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August 15, 2018

Mr. Aaron Yue
Project Manager
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Subject: *Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California* (PGE20180115A)

Dear Mr. Yue:

Enclosed is the Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California, for Pacific Gas and Electric Company's Interim Measures (IMs) Performance Monitoring Program, the Groundwater Monitoring Program, and the Surface Water Monitoring Program for the Topock Project. This report presents the Second Quarter (April through June 2018) performance monitoring results for the IM-3 hydraulic containment system. This report also presents groundwater and surface water monitoring activities, results, and analyses related to the Groundwater and Surface Water Monitoring Programs during Second Quarter 2018.

The IM quarterly performance monitoring report is submitted in conformance with the reporting requirements in the California Environmental Protection Agency, Department of Toxic Substances Control's (DTSC) IM directive, dated February 14, 2005, and updates and modifications approved by DTSC in letters or emails dated October 12, 2007; July 14, 2008; July 17, 2008; March 3, 2010; April 28, 2010; July 23, 2010; June 27, 2014; July 20, 2015; and August 18, 2017.

Please contact me at 760.791.5884 if you have any questions on the combined monitoring report.

Sincerely,

Curt Russell
Topock Remediation Project Manager

Cc: Chris Guerre/DTSC
Pam Innis/DOI
Ken Foster/CA-SLC
Bruce Campbell/AZ-SLD

Topock Project Executive Abstract

Document Title:

Second Quarter 2018 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles CA

Submitting Agency: DTSC

Final Document? ☒ Yes ☐ No

Date of Document: August 15, 2018

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

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

Type of Document:
☐ Draft ☒ Report ☐ Letter ☐ Memo
☐ Other / Explain:

Action Required:
☒ Information Only ☐ Review & Comment
Return to: _____
By Date:_____
☐ Other / Explain:

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

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

What is the consequence of NOT doing this item? What is the consequence of DOING this item?
Submittal of this report is a compliance requirement under DTSC requirements.

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

Brief Summary of attached document:

This quarterly report documents the monitoring activities and performance evaluation of the interim measure (IM) hydraulic containment system under the IM Performance Monitoring Program, the Groundwater Monitoring Program, and Surface Water Monitoring Program for the Topock Project. Hydraulic and chemical monitoring data were collected and used to evaluate the IM hydraulic containment system performance based on a set of standards approved by the California Department of Substances Control (DTSC). Key items included in this report are: (1) measured groundwater elevations and hydraulic gradient data at compliance well pairs that indicate the direction of groundwater flow is away from the Colorado River and toward the pumping centers on site; (2) hexavalent chromium data for monitoring wells; (3) pumping rates and volumes from the IM extraction system; and (4) Groundwater Monitoring Program and Surface Water Monitoring Program activities and results.

Based on the data and evaluation presented in this report, the IM performance standard has been met for Second Quarter 2018. On July 23, 2010, DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from April 1, 2018 through June 30, 2018.

Written by: PG&E

Recommendations:
none

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

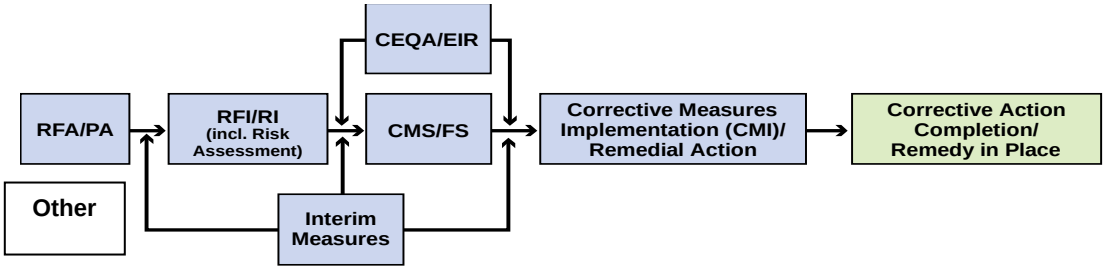
This report is required by DTSC as part of the Interim Measures Performance Monitoring Program.

Other requirements of this information?

None.

Related Reports and Documents:

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



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

Version 9

ARCADIS Design & Consultancy for natural and built assets

Pacific Gas and Electric Company

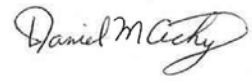
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

Topock Compressor Station,
Needles, California

August 15, 2018

This report was prepared under the supervision of a California Professional Geologist

Frederick T. Stanin, P.G., C. Hg
Principal Hydrogeologist



Daniel M. Cichy
Arcadis Report Lead

Daniel Bush, P.E.
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SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

Topock Compressor Station,

Needles, California

Prepared for:

California Department of Toxic Substances Control

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Date:

August 15, 2018

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ADEQ	Arizona Department of Environmental Quality
CMP	Compliance Monitoring Program
COPC	constituent of potential concern
Cr(VI)	hexavalent chromium
CWG	Consultative Working Group
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ft/ft	foot or feet per foot
GMP	Groundwater Monitoring Program
gpm	gallons per minute
IM	interim measure
IM-3	Interim Measures number 3
IMCP	Interim Measures Contingency Plan
mg/L	milligrams per liter
ORP	oxidation-reduction potential
PDS	post digestion spike
PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
QC	quality control
RCRA	Resource Conservation and Recovery Act
RMP	Surface Water Monitoring Program
RRB	Red Rock Bridge
TDS	total dissolved solids
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit

EXECUTIVE SUMMARY

This quarterly report documents the monitoring activities and performance evaluation of the interim measure (IM) hydraulic containment system under the Groundwater Monitoring Program (GMP), Surface Water Monitoring Program (RMP), and IM Performance Monitoring Program (PMP) for the Topock Compressor Station (the site). Chemical and hydraulic monitoring data were collected and used to determine if site conditions have changed and evaluate the IM hydraulic containment system performance based on a set of standards approved by the California Department of Toxic Substances Control (DTSC).

Key items included in this report are: (1) GMP and RMP activities and results; (2) hexavalent chromium data for monitoring wells in the floodplain area; (3) measured groundwater elevations and hydraulic gradient data at compliance well pairs; and (4) pumping rates and volumes from the IM extraction system.

During Second Quarter 2018, IM extraction well TW-03D was operated to support hydraulic control. Hydraulic gradient data indicate that the minimum landward gradient target of 0.001 feet per foot was exceeded each month, providing evidence of hydraulic containment of the hexavalent chromium plume. Hexavalent chromium concentrations greater than 20 micrograms per liter in the floodplain area were contained for removal and treatment. Based on the data and evaluation presented in this report, the IM performance standard has been met for the Second Quarter 2018.

1 INTRODUCTION

Pacific Gas and Electric Company (PG&E) is implementing interim measures (IMs) to address chromium concentrations in groundwater at the Topock Compressor Station (the site). The Topock Compressor Station is located in eastern San Bernardino County, 15 miles southeast of the City of Needles, California, as shown on Figure 1-1.

This report presents the monitoring data from three PG&E monitoring programs:

- Site-wide Groundwater Monitoring Program (GMP)
- Site-wide Surface Water Monitoring Program (RMP)
- Interim Measures (currently Interim Measure Number 3 [IM-3]) Performance Monitoring Program (PMP).

This report presents the monitoring data collected from PG&E's GMP, RMP, and PMP programs between April 1 and June 30, 2018 (hereafter referred to as "Second Quarter 2018"). Table 1-1 shows the current reporting schedule for these programs.

This report is divided into six sections:

Section 1 introduces the site; the GMP, RMP, and PMP programs; and the regulatory framework.

Section 2 describes the Second Quarter 2018 monitoring activities and site operations conducted in support of these programs.

Section 3 presents GMP and RMP monitoring results for the Second Quarter 2018.

Section 4 presents PMP monitoring results and the IM evaluation for the Second Quarter 2018.

Section 5 describes upcoming monitoring events for the Third Quarter 2018.

Section 6 lists the references cited throughout this report.

This combined GMP, RMP, and PMP reporting format was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in May 2009 (DTSC 2009a).

1.1 Second Quarter 2018 Regulatory Communication

PG&E communications with the DTSC in Second Quarter 2018 in regards to the GMP, RMP, and/or PMP programs are outlined below.

- Submittal to the DTSC of the First Quarter 2018 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report ("PMP-GMP Report") submitted April 30, 2018; Arcadis 2018b).
- Submittal of required GMP, RMP, and PMP notifications. Notifications submitted in Second Quarter 2018 included:
    - On June 22, 2018, Arcadis, on behalf of PG&E sent a quarterly email notification to the DTSC providing hexavalent chromium (Cr[VI]) and dissolved chromium results from four subject floodplain wells (MW-34-100, MW-44-115, MW-46-175, and MW-44-125).

- As part of the conditional approval for the shutoff of extraction well PE-01, GMP monitoring results for monitoring wells listed in the July 20, 2015 DTSC approval letter (see Section 1.4.2.3; DTSC 2015) are compared to the maximum Cr(VI) and dissolved chromium concentrations measured in 2014 (or for biennial sampling frequency, the 2013 maximum concentrations), and results that exceed the previous maximum are required to be reported to the DTSC within 40 days after the end of the quarterly GMP sampling event. In Second Quarter 2018, Cr(VI) and/or dissolved chromium concentrations at five monitoring wells (MW-26, MW-33-040, MW-39-100, MW-47-115, and TW-04) exceeded the 2014 maximum concentrations; a notification email was submitted to the DTSC on June 13, 2018.

1.2 History of Groundwater Impact at the Site

1.2.1 Cr(VI) Impacts to Groundwater

The Topock Compressor Station began operations in 1951. Remediation efforts are ongoing to address Cr(VI) in soil and groundwater resulting from the historical water discharge practices. A comprehensive library documenting the history of remediation at the Topock Compressor Station is available on the DTSC website at http://dtsc-topock.com/ (DTSC 2018).

1.2.2 Background Concentrations of Cr(VI)

Based on a regional study of naturally occurring metals in groundwater and a statistical evaluation of these data, naturally occurring Cr(VI) in groundwater was calculated to exhibit an upper tolerance limit (UTL) concentration of 32 micrograms per liter (µg/L; CH2M Hill 2009c). This concentration is used as the background concentration for remedial activities. At the site, the Cr(VI) plume is mostly present within unconsolidated alluvial fan and fluvial deposits within the Alluvial Aquifer, and, to a lesser extent, in fractured bedrock. Natural groundwater gradients are generally west-to-east at most of the site. The depth to groundwater and the thickness of the saturated sediments vary significantly across the site based on surface topography and the paleo-topography of the top of bedrock surface underneath the site.

1.3 Site-wide Groundwater and Surface Water Monitoring Programs

1.3.1 Basis for GMP and RMP Programs

Routine groundwater and surface water monitoring activities at the site began in 1998 following a RCRA facility investigation and are ongoing (CH2M Hill 2005a). The main objective of the GMP and RMP programs are to monitor concentrations of Cr(VI) and other site constituents in groundwater and surface water to determine if site conditions have changed, and to make decisions about remedial options and future monitoring (CH2M 2005a). In accordance with the 2005 Monitoring Plan for Groundwater and Surface Water Monitoring, quarterly monitoring reports document groundwater and surface water monitoring activities performed at the site during each reporting period. Monitoring reports to date are available on the DTSC website. This report documents the Second Quarter 2018 GMP and RMP monitoring activities.

1.3.2 GMP and RMP Monitoring Networks

The GMP monitoring well network and RMP surface water monitoring network are shown on Figures 1-2 and 1-3, respectively, and are summarized in the table below. The complete GMP network includes 145 wells that monitor groundwater in the Alluvial Aquifer and bedrock. Well construction details for wells in

the GMP monitoring well network are summarized in Table 1-2. The RMP network consists of 16 surface water monitoring locations, nine of which are sampled at multiple depths.

Groundwater Monitoring Wells	Surface Water Monitoring Wells
133 monitoring wells in California, including two normally dry wells	10 river channel locations (9 of which are sampled at two different depths)
8 monitoring wells in Arizona	4 shoreline locations
4 IM-3 extraction wells	2 other surface water sampling locations (adjacent to the shoreline)

GMP and RMP monitoring consists of collecting groundwater and surface water samples, and performing inspections of the monitoring wells and taking corrective actions as needed. GMP and RMP monitoring events are performed quarterly, although the monitoring wells included in each GMP event vary by quarter. In addition, GMP monitoring is performed monthly at two extraction wells (TW-03D and PE-01). Table 1-2 provides a list of the monitoring wells and surface water monitoring locations included in the GMP and RMP programs and the monitoring frequency at each location. Monitoring frequency at GMP wells is also shown on Figure 1-2.

If a storm causes surface water flow in Bat Cave Wash, additional groundwater samples are collected from monitoring wells MW-09, MW-10, and MW-11. Bat Cave Wash is an incised ephemeral stream adjacent to the Topock Compressor Station, which flows following rainfall events and drains into the Colorado River (Figures 1-1 and 1-2).

