	03/30/19	WD, 117	< 0.13 U	< 0.17 U
MW-B	MW-B-33-033119	03/31/19	WD, 33	3.7	2.3
MW-E	MW-E-VAS-52-57	11/05/18	52 - 57	7800	7000
MW-E	MW-E-VAS-82-87	11/06/18	82 - 87	190	200
MW-E	MW-E-VAS-112-117	11/06/18	112 - 117	3000	3100
MW-E	MW-E-VAS-137-142	11/07/18	137 - 142	7900	7300
MW-E	MW-E-70-121418	12/14/18	WD, 70	-	3000
MW-E	MW-E-142-121418	12/14/18	WD, 142	4500	4200
MW-F	MW-F-VAS-52-57	01/06/19	52 - 57	2700	2500
MW-F	MW-F-VAS-82-87	01/07/19	82 - 87	120	110
MW-F	MW-F-VAS-97-102	01/07/19	97 - 102	1900	1800
MW-F	MW-F-VAS-112-117	01/08/19	112 - 117	790	740
MW-F	MW-F-104-022719	02/27/19	WD, 104	1800	1700
MW-F	MW-F-60-022819	02/28/19	WD, 60	2300	2200
MW-G	MW-G-VAS-52-57	02/13/19	52 - 57	790	680
MW-G	MW-G-VAS-67-72	02/14/19	67 - 72	1000	920
MW-G	MW-G-VAS-77-82	02/15/19	77 - 82	710	600
MW-G	MW-G-82-030219	03/02/19	WD, 82	1500	1500
MW-G	MW-G-57-030219	03/02/19	WD, 57	510	560
MW-L	MW-L-VAS-76-81	10/06/18	76 - 81	34	31
MW-L	MW-L-VAS-106-111	10/09/18	106 - 111	0.697 J	0.84

Table B-1. Groundwater Sampling Results

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
 PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
MW-L	MW-L-VAS-141-146	10/10/18	141 - 146	< 0.13 U	< 0.033 U
MW-L	MW-L-VAS-181-186	10/20/18	181 - 186	3.8	3.3
MW-L	MW-L-VAS-218-223	10/21/18	218 - 223	68	66
MW-L	MW-L-VAS-261-266	10/22/18	261 - 266	0.284 J	< 0.17 U
MW-L	MW-L-180-032819	03/28/19	WD, 180	< 0.13 U	< 0.17 U
MW-L	MW-L-245-030319	03/03/19	WD, 245	14	15
MW-L	MW-L-90-032919	03/29/19	WD, 90	19	18
MW-L	MW-L-225-032919	03/29/19	WD, 225	410	380
MW-M	MW-M-VAS-52-57	03/28/19	52 - 57	29	28
MW-M	MW-M-VAS-72-77	03/29/19	72 - 77	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-107-112	03/30/19	107 - 112	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-147-152	03/31/19	147 - 152	Data not yet available	< 0.17 U
MW-M	MW-M-VAS-172-177	04/02/19	172 - 177	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-190-195	04/10/19	190 - 195	< 0.13 U	< 0.17 U
MW-N	MW-N-VAS-121-126	02/14/19	121 - 126	0.699 J	0.51
MW-N	MW-N-VAS-142-147	02/16/19	142 - 147	< 0.13 U	< 0.033 U
MW-N	MW-N-VAS-173-178	02/18/19	173 - 178	< 0.13 U	< 0.033 U
MW-N	MW-N-VAS-210-215	02/21/19	210 - 215	320	290
MW-N	MW-N-VAS-228-233	02/26/19	228 - 233	< 0.13 U	< 0.17 U
MW-N	MW-N-217-040219	04/02/19	WD, 217	110	110
MW-N	MW-N-237-040119	04/01/19	WD, 237	1600	1500
MW-N	MW-N-129-040319	04/03/19	WD, 129	45	46
MW-O	MW-O-VAS-101-106	05/10/19	101 - 106	< 0.13 U	< 0.033 U
MW-O	MW-O-VAS-106-111	05/11/19	106 - 111	< 0.13 U	< 0.17 U
MW-O	MW-O-VAS-12.5-17.5	05/08/19	12 - 18	< 0.13 U	0.163 J
MW-O	MW-O-VAS-136-141	05/11/19	136 - 141	< 0.13 U	< 0.17 U
MW-O	MW-O-VAS-51-56	05/09/19	51 - 56	< 0.13 U	< 0.033 U
MW-O	MW-O-VAS-66-71	05/09/19	66 - 71	< 0.13 U	0.178 J
MW-R	MW-R-VAS-92-97	05/13/19	92 - 97	42	45
MW-R	MW-R-VAS-117-122	05/14/19	117 - 122	4.6	5.8
MW-R	MW-R-VAS-151-156	05/15/19	151 - 156	<0.13 U	< 0.033 U
MW-R	MW-R-VAS-192-197	05/16/19	192 - 197	<0.13 U	< 0.033 U
MW-R	MW-R-VAS-227-232	05/17/19	227 - 232	<0.13 U	< 0.033 U
MW-R	MW-R-VAS-255-260	05/29/19	255 - 260	<0.13 U	< 0.17 U
MW-R	MW-R-VAS-269-274	05/30/19	269 - 274	<0.13 U	< 0.17 U
MW-W	MW-W-VAS-7-12	03/27/19	7 - 12	0.266 J	< 0.17 U
MW-W	MW-W-VAS-22-27	03/28/19	22 - 27	< 0.13 U	< 0.33 U

Table B-1. Groundwater Sampling Results

*June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California*

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
MW-W	MW-W-31-040419	04/04/19	WD, 31	< 0.13 U	< 0.17 U
MW-X	MW-X-VAS-12-17	06/25/19	12-17	Data not yet available	< 0.033 U
MW-X	MW-X-VAS-32-37	06/26/19	32-37	Data not yet available	< 0.033 U
MW-U	MW-U-VAS-137-142	04/12/19	137 - 142	0.818 J	1.4
MW-U	MW-U-VAS-181-186	04/13/19	181 - 186	< 0.13 U	0.112 J
MW-U	MW-U-VAS-222-227	04/14/19	222 - 227	< 0.13 U	< 0.033 U
MW-U	MW-U-VAS-257-262	04/16/19	257 - 262	< 0.13 U	0.0896 J
MW-U	MW-U-VAS-287-292	04/17/19	287 - 292	< 0.13 U	< 0.033 U
MW-U	MW-U-VAS-317-322	04/24/19	317 - 322	< 0.13 U	< 0.17 U
MW-U	MW-U-183-050819	05/08/19	WD, 183	< 0.13 U	< 0.033 U
MW-U	MW-U-273-051019	05/10/19	WD, 273	< 0.13 U	< 0.033 U
IRZ-9	IRZ-9-VAS-27-32	12/03/18	27 - 32	120	120
IRZ-9	IRZ-9-VAS-47-52	12/04/18	47 - 52	< 0.13 U	< 0.033 U
IRZ-9	IRZ-9-VAS-62-67	12/04/18	62 - 67	< 0.13 U	< 0.033 U
IRZ-9	IRZ-9-VAS-182-187	12/11/18	182 - 187	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-207-212	12/13/18	207 - 212	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-232-237	12/13/18	232 - 237	0.811 J	< 0.17 U
IRZ-9	IRZ-9-VAS-264-269	12/15/18	264 - 269	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-276-281	12/16/18	276 - 281	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-292-297	12/18/18	292 - 297	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-32-37	11/17/18	32 - 37	170	220
IRZ-13	IRZ-13-VAS-57-62	11/18/18	57 - 62	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-102-107	11/19/18	102 - 107	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-142-147	11/19/18	142 - 147	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-180-185	11/27/18	180 - 185	230	190
IRZ-13	IRZ-13-VAS-197-202	11/28/18	197 - 202	< 0.13	< 0.83
IRZ-13	IRZ-13-VAS-224-229	11/28/18	224 - 229	< 0.13	< 0.83
IRZ-13	IRZ-13-VAS-237-242	11/29/18	237 - 242	< 0.13 U	< 0.17 U
IRZ-15	IRZ-15-VAS-32-37	11/01/18	32 - 37	13	13
IRZ-15	IRZ-15-VAS-62-67	11/02/18	62 - 67	< 0.65 U	0.459 J
IRZ-15	IRZ-15-VAS-102-107	11/03/18	102 - 107	< 0.65 U	< 0.17 U
IRZ-15	IRZ-15-VAS-132-137	11/04/18	132 - 137	0.228 J	< 0.17 U
IRZ-15	IRZ-15-VAS-162-167	11/05/18	162 - 167	3400	3200
IRZ-15	IRZ-15-VAS-182-187	11/06/18	182 - 187	130	140
IRZ-15	IRZ-15-VAS-222-227	11/07/18	222 - 227	< 0.13 U	< 0.17 U
IRZ-16	IRZ-16-VAS-27-32	02/20/19	27 - 32	480	480
IRZ-16	IRZ-16-VAS-57-62	02/20/19	57 - 62	< 0.33 U	< 0.33 U

Table B-1. Groundwater Sampling Results

*June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California*

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
IRZ-16	IRZ-16-VAS-102-107	02/21/19	102 - 107	< 0.33 U	< 0.33 U
IRZ-16	IRZ-16-VAS-132-137	02/26/19	132 - 137	< 0.17 U	< 0.17 U
IRZ-16	IRZ-16-VAS-147-152	02/27/19	147 - 152	< 0.17 U	< 0.17 U
IRZ-16	IRZ-16-VAS-172-177	02/27/19	172 - 177	110	110
IRZ-16	IRZ-16-VAS-192-197	02/28/19	192 - 197	< 0.17 U	< 0.17 U
IRZ-17	IRZ-17-VAS-32-37	03/02/19	32 - 37	78	67
IRZ-17	IRZ-17-VAS-62-67	03/02/19	62 - 67	0.750 J	0.604 J
IRZ-17	IRZ-17-VAS-102-107	03/03/19	102 - 107	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-132-137	03/13/19	132 - 137	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-137-142	03/12/19	137 - 142	< 0.13 U	< 0.13 U
IRZ-17	IRZ-17-VAS-142-147	03/04/19	142 - 147	68	84
IRZ-17	IRZ-17-VAS-147-152	03/12/19	147 - 152	< 0.13 U	< 0.33 U
IRZ-17	IRZ-17-VAS-152-157	03/04/19	152 - 157	16	7.0
IRZ-17	IRZ-17-VAS-162-167	03/04/19	162 - 167	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-172-177	03/05/19	172 - 177	< 0.13 U	< 0.17 U
IRZ-20	IRZ-17-VAS-197-202	03/06/19	197 - 202	< 0.13 U	< 0.17 U
IRZ-20	IRZ-17-VAS-217-222	03/06/19	217 - 222	< 0.13 U	< 0.17 U
IRZ-20	IRZ-20-VAS-112-117	10/22/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-20	IRZ-20-VAS-131-136	10/23/18	131 - 136	< 0.13 U	< 0.17 U
IRZ-20	IRZ-20-VAS-173-178	10/24/18	173 - 178	< 0.13 U	< 0.83 U
IRZ-21	IRZ-21-VAS-52-57	12/15/18	52 - 57	100	97
IRZ-21	IRZ-21-VAS-77-82	12/16/18	77 - 82	1.3	1.1
IRZ-21	IRZ-21-VAS-112-117	12/16/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-21	IRZ-21-VAS-132-137	12/17/18	132 - 137	< 0.13 U	< 0.17 U
IRZ-21	IRZ-21-VAS-147-152	12/18/18	147 - 152	4000	3600
IRZ-23	IRZ-23-VAS-67-72	12/01/18	67 - 72	86	85
IRZ-23	IRZ-23-VAS-92-97	12/01/18	92 - 97	0.453 J	< 0.033 U
IRZ-23	IRZ-23-VAS-122-127	12/02/18	122 - 127	2100	2000
IRZ-23	IRZ-23-VAS-139-144	12/02/18	139 - 144	3400	3000
IRZ-25	IRZ-25-VAS-52-57	12/05/18	52 - 57	4300	3500
IRZ-25	IRZ-25-VAS-67-72	12/05/18	67 - 72	750	620
IRZ-25	IRZ-25-VAS-92-97	12/06/18	92 - 97	140	130
IRZ-25	IRZ-25-VAS-112-117	12/11/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-25	IRZ-25-VAS-147-152	12/11/18	147 - 152	3800	3600
IRZ-25	IRZ-25-VAS-162-167	12/13/18	162 - 167	3000	3000
IRZ-27	IRZ-27-VAS-52-57	03/15/19	52 - 57	4500	4400
IRZ-27	IRZ-27-VAS-72-77	03/17/19	72 - 77	0.338 J	< 0.033 U

Table B-1. Groundwater Sampling Results

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
IRZ-27	IRZ-27-VAS-102-107	03/18/19	102 - 107	< 0.13 U	< 0.17 U
IRZ-27	IRZ-27-VAS-132-137	03/20/19	132 - 137	1200	1300
IRZ-39	IRZ-39-VAS-27-32	03/30/19	27 - 32	31	29
RB-3	RB-3-VAS-15-20	04/26/19	15 - 20	< 0.13 U	< 0.033 U
RB-3	RB-3-VAS-50-55	04/27/19	50 - 55	< 0.13 U	0.100 J
RB-3	RB-3-VAS-80-85	04/27/19	80 - 85	< 0.13 U	0.132 J
RB-3	RB-3-VAS-120-125	04/28/19	120 - 125	< 0.13 U	< 0.17 U
RB-3	RB-3-VAS-150-155	04/29/19	150 - 155	0.257 J	< 0.17 U
RB-3	RB-3-VAS-180-185	04/29/19	180 - 185	< 0.13 U	< 0.033 U
RB-3	RB-3-VAS-205-210	04/30/19	205 - 210	< 0.13 U	< 0.17 U
RB-4	RB-4-VAS-15-20	04/12/19	15 - 20	< 0.13 U	0.0556 J
RB-4	RB-4-VAS-41-46	04/12/19	41 - 46	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-81-86	04/12/19	81 - 86	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-121-126	04/13/19	121 - 126	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-136-141	04/13/19	136 - 141	< 0.13 U	< 0.17 U
RB-4	RB-4-VAS-155-160	04/17/19	155 - 160	< 0.13 U	< 0.17 U
RB-5	RB-5-VAS-12-17	04/04/19	12 - 17	0.235 J	0.125 J
RB-5	RB-5-VAS-42-47	04/09/19	42 - 47	< 0.13 U	< 0.033 U
RB-5	RB-5-VAS-82-87	04/09/19	82 - 87	0.769 J	0.127 J

Notes:

µg/L = micrograms per liter

ft bgs = feet below ground surface

J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only

U = The analyte was analyzed for but not detected at the analyte method detection limit indicated

VAS = vertical aquifer sampling

WD = sample from well development, depth noted is from bottom of screen

Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D
Date Completed:	04/01/2019	Northing (NAD83):	N/A	
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs	
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1	36						(0.0 - 3.0'); Hand augered for utility clearance	(0.0 - 3.0') Boulders and cobbles prevented clearing to 5 ft. bgs	(0.0 - 130.0') No water used
2									
3									
4									
5	48			Topock - Alluvium Deposits	SW		(3.0 - 7.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (10YR 5/3); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; trace cobbles, angular to subangular; trace boulders; trace silt; trace mica; dry; interbedded gravel lense, larger clasts consist of meta-diorite, boulders fractured		
6									
7									
8									
9									
10		No sieve samples collected							
11									
12	96								
13									
14				Topock - Alluvium Deposits	SM		(7.0 - 27.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; trace cobbles, angular to subangular; trace boulders; trace clay; trace mica; dry; interbedded gravel lenses, larger clasts consist of meta-diorite, boulders fractured	(7.0 - 17.0') Bag for soil core broke lost part of the core, soil compaction	
15									
16									
17									
18	72							(17.0 - 23.0') Rough drilling, core barrel cracked.	
19									
20									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D	
Date Completed:	04/01/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21	72			Topock - Alluvium Deposits	SM			(17.0 - 23.0') Rough drilling, core barrel cracked.	(0.0 - 130.0') No water used
22									
23									
24	48			Topock - Alluvium Deposits	GM		(27.5 - 29.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3); granules to very large pebbles, angular; some very fine to very coarse grained sand, angular to subangular; some silt; trace cobbles, angular; trace mica; dry; weak cementation; larger clasts consist of meta-diorite		
25									
26									
27	108	No sieve samples collected		Topock - Alluvium Deposits	SM		(29.5 - 63.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3) trace red / moderate reddish brown(10R 4/6); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; some silt; trace cobbles, angular to subangular; trace boulders; trace clay; trace mica; dry; mottled; weak cementation; interbedded gravel lenses, larger clasts consist of meta-diorite, boulders fractured		
28									
29									
30									
31									
32									
33									
34									
35									
36									
37	96			Topock - Alluvium Deposits	SM		(32.5 - 33.5'); increase in silt, decrease in sand		
38									
39									
40									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

SOIL BORING LOG PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\07.03.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GPJ 07/03/19 11:36

Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D
Date Completed:	04/01/2019	Northing (NAD83):	N/A	
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs	
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41									(0.0 - 130.0') No water used
42	96								
43									
44									
45							(44.0 - 47.0'); little silt; increase in sand, no cobbles		
46	36								
47									
48							(47.0 - 52.5'); some silt; decrease in sand, increase in granules and pebbles		
49									
50		No sieve samples collected		Topock - Alluvium Deposits	SM				
51	84								
52									
53							(52.5 - 57.0'); decrease in silt, increase sand, increase in granules and pebbles, decrease in clay		
54									
55	36								
56									
57							(57.0 - 58.8'); some silt; moderate cementation; increase in silt, decrease in sand, decrease in granules and pebbles, fractured gravel fragments at 58.5' bgs	(57.0 - 59.0') Rough drilling, drill rods chattering.	
58	24								
59							(58.8'); weak cementation; decrease in silt, increase in granules, fractured gravel fragments at 62.5' bgs		
60	96								




Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, NR = no recovery, blue water table symbol represents depth to water measured during the first VAS interval

Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D
Date Completed:	04/01/2019	Northing (NAD83):	N/A	
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs	
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	96			Topock - Alluvium Deposits	SM				(0.0 - 130.0') No water used
62									
63				Topock - Alluvium Deposits	ML		(63.0 - 64.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 5/4); no plasticity; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace mica; dry; medium stiff to stiff; weak cementation; larger clasts consist of meta-diorite		
64	108	No sieve samples collected					(64.5 - 74.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3) trace dusky red / dark reddish brown(10R 3/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular; some silt; trace cobbles, angular; trace caliche; trace mica; dry; mottled; weak cementation; larger clasts consist of meta-diorite, interbedded silt lenses, fractured gravel fragments at 71.5' and 73' bgs		
65									
66									
67									
68									
69				Topock - Alluvium Deposits	SM				
70									
71	12								
72									
73									
74				Topock - Alluvium Deposits	ML		(74.0 - 75.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 5/4); low plasticity, no dilatency; some small to large pebbles, angular; some very fine to very coarse grained sand, angular to subangular; trace mica; moist; stiff to very stiff; weak cementation; larger clasts consist of meta-diorite		
75									
76				Topock - Alluvium Deposits	SM		(75.0 - 77.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3) trace dusky red / dark reddish brown(10R 3/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular; some silt; trace cobbles, angular; trace mica; moist; mottled; larger clasts consist of metadiorite, interbedded silt and silty gravel lenses, fractured gravel fragments at 76.5' bgs		
77	120		No samples collected MW-10 screened across interval				(77.0 - 81.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 5/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; wet; larger clast consist of metadiorite, interbedded silt, silty sand and silty gravel lenses	(77.0 - 77.0') Approximate depth to water	
78				Topock - Alluvium Deposits	GM				
79									
80									






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Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D
Date Completed:	04/01/2019	Northing (NAD83):	N/A	
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs	
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81				Topock - Alluvium Deposits	GM		(81'); little silt; increase sand and gravel		(0.0 - 130.0') No water used
82							(81.5 - 96.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; some silt; trace cobbles, subangular; trace mica; wet; larger clast consist of metadiorite, interbedded silt, silty sand and silty gravel lenses, weathered gravel		
83	120								
84									
85									
86									
87									
88									
89				Topock - Alluvium Deposits	SM				
90		No sieve samples collected	No samples collected MW-10 screened across interval						
91									
92	120								
93									
94									
95									
96									
97									
98				Topock - Alluvium Deposits	GM		(96.5 - 104.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3) trace brown (7.5YR 4/4); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; little silt; trace mica; wet; mottled; larger clasts consist of metadiorite, interbedded silt and silty sand lenses, weathered gravel		
99	120								
100									

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Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: MW-10D
Date Completed:	04/01/2019	Northing (NAD83):	N/A	
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs	
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101	120		No samples collected MW-10 screened across interval	Topock - Alluvium Deposits	GM				(0.0 - 130.0') No water used
102									
103									
104									
105	60	No sieve samples collected	MW-10D-VAS-107-112 (96 ppb) 4/1/2019 14:32	Topock - Alluvium Deposits	SM		(104.5 - 107.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4) little very dark gray (7.5YR 3/1); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; some silt; trace cobbles, angular to subangular; trace mica; trace organics; wet; mottled; larger clasts consist of metadiorite, interbedded silty gravel, silt nodules		
106									
107									
108									
109	174		MW-10D-VAS-118-123 (190 ppb) 4/2/2019 12:05	Topock - Alluvium Deposits	GM		(107.0 - 115.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/4) and very dark gray (7.5YR 3/1); granules to small cobbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; trace mica; little organics; wet; mottled; larger clasts consist of metadiorite, interbedded silt and silty sand lenses, trace silt nodules, trace reddish brown 5YR 4/4		
110									
111									
112									
113				Topock - Alluvium Deposits	SM		(115.5 - 116.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular; some silt; trace cobbles, angular to subangular; little mica; wet; iron oxide staining; larger clasts consist of metadiorite, trace weathered rock		
114									
115									
116									
117				Topock - Alluvium Deposits	GM		(116.5 - 121.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); very dark gray (7.5YR 3/1) some brown (7.5YR 5/4); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; trace cobbles, angular to subangular; trace mica; little organics; wet; mottled; iron oxide staining; larger clasts consist of metadiorite, interbedded silt and silty sand lenses, trace silt nodules, trace 5 YR 4/4 reddish brown		
118									
119									
120									

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Date Started:	03/31/2019	Surface Elevation:	N/A	Boring No.: <u>MW-10D</u>	
Date Completed:	04/01/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	130 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	73.86 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Jeffers / G. Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121	174	No sieve samples collected	MW-10D- VAS-118- 123 (190 ppb) 4/2/2019 12:05	Topock - Alluvium Deposits	GM				(0.0 - 130.0') No water used
122				Topock - Alluvium Deposits	ML		(121.0 - 123.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 4/3) and very dark gray (5YR 3/1); low plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; trace mica; trace organics; moist to wet; stiff to very stiff; mottled; larger clasts consist of metadiorite		
123			Topock - Weathered Bedrock - conglomerate	ML		(123.0 - 127.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown(2.5YR 4/3) little red (2.5YR 5/6); no plasticity, no dilatency; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; trace mica; moist; stiff to very stiff; mottled; weak cementation; larger clasts consist of metadiorite			
124									
125									
126									
127	36		Topock - Competent Bedrock - conglomerate		(127.0 - 130.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 4/6); dry; friable	(127.0 - 130.0') Rough drilling, bedrock encountered at 127 ft. bgs			
128									
129									
130									

End of Boring at 130.0 'bgs.

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Date Started:	03/31/2019	Surface Elevation:	N/A	Well ID: MW-10D
Date Completed:	04/01/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	N/A	Project: Final GW Remedy Phase I
Driller Name:	Steve Vasquez	Easting (NAD83):	N/A	Location: PG&E Topock, Needles, California
Drilling Asst:	L. Amaya/ O. Flores	Borehole Diameter:	6-12 inches	
Logger:	G. Jeffers / G. Willford	Water Level Start:	73.86 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/11/2019	
Total Depth:	130 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
1					(0.0 - 108.1') 2" PVC Sch 80 Casing		
2							
3							
4		Topock - Alluvium Deposits	SW				
5							
6							
7							
8							
9							
10							
11							
12					(3.0 - 46.0') Portland Cement 5% Bentonite	(3.0 - 46.0') 46 gallons	(3.0 - 46.0') 82 gallons (78%) Note: Type I, Type II, Type V with Hydrogel.
13		Topock - Alluvium Deposits	SM				
14							
15							
16							
17							
18							
19							
20							

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Date Started:	03/31/2019	Surface Elevation:	N/A	Well ID: MW-10D
Date Completed:	04/01/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	N/A	Project: Final GW Remedy Phase I
Driller Name:	Steve Vasquez	Easting (NAD83):	N/A	Location: PG&E Topock, Needles, California
Drilling Asst:	L. Amaya/ O. Flores	Borehole Diameter:	6-12 inches	
Logger:	G. Jeffers / G. Willford	Water Level Start:	73.86 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/11/2019	
Total Depth:	130 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
21					(0.0 - 108.1') 2" PVC Sch 80 Casing		
22							
23							
24		Topock - Alluvium Deposits	SM				
25					(24.5 - 25.5') Centralizer		
26							
27							
28		Topock - Alluvium Deposits	GM				
29							
30					(3.0 - 46.0') Portland Cement 5% Bentonite	(3.0 - 46.0') 46 gallons	(3.0 - 46.0') 82 gallons (78%) Note: Type I, Type II, Type V with Hydrogel.
31							
32							
33							
34							
35		Topock - Alluvium Deposits	SM				
36							
37							
38							
39							
40							

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Date Started:	03/31/2019	Surface Elevation:	N/A	Well ID: MW-10D
Date Completed:	04/01/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	N/A	Project: Final GW Remedy Phase I
Driller Name:	Steve Vasquez	Easting (NAD83):	N/A	Location: PG&E Topock, Needles, California
Drilling Asst:	L. Amaya/ O. Flores	Borehole Diameter:	6-12 inches	
Logger:	G. Jeffers / G. Willford	Water Level Start:	73.86 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/11/2019	
Total Depth:	130 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
41					(0.0 - 108.1') 2" PVC Sch 80 Casing		
42							
43					(3.0 - 46.0') Portland Cement 5% Bentonite	(3.0 - 46.0') 46 gallons	(3.0 - 46.0') 82 gallons (78%) Note: Type I, Type II, Type V with Hydrogel.
44							
45							
46							
47							
48							
49							
50		Topock - Alluvium Deposits	SM		(3.0 - 112.0') 6" Borehole		
51							
52							
53					(46.0 - 101.5') Portland Cement 5% Bentonite	(46.0 - 101.5') 72.1 gallons	(46.0 - 101.5') 190 gallons (164%) Note: Type I, Type II, Type V with Hydrogel, grout settled to 46 ft bgs 4.4.2019.
54							
55							
56							
57							
58							
59							
60							

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Date Started: 03/31/2019	Surface Elevation: N/A	Well ID: MW-10D
Date Completed: 04/01/2019	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): N/A	Project: Final GW Remedy Phase I
Driller Name: Steve Vasquez	Easting (NAD83): N/A	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya/ O. Flores	Borehole Diameter: 6-12 inches	
Logger: G. Jeffers / G. Willford	Water Level Start: 73.86 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 4/11/2019	
Total Depth: 130 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
61		Topock - Alluvium Deposits	SM		(0.0 - 108.1') 2" PVC Sch 80 Casing		
62							
63		Topock - Alluvium Deposits	ML				
64							
65		Topock - Alluvium Deposits	SM				
66							
67							
68							
69							
70					(46.0 - 101.5') Portland Cement 5% Bentonite	(3.0 - 112.0') 6" Borehole	(46.0 - 101.5') 72.1 gallons
71							(46.0 - 101.5') 190 gallons (164%) Note: Type I, Type II, Type V with Hydrogel, grout settled to 46 ft bgs 4.4.2019.
72							
73							
74		Topock - Alluvium Deposits	ML				
75					(74.5 - 75.5') Centralizer		
76		Topock - Alluvium Deposits	SM				
77							
78	No samples collected MW-10 screened across interval	Topock - Alluvium Deposits	GM				
79							
80							

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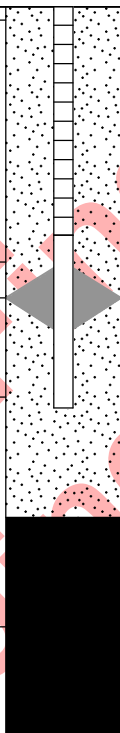

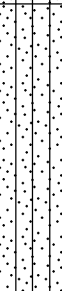

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater
ppb = parts per billion, NR = no recovery, blue water table symbol represents depth to water measured post development

Date Started: 03/31/2019	Surface Elevation: N/A	Well ID: MW-10D
Date Completed: 04/01/2019	Shallow Well Elevation: N/A	
Drilling Co.: Cascade	Deep Well Elevation: N/A	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): N/A	Project: Final GW Remedy Phase I
Driller Name: Steve Vasquez	Easting (NAD83): N/A	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya/ O. Flores	Borehole Diameter: 6-12 inches	
Logger: G. Jeffers / G. Willford	Water Level Start: 73.86 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 4/11/2019	
Total Depth: 130 ft bgs	Well Completion: <input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
101	No samples collected MW-10 screened across interval	Topock - Alluvium Deposits	GM		(0.0 - 108.1') 2" PVC Sch 80 Casing (46.0 - 101.5') Portland Cement 5% Bentonite	(46.0 - 101.5') 72.1 gallons	(46.0 - 101.5') 190 gallons (164%) Note: Type I, Type II, Type V with Hydrogel, grout settled to 46 ft bgs 4.4.2019.
102					(101.5 - 105.0') Bentonite seal chips	(101.5 - 105.0') 0.85 bags	(101.5 - 105.0') 1 bags (18%) Note: Enviroplug 3/8"
103		Topock - Alluvium Deposits	SM		(3.0 - 112.0') 6" Borehole		
104					(108.1 - 123.1') 2" Sch 80 PVC (20-slot) Screen		
105	MW-10D-VAS-107-112 (96 ppb) 4/1/2019 14:32	Topock - Alluvium Deposits	GM		(105.0 - 127.0') Cemex #3 MESH (8x10)	(105.0 - 127.0') 7.8 bags	(105.0 - 127.0') 7.4 bags (-5%) Note: Lapis Lustre Sand
106							
107							
108							
109	MW-10D-VAS-118-123 (190 ppb) 4/2/2019 12:05	Topock - Alluvium Deposits	GM		(112.0 - 130.0') 6" Borehole		
110							
111							
112							

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Date Started:	03/31/2019	Surface Elevation:	N/A	Well ID: MW-10D
Date Completed:	04/01/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	N/A	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	N/A	Project: Final GW Remedy Phase I
Driller Name:	Steve Vasquez	Easting (NAD83):	N/A	Location: PG&E Topock, Needles, California
Drilling Asst:	L. Amaya/ O. Flores	Borehole Diameter:	6-12 inches	
Logger:	G. Jeffers / G. Willford	Water Level Start:	73.86 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/11/2019	
Total Depth:	130 ft bgs	Well Completion:	<input type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction		Calculated Material Volumes	Material Volumes Installed
121	MW-10D-VAS-118-123 (190 ppb) 4/2/2019 12:05	Topock - Alluvium Deposits	GM		(108.1 - 123.1') 2" Sch 80 PVC (20-slot) Screen			
122		Topock - Alluvium Deposits	ML					
123		Topock - Weathered Bedrock - conglomerate	ML		(105.0 - 127.0') Cemex #3 MESH (123.8' x 124.5') Centralizer		(105.0 - 127.0') 7.8 bags	(105.0 - 127.0') 7.4 bags (-5%) Note: Lapis Lustre Sand
124								
125								
126								
127		Topock - Competent Bedrock - conglomerate			(123.1 - 125.5') Sump and End Cap			
128								
129								
130	End of Boring at 130.0' bgs.						(127.0 - 130.0') 0.8 bags	(127.0 - 130.0') 0.75 bags (-6%) Note: Enviroplug 3/8"
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								

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Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
1					(0.0 - 1.0') Concrete Pad (0.5 - 70.0') 2" PVC Sch 40 Casing (0.6 - 160.0') 2" PVC Sch 80 Casing		(0.0 - 1.0') 20 bags (%) Note: 3.5 x 3.5 ft concrete pad with 18" dia lockable vault, King Kon-Crete 4000 PSI
2					(2.0 - 3.0') Portland Cement 6% Bentonite	(2.0 - 3.0') 5.5 gallons	(2.0 - 3.0') 8 gallons (45%) Note: Topped off with Type I, II, and V with Hydrogel on 4/1/19.
3					(3.0 - 8.0') Portland Cement 6% Bentonite	(3.0 - 8.0') 26.6 gallons	(3.0 - 8.0') 30 gallons (13%) Note: Type I, II, and V with Hydrogel
4					(0.0 - 7.0') 12" Borehole		
5							
6							
7							
8							
9							
10							
11							
12							
13					(8.0 - 18.0') Bentonite seal chips	(8.0 - 18.0') 8.14 bags	(8.0 - 18.0') 25 bags (207%) Note: Chips used to fill large void, chips hydrated for 1 hour.
14					(7.0 - 184.0') 10" Borehole		
15							
16							
17							
18							
19					(18.0 - 65.0') Portland Cement 6% Bentonite	(18.0 - 65.0') 206.1 gallons	(18.0 - 65.0') 700 gallons (240%) Note: Type I, II, and V with Hydrogel
20							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started:	12/16/2018	Surface Elevation:	529.6 ft amsl	Well ID: MW-L-90, MW-L-180	
Date Completed:	04/09/2018	Shallow Well Elevation:	529.2 ft amsl		
Drilling Co.:	Cascade	Deep Well Elevation:	529.1 ft amsl	Client:	PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102862.2	Project:	Final Groundwater Remedy Phase
Driller Name:	Dan O'Mara	Easting (NAD83):	7615260.4	Location:	1
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	10-12 inches	PG&E Topock, Needles, California	
Logger:	Michael Andrews	Water Level Start:	74.65 ft bgs	Project Number: RC000753.0051	
Editor:	Sean McGrane	Development End Date:	3/29/2019		
Total Depth:	184 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
21					(0.5 - 70.0') 2" PVC Sch 40 Casing		
22							
23							
24							
25							
26							
27							
28							
29							
30					(18.0 - 65.0') Portland Cement 6% Bentonite	(7.0 - 184.0') 10" Borehole	(18.0 - 65.0') 206.1 gallons
31							(18.0 - 65.0') 700 gallons (240%) Note: Type I, II, and V with Hydrogel
32					(31.5 - 32.5') Centralizer		
33							
34							
35							
36							
37							
38							
39							
40							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
41					(0.5 - 70.0') 2" PVC Sch 40 Casing		
42							
43							
44							
45							
46							
47							
48							
49							
50					(18.0 - 65.0') Portland Cement 6% Bentonite	(7.0 - 184.0') 10" Borehole	(18.0 - 65.0') 206.1 gallons
51							(18.0 - 65.0') 700 gallons (240%) Note: Type I, II, and V with Hydrogel
52							
53							
54							
55							
56							
57							
58							
59							
60							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
61					(0.5 - 70.0') 2" PVC Sch 40 Casing		
62							
63					(18.0 - 65.0') Portland Cement 6% Bentonite	(18.0 - 65.0') 206.1 gallons	(18.0 - 65.0') 700 gallons (240%) Note: Type I, II, and V with Hydrogel
64							
65							
66					(65.0 - 67.0') Bentonite seal chips	(65.0 - 67.0') 1.63 bags	(65.0 - 67.0') 3 bags (84%) Note: Puregold Medium Chips
67		Topock - Fluvial Deposits	SM				
68							
69							
70		Topock - Fluvial Deposits	SW-SM				
71					(70.0 - 90.0') 2" Sch 40 PVC (20-slot) Screen		
72							
73							
74					(67.0 - 94.0') Cemex #3 MESH (8x10)	(67.0 - 94.0') 31.6 bags	(67.0 - 94.0') 41 bags (30%) Note: Lapis Lustre Sand
75		Topock - Fluvial Deposits	SM				
76							
77							
78	MW-L-VAS-76-81 (31 ppb) 10/6/2018 16:34						
79		Topock - Fluvial Deposits	GW-GM				
80							

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Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
81		Topock - Fluvial Deposits	GW-GM		(70.0 - 90.0') 2" Sch 40 PVC (20-slot) Screen		
82							
83		Topock - Alluvium Deposits	NR				
84							
85							
86							
87					(67.0 - 94.0') Cemex #3 MESH (8x10)	(67.0 - 94.0') 31.6 bags	(67.0 - 94.0') 41 bags (30%) Note: Lapis Lustre Sand
88							
89							
90		Topock - Alluvium Deposits	SM		(90.5 - 91.5') Centralizer		
91							
92					(90.0 - 92.3') Sump and End Cap		
93							
94							
95		Topock - Alluvium Deposits	SM				
96							
97					(94.0 - 158.0') Bentonite seal pellets	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (-2%) Note: Pel-Plug (TR30) 3/8"
98			NR				
99							
100							

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Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
101					(0.6 - 160.0') 2" PVC Sch 80 Casing		
102							
103							
104							
105							
106							
107							
108	MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46						
109							
110			NR		(94.0 - 158.0') Bentonite seal pellets	(7.0 - 184.0') 10" Borehole	(94.0 - 158.0') 62.3 buckets
111							(94.0 - 158.0') 61 buckets (-2%) Note: Pel-Plug (TR30) 3/8"
112							
113							
114							
115							
116							
117							
118							
119							
120							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
121					(0.6 - 160.0') 2" PVC Sch 80 Casing		
122							
123							
124							
125							
126							
127							
128							
129							
130			NR		(94.0 - 158.0') Bentonite seal pellets (7.0 - 184.0') 10" Borehole (131.5 - 132.5') Centralizer	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (-2%) Note: Pel-Plug (TR30) 3/8"
131							
132							
133							
134							
135							
136							
137							
138							
139							
140							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
141	MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58	NR			(0.6 - 160.0') 2" PVC Sch 80 Casing		
142							
143							
144							
145							
146							
147		NR			(94.0 - 158.0') Bentonite seal pellets	(94.0 - 158.0') 62.3 buckets	(94.0 - 158.0') 61 buckets (-2%) Note: Pel-Plug (TR30) 3/8"
148							
149							
150							
151							
152							
153							
154							
155							
156							
157		Topock - Alluvium Deposits	GM		(158.0 - 180.0') Cemex #3 MESH (8x10)	(158.0 - 180.0') 31.7 bags	(158.0 - 180.0') 31 bags (-2%) Note: Lapis Lustre Sand
158							
159							
160							

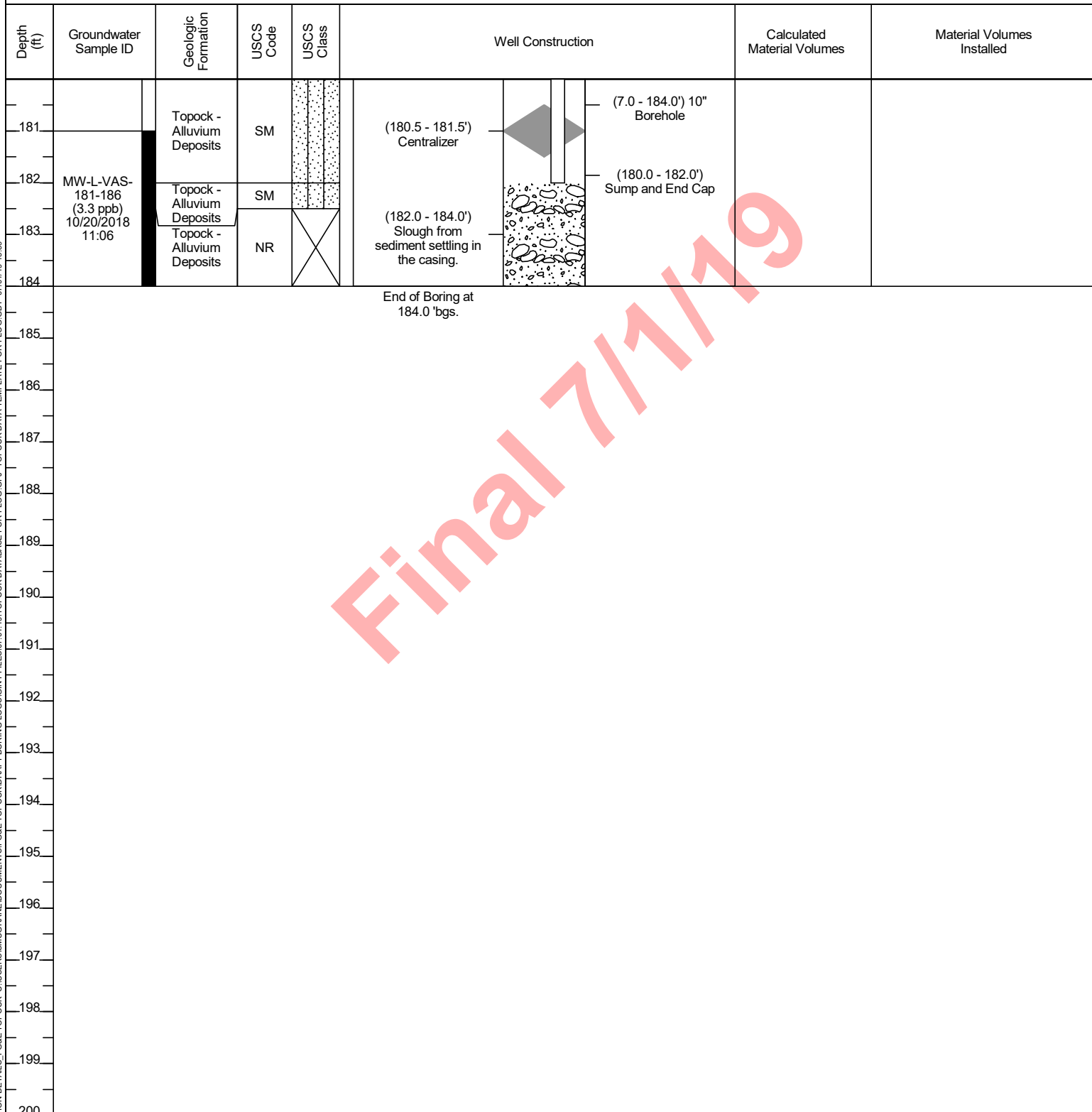
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
161		Topock - Alluvium Deposits	SM		(160.0 - 180.0') 2" Sch 80 PVC (20-slot) Screen		
162							
163							
164		Topock - Alluvium Deposits	GM				
165							
166							
167							
168		Topock - Alluvium Deposits	SM				
169							
170					(158.0 - 180.0') Cemex #3 MESH (8x10)		
171		Topock - Alluvium Deposits	GM		(7.0 - 184.0') 10" Borehole	(158.0 - 180.0') 31.7 bags	(158.0 - 180.0') 31 bags (-2%) Note: Lapis Lustre Sand
172							
173							
174							
175							
176							
177							
178		Topock - Alluvium Deposits	SM				
179							
180							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 12/16/2018	Surface Elevation: 529.6 ft amsl	Well ID: MW-L-90, MW-L-180
Date Completed: 04/09/2018	Shallow Well Elevation: 529.2 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.1 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102862.2	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615260.4	Location: 1
Drilling Asst: E. Huellmantel / T. Wolfe	Borehole Diameter: 10-12 inches	PG&E Topock, Needles, California
Logger: Michael Andrews	Water Level Start: 74.65 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/29/2019	
Total Depth: 184 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Ld borehole.

Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
1		Topock - Fluvial Deposits	SW		(0.0 - 1.0') Concrete Pad (0.5 - 205.0') 2" PVC Sch 80 Casing (0.6 - 235.0') 2" PVC Sch 80 Casing		(0.0 - 1.0') 12 bags (%) Note: 3.5 x 3.5 ft concrete pad with 18" dia lockable vault, King Kon-Crete 4000 PSI
2		Topock - Fluvial Deposits	SW				
3		Topock - Fluvial Deposits	SW				
4		Topock - Fluvial Deposits	SW				
5		Topock - Fluvial Deposits	SW				
6		Topock - Fluvial Deposits	SW				
7		Topock - Fluvial Deposits	SM				
8		Topock - Fluvial Deposits	SM		(1.0 - 15.0') Portland Cement 5% Bentonite	(1.0 - 15.0') 77.6	(1.0 - 15.0') 100 (29%) Note: Type I, II and V and Benseal, large void at approximately 15 feet bgs
9		Topock - Fluvial Deposits	SM				
10		Topock - Fluvial Deposits	SM				
11		Topock - Fluvial Deposits	SM				
12		Topock - Fluvial Deposits	SW-SM				
13		Topock - Fluvial Deposits	SW-SM				
14		Topock - Fluvial Deposits	SW-SM				
15		Topock - Fluvial Deposits	SW-SM				
16		Topock - Fluvial Deposits	SW-SM				
17		Topock - Fluvial Deposits	SW-SM				
18		Topock - Fluvial Deposits	SW-SM		(15.0 - 50.0') Portland Cement 5% Bentonite	(15.0 - 50.0') 168.6 gallons	(15.0 - 50.0') 450 gallons (167%) Note: Type I, II and V and Benseal
19		Topock - Fluvial Deposits	SW-SM				
20		Topock - Fluvial Deposits	SW-SM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
21		Topock - Fluvial Deposits	SW-SM		(0.5 - 205.0') 2" PVC Sch 80 Casing		
22		Topock - Fluvial Deposits	SM				
23		Topock - Fluvial Deposits	GP				
24						(0.0 - 28.0') 12" Borehole	
25			NR				
26							
27		Topock - Fluvial Deposits	ML				
28							
29		Topock - Fluvial Deposits	ML				
30		Topock - Fluvial Deposits	GW		(15.0 - 50.0') Portland Cement 5% Bentonite	(15.0 - 50.0') 168.6 gallons	(15.0 - 50.0') 450 gallons (167%) Note: Type I, II and V and Benseal
31							
32		Topock - Fluvial Deposits	ML				
33							
34						(28.0 - 249.0') 10" Borehole	
35							
36		Topock - Fluvial Deposits	SM				
37							
38							
39		Topock - Fluvial Deposits	SM				
40		Topock - Fluvial Deposits	SM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started:	<u>11/27/2018</u>	Surface Elevation:	<u>530.0 ft amsl</u>	Well ID: MW-L-225, MW-L-245	
Date Completed:	<u>04/04/2019</u>	Shallow Well Elevation:	<u>529.8 ft amsl</u>		
Drilling Co.:	<u>Cascade</u>	Deep Well Elevation:	<u>529.6 ft amsl</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Northing (NAD83):	<u>2102858.8</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Driller Name:	<u>Dan O'Mara</u>	Easting (NAD83):	<u>7615264.9</u>	Location:	<u>1</u>
Drilling Asst:	<u>E. Huellmantel / J. Campbell</u>	Borehole Diameter:	<u>4-12 inches</u>	<u>PG&E Topock, Needles, California</u>	
Logger:	<u>S. McGrane / G. Jeffers</u>	Water Level Start:	<u>76.27 ft bgs</u>	Project Number: <u>RC000753.0051</u>	
Editor:	<u>Sean McGrane</u>	Development End Date:	<u>3/4/2019</u>		
Total Depth:	<u>315 ft bgs</u>	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up		

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
41		Topock - Fluvial Deposits	SM		(0.5 - 205.0') 2" PVC Sch 80 Casing		
42							
43							
44		Topock - Fluvial Deposits	SW		(15.0 - 50.0') Portland Cement 5% Bentonite	(15.0 - 50.0') 168.6 gallons	(15.0 - 50.0') 450 gallons (167%) Note: Type I, II and V and Benseal
45							
46							
47					(46.5 - 47.5') Centralizer		
48		Topock - Fluvial Deposits	SM				
49							
50					(28.0 - 249.0') 10" Borehole		
51							
52		Topock - Fluvial Deposits	SW-SM				
53							
54		Topock - Fluvial Deposits	SW		(50.0 - 58.0') Bentonite seal chips	(50.0 - 58.0') 6.25 bags	(50.0 - 58.0') 2 bags (-68%) Note: Puregold Medium chips, borehole diameter most likely smaller due to grout caking borehole walls.
55							
56							
57							
58							
59		Topock - Fluvial Deposits	SM		(58.0 - 66.0') Portland Cement 5% Bentonite	(58.0 - 66.0') 35.1 gallons	(58.0 - 66.0') 310 gallons (783%) Note: Type I, II and V and Benseal, void from 58 to 66 ft bgs
60							

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WELL CONSTRUCTION DETAILS PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRAFT BORING LOGS\GINT FILES\07.01.19\TOPOCK DATA TEMPLATE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 07/01/19 15:56

Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
61		Topock - Fluvial Deposits	SM		(0.5 - 205.0') 2" PVC Sch 80 Casing		
62							
63		Topock - Fluvial Deposits	GW		(58.0 - 66.0') Portland Cement 5% Bentonite	(58.0 - 66.0') 35.1 gallons	(58.0 - 66.0') 310 gallons (783%) Note: Type I, II and V and Benseal, void from 58 to 66 ft bgs
64							
65							
66		Topock - Fluvial Deposits	SM				
67							
68		Topock - Fluvial Deposits	SW-SM				
69							
70					(28.0 - 249.0') 10" Borehole		
71							
72							
73					(66.0 - 91.0') Bentonite seal chips	(66.0 - 91.0') 20.4 bags	(66.0 - 91.0') 18 bags (-12%) Note: Purgold Medium Chips
74		Topock - Fluvial Deposits	SM				
75							
76							
77							
78	MW-L-VAS-76-81 (31 ppb) 10/6/2018 16:34						
79							
80		Topock - Alluvium	ML				

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
81		Deposits			(0.5 - 205.0') 2" PVC Sch 80 Casing		
82		Topock - Alluvium Deposits	SM				
83							
84		Topock - Alluvium Deposits	SM				
85							
86					(66.0 - 91.0') Bentonite seal chips	(66.0 - 91.0') 20.4 bags	(66.0 - 91.0') 18 bags (-12%) Note: Purgold Medium Chips
87							
88							
89		Topock - Alluvium Deposits	SM				
90							
91					(28.0 - 249.0') 10" Borehole		
92							
93							
94		Topock - Alluvium Deposits	ML				
95		Topock - Alluvium Deposits	SM				
96					(91.0 - 201.0') High Solids Bentonite Grout	(91.0 - 201.0') 482.5 gallon	(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
97		Topock - Alluvium Deposits	ML				
98							
99							
100							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
101					(0.5 - 205.0') 2" PVC Sch 80 Casing		
102							
103							
104							
105							
106		Topock - Alluvium Deposits	ML				
107					(106.5 - 107.5') Centralizer		
108	MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46						
109							
110					(91.0 - 201.0') High Solids Bentonite Grout	(91.0 - 201.0') 482.5 gallon	(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
111							
112							
113		Topock - Alluvium Deposits	ML				
114							
115							
116							
117		Topock - Alluvium Deposits	ML				
118							
119							
120							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
121		Topock - Alluvium Deposits	ML		(0.5 - 205.0') 2" PVC Sch 80 Casing		
122							
123		Topock - Alluvium Deposits	ML				
124							
125							
126							
127		Topock - Alluvium Deposits	ML				
128							
129							
130					(91.0 - 201.0') High Solids Bentonite Grout	(28.0 - 249.0') 10" Borehole	(91.0 - 201.0') 482.5 gallon
131							(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
132							
133							
134							
135		Topock - Alluvium Deposits	ML				
136							
137							
138							
139							
140			ML				

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
141	MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58	Topock - Alluvium Deposits	ML		(0.5 - 205.0') 2" PVC Sch 80 Casing		
142							
143							
144							
145							
146							
147							
148							
149		Topock - Alluvium Deposits	SM		(91.0 - 201.0') High Solids Bentonite Grout		
150							
151							
152							
153							
154							
155							
156							
157		Topock - Alluvium Deposits	GM		(28.0 - 249.0') 10" Borehole	(91.0 - 201.0') 482.5 gallon	(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
158							
159							
160							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
161		Topock - Alluvium Deposits	SM		(0.5 - 205.0') 2" PVC Sch 80 Casing		
162							
163							
164		Topock - Alluvium Deposits	SM				
165							
166		Topock - Alluvium Deposits	GM		(166.5 - 167.5') Centralizer		
167							
168		Topock - Alluvium Deposits	SM				
169							
170					(91.0 - 201.0') High Solids Bentonite Grout		
171		Topock - Alluvium Deposits	GM				
172							
173							
174							
175		Topock - Alluvium Deposits	GM				
176							
177		Topock - Alluvium Deposits	SM				
178							
179		Topock - Alluvium Deposits	SM				
180							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction			Calculated Material Volumes	Material Volumes Installed
181	MW-L-VAS-181-186 (3.3 ppb) 10/20/2018 11:06	Topock - Alluvium Deposits	SM		(0.5 - 205.0') 2" PVC Sch 80 Casing		(0.6 - 235.0') 2" PVC Sch 80 Casing		
182		Topock - Alluvium Deposits	ML						
183									
184									
185		Topock - Alluvium Deposits	SM		(91.0 - 201.0') High Solids Bentonite Grout		(28.0 - 249.0') 10" Borehole	(91.0 - 201.0') 482.5 gallon	(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
186									
187		Topock - Alluvium Deposits	ML						
188									
189		Topock - Alluvium Deposits	SM						
190									
191									
192									
193									
194									
195									
196									
197		Topock - Alluvium Deposits	ML						
198									
199									
200									