1.4 Interim Measure Performance Monitoring Program

1.4.1 Basis for PMP Program

Operation of the current IM-3 system began in July 2005. The IM-3 system is intended to maintain hydraulic control of the groundwater Cr(VI) plume until the final corrective action is in place at the site (CH2MHill 2007b). The IM-3 system consists of a groundwater extraction system (four extraction wells: TW-02D, TW-03D, TW-02S, and PE-01), conveyance piping, a groundwater treatment plant, and an injection well field (for the discharge of the treated groundwater). Figure 1-1 shows the locations of the IM-3 extraction, conveyance, treatment, and injection facilities.

In a letter dated February 14, 2005, the DTSC issued an IM performance directive that established the operational requirements for the IM and methods for evaluating the performance of the IM (DTSC 2005a). As defined by the DTSC, the performance standard for the IM is to *"establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that Cr(VI) concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment"* (DTSC 2005a). The IM is required to maintain a landward hydraulic gradient of at least 0.001 feet per feet (ft/ft) within the lower portion of the Alluvial Aquifer (DTSC 2005a).

In accordance with the February 2005 DTSC directive, the following conditions must be met to demonstrate achievement of the IM performance standard (DTSC 2015):

- Demonstrate that a landward hydraulic gradient is maintained within the lower portion of the Alluvial Aquifer in the floodplain by:

  - Providing potentiometric surface contour maps of the Alluvial Aquifer within the floodplain area.
  - Providing calculated hydraulic gradients using established gradient well pairs.

- Demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment by:
  - Depicting the 20 and 50 µg/L isoconcentration contours for Cr(VI) within the floodplain on potentiometric surface maps and hydrogeologic cross sessions.
  - Providing maps and cross sections of the Cr(VI) concentration for the upper, middle, and lower portions of the Alluvial Aquifer in the floodplain area.
  - Providing time versus concentration graphs for Cr(VI) measured in floodplain wells.

The February 2005 DTSC directive also defined the reporting requirements for the IM (DTSC 2005a). In October 2007, the DTSC approved modifications to the reporting requirements, discontinuing monthly performance monitoring reports and continuing with quarterly and annual reports (DTSC 2007a). The DTSC approved additional updates and modifications to the PMP in letters dated October 12, 2007; July 14, 2008; July 16, 2008; March 3, 2010; April 28, 2010; July 23, 2010; and June 27, 2014 (DTSC 2007a, 2008a, 2008b, 2010a, 2010b, 2010c, 2014b).

1.4.2 PMP Monitoring Network

The PMP consists of a network of monitoring wells that are used to demonstrate achievement of the IM performance standard. Subsets of wells within the PMP network, including the (1) chromium monitoring network, (2) IM extraction wells, (3) IM hydraulic monitoring network, (4) IM Contingency Plan (IMCP) monitoring wells, and (5) IM chemical performance monitoring network, focus on different methods for evaluating performance of the IM. The PMP monitoring network is presented in the table below, and shown on Figure 1-4.

PMP Monitoring Network
Chromium Monitoring Network (145 monitoring wells included in the GMP) IM Extraction Wells (4 monitoring wells) • TW-02D • TW-03D • TW-02S • PE-01 IM Hydraulic Monitoring Network (57 monitoring wells and 2 river monitoring locations) • 16 shallow monitoring wells • 15 mid-depth monitoring wells • 26 deep monitoring wells • 2 river monitoring locations: C-1-3 and RRB

IMCP Monitoring Wells (24 monitoring wells)

- 6 shallow monitoring wells
- 5 mid-depth monitoring wells
- 13 deep monitoring wells

IM Chemical Performance Monitoring Network (10 monitoring wells and 1 river monitoring location)

- 5 shallow monitoring wells
- 2 mid-depth monitoring wells
- 3 deep monitoring wells
- 1 river monitoring location: R-28

The subsets of monitoring well networks within the PMP are described in the following subsections.

1.4.2.1 Chromium Monitoring Network

Cr(VI) data, collected as part of the GMP, are used to generate maps, cross-sections, and concentration time series charts that demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment. As described in Section 1.3.2, groundwater sampling events are performed quarterly; however, the monitoring wells included in each sampling event vary by quarter. In addition, groundwater sampling is performed monthly at extraction wells TW-03D and PE-01. Table 1-2 provides a list of monitoring wells included in the chromium monitoring network (i.e., the GMP monitoring network) and the monitoring frequency of each location.

1.4.2.2 IM Extraction Wells

The PMP includes four IM extraction wells, which are used to ensure a landward hydraulic gradient via groundwater extraction (Figure 1-4). The operation of the IM extraction system, including pumping rates, planned/unplanned downtime, and volume of groundwater extracted from each extraction well, is documented to demonstrate proper operation of the extraction system. In addition, the wells are sampled as part of the GMP: extraction wells TW-03D and PE-01 are sampled monthly, TW-02D is sampled quarterly, and TW-02S is sampled annually.

Wells Monitored for Conditional Shutdown of PE-01

On July 20, 2015, the DTSC conditionally approved a proposal to modify the IM-3 pumping regime by allowing PE-01 to be shut off and pumping to be shifted to TW-03D and TW-02D or TW-02S, so long as gradient targets are maintained, and contingency is not triggered based on chromium concentrations in select floodplain wells (DTSC 2015). Because PE-01 pumps water with low concentrations of chromium (typically less than 5 µg/L), shifting more pumping to a higher concentration extraction well can increase the rate of chromium removal from the floodplain.

As part of the conditional approval for PE-01 shutoff, GMP monitoring results from 48 monitoring wells listed in the July 20, 2015 DTSC approval letter (i.e., wells within approximately 800 feet of TW-03D; Table 1-2) are compared to the maximum detected Cr(VI) and dissolved chromium concentrations from 2014 (or 2013 for wells sampled biennially). If any of the wells exceed the 2014 maximum concentration, then the DTSC must be notified within 40 days after completion of the field sampling event to determine if PE-01 pumping should be reinitiated (DTSC 2015).

1.4.2.3 IM Hydraulic Monitoring Network

The IM hydraulic monitoring network consists of 52 monitoring wells located on the California side of the Colorado River and two river monitoring locations (C-I-3 and RRB) used to evaluate the performance of the IM-3 system by demonstrating compliance of the required hydraulic gradient of 0.001 ft/ft (Figure 1-4, Table 1-2). In addition, five groundwater monitoring wells located on the Arizona side of the Colorado River (MW-54-85, MW-54-140, MW-54-195, MW-55-045, and MW-55-120; not formally part of the PMP) also provide groundwater elevation data that demonstrate hydraulic gradients on the Arizona side of the river (Figure 1-4). Groundwater and surface water elevation data from these locations are collected monthly using pressure transducers installed at each location.

Groundwater elevation data collected from the IM hydraulic monitoring network are used to develop potentiometric maps of shallow, mid-depth, and deep groundwater and measure hydraulic gradients of three well pairs (northern, central, and southern) to demonstrate compliance with the required 0.001 ft/ft landward hydraulic gradient. On August 18, 2017, the DTSC approved use of monitoring well MW-20-130 in place of well MW-45-095 in the central and southern gradient well pairs during months when extraction well PE-01 is not pumped for hydraulic control at the site (DTSC 2017b). The current gradient well pairs are:

- Northern Gradient Pair: MW-31-135 and MW-33-150
- When PE-01 is operated for hydraulic control:
    - Central Gradient Pair: MW-45-095 and MW-34-100
    - Southern Gradient Pair: MW-45-095 and MW-27-085
- When PE-01 is not operated for hydraulic control:
    - Central Gradient Pair: MW-20-130 and MW-34-100
    - Southern Gradient Pair: MW-20-130 and MW-27-085

1.4.2.4 IM Contingency Plan Monitoring Wells

The IMCP was developed to detect and control possible migration of the Cr(VI) plume toward the Colorado River (DTSC 2005a). Twenty-four IMCP wells were selected as part of an early detection system to detect any increases in chromium concentrations at areas of interest across the site (Figure 1-4, Table 1-2). The IMCP wells are sampled quarterly, as part of the GMP monitoring program (note that not all 24 wells are sampled each quarter), to determine if any increasing trends in Cr(VI) concentrations are observed. If Cr(VI) concentrations exceed the established trigger levels (based on historical Cr(VI) concentrations), then a contingency plan must be implemented in accordance with the Revised Contingency Plan Flow Chart (DTSC 2005a; PG&E 2008).

1.4.2.5 IM Chemical Performance Monitoring Network

Eleven IMCP monitoring wells are sampled annually or biennially to help evaluate performance of the future remedy (Figure 1-4, Table 1-2). Wells are sampled for an expanded chemistry suite (total dissolved solids [TDS], chloride, sulfate, nitrate, alkalinity, stable isotopes [oxygen-18 and deuterium], calcium, potassium, magnesium, sodium, bromide, and boron), which was last amended in 2008 (DTSC 2008b;

PG&E 2008). Currently, nine monitoring wells and one river monitoring location (R-28) are sampled annually, and one well is sampled biennially (MW-26). Results of IMCP monitoring were last reported in the Fourth Quarter 2017 and Annual GMP-PMP Report (Arcadis 2018a). The next scheduled monitoring event is planned for Fourth Quarter 2018.

1.5 Sustainability

The GMP, RMP, and PMP programs strive to use sustainable sampling and data collection practices. This section briefly describes some of the sustainability practices now in use, which aim to reduce emissions from travel, reduce waste, conserve resources, and reduce potential impacts to nesting habitat and culturally-sensitive areas.

- Groundwater sampling purge water is disposed on-site via the IM-3 treatment plant and injection process.
- The RMP boat contractor is employed locally.
- Laboratory services are provided by a California-certified Las Vegas-based lab.
- Cr(VI) and nitrate analytical methods were revised to methods with longer holding times.
- Reports are submitted via the DTSC website and electronically, and the number of hard copy quarterly report submittals has been reduced over time.
- Solar-powered data telemetry systems were installed at six key gradient compliance well locations located in floodplain areas with nesting habitat for sensitive avian species.
- Low-flow sampling methods are used at most wells screened in the Alluvial Aquifer, reducing the volume of purge water.
- For wells still using the three-volume purge sampling methods, pumps and tubing are sized for the optimum purge technique at each well.
- Utility vehicles (e.g., Polaris Ranger or Kawasaki Mule) and a quiet electric four-wheel-drive utility vehicle are used to access wells on the floodplain and in some culturally sensitive areas rather than the full-size pickup truck.
- The IM-3 pumping regime was modified to allow PE-01 to be periodically shut off with pumping shifted to TW-03D and TW-02D or TW-02S. When applied, this modification allows for an increase in the rate of chromium removal from the floodplain.

2 SECOND QUARTER 2018 MONITORING ACTIVITIES

This section summarizes the monitoring activities completed during Second Quarter 2018 for the GMP, RMP, and PMP programs.

2.1 Groundwater Monitoring Program

The Second Quarter 2018 GMP consisted of monthly and quarterly groundwater monitoring, and sampling method trials at select monitoring wells.

2.1.1 Monthly Groundwater Monitoring

Monthly GMP monitoring events were performed at IM extraction wells PE-01 and TW-03D in April, May, and June 2018 and consisted of groundwater sampling. The monitoring well locations are shown on Figure 1-2, and listed in Table 1-2. Samples were collected from the tap of the extraction wells (see Table 1-2). During collection of each groundwater sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, oxidation-reduction potential [ORP], turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, Nevada. Samples were analyzed for the following constituents:

- Cr(VI) and dissolved chromium
- General chemistry parameters: specific conductivity, pH, alkalinity, chloride, sulfate, TDS
- COPCs: nitrate/nitrite as nitrogen
- In-Situ By-Products: dissolved iron and dissolved manganese
- Cations: dissolved calcium, dissolved magnesium, dissolved sodium

2.1.2 Quarterly Groundwater Monitoring

The quarterly GMP monitoring event was performed from April 23 through 30 and May 2 through 4, 2018 and consisted of groundwater sampling and inspection of 103 monitoring wells. The monitoring well locations are shown on Figure 1-2 and listed in Table 1-2. Samples were collected using one or multiple sampling methods (including low-flow, three-volume purge, grab, and hydraSleeve; see Table 1-2). During collection of each groundwater sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, ORP, turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, NV; samples collected from monitoring locations in Arizona were sent to EMAX Laboratories, Inc. in Torrance, CA. Samples were analyzed for the following constituents (note that not all samples were analyzed for the complete analytical suite listed below):

- Cr(VI) and dissolved chromium
- General chemistry parameters: Specific conductivity
- COPCs: dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen
- In-Situ By-Products: dissolved arsenic and dissolved manganese

2.1.3 Implementation of Alternative Sampling Methods

2.1.3.1 Site-wide Implementation of Low-flow Sampling Method

On June 27, 2014, the DTSC approved a change from the traditional three-volume purge sampling method to using a low-flow sampling method (DTSC 2014b). This approval applied to monitoring wells screened in alluvial/fluvial sediments with saturated screen lengths of 20 feet or less. Sample collection using the low-flow method at wells meeting the screen length criterion was initiated during the Third Quarter 2014 sampling event and has continued through Second Quarter 2018.

In October 2017, the DTSC approved switching additional monitoring wells from the three-volume purge method to low-flow sampling as part of conditional approval for expanded well sampling trials (DTSC 2017c). Two wells in the GMP program (bedrock well MW-61-110 and observation well OW-3S) were approved to switch from three-volume purge to low-flow sampling (with the rest of the wells approved for this switch under the Compliance Monitoring Program – reported under separate cover). No wells were approved for or switched sampling methods in Second Quarter 2018.

2.1.3.2 Sampling Method Trials at Select Wells

In addition to the low-flow sampling method change, and in accordance with a June 27, 2014 email from the DTSC, PG&E began conducting sampling method trials at monitoring wells MW-38S, MW-38D, MW-40S, and MW-40D during Fourth Quarter 2014 (DTSC 2014b). In August 2015, PG&E sent a letter to the DTSC recommending additional wells for low-flow sampling and proposing an additional sampling method trial for select bedrock wells (PG&E 2015). The DTSC responded to this request with technical memoranda on April 6 and October 20, 2017, which provided conditional approval for actions including expanding the sampling method trials to specific long-screen and bedrock wells (DTSC 2017a, 2017c).

The purpose of the sampling method trials are to directly compare two different sampling methods. The method trials are assessed annually following Fourth Quarter sampling, with the latest assessment included in the Fourth Quarter 2017 and Annual PMP-GMP Report (Arcadis 2018a). The latest annual report presented the results of existing method trials and made recommendations for updates to the trials (currently under agency review). Sampling method trials have continued through Second Quarter 2018 at 10 select wells shown on Figure 1-2: MW-38S, MW-38D, MW-40S, MW-40D, MW-57-185, MW-60BR-245, MW-70BR-225, MW-72BR-200, TW-04, and TW-05 (PG&E 2017).

The next assessment of the sampling method trials will be presented in the Fourth Quarter 2018 and Annual PMP-GMP Report (planned for March 2019).

2.2 Surface Water Monitoring Program

The Second Quarter 2018 RMP monitoring event was performed on June 12 and 13, 2018, and consisted of collecting 25 surface water samples from 16 locations. At 9 of the 16 locations, samples were collected from two depth intervals – shallow (one foot below water surface) and deep (one foot above the river bottom). The surface water locations are shown on Figure 1-3, and listed in Table 1-2. During collection of each surface water sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, ORP, turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, Nevada for analysis of the following constituents:

- Cr(VI) and dissolved chromium

- General chemistry parameters: Specific conductivity and pH
- COPCs: dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen
- In-Situ By-Products: dissolved arsenic, total and dissolved iron, and dissolved manganese
- Geochemical Parameters: dissolved barium and total suspended solids (TSS)

2.3 IM Performance Monitoring Program

IM performance monitoring in Second Quarter 2018 consisted of groundwater chromium monitoring within the floodplain area, a review of IM extraction system operation, and IM hydraulic monitoring. In addition, Cr(VI) and dissolved chromium data collected during chromium monitoring activities were used to monitor shutdown of extraction well PE-01 and evaluate the need to implement the IMCP.

2.3.1 Chromium Monitoring

Chromium monitoring was performed as part of the monthly and quarterly GMP monitoring activities. One-hundred three monitoring wells were sampled for Cr(VI) in April and May 2018. Extraction wells PE-01 and TW-03D were sampled monthly in April, May, and June 2018. The monitoring well locations are shown on Figure 1-4 and listed in Table 1-2. Cr(VI) analytical results were used to evaluate Cr(VI) distribution in the floodplain area.

2.3.2 IM Extraction System Operation

The IM extraction system was operated in April, May, and June 2018. Pumping rates, planned/unplanned downtime, and the volume of groundwater extracted from each IM extraction well were documented. Daily IM-3 inspections were performed, including general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained on site.

Wells Monitored for Conditional Shutdown of PE-01

As part of the conditional approval for PE-01 shutoff, as discussed in Section 1.4.2.1, 30 monitoring wells were sampled for Cr(VI) and dissolved chromium as part of the Second Quarter 2018 GMP program. The monitoring well locations are shown on Figure 1-2 and listed in Table 1-2. Results were evaluated against the maximum detected Cr(VI) and dissolved chromium concentrations from 2014 (or 2013 for wells sampled biennially).

2.3.3 IM Hydraulic Monitoring

Groundwater elevation data from monitoring wells and river monitoring locations within the IM hydraulic monitoring network are measured using pressure transducers, which record continuous water levels at 30-minute intervals. During the first two weeks of each month (April, May, and June 2018), pressure transducers were downloaded from the 52 monitoring wells in the IM hydraulic monitoring network, two river monitoring locations (C-I-3 and RRB), and five wells located on the Arizona side of the Colorado River. The monitoring well and river monitoring locations are shown on Figure 1-4 and listed in Table 1-2. Pressure transducers at the six gradient control monitoring wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, MW-45-095, and MW-20-130) were downloaded via a cellular telemetry system.

2.3.4 IM Contingency Plan Monitoring

As discussed in Section 1.4.2.3, 19 IMCP monitoring wells were sampled for Cr(VI) as part of the Second Quarter 2018 GMP program. The monitoring well locations are shown on Figure 1-4 and listed in Table 1-2. Results were evaluated against established trigger levels (based on historical Cr[VI] concentrations).

3 SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING RESULTS

This section summarizes results from the groundwater and surface water monitoring activities performed during Second Quarter 2018 for the GMP and RMP programs.

3.1 Groundwater Monitoring Results

3.1.1 Cr(VI) and Dissolved Chromium

Table 3-1 presents the Second Quarter 2018 groundwater sample results for Cr(VI) and dissolved chromium, as well as general chemistry parameters (specific conductivity, ORP, pH, and turbidity). The laboratory reports for samples analyzed during Second Quarter 2018 are provided in Appendix A. Historical Cr(VI) and dissolved chromium concentration data are presented in Appendix B.

Figures 3-1a, 3-1b, and 3-1c present the Second Quarter 2018 Cr(VI) results in map view for wells monitoring the upper-depth (shallow wells), mid-depth, and lower-depth (deep wells) intervals, respectively, of the Alluvial Aquifer and bedrock. These figures also show the interpreted extent of groundwater Cr(VI) concentrations higher than 32 µg/L for each depth interval. The value of 32 µg/L is based on the calculated natural background UTL for Cr(VI) in groundwater from the background study (CH2M Hill 2009c).

During Second Quarter 2018, the maximum detected Cr(VI) and dissolved chromium concentrations were 6,900 µg/L (MW-20-130) and 7,000 µg/L (MW-20-130), respectively.

3.1.2 Contaminants of Potential Concern and In Situ By-Products

Table 3-1 presents the Second Quarter 2018 groundwater sample results for COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen) and in situ by-products (dissolved arsenic and dissolved manganese). Maximum concentrations for each constituent are summarized below:

- Dissolved molybdenum: 170 µg/L (MW-46-175)
- Dissolved selenium: 350 µg/L (MW-67-185)
- Nitrate/nitrite as nitrogen: 77 milligrams per liter (mg/L; MW-67-185)
- Dissolved arsenic: 25 µg/L (MW-42-055)
- Dissolved manganese: 1,800 µg/L (MW-71-035)

3.1.3 Well Maintenance

During collection of groundwater samples in Second Quarter 2018, the monitoring wells were inspected. No corrective actions were needed. Appendix C provides a summary of the inspection results

3.2 Surface Water Monitoring Results

3.2.1 Cr(VI) and Dissolved Chromium

Table 3-2 presents the Second Quarter 2018 surface water sample results for Cr(VI) and dissolved chromium, as well as general chemistry parameters (pH and specific conductivity). Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water monitoring locations. The laboratory reports for samples analyzed during Second Quarter 2018 are provided in Appendix A.

3.2.2 Contaminants of Potential Concern and In Situ By-Products

Table 3-2 presents the Second Quarter 2018 surface water results for COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen), in situ by-products (dissolved arsenic, total iron, dissolved iron, and dissolved manganese), and other geochemical indicator parameters (barium and TSS). Maximum concentrations for each constituent are summarized below:

- Dissolved molybdenum: 5.1 µg/L (C-MAR-D and C-TAZ-S)
- Dissolved selenium: 2 µg/L (RC-R22A-D)
- Nitrate/nitrite as nitrogen: 0.43 mg/L (C-TAZ-S, C-I-3-S, R-63)
- Dissolved arsenic: 2.5 µg/L (C-TAZ-S, R-19, C-MAR-D)
- Total iron: 200 µg/L (C-MAR-D)
- Dissolved iron: non-detect at a reporting limit of 20 µg/L (all locations)
- Dissolved manganese: non-detect at a reporting limit of 0.5 µg/L (all locations)
- Dissolved barium: 120 µg/L (C-TAZ-S, R-19, R-63, C-R22A-D, C-MAR-D, C-MAR-S)
- TSS: non-detect at a reporting limit of 10 mg/L (all locations)

3.3 Data Validation and Completeness

Laboratory analytical data from the Second Quarter 2018 sampling events were reviewed by project chemists to assess data quality and to identify deviations from analytical requirements.

The following bullets summarize the notable analytical qualifications in data reported for the Second Quarter 2018:

- Twenty-seven Cr(VI) (USEPA Method 218.6) results exhibited a matrix interference issue that required a dilution to achieve satisfactory matrix spike recovery, resulting in an elevated reporting limit. No flags were applied.
- Two dissolved selenium results (MW-61-110-Q218 and MW-68-240-Q218) and one total iron result (C-NR1-D-Q218) demonstrated relative standard deviations between analyses greater than method criteria.
- Nitrate/nitrite as nitrogen was recovered at concentrations greater than quality control (QC) limits in the matrix spike (MS) of sample C-CON-D-Q218 and the matrix spike duplicate (MSD) of sample

MW-33-090-Q218. The associated parent samples were qualified as estimated detects and flagged "J".

- Dissolved chromium was recovered at concentrations lower than QC limits in the MS/SD of sample MW-23-030-Q218. The associated parent sample result was qualified as an estimated detect and flagged "J".
- Field duplicate samples were collected, analyzed, and met QC criteria except for the field duplicate pair (TW-02D-Q218/MW-910-Q218). Sulfate, dissolved magnesium, specific conductance, total dissolved solids, and total alkalinity demonstrated relative percent differences which exceed criteria. The results were qualified as estimated detects, flagged "J"
- The post digestion spike recovery for molybdenum was greater than QC criteria in sample, MW-60-125-Q218. The associated result was qualified as an estimated detect and flagged "J".
- Based on the March 2007 USEPA ruling, and reaffirmed in the May 2012 USEPA ruling, pH has a 15-minute holding time. As a result, all samples analyzed in a certified lab by Method SM4500-HB (pH) are analyzed outside the USEPA-recommended holding time. Therefore, the pH results for the Second Quarter 2018 sampling event analyzed in a certified lab are considered estimated.

No other significant analytical deficiencies were identified in the Second Quarter 2018 data. Additional details are provided in the data validation reports kept in the project file and available upon request.

4 SECOND QUARTER 2018 IM PERFORMANCE MONITORING PROGRAM EVALUATION

This section summarizes results of the Second Quarter 2018 PMP evaluation.

4.1 Distribution of Hexavalent Chromium in the Floodplain

Cr(VI) data collected as part of the Second Quarter 2018 GMP monitoring activities were used to generate maps, cross-sections, and concentration time series charts to demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment.

Distribution of Cr(VI) concentrations in the upper-depth (shallow wells), mid-depth (mid-depth wells), and lower-depth (deep wells) intervals of the Alluvial Aquifer is shown in plan-view and cross-section view (cross-section A) on Figure 4-1. Figure 4-2 presents Cr(VI) concentrations for cross-section B, oriented parallel to the Colorado River. The locations of cross-sections A and B are shown on Figure 4-1. The figures demonstrate that Cr(VI) concentrations decrease from west to east along the floodplain (cross-section A) and that concentrations greater than 20 µg/L are contained in the floodplain area.

Appendix D provides Cr(VI) concentration time series charts for wells sampled in Second Quarter 2018 and includes Cr(VI) concentration time series charts for six deep monitoring wells in the floodplain area (MW-34-100, MW-36-090, MW-36-100, MW-44-115, MW-44-125, and MW-46-175) that have historically been monitored for chromium encroachment. These six wells are located between the IM extraction wells and the Colorado River, and, therefore, show the distribution of Cr(VI) concentrations at the toe of the Cr(VI) plume. As shown by the concentration time series charts, Cr(VI) concentrations have decreased since initiation of the IM extraction system in 2005 and have remained relatively steady over the past few years. In Second Quarter 2018, Cr(VI) concentrations at the six wells were below 20 µg/L (Appendices B and D). In general, wells showing marked decreases in Cr(VI) concentration are generally located in the floodplain area where IM pumping is removing chromium in groundwater.

4.2 IM Extraction System Operation

During Second Quarter 2018, IM extraction well TW-03D was primarily operated at a target pumping rate of 135 gallons per minute (gpm) to support hydraulic control. Extraction well PE-01 was only operated for brief periods to support IM-3 system maintenance and sampling. Extraction wells TW-02S and TW-02D were not operated except for a brief period during sampling at TW-02D. The IM-3 system extracted and treated 15,716,666 gallons of groundwater during Second Quarter 2018, and an estimated 69.6 pounds (31.6 kilograms) of chromium were removed from the aquifer between March 1 and May 31, 2018 (Table 4-1). Note that groundwater extraction is reported on a different schedule than chromium removal reporting (i.e., April - June and April - May, respectively; Table 4-1). The operational runtime percentage for the IM-3 system during Second Quarter 2018 was 88.7 percent. Appendix E provides the operations log for the IM-3 system, including planned and unplanned downtime.