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
201		Topock - Alluvium Deposits	ML		(0.5 - 205.0') 2" PVC Sch 80 Casing	(91.0 - 201.0') 482.5 gallon	(91.0 - 201.0') 570.2 gallon (18%) Note: Grout settled 20 ft below projected depth of 71 ft.
202					(201.0 - 203.0') Bentonite seal pellets	(201.0 - 203.0') 2.1 buckets	(201.0 - 203.0') 2.5 buckets (19%) Note: Pel-Plug (TR30) 3/8"
203		Topock - Alluvium Deposits	SM				
204							
205		Topock - Alluvium Deposits	ML		(205.0 - 225.0') 2" Sch 80 PVC (20-slot) Screen		
206							
207		Topock - Alluvium Deposits	GM				
208							
209							
210							
211		Topock - Alluvium Deposits	GM		(28.0 - 249.0') 10" Borehole		
212					(203.0 - 228.5') Cemex #3 MESH (8x10)	(203.0 - 228.5') 29.9 bags	(203.0 - 228.5') 29 bags (-3%) Note: Lapis Lustre Sand
213							
214							
215		Topock - Alluvium Deposits	SM				
216							
217		Topock - Alluvium Deposits	SM				
218							
219	MW-L-VAS-218-223 (66 ppb) 10/21/2018 10:50						
220			GM				

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
221	MW-L-VAS-218-223 (66 ppb) 10/21/2018 10:50	Topock - Alluvium Deposits	GM		(205.0 - 225.0') 2" Sch 80 PVC (20-slot) Screen		
222							
223							
224		Topock - Weathered Bedrock - conglomerate	ML		(203.0 - 228.5') Cemex #3 MESH (8x10)	(203.0 - 228.5') 29.9 bags	(203.0 - 228.5') 29 bags (-3%) Note: Lapis Lustre Sand
225					(225.5 - 226.5') Centralizer		
226					(225.0 - 227.4') Sump and End Cap		
227							
228							
229		Topock - Weathered Bedrock - conglomerate	ML		(228.5 - 233.0') Bentonite seal pellets	(228.5 - 233.0') 4.4 buckets	(228.5 - 233.0') 4 buckets (-9%) Note: Pel-Plug (TR30) 3/8"
230					(28.0 - 249.0') 10" Borehole		
231							
232							
233							
234		Topock - Weathered Bedrock - conglomerate	ML		(233.0 - 249.0') Cemex #3 MESH (8x10)	(233.0 - 249.0') 19.5 bags	(233.0 - 249.0') 25 bags (28%) Note: Lapis Lustre Sand
235							
236					(235.0 - 245.0') 2" Sch 80 PVC (20-slot) Screen		
237							
238							
239							
240							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
241		Topock - Weathered Bedrock - conglomerate	SM		(235.0 - 245.0') 2" Sch 80 PVC (20-slot) Screen		
242							
243							
244							
245		Topock - Weathered Bedrock - conglomerate	ML		(233.0 - 249.0') Cemex #3 MESH (8x10)	(233.0 - 249.0') 19.5 bags	(233.0 - 249.0') 25 bags (28%) Note: Lapis Lustre Sand
246					(245.5 - 246.5') Centralizer		
247					(28.0 - 249.0') 10" Borehole		
248					(245.0 - 247.3') Sump and End Cap		
249		Topock - Weathered Bedrock - conglomerate	ML				
250							
251							
252							
253		Topock - Weathered Bedrock - conglomerate	ML				
254							
255					(249.0 - 266.0') Bentonite seal chips	(249.0 - 266.0') 7.4 bags	(249.0 - 266.0') 8 bags (8%) Note: Purgold Medium Chips
256							
257							
258							
259		Topock - Weathered Bedrock - conglomerate	ML				
260							

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
261	MW-L-VAS-261-266 (<0.17 U ppb) 10/22/2018 14:50	Topock - Weathered Bedrock - conglomerate	ML				
262							
263					(249.0 - 266.0') Bentonite seal chips	(249.0 - 266.0') 7.4 bags	(249.0 - 266.0') 8 bags (8%) Note: Purgold Medium Chips
264							
265							
266							
267							
268							
269							
270					(249.0 - 303.0') 7" Borehole		
271		Topock - Weathered Bedrock - conglomerate	ML				
272							
273					(266.0 - 308.0') Portland Cement	(266.0 - 308.0') 77.5 gallons	(266.0 - 308.0') 80 gallons (3%) Note: Type I, II and V
274							
275							
276							
277							
278							
279							
280							

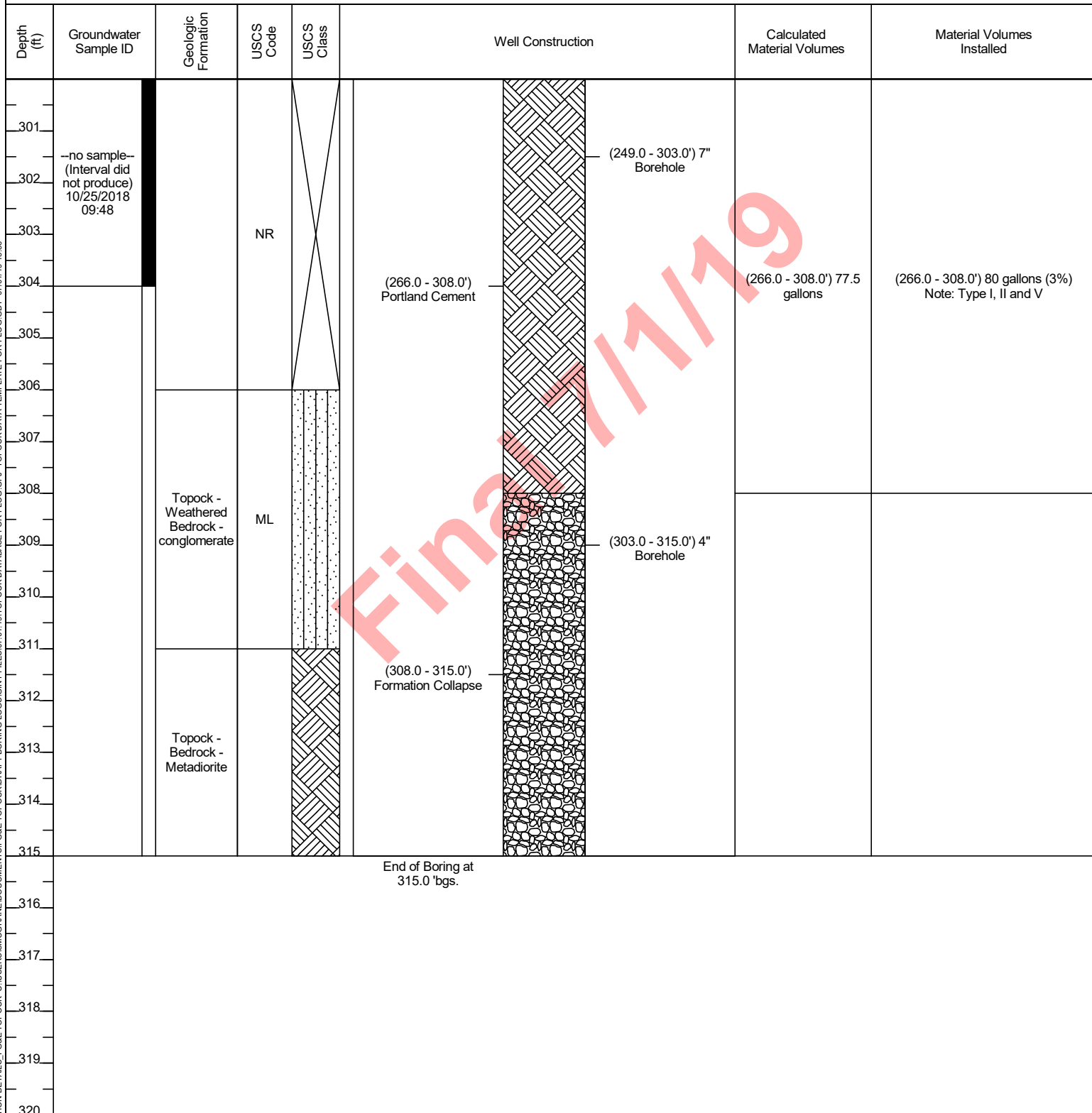
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
281		Topock - Weathered Bedrock - conglomerate	ML				
282							
283							
284							
285							
286							
287							
288							
289							
290		Topock - Weathered Bedrock - conglomerate	ML		(266.0 - 308.0') Portland Cement	(249.0 - 303.0') 7" Borehole	(266.0 - 308.0') 77.5 gallons
291							(266.0 - 308.0') 80 gallons (3%) Note: Type I, II and V
292							
293							
294							
295							
296							
297							
298							
299							
300			NR				

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Date Started: 11/27/2018	Surface Elevation: 530.0 ft amsl	Well ID: MW-L-225, MW-L-245
Date Completed: 04/04/2019	Shallow Well Elevation: 529.8 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 529.6 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102858.8	Project: Final Groundwater Remedy Phase
Driller Name: Dan O'Mara	Easting (NAD83): 7615264.9	Location: 1
Drilling Asst: E. Huellmantel / J. Campbell	Borehole Diameter: 4-12 inches	PG&E Topock, Needles, California
Logger: S. McGrane / G. Jeffers	Water Level Start: 76.27 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 3/4/2019	
Total Depth: 315 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development












WELL CONSTRUCTION DETAILS: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DATA\BASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 07/01/19 15:56

Date Started:	10/03/2018	Surface Elevation:	530.0 ft amsl	Boring No.: MW-Ld	
Date Completed:	11/27/2018	Northing (NAD83):	2102858.8		
Drilling Co.:	Cascade	Easting (NAD83):	7615264.9	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	315 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	76.27 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / J. Campbell	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	S. McGrane / G. Jeffers	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid	
1	72	No sieve samples collected		Topock - Fluvial Deposits	SW		(0.0 - 1.5') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; some granule to large pebbles; some coarse to very coarse grained sand, subangular to subround; trace cobbles; trace boulders, angular to subangular; trace silt; dry	(0.0 - 5.0') Hand cleared for utility clearance		
2				Topock - Fluvial Deposits	SW		(1.5 - 6.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (7.5YR 4/3); very fine grained to very coarse grained, subangular to round; some granule to medium pebbles, angular to subangular; trace silt; dry			
3										
4										
5										
6	120					Topock - Fluvial Deposits	SM			(6.0 - 11.0') Topock - Fluvial Deposits; Sand Silty sand (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subrounded; some granule to very large pebbles, angular to subangular; some silt; trace cobbles, angular; trace boulders, angular to subangular; dry
7										
8										
9										
10										
11										
12						Topock - Fluvial Deposits	SW-SM			(11.0 - 16.0') Topock - Fluvial Deposits; Well graded sand with silt and gravel (SW-SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subangular; some granule to large pebbles; little silt; trace cobbles, angular to subangular; dry
13										
14										
15										
16	96			Topock - Fluvial Deposits	SW-SM		(16.0 - 21.5') Topock - Fluvial Deposits; Well graded sand with silt and gravel (SW-SM); very dark gray (10YR 3/1); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles; little silt; trace cobbles, angular to subangular; dry	(16.0') Lost core barrel down hole		
17										
18										
19										
20										

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Date Started:	10/03/2018	Surface Elevation:	530.0 ft amsl	Boring No.: MW-Ld	
Date Completed:	11/27/2018	Northing (NAD83):	2102858.8		
Drilling Co.:	Cascade	Easting (NAD83):	7615264.9	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	315 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	76.27 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / J. Campbell	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	S. McGrane / G. Jeffers	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid		
21	96	No sieve samples collected		Topock - Fluvial Deposits	SW-SM						
22				Topock - Fluvial Deposits	SM		(21.5 - 22.5') Topock - Fluvial Deposits; Silty sand with gravel (SM); dark gray (10YR 4/1); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subangular; some silt; dry				
23				Topock - Fluvial Deposits	GP		(22.5 - 24.0') Topock - Fluvial Deposits; Poorly graded gravel (GP); black (10YR 2/1); small cobbles to large cobbles, angular to subround; dry				
24											(24.0 - 26.0') (NR); No Recovery sample bags broke
25	60						NR			(26.0') Rough drilling	
26											
27				Topock - Fluvial Deposits	ML		(26.0 - 28.0') Topock - Fluvial Deposits; Sandy silt with gravel (ML); brown (10YR 5/3); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granule to very large pebbles, angular to subangular; trace cobbles, angular to subangular; trace mica; dry				
28											
29	84					Topock - Fluvial Deposits	ML		(28.0 - 29.5') Topock - Fluvial Deposits; Sandy silt with gravel (ML); brown (10YR 5/3); no plasticity; and very fine to very coarse grained sand, angular to subangular; little granule to very large pebbles, angular to subangular; trace cobbles, angular to subangular; trace mica; dry	(31.0') Lost core barrel down hole	
30				Topock - Fluvial Deposits	GW		(29.5 - 31.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); dark yellowish brown (10YR 4/4); granules to small cobbles, angular to subround; little very fine to coarse grained sand, subangular to subround; dry				
31											
32		Topock - Fluvial Deposits	ML		(31.0 - 34.5') Topock - Fluvial Deposits; Sandy silt with gravel (ML); brown (10YR 5/3); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granule to very large pebbles, angular to subangular; trace cobbles, angular to subangular; trace mica; dry						
33	96							(36.0 - 38.0') Drilled to extra two feet to collect lost core 31 to 36 ft. bgs			
34											
35		Topock - Fluvial Deposits	SM		(34.5 - 38.0') Topock - Fluvial Deposits; Silty sand (SM); brown (10YR 5/3); very fine grained to fine grained, subangular to subround; and silt; dry						
36											
37	96										
38											
39		Topock - Fluvial Deposits	SM		(38.0 - 39.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); grayish brown (2.5Y 5/2); very fine grained to very coarse grained, angular to subround; some silt; little granule to large pebbles, angular to subangular; moist						
40				Topock - Fluvial Deposits	SM		(39.0 - 43.0') Topock - Fluvial Deposits; Silty sand (SM); very dark grayish brown (2.5Y 3/2); very fine grained to coarse grained, angular to subangular; and silt; trace granule to medium pebbles, angular to				

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Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	96			Topock - Fluvial Deposits	SM		subangular; trace clay; moist		
42									
43									
44				Topock - Fluvial Deposits	SW		(43.0 - 46.0') Topock - Fluvial Deposits; Well graded sand (SW); brown (7.5YR 5/3); very fine grained to very coarse grained, subangular to subround; trace granule to very large pebbles, angular to subround; trace cobbles, subround; trace silt; dry		
45	120	No sieve samples collected							
46									
47				Topock - Fluvial Deposits	SM		(46.0 - 51.5') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, subangular to subround; little granule to very large pebbles, subangular to subround; little silt; trace cobbles, subangular to subround; trace clay; trace mica; dry; gravel coursening downward in formation.		
48									
49	120			Topock - Fluvial Deposits	SW-SM		(51.5 - 52.0') Topock - Fluvial Deposits; Well graded sand with silt (SW-SM); brown (10YR 5/3); very fine grained to medium grained, angular to subround; trace silt; little mica; dry		
50									
51									
52				Topock - Fluvial Deposits	SW		(52.0 - 59.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); very dark grayish brown (10YR 3/2); very fine grained to very coarse grained, angular to subangular; and granule to very large pebbles, subangular to round; trace cobbles, subangular to subround; some mica; dry		
53	120								
54									
55				Topock - Fluvial Deposits	SM		(59.0 - 62.0') Topock - Fluvial Deposits; Silty sand (SM); brown (10YR 5/3); very fine grained to very coarse grained, angular to subround; little silt; little clay; trace granule to large pebbles, angular to subround;		
56									
57									
58									
59									
60									

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Date Started:	<u>10/03/2018</u>	Surface Elevation:	<u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>	
Date Completed:	<u>11/27/2018</u>	Northing (NAD83):	<u>2102858.8</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615264.9</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>315 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>4-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / J. Campbell</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>S. McGrane / G. Jeffers</u>	Sampling Interval:	<u>Continuous</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	120	No sieve samples collected		Topock - Fluvial Deposits	SM		dry		
62				Topock - Fluvial Deposits	GW		(62.0 - 65.5') Topock - Fluvial Deposits; Well graded gravel with sand (GW); light brownish gray / pale yellowish brown(10YR 6/2); granules to small cobbles, angular to subround; little very fine to very coarse grained sand, angular to subround; trace boulders, angular to subangular; dry		
63									
64									
65	Topock - Fluvial Deposits			SM		(65.5 - 67.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subround; little granule to large pebbles, angular to subangular; little silt; little clay; trace cobbles, angular; dry			
66									
67									
68	Topock - Fluvial Deposits			SW-SM		(67.0 - 69.0') Topock - Fluvial Deposits; Well graded gravel with silt (SW-SM); light brownish gray / pale yellowish brown(10YR 6/2); very fine grained to very coarse grained, angular to subangular; little silt; trace granule to medium pebbles, subangular to round; dry			
69									
70						Topock - Fluvial Deposits	SM		
71									
72									
73	(72.5') olive / moderate olive brown(5Y 4/4); some granule to very large pebbles								
74	(74') dark grayish brown / dark yellowish brown(10YR 4/2)								
75	(75') dark brown (7.5YR 3/4); moist								
76	(76') brown (7.5YR 4/3); and granule to very large pebbles, subangular to round; little silt; trace cobbles, subangular to round; wet; water table								
77									
78									
79									
80	Topock - Alluvium	ML		(79.5 - 80.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML);					

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Date Started: 10/03/2018	Surface Elevation: 530.0 ft amsl	Boring No.: MW-Ld
Date Completed: 11/27/2018	Northing (NAD83): 2102858.8	
Drilling Co.: Cascade	Easting (NAD83): 7615264.9	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 315 ft bgs	Project: Final Groundwater Remedy Phase
Drill Rig Type: Terrasonic track mount	Borehole Diameter: 4-12 inches	Location: 1
Driller Name: Dan O'Mara	Depth to First Water: 76.27 ft bgs	PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / J. Campbell	Sampling Method: 4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger: S. McGrane / G. Jeffers	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120			Deposits			reddish brown(2.5YR 4/3) with reddish brown (5YR 5/3); no plasticity; some very fine to very coarse grained sand, subangular to subround; little granule to very large pebbles, subround to round; wet		(76.0 - 86.0') 60 gal of water used
82				Topock - Alluvium Deposits	SM		(80.0 - 82.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subangular; some granule to large pebbles, angular to subround; some silt; wet		
83				Topock - Alluvium Deposits	SM		(82.5 - 86.0') Topock - Alluvium Deposits; Silty sand (SM); grayish brown (10YR 5/2); very fine grained to very coarse grained, angular to subangular; and silt; trace granule to very large pebbles, angular to subangular; trace cobbles, angular; trace clay; some caliche; dry; strong cementation		
84									
85	120	No sieve samples collected		Topock - Alluvium Deposits	SM		(86.0 - 93.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subangular; some silt; little granule to very large pebbles, angular to subangular; little clay; moist; moderate cementation		(86.0 - 96.0') 20 gal of water used
86									
87									
88									
89				Topock - Alluvium Deposits	SM		(89.5'); decrease in granules to large pebbles, increase in silt		
90									
91									
92									
93	234			Topock - Alluvium Deposits	ML		(93.5 - 94.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); grayish brown (2.5Y 5/2); no plasticity; some very fine to very coarse grained sand, angular to subround; little granule to large pebbles, angular to subround; little silt; little clay; wet; weak cementation		(96.0 - 106.0') 50 gal of water used
94				Topock - Alluvium Deposits	SM		(94.0 - 95.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subangular; some silt; little granule to large pebbles, angular to subangular; little clay; trace cobbles, angular to subangular; moist; moderate cementation		
95				Topock - Alluvium Deposits	ML		(95.0 - 112.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); grayish brown (2.5Y 5/2); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granule to very large pebbles, angular to subangular; trace clay; trace mica; wet; strong cementation		
96							(96'); moist to dry; iron oxide staining; increase in granules to very large pebbles, decrease in sand, increase in silt, decrease in clay		
97									
98									
99									
100									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started:	10/03/2018	Surface Elevation:	530.0 ft amsl	Boring No.: MW-Ld	
Date Completed:	11/27/2018	Northing (NAD83):	2102858.8		
Drilling Co.:	Cascade	Easting (NAD83):	7615264.9	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	315 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	76.27 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / J. Campbell	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	S. McGrane / G. Jeffers	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101									(96.0 - 106.0') 50 gal of water used
102									
103									
104									
105									
106				Topock - Alluvium Deposits	ML		(106'); wet; moderate cementation; iron oxide staining; decrease in granules to large pebbles, increase in sand		(106.0 - 116.0') 100 gal of water used
107							(107'); moist to dry; strong cementation; iron oxide staining; increase in granules to large pebbles, decrease in sand		
108	234		MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46						
109		No sieve samples collected							
110									
111									
112									
113				Topock - Alluvium Deposits	ML		(112.0 - 114.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (10YR 5/3) little dark reddish brown (2.5YR 3/4); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace clay; trace mica; little caliche; moist to dry; strong cementation; iron oxide staining		
114									
115							(114.0 - 121.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); grayish brown (2.5Y 5/2); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granule to very large pebbles, angular to subangular; trace clay; trace mica; with caliche; moist; moderate cementation; iron oxide staining		
116									
117				Topock - Alluvium Deposits	ML		(116') brown (10YR 4/3); no caliche; iron oxide staining		(116.0 - 126.0') 130 gal of water used
118	108								
119									
120									





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Date Started:	10/03/2018	Surface Elevation:	530.0 ft amsl	Boring No.: MW-Ld	
Date Completed:	11/27/2018	Northing (NAD83):	2102858.8		
Drilling Co.:	Cascade	Easting (NAD83):	7615264.9	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	315 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	76.27 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / J. Campbell	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	S. McGrane / G. Jeffers	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121	108			Topock - Alluvium Deposits	ML				(116.0 - 126.0') 130 gal of water used
122				Topock - Alluvium Deposits	ML		(121.0 - 126.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (10YR 4/3) and reddish brown / moderate brown(5YR 4/4); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace mica; trace caliche; moist; strong cementation; iron oxide staining		
123									
124									
125	No sieve samples collected			Topock - Alluvium Deposits	ML		(126.0 - 131.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); dark grayish brown / dark yellowish brown(10YR 4/2); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace clay; little mica; moist; weak cementation; iron oxide staining		(126.0 - 136.0') 140 gal of water used
126									
127				Topock - Alluvium Deposits	ML				
128									
129									
130				Topock - Alluvium Deposits	ML		(131.0 - 139.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); dark yellowish brown (10YR 4/4); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granule to large pebbles, angular to subangular; little clay; little mica; wet; iron oxide staining		
131							(132'); some granule to large pebbles, angular to subangular; trace clay; iron oxide staining; decrease sand, increase silt		
132									
133									
134									
135				Topock - Alluvium Deposits	ML		(136'); iron oxide staining; increase gravel, decrease silt		(136.0 - 146.0') 60 gal of water used
136									
137									
138									
139				Topock - Alluvium Deposits	ML				
140							(139.5 - 146.0') Topock - Alluvium Deposits; Gravelly silt with sand		

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Date Started:	<u>10/03/2018</u>	Surface Elevation:	<u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>	
Date Completed:	<u>11/27/2018</u>	Northing (NAD83):	<u>2102858.8</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615264.9</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>315 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>4-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / J. Campbell</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>S. McGrane / G. Jeffers</u>	Sampling Interval:	<u>Continuous</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141	182.4		MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58	Topock - Alluvium Deposits	ML		(ML); brown (10YR 4/3); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace mica; wet; iron oxide staining		(136.0 - 146.0') 60 gal of water used
142									
143									
144									
145									
146	No sieve samples collected			Topock - Alluvium Deposits	SM		(146.0 - 151.0') Topock - Alluvium Deposits; Sandy silt with gravel (SM); dark grayish brown / dark yellowish brown(10YR 4/2); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; trace cobbles, angular; trace mica; dry; weak cementation	(146.0') Seepage from outside conductor casing, pull 6" casing and 7" conductor casing and install 12" conductor casing	(146.0 - 156.0') 40 gal of water used
147									
148									
149									
150				Topock - Alluvium Deposits	SM		(151.0 - 153.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subangular; some silt; little clay; trace cobbles, angular; trace mica; wet; weak cementation; iron oxide staining		
151									
152									
153									
154				Topock - Alluvium Deposits	GM		(153.0 - 154.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 4/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; some silt; trace mica; moist; weak cementation; iron oxide staining		
155									
156									
157									
158	Topock - Alluvium Deposits	SM		(154.0 - 155.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subangular; some silt; little clay; trace cobbles, angular; trace mica; wet; moderate cementation; iron oxide staining					
159									
160									
	120			Topock - Alluvium Deposits	GM		(155.0 - 156.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (10YR 4/3); low plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little clay; trace mica; moist; strong cementation; iron oxide staining	(156.0') Refill casing (110 gallons) after sampling from 261-266ft bgs	(156.0 - 166.0') 50 gal of water used
	120			Topock - Alluvium Deposits	SM		(156.0 - 157.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 4/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; little clay; trace mica; wet; weak cementation; iron oxide staining		
							(157.0 - 163.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subangular; some silt; little clay; trace mica; moist; strong cementation;		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started:	<u>10/03/2018</u>	Surface Elevation:	<u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>	
Date Completed:	<u>11/27/2018</u>	Northing (NAD83):	<u>2102858.8</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615264.9</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>315 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>4-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / J. Campbell</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>S. McGrane / G. Jeffers</u>	Sampling Interval:	<u>Continuous</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
161	120			Topock - Alluvium Deposits	SM		iron oxide staining		(156.0 - 166.0') 50 gal of water used
162				Topock - Alluvium Deposits	SM		(163.0 - 166.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subangular; some silt; little clay; little mica; wet; weak cementation; iron oxide staining		
163				Topock - Alluvium Deposits	GM		(166.0 - 167.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 4/3); granules to boulders, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; little clay; some mica; wet; strong cementation; iron oxide staining		
164				Topock - Alluvium Deposits	SM		(167.5 - 170.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subangular; some silt; little clay; trace mica; wet; strong cementation; iron oxide staining		
165	120	No sieve samples collected		Topock - Alluvium Deposits	GM		(170.0 - 174.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 5/3); granules to boulders, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; trace clay; some mica; wet; strong cementation; iron oxide staining		(166.0 - 176.0') 45 gal of water used
166				Topock - Alluvium Deposits	GM		(174.0 - 176.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; some mica; wet; strong cementation		
167				Topock - Alluvium Deposits	SM		(176.0 - 177.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular to subangular; some small to very large pebbles, angular to subangular; some silt; little clay; little mica; wet; strong cementation; iron oxide staining		
168				Topock - Alluvium Deposits	SM		(177.5 - 181.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular to subangular; some silt; little small to very large pebbles, angular to subangular; trace clay; little mica; wet; moderate cementation; iron oxide staining		
169	134.4			Topock - Alluvium Deposits	SM				(176.0 - 186.0') 20 gal of water used
170				Topock - Alluvium Deposits	SM				
171				Topock - Alluvium Deposits	SM				
172				Topock - Alluvium Deposits	SM				
173	134.4			Topock - Alluvium Deposits	SM				(176.0 - 186.0') 20 gal of water used
174				Topock - Alluvium Deposits	SM				
175				Topock - Alluvium Deposits	SM				
176				Topock - Alluvium Deposits	SM				
177	134.4			Topock - Alluvium Deposits	SM				(176.0 - 186.0') 20 gal of water used
178				Topock - Alluvium Deposits	SM				
179				Topock - Alluvium Deposits	SM				
180				Topock - Alluvium Deposits	SM				

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Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
181	134.4		MW-L-VAS-181-186 (3.3 ppb) 10/20/2018 11:06	Topock - Alluvium Deposits	SM				(176.0 - 186.0') 20 gal of water used
182				Topock - Alluvium Deposits	ML		(181.5 - 184.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (10YR 5/3); medium plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; wet; iron oxide staining		
183									
184				Topock - Alluvium Deposits	SM		(184.5 - 186.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, angular to subround; some small to very large pebbles, angular to subangular; some silt; trace clay; some mica; wet; weak cementation; iron oxide staining		
185									
186	No sieve samples collected			Topock - Alluvium Deposits	ML		(186.5 - 188.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/3); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little clay; moist; strong cementation; iron oxide staining		(186.0 - 196.0') 35 gal of water used
187									
188				Topock - Alluvium Deposits	SM		(188.5 - 195.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subangular; some silt; little clay; some mica; dry to moist; strong cementation; iron oxide staining		
189									
190									
191				120			Topock - Alluvium Deposits		
192									
193									
194									
195									
196									
197									
198									
199									
200									


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Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
201	120			Topock - Alluvium Deposits	ML				(196.0 - 206.0') 20 gal of water used
202				Topock - Alluvium Deposits	SM		(201.0 - 205.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, angular to subround; some granule to very large pebbles, angular to subround; some silt; trace clay; some mica; dry to moist; moderate cementation; iron oxide staining		
203									
204									
205				Topock - Alluvium Deposits	ML		(205.0 - 206.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (10YR 5/3) and reddish brown / moderate brown (5YR 4/4); no plasticity; some granule to very large pebbles; some very fine to very coarse grained sand, angular to subangular; trace clay; little mica; wet; medium stiff; mottled; weak cementation; iron oxide staining		
206				Topock - Alluvium Deposits	GM		(206.5 - 208.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles, angular to subangular; some silt; little very fine to very coarse grained sand, angular to subangular; little clay; trace mica; moist; moderate cementation; iron oxide staining		(206.0 - 216.0') 40 gal of water used
207									
208									
209	133.2	No sieve samples collected		Topock - Alluvium Deposits	GM		(208.0 - 215.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles, angular to subangular; no plasticity; some very fine to very coarse grained sand, angular to subangular; some silt; little clay; trace mica; moist; moderate cementation; iron oxide staining		
210									
211									
212									
213	111.6			Topock - Alluvium Deposits	SM		(215.0 - 216.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4) and reddish brown (5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subangular; some silt; trace mica; moist; mottled; weak cementation; iron oxide staining		
214				Topock - Alluvium Deposits	SM		(216.0 - 219.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subangular; some silt; little mica; wet; iron oxide staining		
215								(216.0') Driller's observed some heaving when tagging depths during reaming with 10-inch casing	(216.0 - 226.0') 125 gal of water used
216									
217									
218									
219									
220									

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Date Started:	10/03/2018	Surface Elevation:	530.0 ft amsl	Boring No.: MW-Ld	
Date Completed:	11/27/2018	Northing (NAD83):	2102858.8		
Drilling Co.:	Cascade	Easting (NAD83):	7615264.9	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	315 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	76.27 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / J. Campbell	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	S. McGrane / G. Jeffers	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid	
221	111.6	No sieve samples collected	MW-L-VAS-218-223 (66 ppb) 10/21/2018 10:50	Topock - Alluvium Deposits	GM		(GM); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; little mica; wet; iron oxide staining		(216.0 - 226.0') 125 gal of water used (220.0 - 250.0') 1100 gal of water used	
222										
223										
224										
225										
226										
227										
228	120									
229										
230										
231										
232										
233										
234										
235										
236										
237	120									
238										
239										
240										

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
241	120			Topock - Weathered Bedrock - conglomerate	SM		(240.0 - 244.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granule to very large pebbles, angular to subround; some silt; trace cobbles, subangular; little mica; wet; iron oxide staining		(220.0 - 250.0') 1100 gal of water used (226.1 - 246.0') 1100 gal of water used (226.1 - 246.0') 1100 gal of water used
242									
243									
244									
245				Topock - Weathered Bedrock - conglomerate	ML		(244.0 - 254.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little mica; moist to wet; medium stiff to stiff; iron oxide staining		(246.0 - 256.0') 40 gal of water used
246									
247									
248									
249	114	No sieve samples collected		Topock - Weathered Bedrock - conglomerate	ML				(250.0 - 256.0') 40 gal of water used
250									
251									
252									
253	108			Topock - Weathered Bedrock - conglomerate	ML		(254.0 - 258.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); no plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; trace cobbles, angular; trace clay; little mica; moist; medium stiff to stiff; weak cementation; iron oxide staining		(256.0 - 266.0') 140 gal of water used
254									
255									
256									
257				Topock - Weathered Bedrock - conglomerate	ML		(258.0 - 262.5') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); medium plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little clay; little mica; moist; medium stiff to stiff; weak cementation; iron oxide staining		
258									
259									
260									






Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid			
261	108			Topock - Weathered Bedrock - conglomerate	ML		(261'); dry to moist; moderate cementation	(261.0 - 266.0') Sample collected with a disposable bailer	(256.0 - 266.0') 140 gal of water used			
262												
263				MW-L-VAS-261-266 (<0.17 U ppb) 10/22/2018 14:50						(262.5 - 283.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); dark reddish brown (2.5YR 3/4); medium plasticity; some granule to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little clay; little mica; wet; medium stiff; iron oxide staining		
264												
265												
266	138		No sieve samples collected						(266.0 - 267.0') 30 gal of water used			
267												
268										(268'); some clay; little granule to very large pebbles, angular to subangular; little very fine to very coarse grained sand, angular to subangular; moist; stiff; weak cementation		
269												
270												
271		Topock - Weathered Bedrock - conglomerate								ML		
272												
273												
274												
275												
276												
277	120											
278												
279												
280												

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid		
281	120	No sieve samples collected		Topock - Weathered Bedrock - conglomerate	ML		(283.0 - 299.0') Topock - Weathered Bedrock - conglomerate; Gravelly silt with sand (ML); reddish brown / moderate brown(5YR 4/4); medium plasticity; some granule to very large pebbles, angular to subangular; little very fine to very coarse grained sand, angular to subangular; little silt; little clay; trace mica; moist; stiff; strong cementation				
282											
283											
284											
285											
286	120					Topock - Weathered Bedrock - conglomerate	ML				
287											
288											
289											
290											
291	36										
292											
293											
294											
295											
296											
297											
298											
299											
300					NR		(299.0 - 306.0') (NR); No Recovery, sample fell out of core barrel	(299.0') Attempted to collect GW			

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during the second VAS interval

Date Started: <u>10/03/2018</u>	Surface Elevation: <u>530.0 ft amsl</u>	Boring No.: <u>MW-Ld</u>
Date Completed: <u>11/27/2018</u>	Northing (NAD83): <u>2102858.8</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615264.9</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>315 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>76.27 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / J. Campbell</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>S. McGrane / G. Jeffers</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
301	36	No sieve samples collected	--no sample-- (Interval did not produce) 10/25/2018 09:48		NR			sample but formation was non-permeable and produced no water.	
302									
303									
304									
305	(303.0 - 306.0') 6-inch casing got stuck and approximately 3 ft broke off down hole and could not be retrieved (304.0') Rough Drilling (305.0') Drill rods chattering								
306									
307			(306.0 - 311.0') Topock - Weathered Bedrock - conglomerate; Sandy silt (ML); dark reddish brown(2.5YR 3/3); medium plasticity; some fine to medium grained sand, subangular to subround; trace granule to small pebbles, angular to subround; trace coarse-grained sand; trace mica; dry; very stiff; strong cementation						
308									
309									
310									
311	(306.0 - 308.0') Drilled extra two feet to collect lost core, core sample was saturated with drilling/formation water above 307 ft. bgs								
312									
313									
314									
315	(311.0') Rough drilling								
316									
317									
318									
319	(313.5') Core barrel stuck down hole, pulled both core barrel and 6" casing								
320									

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Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1							(0.0 - 66.0'); No recovery cores not collected, see Boring Log MW-Ld for lithology	(0.0 - 18.0') Drilling rate 51.34 minutes, drill rods chattering 1 to 12 ft. bgs, rough drilling 12 to 18 ft. bgs	(0.0 - 184.0') No water used
2									
3									
4									
5									
6									
7								(6.0') Rough drilling due to 20-inch boulder	
8									
9								(8.0') Drilled slow due to 20-inch boulder	
10		No sieve samples collected							
11									
12									
13									
14									
15									
16									
17									
18									
19								(18.0 - 26.0') Drill time 21.11 minutes, voids forming, rough drilling, 6-inch to 20-inch boulder (19.0')	
20									

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Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21								Formation collapsing (18.0 - 26.0') Drill time 21.11 minutes, voids forming, rough drilling, 6-inch to 20-inch boulder	(0.0 - 184.0') No water used
22									
23									
24								(24.0') Heavy rig chatter	
25									
26								(26.0 - 36.0') Drill time 10.35 minutes, rough drilling 31 to 36 ft bgs	
27									
28								(28.0') Voids forming	
29									
30		No sieve samples collected							
31									
32									
33									
34									
35									
36									
37								(36.0 - 56.0') Drill time 73.45 minutes, rough drilling, voids forming 38 to 40 ft. bgs and 46 to 56 ft. bgs (37.0') Rough drilling	
38									
39									
40									

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Date Started:	<u>12/03/2018</u>	Surface Elevation:	<u>529.6 ft amsl</u>	Boring No.: <u>MW-Ls</u>	
Date Completed:	<u>12/15/2018</u>	Northing (NAD83):	<u>2102862.2</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615260.4</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>184 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>10-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>74.65 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / T. Wolfe</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>Michael Andrews</u>	Sampling Interval:	<u>Screen intervals</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41								(36.0 - 56.0') Drill time 73.45 minutes, rough drilling, voids forming 38 to 40 ft. bgs and 46 to 56 ft. bgs	(0.0 - 184.0') No water used
42									
43									
44								(43.0') Rough drilling	
45									
46									
47									
48									
49									
50		No sieve samples collected							
51									
52									
53									
54									
55									
56									
57								(56.0 - 66.0') Drill time 17.05 minutes, voids forming, rough drilling 61 to 65 ft. bgs	
58									
59									
60									






Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during drilling Note: water samples were collected from MW-Ld borehole.

Date Started:	<u>12/03/2018</u>	Surface Elevation:	<u>529.6 ft amsl</u>	Boring No.: <u>MW-Ls</u>	
Date Completed:	<u>12/15/2018</u>	Northing (NAD83):	<u>2102862.2</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615260.4</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>184 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>10-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>74.65 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / T. Wolfe</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>Michael Andrews</u>	Sampling Interval:	<u>Screen intervals</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61								(56.0 - 66.0') Drill time 17.05 minutes, voids forming, rough drilling 61 to 65 ft. bgs (60.0') Heavy rig chatter	(0.0 - 184.0') No water used
62									
63									
64									
65									
66									
67				Topock - Fluvial Deposits	SM		(66.0 - 68.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to coarse grained, subangular to subround; some granule to large pebbles, angular to subangular; little silt; little clay; trace cobbles, angular; trace mica; dry to moist; no odor (67') yellowish brown / moderate yellowish brown (10YR 5/4); little granules to very large pebbles, angular to round; little cobbles, angular to round; trace clay; little mica; dry to moist; no odor	(66.0 - 70.0') Voids forming	
68									
69	72			Topock - Fluvial Deposits	SW-SM		(68.0 - 72.0') Topock - Fluvial Deposits; Well graded sand with silt and gravel (SW-SM); dark yellowish brown (10YR 4/4); fine grained to very coarse grained, angular to subround; some granule to large pebble, angular to subangular; some cobbles, angular to round; little silt; trace boulders, subangular to well-rounded; little mica; dry to moist		
70		No sieve samples collected							
71							(70.5') brown (10YR 4/3); little granule to large pebble, angular to round; trace cobbles, angular to round (71'); wet		
72									
73							(72.0 - 78.5') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, subangular to round; some granule to very large pebble, angular to round; some silt; little cobbles, angular to subangular; little clay; little mica; dry to wet; dry to moist to wet with depth	(72.0 - 76.0') Rough drilling, drill rods chattering, drill time 24.30 minutes	
74	48						(74') angular to round; trace clay		
75				Topock - Fluvial Deposits	SM				
76									
77							(76') dark grayish brown / dark yellowish brown (10YR 4/2); some granule to very large pebble, angular to round; some silt; trace cobbles, subangular to subround; trace clay; trace mica; wet; no odor; increase in granules and very large pebbles (77'); 6" lens with increase in fines	(76.0') Approximate depth to water table	
78	63		MW-L-VAS-76-81 (31 ppb) 10/6/2018 16:34				(78'); 6" lens with increase in fines	(76.1 - 86.0') Drill time 24.45, 76.5 to 81 ft. bgs drill rods chattering, 78 to 84 ft hard/rough drilling	
79				Topock - Fluvial Deposits	GW-GM		(78.5 - 81.3') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles, angular to round; little cobbles, angular to round; little very fine to medium grained sand, subangular to round; trace boulders, boulder; trace silt; trace clay; wet; no odor		
80									

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Date Started:	<u>12/03/2018</u>	Surface Elevation:	<u>529.6 ft amsl</u>	Boring No.: <u>MW-Ls</u>	
Date Completed:	<u>12/15/2018</u>	Northing (NAD83):	<u>2102862.2</u>		
Drilling Co.:	<u>Cascade</u>	Easting (NAD83):	<u>7615260.4</u>	Client:	<u>PG&E</u>
Drilling Method:	<u>Sonic Drilling</u>	Total Depth:	<u>184 ft bgs</u>	Project:	<u>Final Groundwater Remedy Phase</u>
Drill Rig Type:	<u>Terrasonic track mount</u>	Borehole Diameter:	<u>10-12 inches</u>	Location:	<u>1</u>
Driller Name:	<u>Dan O'Mara</u>	Depth to First Water:	<u>74.65 ft bgs</u>	<u>PG&E Topock, Needles, California</u>	
Drilling Asst:	<u>E. Huellmantel / T. Wolfe</u>	Sampling Method:	<u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>	
Logger:	<u>Michael Andrews</u>	Sampling Interval:	<u>Screen intervals</u>		
Editor:	<u>Sean McGrane</u>	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	63	No sieve samples collected		Topock - Fluvial Deposits	GW-GM			(76.1 - 86.0') Drill time 24.45, 76.5 to 81 ft. bgs drill rods chattering, 78 to 84 ft hard/rough drilling	(0.0 - 184.0') No water used
82				Topock - Alluvium Deposits	NR		(81.3 - 86.0') Topock - Alluvium Deposits; (NR); No recovery, boulder at 81.25 jammed up core barrel		
83									
84									
85									
86	108			Topock - Alluvium Deposits	SM		(86.0 - 94.5') Topock - Alluvium Deposits; Sandy silt with gravel (SM); (7.5R 4/3); very fine grained to very coarse grained, subangular to round; some silt; little granule to very large pebble, angular to subangular; trace clay; wet	(86.0 - 96.0') Soft drilling, drill time 21.30 minutes, core very wet	
87									
88									
89									
90									
91		Topock - Alluvium Deposits	SM		(94.5 - 96.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 4/3); very fine grained to coarse grained, angular to subround; and silt; little clay; trace granules to large pebbles, subangular to round; trace cobbles, angular to subangular; little mica; wet; no odor	(96.0 - 106.0') Drill time 15.01 minutes, drill rods chattering 96 to 101 ft. bgs, 102 to 106 soft drilling			
92									
93									
94									
95		NR	NR		(96.0 - 156.0') (NR); iron oxide staining; No recovery core not collected see Boring Log MW-Ld for lithology				
96									
97									
98									
99									
100									

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Date Started: <u>12/03/2018</u>	Surface Elevation: <u>529.6 ft amsl</u>	Boring No.: <u>MW-Ls</u>
Date Completed: <u>12/15/2018</u>	Northing (NAD83): <u>2102862.2</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615260.4</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>184 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>10-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>74.65 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / T. Wolfe</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>Michael Andrews</u>	Sampling Interval: <u>Screen intervals</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101								(96.0 - 106.0') Drill time 15.01 minutes, drill rods chattering 96 to 101 ft. bgs, 102 to 106 soft drilling	(0.0 - 184.0') No water used
102									
103									
104									
105									
106									
107								(106.0 - 126.0') Drill time 20.15 minutes, soft drilling	
108			MW-L-VAS-106-111 (0.84 ppb) 10/9/2018 11:46						
109									
110		No sieve samples collected			NR				
111									
112									
113									
114									
115									
116									
117									
118									
119									
120									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during drilling Note: water samples were collected from MW-Ld borehole.

Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121								(106.0 - 126.0') Drill time 20.15 minutes, soft drilling	(0.0 - 184.0') No water used
122									
123									
124									
125									
126									
127								(126.0 - 146.0') Drill time 26.30, soft drilling	
128									
129									
130		No sieve samples collected			NR				
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									






Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during drilling Note: water samples were collected from MW-Ld borehole.

Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141								(126.0 - 146.0') Drill time 26.30, soft drilling	(0.0 - 184.0') No water used
142									
143			MW-L-VAS-141-146 (<0.033 U ppb) 10/10/2018 14:58						
144									
145									
146									
147								(146.0 - 156.0') Drill rods chattering, drill time 15.05 minutes, drill time with 10-casing 30.20 minutes	
148					NR				
149									
150		No sieve samples collected							
151									
152									
153									
154									
155									
156									
157							(156.0 - 160.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 4/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; trace cobbles, angular to subangular; trace clay; wet	(156.0 - 166.0') Soft drilling, drill time 25.31 minutes, lost core barrel down hole	
158	117			Topock - Alluvium Deposits	GM				
159									
160							(159'); little very fine to very coarse grained sand, subangular to subround; wet; weak cementation; increase granules to very large pebbles		





Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during drilling Note: water samples were collected from MW-Ld borehole.

Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
161	117	No sieve samples collected		Topock - Alluvium Deposits	SM		(160.0 - 163.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to round; little granule to large pebble, angular to subround; little silt; little clay; little mica; wet; no odor; weak cementation	(156.0 - 166.0') Soft drilling, drill time 25.31 minutes, lost core barrel down hole	(0.0 - 184.0') No water used
162									
163									
164									
165	Topock - Alluvium Deposits			GM		(163.5 - 167.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown(10YR 4/2); granules to large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; little clay; wet			
166									
167	Topock - Alluvium Deposits			SM		(167.5 - 170.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 4/3); very fine grained to very coarse grained, angular to subrounded; some granules to very large pebbles, angular to subangular; some silt; little clay; trace mica; wet; no odor	(166.0 - 182.5') Drill time 45.40 minutes, 175 to 179 ft. bgs rough drilling, 181 to 182.5 ft. bgs rough drilling		
168									
169									
170									
171	Topock - Alluvium Deposits			GM		(170.0 - 177.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (10YR 5/3); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subangular; little silt; trace cobbles; trace boulders; trace clay; some mica; wet; strong cementation			
172									
173									
174						(174') dark grayish brown / dark yellowish brown(10YR 4/2); some silt; little clay; wet; strong cementation; decrease in granules to very large pebbles and sand			
175									
176						(176') brown (7.5YR 5/3); trace clay; little mica; wet; increase in silt			
177									
178		Topock - Alluvium Deposits	SM				(177.5 - 182.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular; some small to very large pebbles, angular to subangular; some silt; little clay; little mica; wet; moderate cementation		
179									
180									

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Date Started:	12/03/2018	Surface Elevation:	529.6 ft amsl	Boring No.: MW-Ls	
Date Completed:	12/15/2018	Northing (NAD83):	2102862.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615260.4	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	184 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	74.65 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	Michael Andrews	Sampling Interval:	Screen intervals		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
181	198	No sieve samples collected	MW-L-VAS-181-186 (3.3 ppb) 10/20/2018 11:06	Topock - Alluvium Deposits	SM		(182.0 - 182.5') Topock - Alluvium Deposits; Silty sand (SM); (7.5R 4/3); very fine grained to very coarse grained, subangular to subround; and silt; trace granules to medium pebbles, angular to subangular; little mica; wet; no odor (182.5 - 184.0') Topock - Alluvium Deposits; (NR); No Recovery	(166.0 - 182.5') Drill time 45.40 minutes, 175 to 179 ft. bgs rough drilling, 181 to 182.5 ft. bgs rough drilling (182.4') Large boulder (182.5 - 184.0') Rough drilling	(0.0 - 184.0') No water used
182				Topock - Alluvium Deposits	SM				
183	Topock - Alluvium Deposits			NR					
184	Topock - Alluvium Deposits			NR					
End of Boring at 184.0' bgs.									
185									
186									
187									
188									
189									
190									
191									
192									
193									
194									
195									
196									
197									
198									
199									
200									

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Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
1					(0.0 - 1.0') Concrete Pad (0.5 - 113.8') 2" PVC Sch 80 Casing		(0.0 - 1.0') 8 bags Note: 2.5 x 2.5 ft concrete pad with 18" dia lockable vault, King Kon-Crete 4000 PSI
2					(1.0 - 2.0') Cement		
3					(2.0 - 3.0') Portland Cement 5% Bentonite	(2.0 - 3.0') 5.5 gallons	(2.0 - 3.0') 3 gallons (-45%) Note: Topped off with Type I, II, and V and Hydrogel on 4/1/19.
4							
5							
6							
7							
8							
9							
10			NR				
11					(3.0 - 33.0') Portland Cement 5% Bentonite		
12						(3.0 - 33.0') 43.1 gallons	(3.0 - 33.0') 70 gallons (62%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
13							
14							
15							
16							
17							
18					(17.5 - 18.5') Centralizer		
19							
20							

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Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
21					(0.5 - 113.8') 2" PVC Sch 80 Casing		
22							
23							
24							
25							
26					(3.0 - 33.0') Portland Cement 5% Bentonite	(3.0 - 33.0') 43.1 gallons	(3.0 - 33.0') 70 gallons (62%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
27							
28							
29							
30			NR		(5.0 - 133.0') 6" Borehole		
31							
32							
33							
34							
35							
36					(33.0 - 40.0') Bentonite seal chips	(33.0 - 40.0') 1.5 bags	(33.0 - 40.0') 1 bags (-33%) Note: Puregold & Enviro-Plug medium chips
37							
38							
39							
40							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Nd borehole

Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
41					(0.5 - 113.8') 2" PVC Sch 80 Casing		
42							
43							
44							
45							
46							
47							
48							
49							
50			NR		(40.0 - 105.0') Portland Cement 5% Bentonite	(5.0 - 133.0') 6" Borehole	(40.0 - 105.0') 74.2 gallons
51							(40.0 - 105.0') 200 gallons (170%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
52							
53							
54							
55							
56							
57							
58							
59							
60							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Nd borehole

Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
61					(0.5 - 113.8') 2" PVC Sch 80 Casing		
62							
63							
64							
65							
66							
67							
68					(67.5 - 68.5') Centralizer		
69							
70			NR		(40.0 - 105.0') Portland Cement 5% Bentonite	(5.0 - 133.0') 6" Borehole	(40.0 - 105.0') 74.2 gallons
71							(40.0 - 105.0') 200 gallons (170%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
72							
73							
74							
75							
76							
77							
78							
79							
80							

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Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
81					(0.5 - 113.8') 2" PVC Sch 80 Casing		
82							
83							
84							
85							
86							
87							
88							
89							
90			NR		(40.0 - 105.0') Portland Cement 5% Bentonite	(5.0 - 133.0') 6" Borehole	(40.0 - 105.0') 74.2 gallons
91							(40.0 - 105.0') 200 gallons (170%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
92							
93							
94							
95							
96							
97							
98							
99							
100							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Nd borehole

Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
101					(0.5 - 113.8') 2" PVC Sch 80 Casing		
102							
103			NR		(40.0 - 105.0') Portland Cement 5% Bentonite	(40.0 - 105.0') 74.2 gallons	(40.0 - 105.0') 200 gallons (170%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
104							
105							
106							
107		Topock - Fluvial Deposits	GP		(105.0 - 112.0') Bentonite seal pellets	(105.0 - 112.0') 1.5 bags	(105.0 - 112.0') 1.3 bags (-13%) Note: Puregold & Enviro-Plug medium chips
108							
109							
110					(5.0 - 133.0') 6" Borehole		
111							
112		Topock - Fluvial Deposits	SM				
113							
114		Topock - Fluvial Deposits	GP		(113.8 - 129.0') 2" Sch 80 PVC (20-slot) Screen		
115							
116		Topock - Fluvial Deposits	SM		(112.0 - 133.0') Cemex #3 MESH (8x10)	(112.0 - 133.0') 5.6 bags	(112.0 - 133.0') 8 bags (43%) Note: Lapis Lustre Sand
117							
118							
119		Topock - Alluvium Deposits	SM				
120							



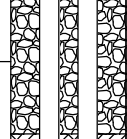

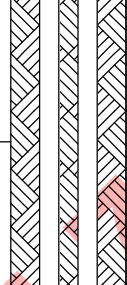

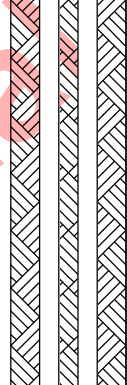

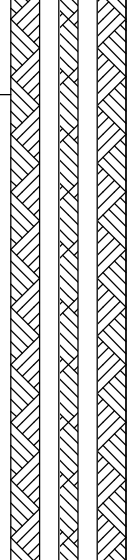
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development Note: water samples were collected from MW-Nd borehole