Extraction wells TW-03D and PE-01 (with mostly all the flow from TW-03D) operated at a combined average pumping rate of 119.8 gpm, including periods of planned and unplanned downtime. The average monthly pumping rates were 111.6 gpm (April 2018), 128.9 gpm (May 2018), and 119.0 gpm (June 2018). Table 4-1 shows the average pumping rates and total groundwater volumes pumped during Second Quarter 2018.

Chromium Concentrations in Wells Monitored for Conditional Shutdown of PE-01

During Second Quarter 2018, Cr(VI) and dissolved chromium concentrations in 25 out of 30 wells monitored were lower than the 2014 maximum concentrations. Cr(VI) concentrations detected at monitoring well TW-04 (8.9 µg/L) exceeded the 2014 maximum concentration, and dissolved chromium concentrations detected at wells MW-26 (2,400 µg/L), MW-33-040 (1.2 µg/L), MW-39-100 (54 µg/L), and MW-47-115 (23 µg/L) exceeded the respective 2014 maximum concentrations. The DTSC was notified of the exceedances at five locations via email on June 13, 2018. Shutdown of extraction well PE-01 continued through the end of the reporting period. Table 4-2 presents the Cr(VI) and dissolved chromium concentrations and their associated 2014 maximum concentrations.

4.3 IM Hydraulic Monitoring Results

Table 4-3 presents the Second Quarter 2018 average monthly and quarterly groundwater and river elevations, calculated from the pressure transducer data. Average daily groundwater and river elevations are provided as hydrographs in Appendix F. Groundwater elevations were adjusted for temperature and salinity differences among wells (i.e., adjusted to a common freshwater equivalent).

Hydraulic Gradient Evaluation: California Floodplain

Figures 4-3a, 4-3b, and 4-3c present the average Second Quarter 2018 groundwater elevations and associated groundwater contours for the shallow, mid-depth, and deep wells, respectively. Figure 4-4 presents the average groundwater elevations and associated groundwater contours for wells located in the floodplain along cross-section A. Due to complex vertical gradients present at portions of the Topock site, water levels for some wells are not considered in the contouring on Figures 4-3a, 4-3b, 4-3c, or 4-4.

During Second Quarter 2018, hydraulic gradients were measured for three gradient well pairs selected for performance monitoring of the IM-3 system (shown on Figure 1-4; note that PE-01 was not operated for hydraulic control):

- Northern Gradient Pair: MW-31-135 and MW-33-150
- Central Gradient Pair: MW-20-130 and MW-34-100
- Southern Gradient Pair: MW-20-130 and MW-27-085

As discussed in Section 1.4.2.2, a landward hydraulic gradient of 0.001 ft/ft must be maintained to demonstrate compliance with the performance standard. Table 4-4 presents the monthly average hydraulic gradients measured for each of the gradient well pairs in Second Quarter 2018, as well as the overall average of all well pairs. The overall monthly average gradients for all well pairs were 0.0040, 0.0042, and 0.0036 ft/ft for April, May, and June 2018, respectively. Landward gradients measured each month exceeded the 0.001 ft/ft requirement, as shown in Table 4-4. Figure 4-5 illustrates the measured hydraulic gradients during Second Quarter 2018 with the concurrent Colorado River elevations and IM-3 pumping rates.

Hydraulic Gradient Evaluation: Arizona Side of the Colorado River

During Second Quarter 2018, pressure transducer data were recorded in five wells located on the Arizona side of the Colorado River. The average quarterly groundwater elevations for monitoring wells MW-54-085, MW-54-140, MW-54-195, MW-55-045, and MW-55-120 are presented on Figures 4-3b and 4-3c, and are used for contouring where appropriate. With the exception of well MW-55-045, all wells in the MW-54 and MW-55 clusters are screened in the deep interval of the Alluvial Aquifer. Well MW-55-045 is

screened across portions of the shallow and middle intervals (Figure 4-3b). In Second Quarter 2018, the pressure transducer located at MW-55-120 was not functioning properly; therefore, groundwater contouring of deep wells on the Arizona side of the Colorado River was limited. However, average quarterly water levels at MW-54-085 and MW-55-045, as shown on Figures 4-3b and 4-3c, indicate that potentiometric levels in monitoring wells in Arizona are higher than those in wells across the river on the California floodplain. This indicates that the apparent hydraulic gradient on the Arizona side of the river is westward and, as a result, groundwater flow would also be toward the west in that area. This is consistent with the site conceptual model and with the current numerical groundwater flow model.

4.4 IM Contingency Plan Monitoring Results

During Second Quarter 2018, Cr(VI) and dissolved chromium concentrations in the 19 IMCP monitoring wells were lower than the established trigger levels; therefore, implementation of the contingency plan was not needed. Cr(VI) and dissolved chromium concentrations for the IMCP wells and their associated trigger levels are presented in Table 4-5.

4.5 Projected River Levels during Next Quarter

Colorado River water level projections provide river level information that is useful for anticipating IM-3 extraction requirements for the upcoming quarter. The Colorado River stage near the site is measured at river monitoring location I-3. Water levels are directly influenced by releases from Davis Dam, and, to a lesser degree, from Lake Havasu elevations, both of which are controlled by the United States Bureau of Reclamation (USBR). Total releases from Davis Dam follow a predictable annual cycle, with the largest monthly releases typically in spring and early summer and the smallest monthly releases in late fall/winter (November and December). Superimposed on this annual cycle is a diurnal cycle determined primarily by daily fluctuations in electric power demand. Releases within a given 24-hour period often fluctuate over a wider range of flows than that of monthly average flows over an entire year. Figure 4-6 shows the river stage measured at location I-3 superimposed on the projected I-3 river levels.

Projected river levels for future months are based on the USBR projections of Davis Dam discharge and Lake Havasu levels from the preceding month. For example, the projected river level for July 2018 is based on the June 2018 USBR projections of Davis Dam release and Lake Havasu level. Future projections of Colorado River stage, shown on Figure 4-6, are based on USBR long-range projections of Davis Dam releases and Lake Havasu levels from June 2018. There is more uncertainty in these projections at longer times in the future because water demand is based on various factors, including climatic factors.

Current USBR projections, presented in Table 4-6, show that the projected Davis Dam release for June 2018 (15,600 cubic feet per second) was more than the actual release in June 2018 (15,300 cubic feet per second). Based on June 2018 USBR predictions, it is anticipated that the Colorado River level at the I-3 gauge in July 2018 will be approximately 1.18 ft lower compared to the actual level in June 2018.

4.6 Second Quarter 2018 Performance Monitoring Program Evaluation Summary

A summary of the Second Quarter 2018 PMP evaluation is provided below.

- Cr(VI) isoconcentration maps indicate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are hydraulically controlled.

- IM extraction well TW-03D was primarily operated to support hydraulic control. A total of 15,716,666 gallons of groundwater were extracted by the IM-3 system, and an estimated 69.6 pounds (31.6 kilograms) of chromium were removed from groundwater.
- Cr(VI) and dissolved chromium concentrations in monitoring wells located within 800 feet of extraction well TW-03D were lower than their established trigger levels, except at five wells. The DTSC was notified with results from the five wells and shutdown of extraction well PE-01 was allowed to continue through the end of the reporting period. The seasonal cycles of Colorado River levels are associated with small fluctuations in chromium concentrations, and the changes observed at these monitoring wells are consistent with past variations over the duration of GMP monitoring.
- Groundwater potentiometric surface maps and the gradient analysis from designated well pairs provide evidence of hydraulic containment of the Cr(VI) plume. The overall monthly average landward gradients in April, May, and June 2018 were 4.0, 4.2, and 3.6 times the required minimum magnitude (0.001 ft/ft), respectively.
- Cr(VI) and dissolved chromium concentrations in the IMCP monitoring wells were lower than their established trigger levels, indicating that chromium concentrations did not increase at areas of interest across the site.

5 UPCOMING OPERATION AND MONITORING EVENTS

GMP, RMP, and PMP monitoring activities will continue under direction from the DTSC in Third Quarter 2018. Monitoring activities and results will be reported in the Third Quarter 2018 PMP-GMP Report (planned for submittal by December 15, 2018).

5.1 Groundwater Monitoring Program

5.1.1 Monthly Groundwater Monitoring

Monthly GMP monitoring events are planned for July, August, September, and October 2018 at extraction wells PE-01 and TW-03D.

5.1.2 Quarterly Groundwater Sampling

The quarterly GMP monitoring event is planned for late September/early October 2018. This event will consist of groundwater sampling and inspection of 20 monitoring wells. Any necessary corrective actions to monitoring wells will be performed in a timely manner.

If rainfall events occur in Third Quarter 2018 that cause surface water flow in Bat Cave Wash, monitoring wells MW-9, MW-10, and MW-11 will be sampled.

5.1.3 Sampling Method Trials at Select Wells

Sampling in support of the sampling method trials will be conducted at monitoring wells MW-38S, MW-60BR-245, and MW-72BR-200 in Third Quarter 2018.

5.2 Surface Water Monitoring Program

The surface water monitoring event is planned for July 2018. This event will consist of surface water sampling at 16 locations.

5.3 IM Performance Monitoring Program

5.3.1 Chromium Monitoring

Chromium monitoring will be performed as part of the Third Quarter 2018 monthly and quarterly GMP monitoring events. Cr(VI) chromium data will be collected from a total of 22 monitoring wells.

5.3.2 IM Extraction System Operation

During Third Quarter 2018, the IM-3 system will continue operating and operations will be documented. IM extraction wells TW-03D and PE-01 (as needed) will be pumped at a target rate of 135 gpm, except during periods of planned and unplanned downtime, to maintain appropriate hydraulic gradients across the Alluvial Aquifer. Extraction will be primarily from TW-03D, coupled with PE-01 only if needed to maintain gradient control during low river stages. If TW-03D and PE-01 cannot produce the target pumping rate of 135 gpm, then TW-02D and/or TW-02S may be pumped to supplement TW-03D and achieve total flow.

Third Quarter 2018 GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter for conditional PE-01 shutoff (DTSC 2015) will be compared to the 2014 (or 2013 for wells sampled biennially) maximum Cr(VI) and dissolved chromium concentrations. Results that exceed the 2014

maximum concentrations will be reported to the DTSC within 40 days after the end of the quarterly GMP sampling event.

5.3.3 IM Hydraulic Monitoring

The IM hydraulic monitoring network will continue to be used to demonstrate compliance of the required 0.001 ft/ft landward hydraulic gradient. During the first two weeks of each month, pressure transducers will be downloaded from the 52 monitoring wells in the IM hydraulic monitoring network, five wells located on the Arizona side of the Colorado River, and two river monitoring locations. Pressure transducers at the six gradient control wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, MW-45-095, and MW-20-130) will continue to be downloaded via cellular telemetry at monthly or more frequent intervals, as needed, to verify that 0.001 ft/ft landward gradients are maintained.

5.3.4 IM Contingency Plan Monitoring

Third Quarter 2018 GMP monitoring results from IMCP wells will be compared to their respective trigger levels. If any exceedances are observed, the DTSC will be notified in accordance with the Revised Contingency Plan Flow Chart (PG&E 2008).

5.4 Quarterly Notifications

An email notification will be sent to the DTSC in Third Quarter 2018 providing Cr(VI) and dissolved chromium results for monitoring wells MW-34-100, MW-44-115, MW-46-175, and MW-44-125.

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TABLES

Table 1-1

Topock Monitoring Reporting Schedule

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Period	Reporting Period	Report Submittal Date	Anticipated Number of Monitoring Locations						
			Groundwater Monitoring Program (GMP)	Surface Water Monitoring Program (RMP)	Chromium Monitoring*	Monitoring for Conditional Shutdown of PE-01*	IM Hydraulic Monitoring	IM Contingency Plan Monitoring*	IM Chemical Performance Monitoring
First Quarter	January - March	April 30	22	16	22	4	59	3	0
Second Quarter	April - June	August 15	105	16	105	30	59	19	0
Third Quarter	July - October	December 15	22	16	22	4	59	3	0
Fourth Quarter	November - December	March 15	143 annual + 2 biennial	16	143 annual + 2 biennial	47	59	24	10 annual + 1 biennial

Notes:

1. On July 23, 2010, DTSC approved a revised reporting schedule that included a revised IM-3 monitoring period (i.e., chromium removed), as follows:
   First Quarter: January - February
   Second Quarter: March - May
   Third Quarter: June - September
   Fourth Quarter: October - December

* = Monitoring consists of collecting hexavalent chromium and/or dissolved chromium data from groundwater monitoring wells; these data are collected during the GMP monitoring event.

GMP = Groundwater Monitoring Program.

DTSC = Department of Toxic Substance Control.

IM = interim measure.

RMP = Surface Water Monitoring Program.