Date Started:	03/26/2019	Surface Elevation:	570.1 ft amsl	Well ID: MW-N-129
Date Completed:	04/12/2019	Shallow Well Elevation:	N/A	
Drilling Co.:	Cascade	Deep Well Elevation:	569.9 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102321.2	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615448.1	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / J. Pacheco	Borehole Diameter:	6-12 inches	
Logger:	D. Maurer/G. Willford	Water Level Start:	115.88 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/3/2019	
Total Depth:	133 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
121	MW-N-VAS-121.0-126.0 (0.51) 2/16/2019 14:09	Topock - Alluvium Deposits	SM		(113.8 - 129.0') 2" Sch 80 PVC (20-slot) Screen		
122							
123							
124		Topock - Alluvium Deposits	ML				
125							
126					(112.0 - 133.0') Cemex #3 MESH (8x10)	(5.0 - 133.0') 6" Borehole	(112.0 - 133.0') 5.6 bags
127							(112.0 - 133.0') 8 bags (43%) Note: Lapis Lustre Sand
128							
129		Topock - Alluvium Deposits	SM				
130					(129.5 - 130.5') Centralizer		
131		Topock - Fluvial Deposits	SM		(129.0 - 131.3') Sump and End Cap		
132							
133							
134					End of Boring at 133.0' bgs.		
135							
136							
137							
138							
139							
140							

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction		Calculated Material Volumes	Material Volumes Installed
1		Topock - Fluvial Deposits	GW-GM		(0.0 - 1.0') Concrete Pad (0.6 - 196.7') 2" PVC Sch 80 Casing		(0.5 - 226.7') 2" PVC Sch 80 Casing	(0.0 - 1.0') 9 bags Note: 2.5 x 2.5 ft concrete pad with 18" dia. lockable vault, King Kon-Crete 4000 PSI
2					(1.0 - 3.0') Hole collapse		(0.0 - 5.0') 12" Borehole	Note: Surrounding native soil
3								
4								
5								
6		Topock - Fluvial Deposits	GM		(3.0 - 7.0') Portland Cement 5% Bentonite		(3.0 - 7.0') 19 gallons	(3.0 - 7.0') 25 gallons (32%) Note: Topped off with Type I, II, and V with Hydrogel - Wyoming bentonite. on 4/1/19.
7								
8								
9								
10								
11		Topock - Fluvial Deposits	GM				(5.0 - 241.0') 10" Borehole	
12								
13								
14								
15								
16		Topock - Fluvial Deposits	GW-GM		(7.0 - 107.0') Portland Cement 5% Bentonite		(7.0 - 107.0') 395.8 gallons	(7.0 - 107.0') 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
17								
18								
19								
20								

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
21		Topock - Fluvial Deposits	GW-GM		(0.6 - 196.7') 2" PVC Sch 80 Casing		
22							
23		Topock - Fluvial Deposits	SP				
24							
25							
26							
27							
28			NR				
29							
30					(7.0 - 107.0') Portland Cement 5% Bentonite		(7.0 - 107.0') 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
31		Topock - Fluvial Deposits	GW				
32							
33		Topock - Fluvial Deposits	SP				
34							
35							
36		Topock - Fluvial Deposits	SM				
37							
38		Topock - Fluvial Deposits	GW				
39							
40							




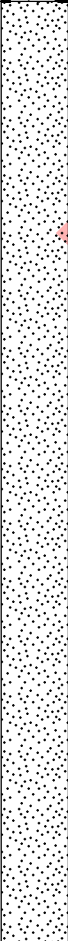


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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction			Calculated Material Volumes	Material Volumes Installed
41		Topock - Fluvial Deposits	GW		(0.6 - 196.7') 2" PVC Sch 80 Casing		(0.5 - 226.7') 2" PVC Sch 80 Casing		
42									
43									
44		Topock - Fluvial Deposits	GW						
45									
46									
47									
48									
49		Topock - Fluvial Deposits	GW						
50					(7.0 - 107.0') Portland Cement 5% Bentonite		(5.0 - 241.0') 10" Borehole	(7.0 - 107.0') 395.8 gallons	(7.0 - 107.0') 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
51									
52									
53									
54									
55									
56		Topock - Fluvial Deposits	SW						
57									
58									
59									
60									

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction			Calculated Material Volumes	Material Volumes Installed	
61		Topock - Fluvial Deposits	GW		(0.6 - 196.7') 2" PVC Sch 80 Casing			(0.5 - 226.7') 2" PVC Sch 80 Casing	7.0 - 107.0' 395.8 gallons	7.0 - 107.0' 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
62										
63										
64										
65										
66										
67										
68		Topock - Fluvial Deposits	SP		(7.0 - 107.0') Portland Cement 5% Bentonite			(5.0 - 241.0') 10" Borehole		
69										
70										
71										
72										
73										
74										
75										
76										
77										
78										
79										
80										









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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
81			SP		(0.6 - 196.7') 2" PVC Sch 80 Casing		
82							
83							
84							
85							
86		Topock - Fluvial Deposits	GW				
87							
88							
89							
90					(7.0 - 107.0') Portland Cement 5% Bentonite	(5.0 - 241.0') 10" Borehole	(7.0 - 107.0') 395.8 gallons
91							(7.0 - 107.0') 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.
92							
93		Topock - Fluvial Deposits	SW				
94							
95							
96							
97		Topock - Fluvial Deposits	GP				
98							
99		Topock - Fluvial Deposits	GW				
100							




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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction			Calculated Material Volumes	Material Volumes Installed	
101		Topock - Fluvial Deposits	GW		(0.6 - 196.7') 2" PVC Sch 80 Casing		(0.5 - 226.7') 2" PVC Sch 80 Casing	(7.0 - 107.0') 395.8 gallons	(7.0 - 107.0') 500 gallons (26%) Note: Portland cement type I, II, and V and Hydrogel - Wyoming bentonite.	
102					(7.0 - 107.0') Portland Cement 5% Bentonite		(0.5 - 226.7') 2" PVC Sch 80 Casing			
103										
104										
105		Topock - Fluvial Deposits	GW-GM			(107.0 - 112.0') Bentonite seal chips	(5.0 - 241.0') 10" Borehole		(107.0 - 112.0') 3.7 bags	(107.0 - 112.0') 3 bags (-19%) Note: Enviroplug Medium Chips
106										
107										
108										
109										
110										
111										
112										
113	Topock - Fluvial Deposits				(112.0 - 185.0') High Solids Bentonite		(112.0 - 185.0') 288.9 gallons	(112.0 - 185.0') 360 gallons (25%) Note: Enviroplug		
114										
115										
116										
117										
118										
119										
120										

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
121	MW-N-VAS-121.0-126.0 (0.51) 2/16/2019 14:09	Topock - Alluvium Deposits	GM		(0.6 - 196.7') 2" PVC Sch 80 Casing		
122							
123							
124							
125							
126		Topock - Alluvium Deposits	GW-GM		(112.0 - 185.0') High Solids Bentonite	(112.0 - 185.0') 288.9 gallons	(112.0 - 185.0') 360 gallons (25%) Note: Enviroplug
127							
128							
129							
130							
131							
132							
133							
134							
135							
136		Topock - Alluvium Deposits	SM				
137							
138							
139							
140							

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
141					(0.6 - 196.7') 2" PVC Sch 80 Casing		
142							
143							
144	MW-N-VAS-142.0-147.0 (<0.033 U) 2/16/2019 10:57	Topock - Alluvium Deposits	SM				
145							
146							
147							
148							
149							
150					(112.0 - 185.0') High Solids Bentonite		
151							
152							
153		Topock - Alluvium Deposits	GM				
154							
155							
156							
157							
158							
159							
160		Topock - Alluvium	GW				
					(5.0 - 241.0') 10" Borehole	(112.0 - 185.0') 288.9 gallons	(112.0 - 185.0') 360 gallons (25%) Note: Enviroplug

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
		Deposits			(0.6 - 196.7') 2" PVC Sch 80 Casing		
161							
162							
163							
164		Topock - Alluvium Deposits	GM				
165							
166							
167							
168		Topock - Alluvium Deposits	SW				
169							
170					(112.0 - 185.0') High Solids Bentonite		
171		Topock - Alluvium Deposits	GM				
172							
173							
174		Topock - Alluvium Deposits	SW				
175	MW-N-VAS-173.0-178.0 (<0.033 U) 2/18/2019 09:20						
176							
177		Topock - Alluvium Deposits	GC				
178							
179							
180							

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
181		Topock - Alluvium Deposits	GC		(0.6 - 196.7') 2" PVC Sch 80 Casing		
182		Topock - Alluvium Deposits	GW		(112.0 - 185.0') High Solids Bentonite	(112.0 - 185.0') 288.9 gallons	(112.0 - 185.0') 360 gallons (25%) Note: Enviroplug
183							
184		Topock - Alluvium Deposits	GC				
185							
186							
187		Topock - Alluvium Deposits	SC		(185.0 - 194.5') Bentonite seal pellets	(185.0 - 194.5') 8 bags	(185.0 - 194.5') 7.7 bags (-4%) Note: Pel-Plug (TR30) 3/8", added more bentonite pellets to avoid open borehole when removing 10 inch casing
188							
189		Topock - Alluvium Deposits	SC		(5.0 - 241.0') 10" Borehole		
190							
191		Topock - Alluvium Deposits	SC				
192							
193							
194		Topock - Alluvium Deposits	GW		(192.0 - 221.0') Cemex #3 MESH (8x10)		
195							
196							
197		Topock - Alluvium Deposits	GC		(196.7 - 216.7') 2" Sch 80 PVC (20-slot) Screen	(194.5 - 221.0') 27 bags	(194.5 - 221.0') 31 bags (15%) Note: Lapis Lustre Sand
198							
199							
200							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
201					(196.7 - 216.7') 2" Sch 80 PVC (20-slot) Screen		
202							
203							
204							
205							
206							
207							
208							
209		Topock - Alluvium Deposits	GC				
210					(192.0 - 221.0') Cemex #3 MESH (8x10)	(5.0 - 241.0') 10" Borehole	(194.5 - 221.0') 27 bags
211							(194.5 - 221.0') 31 bags (15%) Note: Lapis Lustre Sand
212	MW-N-VAS-210.0-215.0 (290) 2/21/2019 09:21						
213							
214							
215							
216							
217							
218		Topock - Weathered Bedrock - conglomerate	GC				
219					(216.7 - 219.0') Sump and End Cap		
220							

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
221					(192.0 - 221.0') Cemex #3 MESH (8x10)	(194.5 - 221.0') 27 bags	(194.5 - 221.0') 31 bags (15%) Note: Lapis Lustre Sand
222							
223					(221.0 - 225.0') Bentonite seal pellets	(221.0 - 225.0') 3.5 bags	(221.0 - 225.0') 3.5 bags (0%) Note: Pel-Plug (TR30) 3/8"
224							
225		Topock - Weathered Bedrock - conglomerate	GC				
226							
227							
228					(226.7 - 236.7') 2" Sch 80 PVC (20-slot) Screen		
229							
230	MW-N-VAS-228.0-233.0 (<0.17 U ppb) 2/26/2019 16:30	Topock - Weathered Bedrock - conglomerate	SW		(5.0 - 241.0') 10" Borehole		
231							
232					(225.0 - 241.0') Cemex #3 MESH (8x10)	(225.0 - 241.0') 17.8 bags	(225.0 - 241.0') 22 bags (24%) Note: Lapis Lustre Sand
233							
234							
235		Topock - Weathered Bedrock - conglomerate	GC				
236							
237							
238							
239					(236.7 - 239.0') Sump and End Cap		
240							




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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Well ID: MW-N-217, MW-N-237
Date Completed:	03/03/2019	Shallow Well Elevation:	569.4 ft amsl	
Drilling Co.:	Cascade	Deep Well Elevation:	569.5 ft amsl	Client: PG&E
Drilling Method:	Sonic Drilling	Northing (NAD83):	2102325.9	Project: Final GW Remedy Phase I
Driller Name:	Dan O'Mara	Easting (NAD83):	7615441.5	Location: PG&E Topock, Needles, California
Drilling Asst:	E. Huellmantel / T. Wolfe	Borehole Diameter:	4-12 inches	
Logger:	P. Knightly/D. Maurer	Water Level Start:	114.51 ft bgs	Project Number: RC000753.0051
Editor:	Sean McGrane	Development End Date:	4/2/2019	
Total Depth:	247 ft bgs	Well Completion:	<input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
241		Topock - Weathered Bedrock - conglomerate	SC		(225.0 - 241.0') Cemex #3 MESH (8x10)	(225.0 - 241.0') 17.8 bags	(225.0 - 241.0') 22 bags (24%) Note: Lapis Lustre Sand
242							
243		Topock - Competent Bedrock - conglomerate	GM		(241.0 - 247.0') Bentonite seal chips	(241.0 - 247.0') 1.2 bags	(241.0 - 247.0') 1 bags (-17%) Note: Enviroplug Medium Chips, tagged bentonite at 240 drilled 10-inch casing to 241.
244							
245							
246							
247		Topock - Bedrock - metadiorite			End of Boring at 247.0' bgs.		
248							
249							
250							
251							
252							
253							
254							
255							
256							
257							
258							
259							
260							




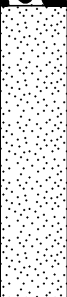
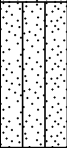

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured post development

Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: <u>MW-Nd</u>	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1	72			Topock - Fluvial Deposits	GW-GM		(0.0 - 7.5') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); yellowish brown / moderate yellowish brown(10YR 5/4) some light brown (7.5YR 6/4); granules to very large pebbles, subangular to subround; some fine to very coarse grained sand, angular to subangular; little silt; trace cobbles, subangular to subround; some coarser clasts composed of metadiorite; dry	(0.0') Paul Knightly geologist on-site 0 to 107 ft bgs	
2									
3									
4									
5									
6									
7									
8	54			Topock - Fluvial Deposits	GM		(7.5 - 17.0') Topock - Fluvial Deposits; Silty gravel with sand (GM); dark grayish brown (2.5Y 4/2); granules to very large pebbles, angular to subround; some silt; little fine to very coarse grained sand; trace cobbles, angular to subround; some coarser clasts composed of metadiorite; dry		
9									
10									
11									
12									
13									
14									
15	90			Topock - Fluvial Deposits	GW-GM		(17.0 - 22.8') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); dark grayish brown / dark yellowish brown(10YR 4/2); granules to very coarse grained, subangular to subround; some fine to very coarse grained sand, subangular to subround; little silt; trace cobbles, subangular to subround; some coarser clasts composed of metadiorite; dry		
16									
17									
18									
19									
20									





















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Date Started: <u>01/07/2019</u>	Surface Elevation: <u>569.7 ft amsl</u>	Boring No.: <u>MW-Nd</u>
Date Completed: <u>03/03/2019</u>	Northing (NAD83): <u>2102325.9</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615441.5</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>247 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>114.51 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / T. Wolfe</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>P. Knightly/D. Maurer</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21	90			Topock - Fluvial Deposits	GW-GM				
22									
23				Topock - Fluvial Deposits	SP		(22.8 - 27.0') Topock - Fluvial Deposits; Poorly graded sand with gravel (SP); reddish yellow (7.5YR 6/6); fine grained to medium grained; little granules to very large pebbles, angular to subangular; little coarser clasts composed of metadiorite; dry		
24									
25	87.6						(25.6') and granules to large pebbles, angular to subround; little coarser clasts composed of metadiorite; dry; decrease in sand		
26							(26.2'); little granules to very large pebbles, angular to subangular; increase in sand		
27									
28							(27.0 - 30.7') (NR); No recovery		
29									
30									
31									
32				Topock - Fluvial Deposits	GW		(30.7 - 33.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); dark grayish brown / dark yellowish brown (10YR 4/2); granules to very large pebbles; little fine to very coarse grained sand, angular to subangular; trace cobbles; trace silt; little coarser clasts composed of metadiorite; dry		
33	96								
34				Topock - Fluvial Deposits	SP		(33.0 - 37.0') Topock - Fluvial Deposits; Poorly graded sand with gravel (SP); reddish yellow (7.5YR 6/6); fine grained to medium grained; little granules to very large pebbles, angular to subangular; little coarser clasts composed of metadiorite; dry		
35									
36							(36') brown (7.5YR 4/2); trace silt; trace clay; decrease in sand		
37									
38				Topock - Fluvial Deposits	SM		(37.0 - 39.0') Topock - Fluvial Deposits; Well graded gravel (SM); light brownish gray / pale yellowish brown (10YR 6/2); fine grained to very coarse grained, angular to subangular; little granules to large pebbles, subangular to subround; little silt; trace clay; some coarser clasts composed of metadiorite; moist; weak cementation; moisture from drilling fluid	(37.0 - 47.0') Rough drilling, formation collapse, drilling water was used could not determine quantity	(37.0') gal of water used
39									
40				Topock - Fluvial Deposits	GW		(39.0 - 41.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); grayish brown (2.5Y 5/2); granules to very large pebbles, angular to subround; little fine to very coarse grained sand, angular to		



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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: MW-Nd	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	96			Topock - Fluvial Deposits	GW		subangular; trace cobbles, angular to subround; trace silt; and coarser clasts composed of metadiorite; dry	(37.0 - 47.0') Rough drilling, fromation collapse, drilling water was used could not determine quantity	
42				Topock - Fluvial Deposits	GW		(41.0 - 47.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); dark gray (2.5Y 4/1); granules to very large pebbles, angular to subround; little fine to very coarse grained sand, angular to subround; trace cobbles, angular to subround; trace silt; trace clay		
43				Topock - Fluvial Deposits	GW				
44				Topock - Fluvial Deposits	GW				
45	120			Topock - Fluvial Deposits	GW		(47.0 - 52.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); dark grayish brown / dark yellowish brown(10YR 4/2); granules to very large pebbles, subangular to round; little very fine to coarse grained sand, subangular to subround; trace cobbles, subangular to round; trace silt; moist; moisture from drilling fluid	(47.0 - 67.0') Drilling water was used could not determine quantity	
46				Topock - Fluvial Deposits	GW				
47				Topock - Fluvial Deposits	GW				
48				Topock - Fluvial Deposits	GW				
49				Topock - Fluvial Deposits	GW				
50				Topock - Fluvial Deposits	GW				
51				Topock - Fluvial Deposits	GW				
52				Topock - Fluvial Deposits	GW				
53	120			Topock - Fluvial Deposits	SW		(52.0 - 60.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (7.5YR 5/3); fine grained to coarse grained, subangular to subround; little granules to large pebbles, subangular to round; little silt; little coarser clast composed of conglomerate; trace coarser clast composed of basalt; dry		
54				Topock - Fluvial Deposits	SW				
55				Topock - Fluvial Deposits	SW				
56				Topock - Fluvial Deposits	SW				
57				Topock - Fluvial Deposits	SW				
58				Topock - Fluvial Deposits	SW				
59				Topock - Fluvial Deposits	SW				
60				Topock - Fluvial Deposits	SW				

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Date Started: 01/07/2019	Surface Elevation: 569.7 ft amsl	Boring No.: MW-Nd
Date Completed: 03/03/2019	Northing (NAD83): 2102325.9	
Drilling Co.: Cascade	Easting (NAD83): 7615441.5	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 247 ft bgs	Project: Final Groundwater Remedy Phase
Drill Rig Type: Terrasonic track mount	Borehole Diameter: 4-12 inches	Location: 1
Driller Name: Dan O'Mara	Depth to First Water: 114.51 ft bgs	PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / T. Wolfe	Sampling Method: 4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger: P. Knightly/D. Maurer	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	120			Topock - Fluvial Deposits	GW		(60.0 - 67.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); brown (7.5YR 5/3); granules to very large pebbles, angular to round; some fine to medium grained sand; trace cobbles, angular to round; trace silt; and coarser clast composed of conglomerate; dry	(47.0 - 67.0') Drilling water was used could not determine quantity	
62									
63									
64									
65									
66	120			Topock - Fluvial Deposits	SP		(67.0 - 80.3') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (10YR 5/3); very fine grained to medium grained; little granules to very large pebbles, subangular to round; trace cobbles, subangular to subround; trace silt; trace clay; trace coarser clast composed of conglomerate; dry to moist; moisture due to drilling fluid, conglomerate cobbles weakly cemented	(67.0 - 77.0') Slow drilling, core sample very hot	
67									
68									
69									
70									
71									
72									
73									
74									
75									
76	120								
77									
78									
79									
80									





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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: MW-Nd	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120			Topock - Fluvial Deposits	SP		(80.3 - 92.2') Topock - Fluvial Deposits; Well graded gravel with sand (GW); brown (7.5YR 5/3); granules to very large pebbles, subangular to round; little fine to medium grained sand; trace cobbles, subangular to round; trace silt; dry		
82					GW				
83									
84									
85									
86									
87	120			Topock - Fluvial Deposits	GW		(92.2 - 96.5') Topock - Fluvial Deposits; Well graded sand with gravel (SW); brown (10YR 5/3); fine grained to coarse grained, angular to subround; some granules to very large pebbles, subangular to round; trace coarser clast composed of conglomerate; dry		
88									
89									
90									
91									
92	120			Topock - Fluvial Deposits	SW		(96.5 - 97.0') Topock - Fluvial Deposits; Poorly graded gravel with sand (GP); reddish brown (2.5YR 4/4) little brown (10YR 5/3); small cobbles, subangular to round; little fine to coarse grained sand, angular to subround; dry; cobbles of conglomerate sandstone		
93									
94									
95									
96									
97	120			Topock - Fluvial Deposits	GP		(97.0 - 105.0') Topock - Fluvial Deposits; Well graded gravel with sand (GW); brown (10YR 5/3); granules to very large pebbles, subround to round; little fine to coarse grained sand, subangular to subround; trace cobbles, angular to round; trace silt; dry		
98									
99									
100									

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Date Started: <u>01/07/2019</u>	Surface Elevation: <u>569.7 ft amsl</u>	Boring No.: <u>MW-Nd</u>
Date Completed: <u>03/03/2019</u>	Northing (NAD83): <u>2102325.9</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615441.5</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>247 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>114.51 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / T. Wolfe</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>P. Knightly/D. Maurer</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101	120			Topock - Fluvial Deposits	GW				
102									
103									
104									
105									
106	120			Topock - Fluvial Deposits	GW-GM		(105.0 - 120.0') Topock - Fluvial Deposits; Well graded gravel with silt and sand (GW-GM); dark grayish brown (2.5Y 4/2); small pebbles to very large pebbles, angular to round; little fine to medium grained sand; little silt; dry		
107							(107.0 - 117.0') reddish brown(2.5YR 5/3); granules to very large pebbles, subround to round; moist	(107.0') Derrick Maurer geologist on-site 107 to 247 ft bgs	
108									
109									
110							(110.0 - 117.0'); trace cobbles; increase in gravel, decrease in sand		
111	120			Topock - Fluvial Deposits	GW-GM			(112.0 - 117.0') Rough drilling, drill rod broke and was retrieved	
112									
113									
114									
115									
116	120			Topock - Fluvial Deposits	GW-GM			(117.0') Approximate depth to water table	(117.0') 150 gal of water used
117							(117.0 - 120.0') reddish brown (2.5YR 4/4); wet		
118									
119									
120									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during second VAS interval




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Date Started: 01/07/2019	Surface Elevation: 569.7 ft amsl	Boring No.: MW-Nd
Date Completed: 03/03/2019	Northing (NAD83): 2102325.9	
Drilling Co.: Cascade	Easting (NAD83): 7615441.5	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 247 ft bgs	Project: Final Groundwater Remedy Phase
Drill Rig Type: Terrasonic track mount	Borehole Diameter: 4-12 inches	Location: 1
Driller Name: Dan O'Mara	Depth to First Water: 114.51 ft bgs	PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / T. Wolfe	Sampling Method: 4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger: P. Knightly/D. Maurer	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121	120			Topock - Alluvium Deposits	GM		(120.0 - 127.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown (2.5YR 4/4); granules to very large pebbles, subangular to subround; little very fine to medium grained sand; little silt; wet		
122									
123									
124									
125	36		MW-N-VAS-121.0-126.0 (0.51) 2/16/2019 14:09	Topock - Alluvium Deposits	GM				
126									
127									
128									
129	84			Topock - Alluvium Deposits	GW-GM		(127.0 - 137.0') Topock - Alluvium Deposits; Well graded gravel with silt and sand (GW-GM); reddish brown (2.5YR 4/4); granules to medium pebbles, subangular to subround; some fine to medium grained sand; little silt; wet		
130							(130.0 - 132.0') reddish brown(2.5YR 4/3)		
131									
132							(132.0 - 137.0') granules to very large pebbles		
133	120			Topock - Alluvium Deposits	SM				
134									
135									
136									
137				Topock - Alluvium Deposits	SM		(137.0 - 147.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 4/3); fine grained to medium grained; little silt; trace granules to very large pebbles, subangular to subround; trace clay; wet		
138									
139									
140									






Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during second VAS interval

Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: <u>MW-Nd</u>	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141	120			Topock - Alluvium Deposits	SM				
142									
143									
144									
145									
146	240			Topock - Alluvium Deposits	GM		(147.0 - 159.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3); granules to very large pebbles, subangular to subround; some fine to medium grained sand; little silt; little clay; wet	(147.0') 6-inch casing broke downhole and was retrieved	
147									
148									
149									
150									
151									
152									
153									
154									
155									
156									
157									
158									
159									
160				Topock - Alluvium	GW		(159.5 - 160.0') Topock - Alluvium Deposits; Well graded gravel with		








Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during second VAS interval

Date Started: <u>01/07/2019</u>	Surface Elevation: <u>569.7 ft amsl</u>	Boring No.: <u>MW-Nd</u>
Date Completed: <u>03/03/2019</u>	Northing (NAD83): <u>2102325.9</u>	
Drilling Co.: <u>Cascade</u>	Easting (NAD83): <u>7615441.5</u>	Client: <u>PG&E</u>
Drilling Method: <u>Sonic Drilling</u>	Total Depth: <u>247 ft bgs</u>	Project: <u>Final Groundwater Remedy Phase</u>
Drill Rig Type: <u>Terrasonic track mount</u>	Borehole Diameter: <u>4-12 inches</u>	Location: <u>1</u>
Driller Name: <u>Dan O'Mara</u>	Depth to First Water: <u>114.51 ft bgs</u>	<u>PG&E Topock, Needles, California</u>
Drilling Asst: <u>E. Huellmantel / T. Wolfe</u>	Sampling Method: <u>4 inch x 10 ft Core Barrel</u>	Project Number: <u>RC000753.0051</u>
Logger: <u>P. Knightly/D. Maurer</u>	Sampling Interval: <u>Continuous</u>	
Editor: <u>Sean McGrane</u>	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
161	240			Deposits	GM		sand (GW); brown (7.5YR 4/3); granules to very large pebbles, subangular to subround; and fine to medium grained sand; trace silt; wet		
162							(160.0 - 167.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3); granules to very large pebbles, subangular to subround; some fine to medium grained sand; little silt; wet		
163									
164									
165									
166	96			Topock - Alluvium Deposits	SW		(167.5 - 170.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 4/3); fine grained to coarse grained, subangular to subround; some granules to very large pebbles, subangular to subround; trace silt; wet	(167.0 - 175.0') Rough drilling	
167									
168									
169									
170									
171	144			Topock - Alluvium Deposits	GM		(170.0 - 173.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3); granules to very large pebbles, subangular to subround; some fine to medium grained sand; little silt; wet	(173.0 - 178.0') Sample collected with bailer	
172									
173									
174									
175									
176			MW-N-VAS-173.0-178.0 (<0.033 U) 2/18/2019 09:20	Topock - Alluvium Deposits	SW		(173.5 - 175.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (7.5YR 4/4); fine grained to coarse grained, subangular to subround; some granules to very large pebbles, subangular to subround; trace silt; wet		
177									
178									
179									
180				Topock - Alluvium Deposits	GC		(175.0 - 181.5') Topock - Alluvium Deposits; Clayey gravel with sand (GC); brown (10YR 5/3); granules to very large pebbles, subangular to subround; little fine to medium grained sand; little clay; trace silt; moist to wet		(177.0') 250 gal of water used

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during second VAS interval

Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: <u>MW-Nd</u>	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
181	144			Topock - Alluvium Deposits	GC				
182				Topock - Alluvium Deposits	GW		(181.5 - 183.5') Topock - Alluvium Deposits; Well graded gravel with sand (GW); light gray (10YR 7/2); granules to very large pebbles, angular to subround; little fine to medium grained sand; trace silt; dry to moist		
183									
184				Topock - Alluvium Deposits	GC		(183.5 - 187.0') Topock - Alluvium Deposits; Clayey gravel with sand (GC); brown (10YR 5/3); granules to very large pebbles, subangular to subround; little fine to medium grained sand; little clay; trace silt; moist		
185									
186									
187	120			Topock - Alluvium Deposits	SC		(187.0 - 190.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown / moderate brown (5YR 4/4); fine grained to medium grained; little granules to large pebbles, angular to subangular; little clay; trace silt; moist		
188									
189				Topock - Alluvium Deposits	SC		(190.0 - 193.5') Topock - Alluvium Deposits; Clayey sand (SC); brown (7.5YR 4/3); fine grained to medium grained; dry; weak cementation; increase in sand, decrease in gravel		
190									
191									
192				Topock - Alluvium Deposits	GW		(193.5 - 197.0') Topock - Alluvium Deposits; Well graded gravel (GW); (7.5R 5/3); granules to very large pebbles, angular to subround; trace fine to medium grained sand; trace silt; dry		
193	228								
194									
195				Topock - Alluvium Deposits	GC		(197.0 - 217.0') Topock - Alluvium Deposits; Clayey gravel with sand (GC); brown (7.5YR 4/3); granules to very large pebbles, subangular to subround; little fine to medium grained sand; little clay; trace silt; moist to wet		
196									
197									
198									
199									
200									

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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: MW-Nd	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
201									
202									
203									
204									
205									
206									
207									
208									
209	228			Topock - Alluvium Deposits	GC				(207.0') 70 gal of water used
210									
211									
212			MW-N-VAS-210.0-215.0 (290)						
213			2/21/2019 09:21						
214									
215									
216									
217								(216.0 - 217.0') Lost soil core down hole, tripped back in to retrieve	
218							(217.0 - 230.5') Topock - Weathered Bedrock - conglomerate; Clayey gravel with sand (GC); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, subangular to subround; some clay; little fine to medium grained sand; trace silt; moist to wet		(217.0 - 217.0') 120 gal of water used
219	240			Topock - Weathered Bedrock - conglomerate	GC				
220									




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Date Started:	01/07/2019	Surface Elevation:	569.7 ft amsl	Boring No.: MW-Nd	
Date Completed:	03/03/2019	Northing (NAD83):	2102325.9		
Drilling Co.:	Cascade	Easting (NAD83):	7615441.5	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	247 ft bgs	Project:	Final Groundwater Remedy Phase
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	4-12 inches	Location:	1
Driller Name:	Dan O'Mara	Depth to First Water:	114.51 ft bgs	PG&E Topock, Needles, California	
Drilling Asst:	E. Huellmantel / T. Wolfe	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	P. Knightly/D. Maurer	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
221									
222									
223									
224									
225				Topock - Weathered Bedrock - conglomerate	GC				
226									
227									
228									
229	240								
230			MW-N-VAS-228.0-233.0 (<0.17 U ppb) 2/26/2019 16:30						
231				Topock - Weathered Bedrock - conglomerate	SW		(230.5 - 231.0') Topock - Weathered Bedrock - conglomerate; Well graded sand with gravel (SW); reddish brown (5YR 4/3); medium grained to very coarse grained, subangular to subround; some granules to medium pebbles, subangular to subround; trace silt; trace coarser clasts composed of metadiorite; wet		
232							(231.0 - 240.0') Topock - Weathered Bedrock - conglomerate; Clayey gravel with sand (GC); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, subangular to subround; some clay; little fine to medium grained sand; trace silt; moist to wet		
233									
234									
235				Topock - Weathered Bedrock - conglomerate	GC				
236									
237									
238	120								
239									
240									

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Date Started: 01/07/2019	Surface Elevation: 569.7 ft amsl	Boring No.: MW-Nd
Date Completed: 03/03/2019	Northing (NAD83): 2102325.9	
Drilling Co.: Cascade	Easting (NAD83): 7615441.5	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 247 ft bgs	Project: Final Groundwater Remedy Phase
Drill Rig Type: Terrasonic track mount	Borehole Diameter: 4-12 inches	Location: 1
Driller Name: Dan O'Mara	Depth to First Water: 114.51 ft bgs	PG&E Topock, Needles, California
Drilling Asst: E. Huellmantel / T. Wolfe	Sampling Method: 4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger: P. Knightly/D. Maurer	Sampling Interval: Continuous	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
241	120			Topock - Weathered Bedrock - conglomerate	SC		(240.0 - 242.5') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); reddish brown (5YR 4/3); fine grained to medium grained; some clay; little granules to medium pebbles, subangular to subround; trace silt; moist to wet		
242									
243				Topock - Competent Bedrock - conglomerate	GM		(242.5 - 246.5') Topock - Competent Bedrock - conglomerate; Silty gravel with sand (GM); reddish brown (5YR 4/3); granules to very large pebbles, subangular to subround; little fine to medium grained sand; little silt; trace clay; dry		
244									
245									
246				Topock - Bedrock - metadiorite			(246.5 - 247.0') Topock - Bedrock - metadiorite; (10YR 2.5/1)	(246.5 - 247.0') Drill bit broke/melted and had a 0.5 of bedrock in the core	
247							End of Boring at 247.0' bgs.		
248									
249									
250									
251									
252									
253									
254									
255									
256									
257									
258									
259									
260									

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SOIL BORING LOG PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK DRAFT BORING LOGS\GINT FILES\07.01.19\TOPOCK DATABASE FOR FLOG.GPJ TOPOCK DATA TEMPLATE FOR FLOG.GDT 07/01/19 17:18

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: MW-Ns	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1	72						(0.0 - 106.0') (NR); No recovery cores not collected, see Boring Log MW-Nd for lithology		
2									
3									
4									
5									
6									
7	120						NR		
8									
9									
10									
11									
12									
13	120						NR		
14									
15									
16									
17									
18									
19									
20									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: MW-Ns	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21									
22									
23	120								
24									
25									
26									
27									
28									
29									
30									
31	120								
32									
33									
34									
35									
36									
37									
38	120								
39									
40									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

Boring Log

Sheet: 3 of 7

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: MW-Ns	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051	
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	120							(40.0 - 42.0') Rough drilling	
42									
43									
44									
45									
46	120							(46.0 - 56.0') Rough drilling	
47									
48									
49									
50									
51	120								
52									
53									
54									
55									
56	120								
57									
58									
59									
60									

NR

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

Boring Log

Sheet: 4 of 7

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: MW-Ns
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2	
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project: Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs	
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number: RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval	
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	120								
62									
63									
64									
65	(66.0 - 76.0') Rough drilling								
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77	120								
78									
79									
80									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

SOIL BORING LOG PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRAFT BORING LOGS\GINT FILES\07.02.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 07/02/19 16:40

Boring Log

Sheet: 5 of 7





Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: <u>MW-Ns</u>	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120								
82									
83									
84									
85									
86									
87								(86.0 - 92.0') Drill rods chattering	
88									
89									
90									
91	120								
92									
93									
94									
95									
96	120								
97									
98									
99									
100									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole





SOIL BORING LOG PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRAFT BORING LOGS\GINT FILES\07.02.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 07/02/19 16:40

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: <u>MW-Ns</u>	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101	120				NR				
102									
103									
104									
105	60				GP				
106									
107									
108									
109	144			Topock - Fluvial Deposits	GP		(106.0 - 111.0') Topock - Fluvial Deposits; Poorly graded gravel (GP); grayish brown (2.5Y 5/2); boulders, angular; some very fine to fine grained sand, angular; little clay; dry; homogeneous; possibly composed of basalt, pulverized into powder and very very fine to coarse grained sand	(106.0 - 111.0') Rough drilling, core very hot	
110									
111									
112									
113				Topock - Fluvial Deposits	SM		(111.0 - 114.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); pale yellow (2.5Y 7/3) trace (5R 7/1); very fine grained to very coarse grained, subangular to round; some silt; little granules to very large pebbles, subangular to round; trace cobbles, subround to round; trace clay; dry; gravel composed of mixed lithology		
114							(113.0 - 114.0') dark brown (10YR 3/3); moist		
115				Topock - Fluvial Deposits	GP		(114.0 - 114.5') Topock - Fluvial Deposits; Poorly graded gravel (GP); dark red (10R 3/6); boulders; composed of rhyolite		
116							(114.5 - 117.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); dark brown (10YR 3/3) little light brown (7.5YR 6/4); very fine grained to very coarse grained, subangular to round; some silt; little granules to very large pebbles, subangular to round; trace cobbles, subround to round; trace clay; moist; weak cementation; gravel composed of mixed lithology		
117									
118									
119									
120				Topock - Alluvium Deposits	SM		(117.0 - 123.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 5/3) little reddish yellow (7.5YR 6/6); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subround; some silt; little clay; moist; weak cementation		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

Date Started:	03/06/2019	Surface Elevation:	570.1 ft amsl	Boring No.: <u>MW-Ns</u>	
Date Completed:	03/26/2019	Northing (NAD83):	2102321.2		
Drilling Co.:	Cascade	Easting (NAD83):	7615448.1	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	133 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	115.88 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	D. Maurer/G. Willford	Sampling Interval:	Screen Interval		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121	144			Topock - Alluvium Deposits	SM				
122									
123									
124	120		MW-N-VAS-121.0-126.0 (0.51) 2/16/2019 14:09	Topock - Alluvium Deposits	ML		(123.0 - 128.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 5/4); low plasticity; some very fine to very coarse grained sand, angular to subround; little granules to medium pebbles, subangular to subround; little clay; moist; weak cementation		
125									
126									
127									
128			Topock - Alluvium Deposits	SM		(128.0 - 130.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); grayish brown (10YR 5/2); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subround; little clay; trace cobbles, subangular; dry			
129									
130							Topock - Fluvial Deposits		
131									
132									
133	End of Boring at 133.0' bgs.								
134									
135									
136									
137									
138									
139									
140									

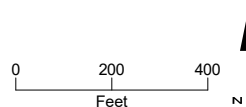
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = No Recovery, blue water table symbol represents depth to water measured during MW-Nd second VAS interval Note: water samples were collected from MW-Nd borehole

Attachment C
Soil Sampling Locations and Available Soil
Analytical Results
(Soil Data Presented in Excel File)



LEGEND

- Soil Sample Location



Baseline and Opportunistic Soil Sampling Locations

June 2019 Monthly Progress Report
Groundwater Remedy Phase 1 Construction
PG&E Topock Compressor Station, Needles, California

JACOBS

Attachment D
Perimeter Air Sampling Analytical Results

Attachment D. Perimeter Air Sampling Analytical Results

In conformance with the approved *Construction/Remedial Action Work Plan for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California* (CH2M, 2015), air monitoring has been conducted during construction to evaluate the ongoing effectiveness of the dust control program, to guide modifications to field activities and engineering control measures, if necessary, and to document that construction activities do not result in the migration of soil contaminants beyond the work area boundaries.

Perimeter air monitoring has been performed if construction activities have the potential to generate visible dust. The air monitoring program consists of both real-time fugitive dust monitoring and perimeter air sampling for select soil contaminants. Locations to be monitored and sampled are as follows:

- Real-time fugitive dust monitoring is performed at the perimeter of the work areas (outside of the exclusion zone) that have the potential to generate visible dust, including the Construction Headquarters (CHQ) and the Soil Processing Yard (SPY).
- Perimeter air sampling for hexavalent chromium is performed at the perimeter of the work areas (outside of the exclusion zone) that are inside Areas of Concern (AOCs) within the construction footprint where hexavalent chromium concentrations in soil have been historically reported. Air sampling for hexavalent chromium in the SPY will be performed when soil from AOCs with reported concentrations of hexavalent chromium is actively being processed. Air sampling may also be performed at other work areas at the site based on hexavalent chromium concentrations reported from new soil data or based on field observations during construction activities.
- Air sampling for asbestos will be limited to work areas where Asbestos Containing Material (ACM) has been observed in prior field investigations, including two areas in AOC 12 and one area in AOC 4. Perimeter air monitoring may also be performed at other work areas at the site if ACM is discovered during construction activities.

Project-specific levels of concern (LOC) and action levels were developed as an indicator to determine whether additional dust control measures, as presented in the project's Dust Control Plan required by the Mojave Desert Air Quality Management District (MDAQMD), are necessary.

- The LOCs, which represent conservative concentrations of compounds that receptors outside the work area could be safely exposed to during construction, have been evaluated for all compounds that have been detected in soil samples collected at the site in the prior investigations. The LOCs were developed using standard U.S. Environmental Protection Agency (USEPA) and California Environmental Protection Agency risk assessment methodology, toxicology data, and exposure assumptions (USEPA, 2009, 2017; California Department of Toxic Substances Control [DTSC], 2018). Both cancer and noncancer health effects were considered. For each type of health effect, the LOC was back-calculated from an established target or from acceptable cancer risk or noncancer hazard where USEPA or DTSC toxicity values are available. The LOCs for cancer effects are based on a target excess cancer risk of one in a million (1×10^{-6}). The LOCs for noncancer effects are based on a target hazard quotient of 1. The LOCs were developed using these assumptions:
 - Receptors are present outside the perimeter of the work areas
 - Exposure via inhalation is 10 hours per day for a 10 days on /4 days off schedule
 - Duration of Phase 1 of the final groundwater remedy construction is 20 months
- The action level for fugitive dust monitoring is 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for a net (downwind minus upwind) dust concentration. This action level is based on MDAQMD Rule 403, Part C. A 10-hour time-weighted average of readings collected throughout the work day will be used to document compliance with MDAQMD Rule 403.
- For analytes detected in soil, the following equation was used to calculate maximum allowable airborne particulate concentrations for receptor exposure outside the work area (based on the approach presented by Marlowe (1999):

$$AL = \frac{LOC \times 1,000,000 \text{ mg/kg}}{CS}$$

Where:

AL = action level for airborne particulates ($\mu\text{g}/\text{m}^3$)

LOC = Project specific risk-based level of concern ($\mu\text{g}/\text{m}^3$)

CS = maximum detected concentration of compound in site soil (milligrams per kilogram [mg/kg])

Action levels were determined as follows:

- Soil data from prior investigations were gathered for the entire site.
- Sample locations within the maximum construction footprint were evaluated. Some sample locations were removed from evaluation as they were within the compressor station in locations where no construction activities will actually occur.
- The maximum reported soil concentration for each compound was determined and then used to calculate an airborne particulate action level.
- All compounds had allowable airborne particulate action levels greater than $100 \mu\text{g}/\text{m}^3$ except for hexavalent chromium at a few locations.
- Lead does not have USEPA or DTSC toxicity values; however, an action level was calculated using the DTSC (2011) LeadSpread 8 model. This is based on the maximum reported soil concentration for lead of 1,400 mg/kg from samples collected within the construction footprint and a blood level of concern through inhalation of 1 microgram per deciliter. The resulting action level for lead is $548 \mu\text{g}/\text{m}^3$.
- Therefore, keeping fugitive dust below the action level $100 \mu\text{g}/\text{m}^3$ will result in airborne particulate concentrations of contaminants (other than hexavalent chromium) remaining below their respective LOCs.
- Fugitive dust monitoring will be used to evaluate airborne contaminants in dust for all compounds except for hexavalent chromium.

In June 2019, 212 real time dust observation/monitoring events were conducted at the perimeter of the work areas (outside of the exclusion zone). There were several temporary exceedances of the action level for fugitive dust monitoring ($100 \mu\text{g}/\text{m}^3$), see details below:

- On June 17, 2019, there was one temporary exceedance due to construction vehicle movement in the floodplain. Contractor applied water to reduce fugitive dust.
- On June 27, 2019, there were two temporary exceedances due to construction vehicle movement on the aggregate base access road in the floodplain. Contractor slowed down but dust is still evident.
- On June 28, 2019, there were two temporary exceedances due to vehicle movement on the access dirt road to MW-X location. Contractor called for water to be applied to the portion of the access road next to the MW-X drilling location.

In addition, two perimeter air sampling events for hexavalent chromium were conducted from June 17 to 18 during installation of IRZ-23 at the MW-20 Bench. Air samples for hexavalent chromium were collected at one upwind and two downwind locations during each sampling event, and sent to Chester LabNet, a laboratory accredited by the National Environmental Laboratory Accreditation Program, for analysis. Table 1 presents the validated analytical results available to date. The results are below the LOC for hexavalent chromium which is $0.00094 \mu\text{g}/\text{m}^3$.

References Cited:

California Department of Toxic Substances Control (DTSC). 2011. LeadSpread 8.
<https://www.dtsc.ca.gov/AssessingRisk/LeadSpread8.cfm>.

California Department of Toxic Substances Control (DTSC). 2018. Human Health Risk Assessment Note 3 – DTSC-Modified Screening Levels (DTSC-SLs), California Department of Toxic Substances Control, Human and Ecological Risk Office (HERO). January.

CH2M HILL, Inc. (CH2M). 2015. *Construction/Remedial Action Work Plan for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California*. November 18.

Marlowe, C. 1999. *Safety Now! Controlling Chemical Exposures at Hazardous Waste Sites with Real-Time Measurements*. Fairfax, Va.: American Industrial Hygiene Association Press.

U.S. Environmental Protection Agency (USEPA). 2009. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)*. Final. OSWER 9285.7-82. January.

U.S. Environmental Protection Agency (USEPA). 2017. Regional Screening Levels (RSLs)—Generic Tables. November.

Table 1. Perimeter Air Sampling Results

June 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location ID	Location	Date	Sample Type	Hexavalent Chromium (ug/m ³)
AOC13-D1	AOC13 Downwind 1	10/09/18	N	0.000732 J
AOC13-D2	AOC13 Downwind 2	10/09/18	N	0.000709 J
AOC13-U	AOC13 Upwind	10/09/18	N	ND (0.000172)
AOC30-IRZ-23-D1	AOC30-IRZ-23 Downwind 1	2/20/2019	N	ND (0.0000859)
AOC30-IRZ-23-D2	AOC30-IRZ-23 Downwind 2	2/20/2019	N	ND (0.0000862)
AOC30-IRZ-23-U1	AOC30-IRZ-23 Upwind	2/20/2019	N	0.000104 J
AOC4-D1	AOC4 Downwind 1	5/14/2019	N	ND (0.000148)
AOC4-D2	AOC4 Downwind 2	5/14/2019	N	ND (0.000155)
AOC4-U	AOC4 Upwind	5/14/2019	N	ND (0.000148)
AOC11-D1	AOC11 Downwind 1	5/15/2019	N	ND (0.0000392)
AOC11-D2	AOC11 Downwind 2	5/15/2019	N	0.0001262 J
AOC11-U	AOC11 Upwind	5/15/2019	N	ND (0.0000386)
AOC4-D1	AOC4 Downwind 1	5/16/2019	N	0.0000423 J
AOC4-D2	AOC4 Downwind 2	5/16/2019	N	ND (0.0000385)
AOC4-U	AOC4 Upwind	5/16/2019	N	ND (0.0000378)
AOC30-D1	AOC30 Downwind 1	6/17/2019	N	ND (0.0000633)
AOC30-D2	AOC30 Downwind 2	6/17/2019	N	ND (0.0000636)
AOC30-U1	AOC30 Upwind	6/17/2019	N	ND (0.0000589)
AOC30-D1	AOC30 Downwind 1	6/18/2019	N	0.0000407 J
AOC30-D2	AOC30 Downwind 2	6/18/2019	N	ND (0.0000313)
AOC30-U1	AOC30 Upwind	6/18/2019	N	ND (0.000031)

Notes:

ug/m³ micrograms per cubic meter
J concentration or reporting limit estimated by laboratory or data validation
N primary sample
ND not detected at the listed reporting limit

Attachment E
Noise Monitoring Results
(SEIR NOISE-2 Requirement)

Attachment E. Noise Monitoring Results

In conformance with the SEIR Mitigation Measure NOISE-2, noise monitoring has been conducted with ANSI S1.4 Type 1, precision sound level meters when construction activities are within the specified distance (e.g., 1,850 feet from sensitive receptors in California) at approved monitoring locations previously determined in coordination with the Tribes and land owners/managers (refer to Figures 1, 2 and 3). The goal of the noise monitoring is to identify if noise levels from project construction activities exceed applicable standards of the San Bernardino and Mohave County codes. Exceedance of standards would require coordination with the Tribes and land owners/managers to evaluate the potential constraints and locations for temporary engineered acoustical barriers. Consistent with the request of the Tribes, monitoring equipment is not left at the approved monitoring locations, rather it is mounted on a tripod for attended representative measurements and removed when the monitoring event is complete.

When a new construction activity is conducted or a previously monitored construction activity is conducted closer to a noise-sensitive area, monitoring is conducted at more frequent intervals to evaluate the potential need for an acoustical barrier. As the activities continue in the same location and multiple attended measurements indicate that the applicable standard has not been exceeded by the construction activity, periodic attending monitoring events are conducted to confirm continued compliance.

The attended monitoring events document the A-weighted L_{eq} sound level at periodic intervals (e.g., 5, 10, 15, 20, 30, 40, 50 and 60 minutes). The trend of the data at these intervals is evaluated in the field to assess the stability in the sound level to determine the duration of the monitoring event. When this interval data is relatively stable or clearly below the standard, the attended monitoring event will typically be 15 to 30 minutes in duration. As the applicable standards are in terms of the 24-hour average L_{dn} which is based on the L_{eq} metric, the measured L_{eq} is compared to the applicable L_{dn} standard for mobile noise sources (i.e., 60 A-weighted decibels [dBA] for Park Moabi, 65 dBA at all other locations). This results in a reasonable and conservative assessment given construction activities are not emitting noise continuously over a 24-hour period, nor are they occurring during the nighttime hours (10 p.m. to 7 a.m.).

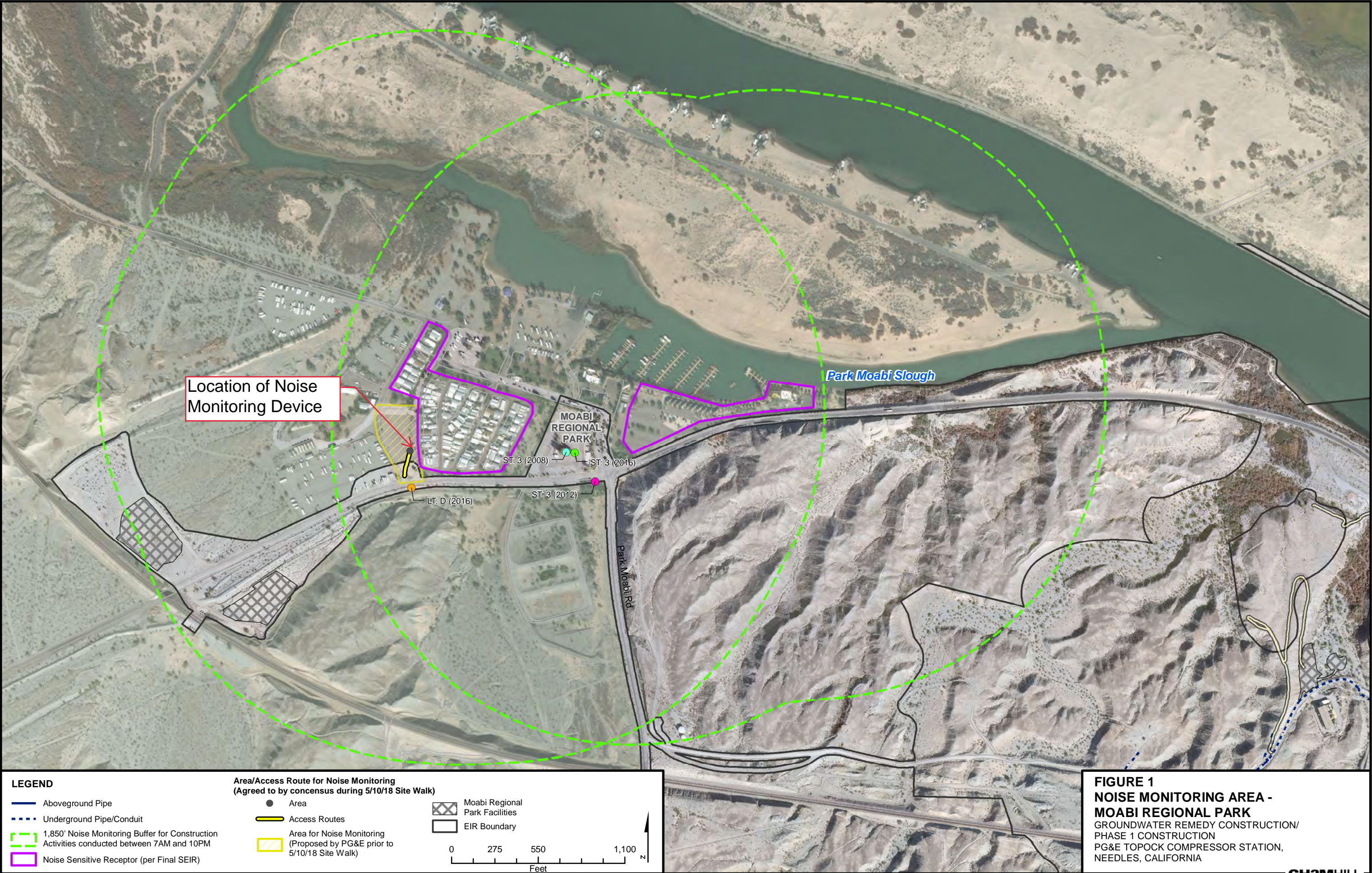
In June 2019, 32 monitoring events have been conducted at the Park Moabi monitoring location (Figure 1). Construction activities closest to this monitoring location include activities at the SPY and CHQ, as well as construction traffic on NTH. The sound level typically varied between 39 and 52 dBA, with an average and median of 47 dBA.