Table 1-2
GMP, RMP, and PMP Monitoring Summary
Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location ID	Site Area	Monitoring Well Construction Details							Monitoring Programs & Frequency							Notes
											PMP Monitoring					
		Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diamter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring	RMP Monitoring	Chromium Monitoring	Monitoring for Conditional Shutdown of PE-01	IM Hydraulic Monitoring	IM Contingency Plan Monitoring	IM Chemical Performance Monitoring	
MONITORING WELLS																
MW-09	Bat Cave Wash	536.56	77 - 87	Alluvial	4 in PVC	89.4	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-10	Bat Cave Wash	530.65	74 - 94	Alluvial	4 in PVC	96.9	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-11	Bat Cave Wash	522.54	62.5 - 82.5	Alluvial	4 in PVC	86.1	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-12	East of Station	484.01	27.5 - 47.5	Alluvial	4 in PVC	50.4	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-13	Bat Cave Wash	488.64	28.5 - 48.5	Alluvial	4 in PVC	52.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-14	East Mesa	570.99	111 - 131	Alluvial	4 in PVC	133.8	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-15	East of New Ponds	641.52	180.5 - 200.5	Alluvial	4 in PVC	203.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-16	Near New Ponds	657.31	198 - 218	Alluvial	4 in PVC	218.1	Shallow	LF	Biennial	--	Biennial	--	--	--	--	
MW-17	West of Mesa Area	589.96	130 - 150	Alluvial	4 in PVC	153.6	Shallow	LF	Biennial	--	Biennial	--	--	--	--	
MW-18	West Mesa	545.32	85 - 105	Alluvial	4 in PVC	106.7	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-19	Route 66	499.92	46 - 66	Alluvial	4 in PVC	65.8	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-20-070	MW-20 bench	500.07	50 - 70	Alluvial	4 in PVC	69.6	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-20-100	MW-20 bench	500.58	89.5 - 99.5	Alluvial	4 in PVC	101.4	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-20-130	MW-20 bench	500.66	121 - 131	Alluvial	4 in PVC	132.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	Hydraulic Gradient Well
MW-21	Route 66	505.55	39 - 59	Alluvial	4 in PVC	58.5	Shallow	LF	Semiannual	--	Semiannual	--	--	Semiannual	--	Low recharge well; typically purges dry at 1 casing volume
MW-22	Floodplain	460.72	5.5 - 10.5	Fluvial	2 in PVC	12.4	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-23-060	East Ravine	504.08	50 - 60	Bedrock	2 in Sch 40 PVC	60.2	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-23-080	East Ravine	504.13	75 - 80	Bedrock	2 in Sch 40 PVC	80.8	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24A	MW-24 Bench	567.16	104 - 124	Alluvial	4 in PVC	127.5	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24B	MW-24 Bench	564.76	193 - 213	Alluvial	4 in PVC	214.8	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24BR	MW-24 Bench	563.95	378 - 437	Bedrock	4 in PVC	441.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Low recharge well; typically purges dry at 1 casing volume
MW-25	Near Bat Cave Wash	542.90	84.5 - 104.5	Alluvial	4 in PVC	106.5	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	Annual	
MW-26	Route 66	502.22	51.5 - 71.5	Alluvial	2 in PVC	70.1	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Biennial	
MW-27-020	Floodplain	460.56	7 - 17	Fluvial	2 in PVC	14.4	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-27-060	Floodplain	461.49	47.3 - 57.3	Fluvial	2 in PVC	59.0	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-27-085	Floodplain	460.99	77.5 - 87.5	Fluvial	2 in PVC	80.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	Hydraulic Gradient Well
MW-28-025	Floodplain	466.77	13 - 23	Fluvial	2 in PVC	21.1	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-28-090	Floodplain	467.53	70 - 90	Fluvial	2 in PVC	98.4	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-29	Floodplain	485.21	29.5 - 39.5	Fluvial	2 in PVC	41.5	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-30-030	Floodplain	468.12	12 - 32	Fluvial	2 in PVC	26.9	Shallow	LF	Annual	--	Annual	Annual	--	--	--	
MW-30-050	Floodplain	468.81	40 - 50	Fluvial	4 in PVC	52.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-31-060	MW-20 Bench	496.81	41.5 - 61.5	Alluvial	4 in PVC	64.0	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-31-135	MW-20 Bench	498.11	113 - 133	Alluvial	2 in PVC	135.4	Deep	LF	Annual	--	Annual	Annual	Monthly	--	--	Hydraulic Gradient Well
MW-32-020	Floodplain	461.51	10 - 20	Fluvial	2 in PVC	19.6	Shallow	LF	Annual	--	Annual	Annual	--	Annual	--	
MW-32-035	Floodplain	461.63	27.5 - 35	Fluvial	4 in PVC	37.2	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	Annual	
MW-33-040	Floodplain	487.38	29 - 39	Fluvial	2 in PVC	41.8	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-33-090	Floodplain	487.55	69 - 89	Alluvial	4 in PVC	88.3	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-33-150	Floodplain	487.77	132 - 152	Alluvial	2 in PVC	155.4	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	Hydraulic Gradient Well
MW-33-210	Floodplain	487.25	190 - 210	Alluvial	2 in PVC	223.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-34-055	Floodplain	460.95	45 - 55	Fluvial	4 in PVC	56.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	Annual	
MW-34-080	Floodplain	461.20	73 - 83	Fluvial	4 in PVC	84.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	Annual	
MW-34-100	Floodplain	460.97	89.5 - 99.5	Fluvial	2 in PVC	117.0	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	Annual	Hydraulic Gradient Well
MW-35-060	Route 66	484.33	41 - 61	Alluvial	2 in PVC	56.8	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-35-135	Route 66	484.24	116 - 136	Alluvial	2 in PVC	158.7	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-36-020	Floodplain	469.33	10 - 20	Fluvial	1 in PVC	20.3	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-040	Floodplain	469.59	30 - 40	Fluvial	1 in PVC	40.3	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-050	Floodplain	469.62	46 - 51	Fluvial	1 in PVC	108.0	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-070	Floodplain	469.27	60 - 70	Fluvial	1 in PVC	70.3	Middle	LF	Annual	--	Annual	Annual	Monthly	Annual	--	
MW-36-090	Floodplain	469.64	80 - 90	Fluvial	1 in PVC	90.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-36-100	Floodplain	469.65	88 - 98	Fluvial	2 in PVC	108.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-37D	Bat Cave Wash	486.19	180 - 200	Alluvial	2 in PVC	226.7	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-37S	Bat Cave Wash	485.97	64 - 84	Alluvial	2 in PVC	85.0	Middle	LF	Annual	--	Annual	--	--	--	--	
MW-38D	Bat Cave Wash	525.31	163 - 183	Alluvial	2 in PVC	190.9	Deep	LF, 3V	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial
MW-38S	Bat Cave Wash	526.59	75 - 95	Alluvial	2 in PVC	98.1	Shallow	LF, 3V	Quarterly	--	Quarterly	--	--	--	--	Sampling Method Trial
MW-39-040	Floodplain	468.02	30 - 40	Fluvial	1 in PVC	42.1	Shallow	LF	Annual	--	Annual	Annual	Monthly	Annual	--	
MW-39-050	Floodplain	467.93	47 - 52	Fluvial	1 in PVC	54.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-060	Floodplain	468.00	49 - 59	Alluvial	1 in PVC	15.2	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-070	Floodplain	468.02	60 - 70	Alluvial	1 in PVC	71.7	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-080	Floodplain	467.92	70 - 80	Alluvial	1 in PVC	82.6	Deep	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-100	Floodplain	468.12	80 - 100	Alluvial	2 in PVC	117.7	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-40D	I-40 Median	566.08	240 - 260	Alluvial	2 in PVC	266.0	Deep	LF, H	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial
MW-40S	I-40 Median	566.04	115 - 135	Alluvial	2 in PVC	134.0	Shallow	LF, H	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial

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PG&E Topock Compressor Station, Needles, California

Location ID	Site Area	Monitoring Well Construction Details							Monitoring Programs & Frequency							Notes
											PMP Monitoring					
		Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diamter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring	RMP Monitoring	Chromium Monitoring	Monitoring for Conditional Shutdown of PE-01	IM Hydraulic Monitoring	IM Contingency Plan Monitoring	IM Chemical Performance Monitoring	
MW-41D	Bat Cave Wash	479.42	271 - 291	Alluvial	2 in PVC	311.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-41M	Bat Cave Wash	479.84	170 - 190	Alluvial	2 in PVC	190.0	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-41S	Bat Cave Wash	480.07	40 - 60	Alluvial	2 in PVC	60.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-42-030	Floodplain	463.74	9.8 - 29.8	Fluvial	2 in Sch 40 PVC	30.1	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-42-055	Floodplain	463.85	42.5 - 52.5	Fluvial	2 in PVC	52.8	Middle	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-42-065	Floodplain	463.37	56.2 - 66.2	Fluvial	2 in PVC	80.0	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-43-025	Floodplain	462.54	15 - 25	Fluvial	2 in PVC	25.0	Shallow	LF	Annual	--	Annual	--	Monthly	--	--	
MW-43-075	Floodplain	462.71	65 - 75	Fluvial	2 in PVC	75.0	Deep	LF	Annual	--	Annual	--	--	Annual	--	
MW-43-090	Floodplain	462.76	80 - 90	Fluvial	2 in PVC	97.0	Deep	LF	Annual	--	Annual	--	Monthly	Annual	--	
MW-44-070	Floodplain	471.84	61 - 71	Fluvial	2 in PVC	70.0	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-44-115	Floodplain	471.94	105 - 115	Alluvial	2 in PVC	113.5	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	--	
MW-44-125	Floodplain	472.11	116 - 125	Alluvial	2 in PVC	128.8	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-45-095a	Floodplain	468.27	83 - 93	Fluvial	2 in PVC	97.0	Deep	--	--	--	--	X	Monthly	--	--	Pressure transducer location; Hydraulic Gradient Well
MW-46-175	Floodplain	482.16	165 - 175	Alluvial	2 in PVC	175.5	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	--	
MW-46-205	Floodplain	482.23	196.5 - 206.5	Alluvial	2 in PVC	206.5	Deep	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-47-055	Floodplain	484.04	45 - 55	Alluvial	2 in PVC	55.0	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-47-115	Floodplain	484.17	105 - 115	Alluvial	2 in PVC	115.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-48	East of Station	486.22	124 - 134	Bedrock	2 in PVC	138.0	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	Low recharge well; typically purges dry at 1 casing volume
MW-49-135	Floodplain	483.97	125 - 135	Alluvial	1.5 in PVC	135.0	Deep	LF	Annual	--	Annual	--	Monthly	--	--	
MW-49-275	Floodplain	483.95	255 - 275	Alluvial	2 in PVC	274.7	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-49-365	Floodplain	484.01	346 - 366	Alluvial	2 in PVC	367.4	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-50-095	Route 66	496.49	85 - 95	Alluvial	2 in PVC	95.0	Middle	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-50-200	Route 66	496.35	190 - 200	Alluvial	2 in PVC	204.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-51	Route 66	501.56	97 - 112	Alluvial	4 in PVC	113.3	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-52D	Floodplain	462.16	85 - 87	Fluvial	0.75 in MLABS	89.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-52M	Floodplain	462.16	66 - 68	Fluvial	0.75 in MLABS	70.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-52S	Floodplain	462.16	47 - 49	Fluvial	0.75 in MLABS	51.5	Middle	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-53D	Floodplain	461.32	123.5 - 125	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-53M	Floodplain	461.32	98.5 - 100	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-54-085	Arizona	466.10	77 - 87	Fluvial	2 in PVC	93.2	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-54-140	Arizona	465.98	128 - 138	Fluvial	2 in PVC	138.0	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-54-195	Arizona	466.32	185 - 195	Fluvial	2 in PVC	195.0	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-55-045	Arizona	465.84	37 - 47	Fluvial	2 in PVC	54.0	Middle	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-55-120	Arizona	465.82	108 - 118	Fluvial	2 in PVC	120.3	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-56D	Arizona	461.36	103.5 - 105.5	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-56M	Arizona	461.36	73.5 - 75.5	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-56S	Arizona	461.36	33.5 - 35.5	Fluvial	0.75 in MLABS	---	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-57-050	East Ravine	508.76	40 - 50	Bedrock	2 in Sch 40 PVC	50.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-57-070	East Ravine	509.37	55 - 70	Bedrock	2 in Sch 40 PVC	70.0	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-57-185	East Ravine	508.97	70 - 184	Bedrock	4 in Sch 40 PVC	184.7	Bedrock	LF, 3V	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial
MW-58-065	East Ravine	523.26	54 - 64	Bedrock	2 in Sch 40 PVC	66.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-58BR	East Ravine	---	--	Bedrock	---	---	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-59-100	East Ravine	541.61	86 - 101	Alluvial	2 in Sch 40 PVC	101.0	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-60-125	East Ravine	555.47	103 - 123	Bedrock	2 in Sch 40 PVC	122.5	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-60BR-245	East Ravine	554.95	136 - 245	Bedrock	5 in	244.1	Bedrock	LF, 3V	Quarterly	--	Quarterly	--	--	--	--	Sampling Method Trial
MW-61-110	East Ravine	544.03	92 - 112	Bedrock	2 in Sch 40 PVC	112.5	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-62-065	East Ravine	503.56	44.5 - 64.5	Bedrock	2 in Sch 40 PVC	67.4	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-62-110	East Ravine	504.05	85 - 110	Bedrock	---	110.0	Bedrock	G	Quarterly	--	Quarterly	--	--	--	--	
MW-62-190	East Ravine	504.05	155 - 192	Bedrock	---	190.0	Bedrock	3V	Semiannual	--	Semiannual	--	--	--	--	
MW-63-065	East Ravine	504.47	46 - 66	Bedrock	2 in Sch 40 PVC	65.6	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-64BR	East Ravine	575.60	2 - 258	Bedrock	3 in	260.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-65-160	Topock Compressor Station	596.59	150 - 160	Alluvial	2 in PVC	160.1	Shallow	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-65-225	Topock Compressor Station	596.58	215 - 225	Alluvial	2 in PVC	225.1	Deep	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-66-165	Topock Compressor Station	586.16	142 - 162	Alluvial	2 in PVC	162.1	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-66-230	Topock Compressor Station	586.22	218 - 228	Alluvial	2 in PVC	228.1	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-66BR-270	Topock Compressor Station	586.15	248 - 271	Bedrock	5 in	270.6	Bedrock	3V	Semiannual	--	Semiannual	--	--	--	--	
MW-67-185	Topock Compressor Station	625.91	177 - 187	Alluvial	2 in	186.7	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-67-225	Topock Compressor Station	625.83	210 - 225	Alluvial	2 in PVC	225.0	Middle	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-67-260	Topock Compressor Station	625.81	250 - 260	Alluvial	2 in PVC	260.0	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-68-180	Topock Compressor Station	621.17	165 - 180	Alluvial	2 in PVC	180.1	Shallow	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-68-240	Topock Compressor Station	621.17	220 - 240	Alluvial	2 in PVC	240.1	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-68BR-280	Topock Compressor Station	620.64	257 - 279	Bedrock	5 in	278.2	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-69-195	Topock Compressor Station	631.36	176 - 196	Bedrock	2 in	195.5	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	