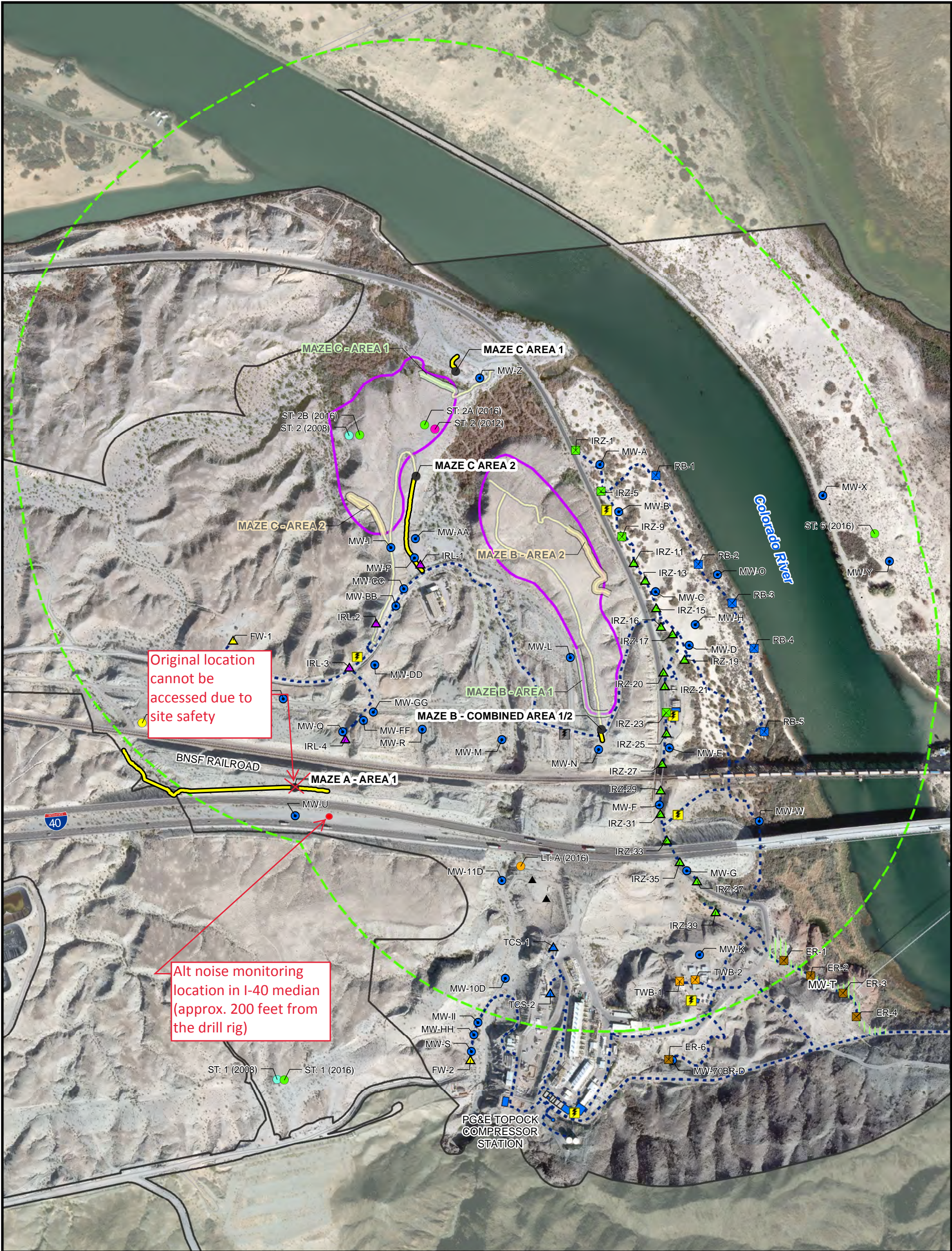
In June 2019, 31 monitoring events have been conducted at Maze B-Combined Area 1/2 (Figure 2). Construction activities closest to this monitoring location include activities at MW-R and MW-20 Bench, as well as construction traffic on the access road. The sound levels varied between 45 and 63 dBA, with an average and median of 54 dBA.

In June 2019, 32 monitoring events have been conducted at Maze C-Area 1 (Figure 2). Construction activities closest to this monitoring location include construction traffic on NTH, pipeline and access road construction activities in the northern end of the floodplain. The sound level typically varied between 44 and 60 dBA, with an average and median of 51-52 dBA.

In June 2019, 12 monitoring events have been conducted at the mobile home park in Topock Marina (Figure 4). Construction activities closest to this monitoring location include site preparation for drilling at MW-X and MW-Y', and associated drilling activities. The sound level typically varied between 50 and 67 dBA, with an average of 59 dBA and median of 61 dBA. Sound levels spiked when there are boat traffic, train traffic, and bird activities around the mobile homes.

Monitoring will continue as work progresses and moves into new areas to identify when an acoustical barrier needs to be considered.





LEGEND
Planned Wells:

- Extraction, East Ravine
- Extraction, NTH IRZ
- Extraction, Riverbank
- Extraction, Transwestern Bench
- Injection, Freshwater
- Injection, Inner Recirculation Loop
- Injection, NTH IRZ
- Injection, Topock Compressor Station
- Remedy Monitoring Well
- Recirculation Well
- Area for Monitoring Well MW-T

Pipeline Corridor for Remedy

- Underground Pipe/Conduit

Remedy Facilities

- Planned Transformer
- Future Provisional Transformer
- Proposed Remedy Structure
- Contingent Freshwater Pre-injection Treatment System
- 1,850' Noise Monitoring Buffer for Construction Activities conducted between 7AM and 10PM
- Noise Sensitive Receptor (per Final SEIR)
- EIR Boundary

Areas/Access Routes for Noise Monitoring (Agreed to by consensus during 5/10/18 Site Walk)

- Area
- Access Route

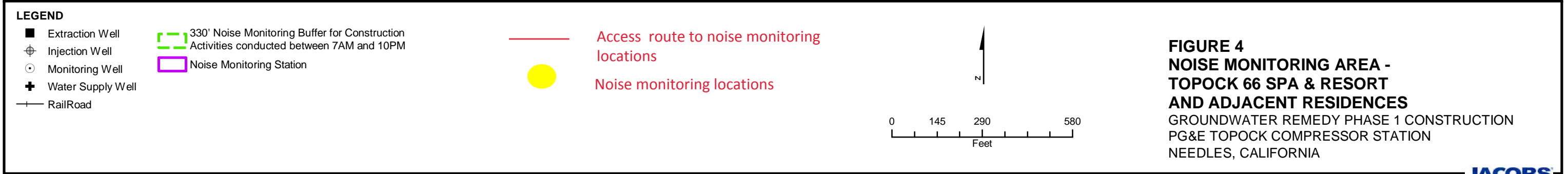
Areas for Noise Monitoring (Proposed by PG&E Prior to 5/10/18 Site Walk)

- Area 1
- Area 2
- Access Route

0 275 550 1,100
Feet

FIGURE 2
NOISE MONITORING AREAS-
NORTH OF I-40
GROUNDWATER REMEDY CONSTRUCTION/
PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL



Attachment F
Discharge Monitoring Record in
compliance with Monitoring and Reporting
Program for Order No. 2003-0003-DWQ
(Table 2)

Dishcharge Monitoring Record



PIVOT
Corporation

PGE Project / Property Name: Topock Final Remedy

Project Number: ARC-18-T46

Affected System: Pipeline C5 STA 17+80 to C3 14+85

Discharge Date	C6 Discharge Location - Approximate QTY (gal)	C5 Discharge Location - Approximate QTY (gal)	Discharge Monitor Initials*
5/17/2019	6,300	--	ST
5/20/2019	1,800	5400	ST
5/21/2019	2,700	--	ST
5/22/2019	3,100	3,000	ST
5/23/2019	--	4,500	ST
5/24/2019	--	4,500	ST
5/28/2019	--	300	ST
6/4/2019	--	300	DZ
6/5/2019	--	800	DZ

* By signing this record form, I acknowledge that all ground discharge has been observed and monitored for the following compliance requirements:

- a.No ponding of discharge water
- b.No attracting wildlife
- c.No channelizing of discharge water and runoff outside of work area
- d.No water discharged to washes or jurisdictional waters

Attachment G
Six-Week Look-Ahead Schedule
(July 7 through August 17, 2019)

PG&E Topock Final Groundwater Remedy	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Primary Planned Activities	7/7/2019	7/8/2019	7/9/2019	7/10/2019	7/11/2019	7/12/2019	7/13/2019
Start Time (PST)	6:30 AM		6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM
Pipeline C Installation E5, F5	No Work	No Work	Pull box installation C3/C4/C5	Pull box installation C3/C4/C5	Pull box installation C3/C4/C5	Pull box installation C3/C4/C5	Pull box installation C3/C4/C5
TCS Approach Pipeline Installation F5, G5, G6			--	--	Potholing of existing utilities along Pipeline F1	--	--
Well Installation			MW-C (E5), MW-X (E6), RB-2 pilot (E5), MW-D site setup (E5), RB-5 (E5)	MW-C (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-C (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-C (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-C (E5), MW-H site setup (E5), MW-X (E6), MW-D (E5), RB-5 (E5)
Well Development			--	--	IRZ-21 (E5)	IRZ-21 (E5)	MW-O (E5)
Well Testing			IRZ-20 (E5)	IRZ-20 (E5)	--	--	--
Primary Planned Activities	7/14/2019	7/15/2019	7/16/2019	7/17/2019	7/18/2019	7/19/2019	7/20/2019
Start Time (PST)	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	No Work
Pipeline C Installation E5, F5	--	Floodplain soil transfer & Stockpiling	Floodplain soil transfer & Stockpiling	Floodplain soil transfer & Stockpiling	Floodplain soil transfer & Stockpiling	Floodplain soil transfer & Stockpiling	
TCS Approach Pipeline Installation F5, G5, G6	--	Excavation and clearance of knoll along Pipeline B alignment	Excavation and clearance of knoll along Pipeline B alignment	Excavation and clearance of knoll along Pipeline B alignment	Excavation and clearance of knoll along Pipeline B alignment	Excavation and clearance of knoll along Pipeline B alignment	
Well Installation	MW-C (E5), MW-H site setup (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-C (E5), MW-H site setup (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-C (E5), MW-H site setup (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-5 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)	--	
Well Development	MW-O (E5)	MW-O (E5)	MW-O (E5)	MW-O (E5)	--	--	
Well Testing	--	--	--	--	IRZ-21 (E5)	--	
Primary Planned Activities	7/21/2019	7/22/2019	7/23/2019	7/24/2019	7/25/2019	7/26/2019	7/27/2019
Start Time (PST)			6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM
Pipeline C Installation E5, F5	No Work	No Work	Floodplain conduit testing, Tentative: Dewatering test excavation @ C8, Pipeline installation @ C6	Floodplain conduit testing, Tentative: Dewatering test excavation @ C8, Pipeline installation @ C6	Floodplain conduit testing, Tentative: Dewatering test excavation @ C8, Pipeline installation @ C6	Floodplain conduit testing, Tentative: Dewatering test excavation @ C8, Pipeline installation @ C6	Floodplain conduit testing, Tentative: Dewatering test excavation @ C8, Pipeline installation @ C6
Well Installation			MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-X (E6), MW-D (E5), RB-4 (E5)
Well Development			--	--	MW-C (E25)	MW-C (E25)	MW-C (E25)
Well Testing			IRZ-21 (E5)	IRZ-21 (E5)	--	--	--
Primary Planned Activities	7/28/2019	7/29/2019	7/30/2019	7/31/2019	8/1/2019	8/2/2019	8/3/2019
Start Time (PST)	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	No Work
Pipeline C Installation E5, F5	--	Floodplain conduit testing, Pipeline installation @ C6	Floodplain conduit testing, Pipeline installation @ C6	Floodplain conduit testing, Pipeline installation @ C6	Floodplain conduit testing, Pipeline installation @ C6	Floodplain conduit testing, Pipeline installation @ C6	
Well Installation	MW-H (E5), MW-Y' (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), MW-D (E5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), MW-D (E5), IRZ-19 site setup (F5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), MW-D (E5), IRZ-19 site setup (F5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), MW-D (E5), IRZ-19 site setup (F5), RB-4 (E5)	--	
Well Development	MW-C (E25)	MW-C (E25)	MW-C (E25)	--	--	--	
Well Testing	--	--	--	IRZ-25 (E5)	IRZ-25 (E5)	--	
Primary Planned Activities	8/4/2019	8/5/2019	8/6/2019	8/7/2019	8/8/2019	8/9/2019	8/10/2019
Start Time (PST)			6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM
Pipeline C Installation E5, F5	No Work	No Work	Pipeline installation @ C6	Pipeline installation @ C6	Pipeline installation @ C6	Pipeline installation @ C6	Pipeline installation @ C6
Well Installation			MW-H (E5), MW-Y' (E6), MW-D (E5), IRZ-19 site setup (F5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 site setup (F5), RB-4 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)
Well Development			--	--	--	--	--
Well Testing			--	--	--	--	--
Primary Planned Activities	8/11/2019	8/12/2019	8/13/2019	8/14/2019	8/15/2019	8/16/2019	8/17/2019
Start Time (PST)	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	6:30 AM	No Work
TCS Approach Pipeline Installation F5, G5, G6	--	Tentative: Pipeline installation @ B	Tentative: Pipeline installation @ B	Tentative: Pipeline installation @ B	Tentative: Pipeline installation @ B	Tentative: Pipeline installation @ B	
Well Installation	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)	MW-H (E5), MW-Y' (E6), IRZ-19 pilot boring (F5), RB-3 (E5)	MW-Y' (E6), RB-3 (E5), MW-S (G5)	MW-Y' (E6), RB-3 (E5), MW-S (G5)	--	
Well Development	--	--	--	--	--	--	
Well Testing	--	--	--	--	--	--	

Tasks shown tentative are pending contracting or ERTC and may be rescheduled, PG&E to notify of changes as soon as additional information is available.
The timing of field activities are estimated and may change day-to-day based on site conditions, field progress, or other factors.
When planning to visit the site to observe a specific activity or area, please contact Curt Russell (760-791-5884) for the latest schedule information.
"G5" - Intrusive work location as described on the project grid map. See Project Grid Map tab for location of grid positions provided on the lookahead

Attachment H
Available Groundwater Monitoring Data
(DTSC Condition of Approval xi)

Attachment H. Available Groundwater Monitoring Data

Pursuant to Condition of Approval # xi in DTSC's approval letter dated August 24, 2018 (DTSC, 2018a), PG&E is required to report data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection. In compliance with this requirement, PG&E initially submitted validated data to DTSC via monthly emails. For ease of recordkeeping and to minimize the number of ad-hoc compliance reports/emails, PG&E has since included validated data in each monthly progress report starting with the November 2018 report.



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GMP 2019-04 Sampling


Lab Method Description Units							ASSET Arsenic, Dissolved SW 6020 ug/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, Total Dissolved SW 6020 ug/L	ASSET Manganese, Dissolved SW 6020 ug/L	ASSET Molybdenum, Dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET Selenium, Dissolved SW 6020 ug/L	ASSET Specific Conductance EPA 120.1 uS/cm
Location ID	Sample ID	Sample Type	Sample Method	Date Sampled	Matrix	Status*								
MW-09	MW-09-Q219	N		05/17/19	GW	Preliminary	1.8	150	150	ND (0.5)	4.4	12	5.7	3,200
MW-10	MW-10-Q219	N		05/17/19	GW	Preliminary		180	180		20	12	6.4	3,100
MW-10	MW-901-Q219	FD		05/17/19	GW	Preliminary		180	180		19	12	6.7	3,100
MW-11	MW-11-Q219	N		05/17/19	GW	Preliminary	1.4	51	49	1.5	4.8	5.1	4.7	2,300
MW-12	MW-12-Q219	N		05/22/19	GW	Preliminary		1600	1600		6.3	16	32	6,900
MW-14	MW-14-Q219	N		05/15/19	GW	Preliminary	0.7	14	13	ND (0.5)	11	3.1	2	2,800
MW-19	MW-19-Q219	N		05/15/19	GW	Preliminary		250	250					2,000
MW-20-070	MW-20-070-Q219	N		05/24/19	GW	Preliminary		1700	1800		35	8.7	7.1	1,800
MW-20-100	MW-20-100-Q219	N		05/24/19	GW	Preliminary		1300	1500		3.7	7.9	6	2,200
MW-20-130	MW-20-130-Q219	N		05/24/19	GW	Preliminary	4.6	5900	6800	1.7	42	11	34	10,000
MW-20-130	MW-902-Q219	FD		05/24/19	GW	Preliminary	4.5	6000	6800	2.2	40	11	36	10,000
MW-21	MW-21-Q219	N		05/23/19	GW	Preliminary		6.5	6.7		59	0.69	13	12,000
MW-23-060	MW-23-060-Q219	N		05/21/19	GW	Preliminary	5.7	40	35	ND (0.5)				16,000
MW-23-080	MW-23-080-Q219	N		05/21/19	GW	Preliminary	5.6	ND (1)	1.1	ND (0.5)				17,000
MW-24A	MW-24A-Q219	N		05/17/19	GW	Preliminary	ND (0.1)	ND (0.2)	ND (1)	16	110	0.051	ND (0.5)	1,600
MW-24B	MW-24B-Q219	N		05/17/19	GW	Preliminary	3.1	86	73	100	56	0.71	ND (2.5)	20,000
MW-24B	MW-903-Q219	FD		05/17/19	GW	Preliminary	3	84	73	100	55	0.71	ND (2.5)	20,000
MW-25	MW-25-Q219	N		05/15/19	GW	Preliminary	1.3	68	66	ND (0.5)	4.2	12	8.4	2,000
MW-26	MW-26-Q219	N		05/22/19	GW	Preliminary	1.9	2300	2500	ND (0.5)	30	21	39	3,700
MW-28-025	MW-28-025-Q219	N		05/21/19	GW	Preliminary	0.81	ND (0.2)	ND (1)	ND (0.5)	4.4	ND (0.05)	ND (0.5)	1,000
MW-28-090	MW-28-090-Q219	N		05/21/19	GW	Preliminary	2.2	ND (0.2)	ND (1)	280	23	ND (0.05)	ND (0.5)	4,600
MW-29	MW-29-Q219	N		05/21/19	GW	Preliminary	15	ND (0.2)	ND (1)	300	30	ND (0.05)	ND (0.5)	2,500
MW-31-060	MW-31-060-Q219	N		05/20/19	GW	Preliminary	1	250	240	0.7				3,800
MW-31-060	MW-904-Q219	FD		05/20/19	GW	Preliminary	1	250	240	ND (0.5)				3,900
MW-33-150	MW-33-150-Q219	N		05/21/19	GW	Preliminary	1.7	5.5	21	74	48	1.5	0.93	14,000
MW-35-060	MW-35-060-Q219	N		05/24/19	GW	Preliminary	1.3	24	22	ND (0.5)	11	2	1.5	4,600
MW-35-135	MW-35-135-Q219	N		05/24/19	GW	Preliminary	0.82	28	24	1.3	19	2.4	1.3	9,200
MW-37D	MW-37D-Q219	N		05/20/19	GW	Preliminary		6.2	6		60	0.55	ND (0.5)	14,000
MW-38D	MW-38D-Q219	N		05/17/19	GW	Preliminary	7.2	21	17	21	80	ND (0.05)	ND (2.5)	22,000
MW-38S	MW-38S-Q219	N		05/17/19	GW	Preliminary	5.8	6	5.7	46	22	5.2	3.7	1,700
MW-40D	MW-40D-Q219	N		05/22/19	GW	Preliminary	4.5	120	120	ND (0.5)	54	2.5	2	15,000
MW-40D	MW-906-Q219	FD		05/22/19	GW	Preliminary	4.5	120	120	ND (0.5)	54	2.6	1.9	15,000
MW-40S	MW-40S-Q219	N		05/22/19	GW	Preliminary	2.7	12	15	1.8	18	5.6	5.6	2,100
MW-41D	MW-41D-Q219	N		05/15/19	GW	Preliminary	2.4	ND (1)	ND (1)	180	73	ND (0.05)	ND (0.5)	18,000
MW-46-175	MW-46-175-Q219	N		05/21/19	GW	Preliminary		7.6	9.1		190	1.1	0.78	17,000
MW-46-205	MW-46-205-Q219	N		05/21/19	GW	Preliminary		2.4	2.7					21,000
MW-47-055	MW-47-055-Q219	N		05/16/19	GW	Preliminary	1.1	17	15	ND (0.5)				4,800
MW-47-055	MW-907-Q219	FD		05/16/19	GW	Preliminary	1.1	17	15	ND (0.5)				4,700
MW-47-115	MW-47-115-Q219	N		05/16/19	GW	Preliminary		27	23					12,000
MW-48	MW-48-Q219	N		05/23/19	GW	Preliminary		ND (1)	ND (1)					17,000
MW-50-095	MW-50-095-Q219	N		05/20/19	GW	Preliminary		13	12					5,600
MW-50-200	MW-50-200-Q219	N		05/20/19	GW	Preliminary		5800	6200					21,000




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GMP 2019-04 Sampling

Lab Method Description Units							ASSET Arsenic, Dissolved SW 6020 ug/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, Total Dissolved SW 6020 ug/L	ASSET Manganese, Dissolved SW 6020 ug/L	ASSET Molybdenum, Dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET Selenium, Dissolved SW 6020 ug/L	ASSET Specific Conductance EPA 120.1 uS/cm
Location ID	Sample ID	Sample Type	Sample Method	Date Sampled	Matrix	Status*								
MW-51	MW-51-Q219	N		05/22/19	GW	Preliminary	4.1	3300	3800	ND (0.5)	48	8.3	15	13,000
MW-57-070	MW-57-070-Q219	N		05/20/19	GW	Preliminary	1.3	380	400	1.2	4	9.6	3.2	2,600
MW-57-185	MW-57-185-LF_S-Q2	N		05/20/19	GW	Preliminary	3.4	4.6	5.2	6.2	81	0.11	ND (2.5)	18,000
MW-57-185	MW-909-Q219	FD		05/20/19	GW	Preliminary	3.4	4.7	5.1	4.8	83	0.1	ND (2.5)	18,000
MW-58BR	MW-58BR-Q219	N		05/21/19	GW	Preliminary	1.9	12	14	270	26	0.68	1.9	8,200
MW-59-100	MW-59-100-Q219	N		05/20/19	GW	Preliminary	2.3	2000	2200	ND (0.5)	9.4	1.7	1.8	14,000
MW-59-100	MW-910-Q219	FD		05/20/19	GW	Preliminary	2.2	2200	2300	2.9	9	1.7	1.9	14,000
MW-60-125	MW-60-125-Q219	N		05/22/19	GW	Preliminary	1.6	880	890	4.3	17	3.7	6.2	8,700
MW-60BR-245	MW-60BR-245-3V-Q	N		05/22/19	GW	Preliminary	8.8	130	120	7.9	60	0.3	2.7	16,000
MW-60BR-245_D	MW-60BR-245-LF_D	N		05/23/19	GW	Preliminary	9.2	68	61	6.7	63	0.22	3.2	17,000
MW-60BR-245_S	MW-60BR-245-LF_S	N		05/23/19	GW	Preliminary	8.7	85	74	6.7	59	0.22	2.7	17,000
MW-61-110	MW-61-110-Q219	N		05/23/19	GW	Preliminary	3.7	280	280	210	23	0.54	0.87	16,000
MW-62-065	MW-62-065-Q219	N		05/21/19	GW	Preliminary	1.6	570	560	0.89	13	4.8	4.3	6,200
MW-62-110	MW-62-110-Q219	N		05/22/19	GW	Preliminary	3	ND (1)	ND (1)	150	68	ND (0.05)	ND (0.5)	12,000
MW-62-190	MW-62-190-Q219	N		05/22/19	GW	Preliminary	1.3	ND (1)	ND (1)	780	46	ND (0.05)	ND (0.5)	18,000
MW-63-065	MW-63-065-Q219	N		05/21/19	GW	Preliminary	1.5	1.3	2.8	2.5	19	0.93	1	6,700
MW-64BR	MW-64BR-Q219	N		05/21/19	GW	Preliminary	4	ND (1)	ND (1)	960	65	ND (0.05)	ND (0.5)	13,000
MW-65-160	MW-65-160-Q219	N		05/16/19	GW	Preliminary	0.69	160	190	76	110	14	9.4	4,000
MW-65-225	MW-65-225-Q219	N		05/16/19	GW	Preliminary	2.5	180	160	40	44	2.6	2.3	15,000
MW-66-165	MW-66-165-Q219	N		05/16/19	GW	Preliminary	1.2	550	570	ND (0.5)	5.5	25	28	3,900
MW-66-230	MW-66-230-Q219	N		05/16/19	GW	Preliminary	9.8	6400	7000	3.6	71	11	9	19,000
MW-66BR-270	MW-66BR-270-Q219	N		05/22/19	GW	Preliminary	ND (0.1)	ND (1)	ND (1)	66	10	1.7	ND (0.5)	2,300
MW-67-185	MW-67-185-Q219	N		05/16/19	GW	Preliminary	1	2100	2200	ND (0.5)	5.7	79	400	7,700
MW-67-225	MW-67-225-Q219	N		05/16/19	GW	Preliminary	3.4	3100	3300	2.9	48	26	93	7,000
MW-67-260	MW-67-260-Q219	N		05/16/19	GW	Preliminary	8.9	800	850	130	69	0.55	ND (2.5)	18,000
MW-68-180	MW-68-180-Q219	N		05/22/19	GW	Preliminary	3.1	5400	6200	ND (0.5)	36	9.4	11	3,500
MW-68-240	MW-68-240-Q219	N		05/23/19	GW	Preliminary	1.6	2000	2000	29	30	4.3	4.8	16,000
MW-68-240	MW-912-Q219	FD		05/23/19	GW	Preliminary	1.7	1900	2100	29	31	4.3	4.7	16,000
MW-68BR-280	MW-68BR-280-Q219	N		05/22/19	GW	Preliminary	1.2	ND (1)	ND (1)	150	40	ND (0.05)	ND (2.5)	20,000
MW-69-195	MW-69-195-Q219	N		05/16/19	GW	Preliminary	2.2	120	120	0.54	58	10	8	2,600
MW-70-105	MW-70-105-Q219	N		05/21/19	GW	Preliminary	3.7	170	170	6	66	4.9	4.6	3,500
MW-70BR-225	MW-70BR-225-LF-Q2	N		05/21/19	GW	Preliminary	2	1600	1700	1.1	20	3.5	2.8	13,000
MW-71-035	MW-71-035-Q219	N		05/23/19	GW	Preliminary	1.2	ND (1)	ND (1)	18	13	0.085	0.52	14,000
MW-72-080	MW-72-080-Q219	N		05/24/19	GW	Preliminary	10	55	51	77	85	0.37	ND (2.5)	13,000
MW-72BR-200_S	MW-72BR-200-LF_S	N		05/23/19	GW	Preliminary	13	ND (1)	ND (1)	210	76	ND (0.05)	ND (0.5)	15,000
MW-73-080	MW-73-080-Q219	N		05/23/19	GW	Preliminary	1.8	34	35	5.7	30	3.3	4.3	12,000
MW-74-240	MW-74-240-Q219	N		05/22/19	GW	Preliminary	8.3	0.55	ND (1)	4.5	19	2.1	2.4	800
TW-01	TW-01-Q219	N		05/24/19	GW	Preliminary		2300	2400		15	15	14	7,000


<div><div>Design & Consultancy for natural and built assets</div></div> <div>GMP 2019-04 Sampling</div>							Lab Method Description Units	ASSET Arsenic, Dissolved SW 6020 ug/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, Total Dissolved SW 6020 ug/L	ASSET Manganese, Dissolved SW 6020 ug/L	ASSET Molybdenum, Dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET Selenium, Dissolved SW 6020 ug/L	ASSET Specific Conductance EPA 120.1 uS/cm
Location ID	Sample ID	Sample Type	Sample Method	Date Sampled	Matrix	Status*									
TW-04	TW-04-LF-Q219	N		05/16/19	GW	Preliminary		5.1	4.5	16	42		ND (2.5)	20,000	
TW-05	TW-05-LF-Q219	N		05/20/19	GW	Preliminary		11	9.9	3.1	31		0.59	12,000	
TW-05	MW-913-Q219	FD		05/20/19	GW	Preliminary		11	9.6	3	30		0.52	12,000	

*Data results were significantly delayed this quarter due to lab instrument issues so preliminary results are included.