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Location ID	Site Area	Monitoring Well Construction Details							Monitoring Programs & Frequency							Notes
											PMP Monitoring					
		Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diamter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring	RMP Monitoring	Chromium Monitoring	Monitoring for Conditional Shutdown of PE-01	IM Hydraulic Monitoring	IM Contingency Plan Monitoring	IM Chemical Performance Monitoring	
MW-70-105	East Ravine	541.47	85 - 105	Bedrock	2 in PVC	107.8	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-70BR-225	East Ravine	539.84	120 - 227	Bedrock	5 in	229.3	Bedrock	LF, 3V	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial
MW-71-035	East Ravine	483.69	26 - 36	Alluvial	2 in	36.2	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-72-080	East Ravine	513.32	60 - 80	Bedrock	2 in	80.1	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-72BR-200	East Ravine	513.79	107 - 200	Bedrock	---	200.0	Bedrock	LF, 3V	Quarterly	--	Quarterly	--	--	--	--	Sampling Method Trial
MW-73-080	East Ravine	505.84	60.2 - 80.2	Bedrock	2 in	79.9	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-74-240	East Ravine	672.34	220 - 240	Bedrock	2 in	239.7	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
OW-03D	West Mesa	558.63	242 - 262	Alluvial	2 in Sch 40 PVC	272.5	Deep	LF	Annual	--	Annual	--	--	--	--	
OW-03M	West Mesa	558.9	180 - 200	Alluvial	2 in Sch 40 PVC	200.3	Middle	LF	Annual	--	Annual	--	--	--	--	
OW-03S	West Mesa	558.58	86 - 116	Alluvial	2 in Sch 40 PVC	116.3	Shallow	3V	Annual	--	Annual	--	--	--	--	
PGE-07BR	MW-24 Bench	--	249 - 300	Bedrock	7 in	300.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Inactive supply well
PGE-8	Station	596.01	405-554	Bedrock	6.75 in Steel	564.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Inactive injection well
PT-2D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
PT-5D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
PT-6D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
TEST AND EXTRACTON WELLS																
PE-01	Floodplain	457.52	79 - 89	Fluvial	6 in Sch 40	99.0	Deep	tap	Monthly	--	Monthly	Monthly	--	--	--	IM extraction well
TW-01	Plan B Test	620.55	169 - 269	Alluvial	5 in PVC	271.0	Shallow	3V	Semiannual	--	Semiannual	--	--	--	--	Inactive pilot test well
TW-02D	MW-20 bench	493.29	113 - 148	Alluvial	6 in Sch 80 PVC	150.0	Deep	tap	Quarterly	--	Quarterly	--	--	--	--	IM extraction well
TW-02S	MW-20 bench	499.05	42.5 - 92.5	Alluvial	6 in Sch 80 PVC	97.5	Shallow	tap	Annual	--	Annual	--	--	--	--	IM extraction well
TW-03D	MW-20 bench	498.09	111 - 156	Alluvial	8 in PVC	156.0	Deep	tap	Monthly	--	Monthly	--	--	--	--	IM extraction well
TW-04	Floodplain	484.11	210 - 250	Alluvial	4 in PVC	255.0	Deep	LF, 3V	Semiannual	--	Semiannual	Semiannual	--	--	--	Sampling Method Trial
TW-05	Route 66	496.30	110 - 150	Alluvial	4 in PVC	155.0	Deep	LF, 3V	Semiannual	--	Semiannual	--	--	--	--	Sampling Method Trial
WATER SUPPLY WELLS																
Park Moabi-3	Park Moabi	518.55	80 - 200	Alluvial	8 in Steel	252.0	Middle	tap	Annual	--	Annual	--	--	--	--	Active supply well
Park Moabi-4	Park Moabi	---	93 - 140	Alluvial	Steel	---	Middle	tap	Annual	--	Annual	--	--	--	--	Active supply well
SURFACE WATER MONITORING LOCATIONS																
C-BNS	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
C-CON	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-I-3	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	Monthly	--	--	Deep and shallow depth intervals
C-MAR	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR1	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR3	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR4	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-R22A	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-R27	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-TAZ	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
R-28	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	Annual	
R-19	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
R-63	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
RRB	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	Monthly	--	--	
SW-1	Other Surface Water Monitoring Location	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
SW-2	Other Surface Water Monitoring Location	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	

Notes:
1. On June 27, 2014, DTSC approved discontinuation of groundwater sampling at monitoring well MW-45-095a. This location was originally included in the list of wells monitored for conditional shutdown of PE-01.

-- = not applicable.
3V = three volume.
amsl = above mean sea level.
bgs = below ground surface.
Deep = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
ft = feet.
G = grab sample.
GMP = Groundwater Monitoring Program.
H = HydraSleeve
ID = identification.
IM = interim measure.
LF = low flow (minimal drawdown).
Middle = mid-depth interval of Alluvial Aquifer.
PMP = Performance Monitoring Program.
RMP = Surface Water Monitoring Program.
Shallow = shallow interval of Alluvial Aquifer.
Tap = sampled from tap of extraction well.

Table 3-1

Groundwater Sampling Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	COPCs			In Situ Byproducts		Selected Field Parameters		
								Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-09	SA	5/2/2018		LF	150	140	3,000	4.3	5	11	1.7	ND (0.5)	95	7.1	5
MW-10	SA	5/2/2018		LF	170	160	2,700	21	6.1	10	---	---	95	6.9	20
MW-11	SA	5/2/2018		LF	57	53	2,200	5.2	4.6	5	1.3	ND (0.5)	100	6.4	11
MW-11	SA	5/2/2018	FD	---	58	55	2,200	5.3	4.7	5.5	1.3	ND (0.5)	---	---	---
MW-12	SA	5/1/2018		LF	1,500	1,600	6,800	8	29	16	---	---	93	7.7	15
MW-14	SA	5/1/2018		LF	13	14	2,500	12	2.1	3.8	0.73	ND (0.5)	140	7.2	38
MW-19	SA	4/27/2018		LF	370	380	2,000	---	---	---	---	---	91	7.6	6
MW-20-070	SA	4/27/2018		LF	1,700	1,700	1,800	31	5.6	9.4	---	---	-63	7.9	3
MW-20-100	MA	4/27/2018		LF	1,800	1,800	2,100	3.6	6.3	8.7	---	---	-72	7.6	3
MW-20-130	DA	4/27/2018		LF	6,900	7,000	11,000	45	28	11	4.5	3.6	-81	7.7	7
MW-21	SA	5/2/2018		LF	ND (1)	1	13,000	59	25	1.5	---	---	51	6.9	71
MW-21	SA	5/2/2018	FD	---	ND (1)	ND (1)	13,000	59	22	1.6	---	---	---	---	---
MW-22	SA	4/23/2018		LF	ND (1)	ND (5)	10,000	---	---	---	14	1,700	-98	7.1	22
MW-23-060	BR	4/26/2018		LF	39	37 J	15,000	---	---	---	3.9	4.2	-90	9.3	5
MW-23-080	BR	4/26/2018		LF	ND (1)	1.5	15,000	---	---	---	5.5	5.2	-84	11	7
MW-24A	SA	5/2/2018		LF	ND (0.2)	ND (1)	1,700	140	ND (0.5)	0.051	ND (0.1)	16	-110	8.0	5
MW-24B	DA	5/2/2018		LF	200	200	19,000	62	2	1.4	3.1	100	-52	7.5	4
MW-25	SA	5/1/2018		LF	68	65	2,000	3.3	8.5	12	1.3	ND (0.5)	85	7.3	11
MW-26	SA	5/1/2018		LF	2,300	2,400	3,700	31	41	20	1.9	ND (0.5)	180	7.0	7
MW-27-085	DA	4/24/2018		LF	ND (1)	ND (1)	9,400	18	ND (0.5)	ND (0.05)	1.5	83	-25	7.3	6
MW-28-025	SA	4/25/2018		LF	ND (0.2)	ND (1)	1,000	4.2	ND (0.5)	0.05	0.88	28	-74	7.6	1
MW-28-025	SA	4/25/2018	FD	---	ND (0.2)	ND (1)	1,000	4.2	ND (0.5)	ND (0.05)	0.86	28	---	---	---
MW-28-090	DA	4/25/2018		LF	ND (0.2)	ND (1)	6,100	23	ND (0.5)	ND (0.05)	1.8	190	-95	7.3	7
MW-29	SA	4/25/2018		LF	ND (0.2)	ND (1)	2,900	19	ND (0.5)	ND (0.05)	9.8	360	-180	7.2	4
MW-31-060	SA	4/27/2018		LF	380	390	3,200	---	---	---	1.1	ND (0.5)	-76	7.7	5
MW-32-035	SA	4/23/2018		LF	ND (1)	ND (1)	8,100	---	---	---	5.9	1,200	-92	7.5	24
MW-33-040	SA	4/25/2018		LF	ND (1)	1.2	8,100	130	ND (0.5)	ND (0.05)	11	18	52	7.6	6
MW-33-090	MA	4/24/2018		LF	3.3	3.8	8,900	9.8	ND (0.5)	0.99 J	1.1	3	58	7.2	15
MW-33-150	DA	4/25/2018		LF	5.2	5	14,000	47	0.79	1.3	1.4	23	-96	7.5	2
MW-33-210	DA	4/25/2018		LF	6	5.9	18,000	20	ND (2.5)	1.4	1.2	7.2	-94	7.5	3
MW-34-080	DA	4/24/2018		LF	ND (1)	ND (1)	7,400	---	---	ND (0.05)	1.5	48	-84	7.3	---
MW-34-100	DA	4/24/2018		LF	ND (1)	1.1	9,100	47	ND (0.5)	ND (0.05)	1.5	150	7.5	7.5	5
MW-34-100	DA	4/24/2018	FD	---	ND (1)	1.3	8,800	44	ND (0.5)	ND (0.05)	1.4	150	---	---	---
MW-35-060	SA	4/27/2018		LF	22	24	5,900	10	ND (2.5)	2.2	1.1	ND (0.5)	56	7.3	27
MW-35-135	DA	4/27/2018		LF	26	25	10,000	19	ND (2.5)	2.7	0.83	1.5	47	7.5	10
MW-36-090	DA	4/24/2018		LF	ND (0.2)	ND (1)	4,300	---	---	---	3.9	83	-78	7.4	1
MW-36-100	DA	4/24/2018		LF	6.6	11	5,700	22	ND (0.5)	ND (0.05)	4.3	330	-42	7.4	12
MW-37D	DA	5/3/2018		LF	7.4	7.1	14,000	53	ND (0.5)	0.44	---	---	48	7.6	4
MW-38D	DA	5/2/2018		3V	15	14	21,000	88	ND (0.5)	ND (0.05)	7.4	38	-62	7.5	14
MW-38D	DA	5/2/2018		LF	15	14	22,000	85	ND (0.5)	ND (0.05)	7.2	29	-58	7.5	24
MW-38S	SA	5/2/2018		3V	1.1	1.3	1,700	32	3.2	4.7	6.4	46	23	7.7	2
MW-38S	SA	5/2/2018		LF	1.8	2	1,700	31	3.7	4.5	6.3	37	22	7.3	5
MW-39-100	DA	4/24/2018		LF	57	54	12,000	7.1	ND (0.5)	ND (0.05)	2.3	5.1	-87	7.1	9

Table 3-1

Groundwater Sampling Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	COPCs			In Situ Byproducts		Selected Field Parameters		
								Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-40D	DA	4/25/2018		H	25	31	15,000	45	ND (2.5)	0.55	4.3	33	-91	6.8	12
MW-40D	DA	4/25/2018		LF	120	120	16,000	50	1.8	2.7	4.4	5.1	-6.2	7.2	4
MW-40S	SA	4/25/2018		H	18	17	1,600	26	5.7	14	4	ND (0.5)	100	7.0	11
MW-40S	SA	4/25/2018		LF	20	20	1,700	27	6.1	9.5	3.9	0.5	86	7.5	7
MW-41D	DA	5/4/2018		LF	ND (1)	ND (1)	19,000	93	ND (0.5)	0.44	2.2	73	-26	7.3	5
MW-42-055	MA	4/24/2018		LF	ND (0.2)	ND (1)	930	---	---	---	25	17	-28	8.7	6
MW-42-065	MA	4/24/2018		LF	ND (0.2)	ND (1)	2,000	---	---	---	12	170	-61	7.7	6
MW-44-070	MA	4/24/2018		LF	ND (0.2)	ND (1)	1,800	---	---	---	3.1	150	-84	8.0	13
MW-44-115	DA	4/24/2018		LF	8.9	9.5	10,000	74	ND (0.5)	0.13	5.3	9.7	68	7.2	9
MW-44-125	DA	4/24/2018		LF	ND (0.2)	3.1	2,000	12	ND (0.5)	ND (0.05)	2.8	170	-91	7.9	5
MW-46-175	DA	4/25/2018		LF	7.4	8.3	19,000	170	ND (2.5)	1.1	---	---	36	8.5	10
MW-46-205	DA	4/25/2018		LF	ND (1)	ND (1)	22,000	---	---	---	---	---	89	8.4	3
MW-47-055	SA	4/26/2018		LF	15	15	4,200	---	---	---	1	ND (0.5)	45	7.3	9
MW-47-055	SA	4/26/2018	FD	---	14	14	4,300	---	---	---	0.98	ND (0.5)	---	---	---
MW-47-115	DA	4/25/2018		LF	23	23	13,000	---	---	---	---	---	-89	7.7	10
MW-48	BR	5/3/2018		LF	ND (1)	ND (1)	15,000	---	---	---	---	---	200	7.6	9
MW-50-095	MA	4/27/2018		LF	11	10	5,000	---	---	---	---	---	79	7.7	46
MW-50-200	DA	4/27/2018		LF	6,500	6,800	20,000	---	---	---	---	---	85	7.6	10
MW-51	MA	5/1/2018		LF	3,500	3,700	12,000	47	15	8.9	4	4.5	120	7.1	2
MW-52D	DA	4/23/2018		LF	ND (1)	ND (5)	20,000	---	---	---	4.1	260	120	1.0	1
MW-52M	DA	4/23/2018		LF	ND (1)	ND (5)	14,000	---	---	---	0.98	160	51	5.0	1
MW-52S	MA	4/24/2018		LF	ND (1)	ND (1)	19,000	---	---	---	3	230	-91	8.0	1
MW-53D	DA	4/23/2018		LF	ND (1)	ND (1)	24,000	---	---	---	2.9	1,400	110	2.9	1
MW-53M	DA	4/23/2018		LF	ND (1)	ND (1)	18,000	---	---	---	4.8	400	140	3.1	2
MW-54-085	DA	5/4/2018	(a)	LF	ND (0.1)	ND (0.2)	7,390	---	---	---	4.34	556	-89	7.7	8
MW-54-140	DA	5/4/2018	(a)	LF	ND (0.5)	ND (0.2)	11,300	---	---	---	3.14	103	44	7.4	8
MW-54-195	DA	5/4/2018	(a)	LF	ND (0.5)	ND (0.2)	17,200	---	---	---	1.01	232	-260	8.1	9
MW-55-045	MA	5/3/2018	(a)	LF	ND (0.1)	ND (0.2)	1,250	---	---	---	---	---	-100	7.6	18
MW-55-120	DA	5/3/2018	(a)	LF	8	8.35	6,710	---	---	---	---	---	54	7.9	5
MW-56D	DA	5/2/2018	(a)	LF	ND (0.5)	ND (0.2)	19,000	---	---	---	---	---	-49	6.8	2
MW-56M	DA	5/2/2018	(a)	LF	ND (0.5)	ND (0.2)	12,600	---	---	---	---	---	-89	6.4	7
MW-56S	SA	5/2/2018	(a)	LF	ND (0.1)	ND (0.2)	5,110	---	---	---	---	---	-100	7.2	7
MW-57-070	BR	5/3/2018		LF	340	360	2,500	5	3.5	8.8	1.2	1.6	150	7.1	19
MW-57-185	BR	5/3/2018		3V	7.7	7.5	18,000	91	ND (0.5)	ND (0.05)	13	240	-46	9.0	2
MW-57-185	BR	5/3/2018		LF	5.3	5.2	17,000	86	ND (0.5)	ND (0.05)	4.2	12	51	10	19
MW-58BR	BR	5/3/2018		LF	9.3	9.2	7,800	26	1.9	0.87	1.7	280	88	7.4	7
MW-59-100	SA	5/3/2018		LF	2,800	3,000	11,000	7.3	2.8	2.5	2.2	1.4	100	6.5	12
MW-60-125	BR	5/2/2018		LF	510	470	8,400	21 J	4.4	3	1.7	2.9	-79	7.5	40
MW-60BR-245	BR	5/2/2018		3V	73	67	16,000	57	2.6	0.16	8.2	9.6	-80	8.2	6
MW-60BR-245	BR	5/2/2018		LF	1.2	1.7	16,000	61	2.3	0.063	5.2	21	-80	8.2	6
MW-61-110	BR	5/4/2018		LF	330	340	15,000	25	1.1 J	0.53	3.2	130	-43	7.0	4
MW-62-065	BR	5/1/2018		LF	520	530	5,900	15	3.8	4.1	1.4	4.3	-70	7.9	25
MW-62-110	BR	5/3/2018		G	ND (1)	ND (1)	13,000	70	ND (0.5)	ND (0.05)	4.4	160	54	7.3	5

Table 3-1

Groundwater Sampling Results, Second Quarter 2018

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PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	COPCs			In Situ Byproducts		Selected Field Parameters		
								Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-62-190	BR	5/3/2018		G	ND (1)	ND (1)	18,000	48	ND (0.5)	ND (0.05)	1.4	820	-36	7.3	6
MW-63-065	BR	4/26/2018		LF	0.85	1.3	6,000	18	0.78	0.97	1.5	14	64	6.9	15
MW-64BR	BR	5/2/2018		LF	ND (1)	ND (1)	13,000	65	ND (0.5)	ND (0.05)	3.5	850	-91	6.9	23
MW-65-160	SA	4/30/2018		LF	160	170	3,700	53	8.5	11	0.85	21	66	7.1	7
MW-65-225	DA	4/30/2018		LF	110	100	17,000	54	1.4	1.9	2.9	56	82	7.3	27
MW-66-165	SA	4/30/2018		LF	540	540	3,900	6.9	31	24	1.2	ND (0.5)	-92	7.4	45
MW-66-230	DA	4/30/2018		LF	6,700	6,900	17,000	83	17	22	6.4	4.5	-100	7.7	3
MW-66-230	DA	4/30/2018	FD	---	6,800	6,900	17,000	82	17	23	6	4.3	---	---	---
MW-66BR-270	BR	5/2/2018		3V	ND (1)	ND (1)	17,000	3.1	ND (0.5)	ND (0.05)	ND (0.1)	620	-90	7.8	71
MW-67-185	SA	4/30/2018		LF	1,800	1,700	7,300	7.6	350	77	0.96	ND (0.5)	140	6.9	20
MW-67-225	MA	4/30/2018		LF	2,800	2,800	6,900	48	89	27	3.5	7.4	110	7.3	35
MW-67-260	DA	4/30/2018		LF	820	830	18,000	80	0.96	0.46	9.1	130	-25	7.6	7
MW-68-180	SA	5/1/2018		LF	5,600	6,100	3,300	35	11	11	3.2	ND (0.5)	100	7.3	35
MW-68-240	DA	5/1/2018		LF	2,000	2,100	15,000	24	4.1 J	4.6	1.9	28	160	7.0	2
MW-68BR-280	BR	5/1/2018		LF	ND (1)	ND (5)	20,000	55	ND (2.5)	ND (0.05)	1.5	48	-160	8.6	14
MW-69-195	BR	5/1/2018		LF	210	210	3,100	60	14	18	2	ND (0.5)	140	7.0	4
MW-70-105	BR	5/3/2018		LF	160	150	3,300	71	4.9	4.4	4	1.5	-74	7.9	10
MW-70BR-225	BR	5/3/2018		3V	1,800	1,800	13,000	19	2.5	3.6	1.9	1.2	-82	7.6	2
MW-70BR-225	BR	5/3/2018		LF	1,300	1,300	12,000	20	2.4	3.1	1.5	12	-77	7.1	10
MW-71-035	SA	5/2/2018		LF	ND (1)	ND (1)	16,000	21	ND (0.5)	ND (0.05)	2.7	1,800	-33	6.5	116
MW-72-080	BR	4/26/2018		LF	68	62	15,000	75	ND (2.5)	0.5	11	69	-81	8.4	3
MW-72BR-200	BR	4/26/2018		3V	3.3	2.6	14,000	67	ND (2.5)	0.15	14	57	-190	7.9	7
MW-72BR-200	BR	4/26/2018		LF	ND (1)	2	15,000	75	ND (2.5)	0.058	14	110	-170	8.2	13
MW-73-080	BR	5/1/2018		LF	57	58	11,000	25	4.4	3.7	1.5	24	58	6.2	13
MW-74-240	BR	5/2/2018		LF	0.46	ND (1)	860	23	2.3	2.2	8.1	4.3	36	8.6	67
PE-01	DA	4/3/2018		Tap	ND (0.2)	ND (1)	2,600	---	---	0.057	---	530	55	8.1	2
PE-01	DA	5/4/2018		Tap	ND (0.2)	1.8	1,800	---	---	ND (0.05)	---	310	180	7.1	7
PE-01	DA	6/7/2018		Tap	ND (0.2)	ND (1)	1,200	---	---	ND (0.05)	---	440	---	---	1
R-28	0	6/12/2018		G	ND (0.2)	ND (1)	920	4.6	1.5	0.36	2.4	ND (0.5)	100	8.2	2
TW-01	SA	5/1/2018		3V	2,400	3,100	7,300	15	14	16	---	---	-58	7.5	3
TW-02D	DA	5/4/2018		Tap	150	150	3,900 J	10	2.2	---	---	3.2 J	160	7.1	5
TW-02D	DA	5/4/2018	FD	---	150	140	5,000 J	11	2.3	---	---	5.7 J	---	---	---
TW-03D	DA	4/3/2018		Tap	570	550	8,300	---	---	2	---	19	110	7.5	3
TW-03D	DA	5/4/2018		Tap	490	490	7,200	---	---	2.7	---	13	170	7.0	8
TW-03D	DA	6/7/2018		Tap	470	480	7,200	---	---	2.7	---	14	93	7.5	1
TW-04	DA	4/26/2018		3V	8.9	9.4	20,000	59	ND (2.5)	---	---	45	-89	7.8	3
TW-04	DA	4/26/2018		LF	ND (1)	ND (5)	20,000	68	ND (2.5)	---	---	160	-71	7.8	32

Table 3-1

Groundwater Sampling Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	COPCs: Dissolved Molybdenum (µg/L)	COPCs: Dissolved Selenium (µg/L)	COPCs: Nitrate/Nitrite as Nitrogen (mg/L)	In Situ Byproducts: Dissolved Arsenic (µg/L)	In Situ Byproducts: Dissolved Manganese (µg/L)	Selected Field Parameters: ORP (mV)	Selected Field Parameters: Field pH (SU)	Selected Field Parameters: Turbidity (NTU)
TW-05	DA	5/1/2018		3V	11	11	11,000	31	ND (2.5)	---	---	1.8	-74	8.1	6
TW-05	DA	5/1/2018		LF	8.8	9.1	11,000	30	ND (0.5)	---	---	5	-73	8.1	20

Notes:

(a) Samples collected in Arizona and analyzed at a laboratory approved by the Arizona Department of Heath Services.

1. Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.
2. ORP is reported to two significant figures. Specific conductance is reported to three significant figures.
3. The following analytical methods were used:
   Hexavalent chromium = USEPA 218.6
   Arizona Samples: dissolved chromium, dissolved arsenic, dissolved manganese = SW6020a
   California Samples: dissolved chromium, dissolved arsenic, dissolved manganese = SW6020
   PE-01/TW-03D: dissolved chromium, dissolved manganese = USEPA 200.8
   Specific conductance = USEPA 120.1
   Dissolved selenium = SW6020
   Nitrate/Nitrate as Nitrogen = SM 4500-NO3 F

-- = not applicable.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.
3V = three volume.
BR = bedrock.
COPC = constituent of potential concern.
DA = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
G = Grab sample.
H = HydraSleeve.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown)
MA = mid-depth interval of Alluvial Aquifer.
mV = millivolts.
ND = not detected at listed reporting limit.
NTU = nephelometric turbidity units.
ORP = oxidation-reduction potential.
SA = shallow interval of Alluvial Aquifer.
SU = standard units.
Tap = sampled from tap of extraction well.
USEPA = United States Environmental Protection Agency.