<div><div> ARCADIS</div><div>Design & Consultancy for natural and built assets</div></div> <div>PMP 2019-05 Sampling</div>						Lab	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
Method						Alkalinity, total as CaCO3 SM 2320 B mg/L	Calcium, dissolved EPA 200.7 mg/L	Chloride EPA 300.0 mg/L	Chromium, Hexavalent EPA 218.6 ug/L	Chromium, total dissolved EPA 200.8 ug/L	Iron, dissolved EPA 200.7 ug/L	Magnesium, dissolved EPA 200.7 mg/L	Manganese, dissolved EPA 200.8 ug/L	Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	pH SM 4500-H+ B PHUNITS	Sodium, dissolved EPA 200.7 mg/L	Specific conductance EPA 120.1 uS/cm	Sulfate EPA 300.0 mg/L	Total dissolved solids SM 2540 C mg/L
Description																			
Units																			
Location ID	Sample ID	Sample Type	Sample Method	Matrix	Date Sampled														
PE-01	PE-01-0519	N	Tap	GW	5/9/2019	220	110	550	ND (0.2)	ND (1.0)	1,200	25	360	ND (0.05)	7.5	190	2,400	270	1,500
TW-03D	TW-03D-0519	N	Tap	GW	5/9/2019	160	230	2,100	460	440	ND (20)	25	21	2.7	7.2	1,600	7,100	490	4,200

 <div> <div>Design & Consultancy for natural and built assets</div> <div>Lab</div> </div>						ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
<div>TMP 2019-05 Baseline Sampling</div> <div>Method Description Units</div>						Chromium, Hexavalent EPA 218.6 ug/L	Chromium, Total Dissolved SW 6010 ug/L	ASSET Alkalinity, total as CaCO3 SM 2320 mg/L	Aluminum SW 6010B ug/L	Aluminum, dissolved SW 6010B ug/L	Antimony SW 6020 ug/L	Antimony, dissolved SW 6020 ug/L	Arsenic SW 6020 ug/L	Arsenic, dissolved SW 6020 ug/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*									
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary									
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	78	190	ND (50)	ND (0.5)	ND (0.5)	1.3	1.3	110	110
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	110	520	270	ND (0.5)	ND (0.5)	3.6	3.4	85	88
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	97	320	ND (50)	ND (0.5)	ND (0.5)	4	3.9	38	33
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	110	1,100	ND (50)	ND (0.5)	ND (0.5)	1.6	1.3	53	34
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	130	1,500	480	ND (0.5)	ND (0.5)	5.4	4.9	110	97
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	91	260	ND (50)	ND (0.5)	ND (0.5)	1.9	2	110	110
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	91	930	ND (50)	ND (0.5)	ND (0.5)	2.2	1.9	130	110
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	97	270	ND (50)	ND (0.5)	ND (0.5)	3.4	3.5	46	47
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	97	73	ND (50)	ND (0.5)	ND (0.5)	3.3	3.4	44	45
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	93	140	ND (50)	ND (0.5)	ND (0.5)	3.6	3.2	61	45
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	41			ND (0.5)	ND (0.5)	3.2	2.7	58	55
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	36			ND (0.5)	ND (0.5)	5.7	4.5	65	49
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	34			ND (0.5)	ND (0.5)	5.2	5	160	160
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	95			ND (0.5)	ND (0.5)	0.73	0.66	73	76
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	120	150	200	ND (0.5)	ND (0.5)	1.1	1	63	60
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	29	400	230	ND (0.5)	ND (0.5)	4.3	3.8	56	54
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	44	1,500	240	ND (0.5)	ND (0.5)	5	4.4	150	130
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	45	880	240	ND (0.5)	ND (0.5)	4.6	4.5	130	130
MW-U-183	MW-U-183-0519	N	GW	05/22/19		58			ND (0.5)	ND (0.5)	1.3	1.2	190	170
MW-U-273	MW-U-273-0519	N	GW	05/22/19		64			ND (0.5)	ND (0.5)	4.4	4.4	72	57
MW-W-31	MW-W-31-0519	N	GW	05/23/19		790			ND (2.5)	ND (2.5)	9.1	5.1	220	130


*Data results were significantly delayed this quarter due to lab instrument issues so preliminary results are included.

<div>  <div> Design & Consultancy for natural and built assets </div> </div> <div> <div>TMP 2019-05 Baseline Sampling</div> <div> Lab Method Description Units </div> </div>						ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
						Barium SW 6020 ug/L	Barium, dissolved SW 6020 ug/L	Beryllium SW 6020 ug/L	Beryllium, dissolved SW 6020 ug/L	Boron SW 6010B ug/L	Boron, dissolved SW 6010B ug/L	Bromide mg/L EPA 300.0 mg/L	Cadmium SW 6020 ug/L	Cadmium, dissolved SW 6020 ug/L	Calcium SW 6010B ug/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*										
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary										
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	ND (5)	ND (5)	930	890	ND (2.5)	ND (0.5)	ND (0.5)	240000	230000	3200
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (5)	720	690	ND (1)	ND (0.5)	ND (0.5)	140000	150000	1300
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	ND (25)	ND (25)	2400	2400	ND (2.5)	ND (0.5)	ND (0.5)	350000	350000	3600
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	780	730	ND (1)	ND (0.5)	ND (0.5)	140000	120000	490
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	ND (2.5)	ND (2.5)	1800	1800	1.4	ND (0.5)	ND (0.5)	170000	170000	2000
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	690	670	ND (2.5)	ND (0.5)	ND (0.5)	180000	170000	690
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	700	690	ND (2.5)	ND (0.5)	ND (0.5)	180000	170000	690
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	ND (12)	ND (12)	1100	1100	ND (2.5)	ND (0.5)	ND (0.5)	280000	270000	2600
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	ND (12)	ND (12)	1200	1200	ND (2.5)	ND (0.5)	ND (0.5)	290000	280000	2600
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	ND (12)	ND (12)	1200	1200	ND (2.5)	ND (0.5)	ND (0.5)	300000	290000	2700
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)			ND (2.5)	ND (0.5)	ND (0.5)			3700
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)			ND (2.5)	ND (0.5)	ND (0.5)			5600
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)			ND (2.5)	ND (0.5)	ND (0.5)			6800
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	ND (0.5)	ND (0.5)			ND (2.5)	ND (0.5)	ND (0.5)			560
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	ND (0.5)	ND (0.5)	520	510	ND (1)	ND (0.5)	ND (0.5)	120000	120000	370
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	ND (2.5)	ND (2.5)	2100	2100	ND (2.5)	ND (0.5)	ND (0.5)	270000	260000	3700
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	ND (2.5)	ND (12)	2400	2400	ND (2.5)	ND (0.5)	ND (0.5)	550000	580000	6500
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	ND (2.5)	ND (12)	2500	2300	ND (2.5)	ND (0.5)	ND (0.5)	560000	530000	6400
MW-U-183	MW-U-183-0519	N	GW	05/22/19		ND (0.5)	ND (0.5)			ND (2.5)	ND (0.5)	ND (0.5)			2100
MW-U-273	MW-U-273-0519	N	GW	05/22/19		ND (2.5)	ND (2.5)			ND (1)	ND (0.5)	ND (0.5)			2100
MW-W-31	MW-W-31-0519	N	GW	05/23/19		ND (2.5)	ND (2.5)			ND (2.5)	ND (2.5)	ND (2.5)			4100


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<div><div></div><div>Design & Consultancy for natural and built assets</div></div>						Lab	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
TMP 2019-05 Baseline Sampling						Method	Calcium, dissolved SW 6010B ug/L	Chloridemg/L EPA 300.0 mg/L	Chromium, Hexavalent EPA 218.6 ug/L	Chromium, total dissolved SW 6020 ug/L	Chromium, total SW 6020 ug/L	Cobalt SW 6020 ug/L	Cobalt, dissolved SW 6020 ug/L	Copper SW 6020 ug/L	Copper, dissolved SW 6020 ug/L	Fluoridemg/L EPA 300.0 mg/L	
						Description											
		Units															
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*												
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary	130											
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	0.4	ND (1)	4.4	ND (0.5)	ND (0.5)	ND (1)	ND (1)	3.1	200	99		
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	5.7	6.9	9.5	ND (0.5)	ND (0.5)	ND (1)	ND (1)	2.4	570	150		
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	6900	7700	7300	ND (0.5)	ND (0.5)	ND (1)	ND (1)	2.7	330	ND (20)		
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	3600	4100	4000	ND (0.5)	ND (0.5)	ND (1)	ND (1)	1.4	850	ND (20)		
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	2600	3000	3400	ND (0.5)	ND (0.5)	ND (1)	ND (1)	1.9	1200	97		
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	1600	1600	1700	ND (0.5)	ND (0.5)	ND (1)	ND (1)	0.97	200	26		
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	1300	1400	1400	ND (0.5)	ND (0.5)	ND (1)	ND (1)	1	950	ND (20)		
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	2000	2100	2100	ND (0.5)	ND (0.5)	ND (1)	ND (1)	2.2	ND (20)	ND (20)		
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	2000	2000	2200	ND (0.5)	ND (0.5)	ND (1)	ND (1)	2.1	ND (20)	ND (20)		
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	2000	2000	2700	ND (0.5)	ND (0.5)	ND (1)	ND (1)	2.1	120	ND (20)		
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	ND (1.0)	ND (1)	3.8	ND (0.5)	ND (0.5)	ND (1)	ND (1)	4.4				
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	530	580	580	0.89	ND (0.5)	1.1	ND (1)	4.3				
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	ND (1.0)	ND (1)	3.7	ND (0.5)	ND (0.5)	ND (1)	ND (1)	4.3				
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	28	28	29	ND (0.5)	ND (0.5)	ND (1)	ND (1)	1.4				
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	130	140	140	ND (0.5)	ND (0.5)	ND (1)	1.2	0.58	130	ND (20)		
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	150	150	200	ND (0.5)	ND (0.5)	ND (1)	ND (1)	4.6	630	67		
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	1600	1500	1600	0.52	ND (0.5)	ND (1)	ND (1)	4.5	1500	55		
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	1600	1600	1600	ND (0.5)	ND (0.5)	ND (1)	ND (1)	4.5	840	ND (20)		
MW-U-183	MW-U-183-0519	N	GW	05/22/19		ND (0.2)	ND (1)	4.1	0.64	ND (0.5)	ND (1)	ND (1)	3				
MW-U-273	MW-U-273-0519	N	GW	05/22/19		0.25	ND (1)	4.3	0.6	ND (0.5)	ND (1)	ND (1)	4.6				
MW-W-31	MW-W-31-0519	N	GW	05/23/19		ND (1.0)	ND (5)	61	3.5	ND (2.5)	ND (5)	ND (5)	1.7				


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 <div> <div>Design & Consultancy for natural and built assets</div> <div>Lab</div> </div>						ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
<div>TMP 2019-05 Baseline Sampling</div> <div>Method Description Units</div>						Iron SW 6010B ug/L	Iron, dissolved SW 6010B ug/L	Lead SW 6020 ug/L	Lead, dissolved SW 6020 ug/L	Magnesium SW 6010B ug/L	Magnesium, dissolved SW 6010B ug/L	Manganese SW 6020 ug/L	Manganese, dissolved SW 6020 ug/L	Mercury EPA 7470A ug/L	Mercury, dissolved EPA 7470A ug/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*										
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary										
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (10)	31,000	35,000	1100	1100	ND (0.2)	ND (0.2)	47	46
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	26,000	30,000	860	960	ND (0.2)	ND (0.2)	18	18
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	ND (50)	ND (50)	14,000	15,000	44	40	ND (0.2)	ND (0.2)	21	21
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	1.7	ND (1)	21,000	21,000	42	ND (0.5)	ND (0.2)	ND (0.2)	6	6.1
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	3.1	ND (1)	15,000	15,000	280	280	ND (0.2)	ND (0.2)	32	31
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	31,000	32,000	340	350	ND (0.2)	ND (0.2)	18	19
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	31,000	32,000	390	360	ND (0.2)	ND (0.2)	20	19
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	ND (1)	ND (1)	20,000	19,000	22	21	ND (0.2)	ND (0.2)	17	17
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	ND (1)	ND (1)	20,000	20,000	21	21	ND (0.2)	ND (0.2)	17	17
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	20,000	21,000	57	24	ND (0.2)	ND (0.2)	17	17
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	ND (5)	ND (5)			40	33	ND (0.2)	ND (0.2)	35	34
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	ND (5)	ND (5)			57	7	ND (0.2)	ND (0.2)	49	45
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	ND (5)	ND (5)			30	23	ND (0.2)	ND (0.2)	63	64
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	ND (1)	ND (1)			21	4.6	ND (0.2)	ND (0.2)	3.8	4
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	ND (1)	ND (1)	22,000	24,000	8.8	7.5	ND (0.2)	ND (0.2)	3.3	3.3
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	ND (5)	ND (5)	9,300	9,300	210	190	ND (0.2)	ND (0.2)	100	100
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	ND (5)	ND (5)	14,000	14,000	470	440	ND (0.2)	ND (0.2)	69	72
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	ND (5)	ND (5)	14,000	13,000	460	440	ND (0.2)	ND (0.2)	71	73
MW-U-183	MW-U-183-0519	N	GW	05/22/19		ND (5)	ND (1)			720	710	ND (0.2)	ND (0.2)	16	16
MW-U-273	MW-U-273-0519	N	GW	05/22/19		ND (5)	ND (5)			79	62	ND (0.2)	ND (0.2)	44	46
MW-W-31	MW-W-31-0519	N	GW	05/23/19		8.6	ND (5)			880	420	ND (0.2)	ND (0.2)	24	14


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						Molybdenum SW 6020 ug/L	Molybdenum, dissolved SW 6020 ug/L	Nickel SW 6020 ug/L	Nickel, dissolved SW 6020 ug/L	Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	Potassium, dissolved SW 6010B ug/L	Selenium SW 6020 ug/L	Selenium, dissolved SW 6020 ug/L	Silver SW 6020 ug/L	Silver, dissolved SW 6020 ug/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*										
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary										
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	1	ND (1)	0.88	ND (500)	0.98	0.8	ND (0.5)	ND (0.5)	ND (500)	540
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	0.86	ND (500)	0.92	0.73	ND (0.5)	ND (0.5)	ND (500)	220
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	9.1	ND (500)	27	28	ND (0.5)	ND (0.5)	ND (500)	900
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	1.1	ND (1)	12	ND (500)	9.4	10	ND (0.5)	ND (0.5)	ND (500)	310
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	3.2	ND (1)	14	ND (500)	79	78	ND (0.5)	ND (0.5)	ND (500)	830
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	7.9	ND (500)	9.6	9.1	ND (0.5)	ND (0.5)	ND (500)	360
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	ND (1)	ND (1)	7.1	ND (500)	8.8	8.6	ND (0.5)	ND (0.5)	ND (500)	360
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	ND (1)	ND (1)	9.3	ND (500)	9.7	11	ND (0.5)	ND (0.5)	ND (500)	520
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	ND (1)	ND (1)	9.1	ND (500)	9.9	9.5	ND (0.5)	ND (0.5)	ND (500)	520
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	2.4	ND (1)	9.1	ND (500)	9.5	9.6	ND (0.5)	ND (0.5)	ND (500)	520
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	1.3	ND (1)	0.34		ND (2.5)	0.64	ND (0.5)	ND (0.5)		490
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	3.3	ND (1)	0.69		ND (2.5)	0.59	ND (0.5)	ND (0.5)		710
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	1.9	ND (1)	0.053		ND (0.5)	ND (2.5)	ND (0.5)	ND (2.5)		650
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	ND (1)	ND (1)	4.2		3	3.1	ND (0.5)	ND (0.5)		160
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	2.2	2.6	18	ND (500)	9.3	9.7	ND (0.5)	ND (0.5)	ND (500)	230
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	1.6	1	6.3	ND (500)	5.9	5.8	ND (0.5)	ND (0.5)	ND (500)	1000
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	2.9	ND (1)	2.9	ND (500)	2.8	3.3	ND (2.5)	ND (2.5)	ND (500)	900
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	1.9	ND (1)	3.1	ND (500)	2.7	2.6	ND (2.5)	ND (2.5)	ND (500)	920
MW-U-183	MW-U-183-0519	N	GW	05/22/19		3.3	1.3	1.2		1.6	1.7	ND (0.5)	ND (0.5)		450
MW-U-273	MW-U-273-0519	N	GW	05/22/19		2.5	ND (1)	2.4		3.4	3.6	ND (0.5)	ND (0.5)		470
MW-W-31	MW-W-31-0519	N	GW	05/23/19		39	ND (5)	ND (0.05)		ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)		1400


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<div>  <div> Design & Consultancy for natural and built assets </div> </div> <div> <div>TMP 2019-05 Baseline Sampling</div> <div> Lab Method Description Units </div> </div>						ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
						Sodium, dissolved SW 6010B ug/L	Sulfate EPA 300.0 mg/L	Thallium SW 6020 ug/L	Thallium, dissolved SW 6020 ug/L	ASSET Total dissolved solids SM 2540 C mg/L	Total organic carbon SM 5310 mg/L	ASSET Vanadium SW 6020 ug/L	ASSET Vanadium, dissolved SW 6020 ug/L	ASSET Zinc SW 6020 ug/L	ASSET Zinc, dissolved SW 6020 ug/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*										
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary										
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (5)	5700	ND (1)	ND (1)	ND (1)	ND (10)	ND (10)		
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	2400	ND (1)	2.1	1	ND (10)	ND (10)		
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary	ND (25)	ND (25)	6300	ND (1)	2.3	1.8	ND (10)	ND (10)		
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	1400	ND (1)	7.2	5.7	ND (10)	ND (10)		
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	4500	ND (1)	5.4	3	ND (10)	ND (10)		
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	1800	ND (1)	2.1	1.8	ND (10)	ND (10)		
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	1700	ND (1)	2.9	1.5	ND (10)	ND (10)		
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary	ND (0.5)	ND (0.5)	5400	ND (1)	1.1	1.1	ND (10)	ND (10)		
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary	ND (0.5)	ND (0.5)	5200	ND (1)	1	1.1	ND (10)	ND (10)		
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary	ND (0.5)	ND (0.5)	4900	ND (1)	3.2	1.2	ND (10)	ND (10)		
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)	6400	ND (1)	8.1	6.2	ND (10)	ND (10)	930	ND (250)
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)	9800	ND (1)	13	7	28	ND (10)	2000	ND (250)
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	ND (2.5)	ND (2.5)	11000	ND (1)	2.6	1.5	39	ND (10)	500	ND (1,000)
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	ND (0.5)	ND (0.5)	1500	ND (10)	2.5	2.2	ND (10)	37	260	ND (50)
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary	ND (0.5)	ND (0.5)	1200	ND (1)	6.7	6.5	ND (10)	ND (10)		
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary	ND (2.5)	ND (2.5)	7300	ND (1)	3.1	2.2	ND (10)	ND (10)		
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary	ND (2.5)	ND (2.5)	11000	ND (1)	3.8	1.4	ND (10)	ND (10)		
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary	ND (2.5)	ND (2.5)	11000	ND (1)	2.7	1.4	ND (10)	ND (10)		
MW-U-183	MW-U-183-0519	N	GW	05/22/19		ND (2.5)	ND (0.5)	4600	ND (10)	2.8	1.3	ND (10)	ND (10)		
MW-U-273	MW-U-273-0519	N	GW	05/22/19		ND (2.5)	ND (2.5)	4000	ND (1)	13	10	13	ND (10)		
MW-W-31	MW-W-31-0519	N	GW	05/23/19		ND (2.5)	ND (2.5)	7600	1.1	15	ND (5)	ND (50)	ND (50)		


*Data results were significantly delayed this quarter due to lab instrument issues so preliminary result

<div>  <div> Design & Consultancy for natural and built assets </div> </div> <div> <div>TMP 2019-05 Baseline Sampling</div> <div> Lab Method Description Units </div> </div>						BCLabs	BCLabs	BCLabs	BCLabs	BCLabs	BCLabs	BCLabs	BCLabs	BCLabs	BCLabs
						Aluminum SW 6010B ug/L	Aluminum, dissolved SW 6010B ug/L	Ammonia as nitrogen SM 4500-NO3 mg/L	Boron SW 6010B ug/L	Boron, dissolved SW 6010B ug/L	Calcium SW 6010B mg/L	Calcium, dissolved SW 6010B mg/L	Iron SW 6010B ug/L	Iron, dissolved SW 6010B ug/L	Magnesium SW 6010B mg/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*										
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary										
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary										
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary										
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary										
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary										
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary										
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary										
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary										
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary										
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary										
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary										
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	ND (0.2)	1600	1300	310	270	1300	ND (250)	23	20	18
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	ND (0.2)	2200	1800	430	390	4300	ND (250)	25	21	25
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	ND (0.2)	2600	2800	440	400	ND (500)	ND (1,000)	11	9.9	41
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	ND (0.2)	430	300	180	150	410	ND (50)	28	25	9.8
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary										
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary										
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary										
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary										
MW-U-183	MW-U-183-0519	N	GW	05/22/19											
MW-U-273	MW-U-273-0519	N	GW	05/22/19											
MW-W-31	MW-W-31-0519	N	GW	05/23/19											

*Data results were significantly delayed this quarter due to lab instrument issues so preliminary result

<div>  <div> Design & Consultancy for natural and built assets </div> </div>						Lab	BCLabs	BCLabs	BCLabs
<div>TMP 2019-05 Baseline Sampling</div>						Method Description Units	Magnesium, dissolved SW 6010B mg/L	Potassium, dissolved SW 6010B mg/L	Sodium, dissolved SW 6010B mg/L
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*				
MW-10D	MW-10D-0519	N	GW	05/17/19	Preliminary				
MW-B-117	MW-B-117-0519	N	GW	05/15/19	Preliminary				
MW-B-33	MW-B-33-0519	N	GW	05/15/19	Preliminary				
MW-E-142	MW-E-142-0519	N	GW	05/15/19	Preliminary				
MW-E-72	MW-E-72-0519	N	GW	05/15/19	Preliminary				
MW-F-104	MW-F-104-0519	N	GW	05/15/19	Preliminary				
MW-F-60	MW-F-60-3V-0519	N	GW	05/15/19	Preliminary				
MW-F-60	MW-F-60-LF-0519	N	GW	05/15/19	Preliminary				
MW-G-57	MW-G-57-0519	N	GW	05/13/19	Preliminary				
MW-G-57	MW-919-Q219	FD	GW	05/13/19	Preliminary				
MW-G-82	MW-G-82-0519	N	GW	05/15/19	Preliminary				
MW-L-180	MW-L-180-0519	N	GW	05/14/19	Preliminary	2100			
MW-L-225	MW-L-225-0519	N	GW	05/14/19	Preliminary	3000			
MW-L-245	MW-L-245-0519	N	GW	05/14/19	Preliminary	4200			
MW-L-90	MW-L-90-0519	N	GW	05/14/19	Preliminary	240			
MW-N-129	MW-N-129-0519	N	GW	05/13/19	Preliminary				
MW-N-217	MW-N-217-0519	N	GW	05/13/19	Preliminary				
MW-N-237	MW-N-237-0519	N	GW	05/13/19	Preliminary				
MW-N-237	MW-920-Q219	FD	GW	05/13/19	Preliminary				
MW-U-183	MW-U-183-0519	N	GW	05/22/19					
MW-U-273	MW-U-273-0519	N	GW	05/22/19					
MW-W-31	MW-W-31-0519	N	GW	05/23/19					

*Data results were significantly delayed this quarter due to lab instrument issues so preliminary result

<div><div>Design & Consultancy for natural and built assets</div></div>						Lab	ASSET	ASSET
<div>TMP 2019-05 Post Development</div>						Method	Chromium,	Chromium, Total
						Description	Hexavalent	Dissolved
						Units	EPA 218.6	SW 6010
						ug/L	ug/L	
Location ID	Sample ID	Sample Type	Matrix	Date Sampled	Status*			
MW-U-183	MW-U-183-050819	N	GW	05/08/19	Preliminary	ND (0.2)	ND (1)	
MW-U-273	MW-U-273-051019	N	GW	05/10/19	Preliminary	ND (0.2)	ND (1)	

*Data results were significantly delayed this quarter due to lab instrument issues so preliminary results are included.