Table 3-2

Surface Water Sampling Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Sample Type	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Field pH (SU)	Specific Conductance (µS/cm)	COPCs			In Situ Byproducts				Geochemical Indicators	
							Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/ Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Iron (µg/L)	Iron (µg/L)	Dissolved Manganese (µg/L)	Dissolved Barium (µg/L)	Total Suspended Solids (mg/L)
IN-CHANNEL LOCATIONS															
C-BNS	06/12/18		ND (0.2)	ND (1)	8.2	900	4.8	1.8	0.41	2.4	ND (20)	44	ND (0.5)	110	ND (10)
C-CON-D	06/13/18		ND (0.2)	ND (1)	8.1	900	4.8	1.8	0.38 J	2.4	ND (20)	22	ND (0.5)	110	ND (10)
C-CON-S	06/13/18		ND (0.2)	ND (1)	8.1	890	4.7	1.8	0.37	2.4	ND (20)	ND (20)	ND (0.5)	110	ND (10)
C-I-3-D	06/12/18		ND (0.2)	ND (1)	8.1	910	4.6	1.7	0.42	2.3	ND (20)	42	ND (0.5)	110	ND (10)
C-I-3-S	06/12/18		ND (0.2)	ND (1)	8.1	910	4.6	1.7	0.43	2.3	ND (20)	63	ND (0.5)	110	ND (10)
C-MAR-D	06/13/18		ND (0.2)	ND (1)	8.0	890	5.1	1.7	0.37	2.5	ND (20)	170	ND (0.5)	120	ND (10)
C-MAR-D	06/13/18	FD	ND (0.2)	ND (1)	--	890	4.7	1.5	0.39	2.3	ND (20)	200	ND (0.5)	110	ND (10)
C-MAR-S	06/13/18		ND (0.2)	ND (1)	8.0	890	5	1.8	0.4	2.4	ND (20)	190	ND (0.5)	120	ND (10)
C-NR1-D	06/13/18		ND (0.2)	ND (1)	8.2	900	4.8	1.7	0.36	2.3	ND (20)	22 J	ND (0.5)	110	ND (10)
C-NR1-S	06/13/18		ND (0.2)	ND (1)	8.2	900	4.7	1.7	0.36	2.3	ND (20)	ND (20)	ND (0.5)	110	ND (10)
C-NR3-D	06/13/18		ND (0.2)	ND (1)	8.1	890	4.6	1.7	0.4	2.1	ND (20)	ND (20)	ND (0.5)	110	ND (10)
C-NR3-S	06/13/18		ND (0.2)	ND (1)	8.1	900	4.7	1.6	0.35	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (10)
C-NR4-D	06/13/18		ND (0.2)	ND (1)	8.1	920	4.7	1.6	0.41	2.3	ND (20)	24	ND (0.5)	110	ND (10)
C-NR4-S	06/13/18		ND (0.2)	ND (1)	8.1	900	4.8	1.7	0.42	2.3	ND (20)	27	ND (0.5)	110	ND (10)
C-R22A-D	06/12/18		ND (0.2)	ND (1)	8.2	920	5	2	0.41	2.4	ND (20)	34	ND (0.5)	120	ND (10)
C-R22A-S	06/12/18		ND (0.2)	ND (1)	8.2	910	4.8	1.7	0.4	2.4	ND (20)	44	ND (0.5)	110	ND (10)
C-R27-D	06/12/18		ND (0.2)	ND (1)	8.2	920	4.8	1.9	0.38	2.4	ND (20)	45	ND (0.5)	110	ND (10)
C-R27-S	06/12/18		ND (0.2)	ND (1)	8.2	920	4.7	1.7	0.36	2.3	ND (20)	38	ND (0.5)	110	ND (10)
C-TAZ-D	06/12/18		ND (0.2)	ND (1)	7.8	920	4.7	1.8	0.41	2.3	ND (20)	25	ND (0.5)	110	ND (10)
C-TAZ-S	06/12/18		ND (0.2)	ND (1)	8.0	920	5.1	1.7	0.43	2.5	ND (20)	20	ND (0.5)	120	ND (10)
SHORELINE LOCATIONS															
R-19	06/13/18		ND (0.2)	ND (1)	8.1	890	5	1.7	0.41	2.5	ND (20)	24	ND (0.5)	120	ND (10)
R-28	06/12/18		ND (0.2)	ND (1)	8.2	920	4.6	1.5	0.36	2.4	ND (20)	76	ND (0.5)	110	ND (10)
R-63	06/12/18		ND (0.2)	ND (1)	8.2	920	4.8	1.6	0.43	2.4	ND (20)	57	ND (0.5)	110	ND (10)
R-63	06/12/18	FD	ND (0.2)	ND (1)	--	910	4.9	1.7	0.36	2.4	ND (20)	30	ND (0.5)	120	ND (10)
RRB	06/13/18		ND (0.2)	ND (1)	8.1	890	4.7	1.6	0.42	2.2	ND (20)	23	ND (0.5)	110	ND (10)
OTHER SURFACE WATER LOCATIONS															
SW-1	06/12/18		ND (0.2)	ND (1)	7.7	960	--	--	--	--	--	--	--	--	--
SW-2	06/12/18		ND (0.2)	ND (1)	7.6	980	--	--	--	--	--	--	--	--	--
SW-2	06/12/18	FD	ND (0.2)	ND (1)	--	960	--	--	--	--	--	--	--	--	--

Notes:

1. Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.
2. The following analytical methods were used:
   - Hexavalent chromium = USEPA 218.6
   - Dissolved chromium, dissolved arsenic, dissolved barium = SW6020
   - Dissolved iron, total iron, dissolved manganese, dissolved molybdenum = SW6010B
   - Specific conductance = USEPA 120.1
   - Dissolved selenium = SW6020A
   - Nitrate/Nitrate as Nitrogen = SM 4500-NO3 F
   - Total suspended solids = SM 2540D

-- = not applicable.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.
COPC = constituent of potential concern.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
ND = not detected at listed reporting limit.
SU = standard units.
USEPA = United States Environmental Protection Agency.

Printed: 7/31/2018

TABLE 4-1
Pumping Rate and Extracted Volume for IM System, Second Quarter 2018
Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Extraction Well ID	April 2018		May 2018		June 2018		Second Quarter 2018	
	Average Pumping Rate[a] (gpm)	Volume Pumped (gal)	Average Pumping Rate[a] (gpm)	Volume Pumped (gal)	Average Pumping Rate[a] (gpm)	Volume Pumped (gal)	Average Pumping Rate[a] (gpm)	Volume Pumped (gal)
TW-02S	0.00	0	0.00	0	0.00	0	0.00	0
TW-02D	0.00	0	0.00	42	0.00	0	0.00	42
TW-03D	111.55	4,819,173	128.94	5,755,987	119.00	5,140,616	119.83	15,715,776
PE-01	0.00	183	0.01	298	0.01	367	0.01	848
TOTAL	**111.6**	**4,819,356**	**128.9**	**5,756,326**	**119.0**	**5,140,983**	**119.8**	**15,716,666**

Chromium Removed This Quarter (kg)	31.6
Chromium Removed Project to Date (kg)	4180
Chromium Removed This Quarter (lb)	69.6
Chromium Removed Project to Date (lb)	9220

Notes:
DTSC = Department of Toxic Substances Control.
gal = gallons.
gpm = gallons per minute.
IM = Interim Measures.
kg = kilograms.
lb = pounds.

[a] The "Average Pumping Rate" is the overall average during the reporting period, including system downtime, based on flow meter readings.

Chromium removed includes the period of March 1, 2018 through May 31, 2018. On July 23, 2010, DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from March 1, 2018 through May 31, 2018.

Table 4-2

Wells Monitored for Conditional Shutdown of PE-01, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Sample Method	Hexavalent Chromium		Dissolved Chromium		Exceeded 2014 Maximum Concentration?
			2014 Maximum Concentration (µg/L)	Q2 2018 Result (µg/L)	2014 Maximum Concentration (µg/L)	Q2 2018 Result (µg/L)	
WELLS IN SHALLOW ZONE OF ALLUVIAL AQUIFER							
MW-20-070	4/27/2018	LF	2,200	1,700	2,400	1,700	No
MW-26	5/1/2018	LF	2,400	2,300	2,300	2,400	Yes
MW-27-020	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-28-025	4/25/2018	LF	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	No
MW-30-030	--	--	0.21	NS	ND (1.0)	NS	--
MW-31-060	4/27/2018	LF	600	380	660	390	No
MW-32-020	--	--	ND (1.0)	NS	ND (5.0)	NS	--
MW-32-035	4/23/2018	LF	ND (1.0)	ND (1)	ND (1.0)	ND (1)	No
MW-33-040	4/25/2018	LF	0.28	ND (1)	ND (1.0)	1.2	Yes
MW-36-020	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-36-040	--	--	0.34	NS	ND (1.0)	NS	--
MW-39-040	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-42-030	--	--	0.54	NS	ND (1.0)	NS	--
MW-47-055	4/26/2018	LF	16	15	16	15	No
WELLS IN MIDDLE ZONE OF ALLUVIAL AQUIFER							
MW-20-100	4/27/2018	LF	2,900	1,800	2,900	1,800	No
MW-27-060	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-30-050	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-33-090	4/24/2018	LF	13.3	3.3	15.5	3.8	No
MW-34-055	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-36-050	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-36-070	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-39-050	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-39-060	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-39-070	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-42-055	4/24/2018	LF	0.35	ND (0.2)	2.8	ND (1)	No
MW-42-065	4/24/2018	LF	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	No
MW-44-070	4/24/2018	LF	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	No
MW-51	5/1/2018	LF	4,800	3,500	4,800	3,700	No
WELLS IN DEEP ZONE OF ALLUVIAL AQUIFER							
MW-20-130	4/27/2018	LF	9,100	6,900	9,000	7,000	No
MW-27-085	4/24/2018	LF	ND (1.0)	ND (1)	ND (1.0)	ND (1)	No
MW-28-090	4/25/2018	LF	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	No
MW-31-135	--	--	12	NS	12	NS	--
MW-33-150	4/25/2018	LF	12	5.2	10.8	5	No
MW-33-210	4/25/2018	LF	13	6	13.5	5.9	No
MW-34-080	4/24/2018	LF	ND (0.20)	ND (1)	ND (1.0)	ND (1)	No
MW-34-100	4/24/2018	LF	263	ND (1)	270	1.3	No
MW-36-090	4/24/2018	LF	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	No
MW-36-100	4/24/2018	LF	65	6.6	62	11	No
MW-39-080	--	--	ND (0.20)	NS	ND (1.0)	NS	--
MW-39-100	4/24/2018	LF	57	57	49	54	Yes
MW-44-115	4/24/2018	LF	41.6	8.9	42.9	9.5	No
MW-44-125	4/24/2018	LF	4.0 J	ND (0.2)	5.9	3.1	No

Table 4-2

Wells Monitored for Conditional Shutdown of PE-01, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Sample Method	Hexavalent Chromium		Dissolved Chromium		Exceeded 2014 Maximum Concentration?
			2014 Maximum Concentration (µg/L)	Q2 2018 Result (µg/L)	2014 Maximum Concentration (µg/L)	Q2 2018 Result (µg/L)	
MW-45-095a	--	--	13.7*	NS	14.2*	NS	--
MW-46-175	4/25/2018	LF	46.3	7.4	46.1	8.3	No
MW-46-205	4/25/2018	LF	5.5	ND (1)	4.8	ND (1)	No
MW-47-115	4/25/2018	LF	24	23	20	23	Yes
PE-01	3/7/2018	tap	5.6	2.3	6	2	No
TW-04	4/26/2018	3V	7.4*	8.9	6.5*	9.4	Yes

Notes:

1. Monitoring wells presented in the table are located within approximately 800 feet of TW-03D, as stated in DTSC 2015.
2. * = Result is the maximum concentration from 2013.
3. Values shown in parentheses are the reporting limit.
4. If a field duplicate sample was collected, the maximum concentration between the primary and field duplicate sample is presented.
5. On June 27, 2014, DTSC approved discontinuation of groundwater sampling at monitoring well MW-45-095a.

-- = not applicable.
µg/L = micrograms per liter.
3V = three volume.
DTSC = Department of Toxic Substance Control.
ID = identification.
LF = low flow (minimal drawdown).
ND = not detected at listed reporting limit.
NS = not sampled.
Q2 = second quarter.
Tap = sampled from tap of extraction well.

References:

DTSC. 2015. Letter from Aaron Yue/DTSC to Yvonne Meeks/PG&E. "Conditional Approval of Proposal to Modify Interim Measures 3 (IM3) Extraction Well Pumping at Pacific Gas and Electric Company, Topock Compressor Station (PG&E), Needles, California (USEPA ID No. CAT080011729)." July 20.

Table 4-3

Interim Measure Hydraulic Monitoring Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Location ID	Groundwater Elevation (ft amsl)				
	April Average	May Average	June Average	Quarterly Average	Days in Quarterly Average
WELLS IN SHALLOW ZONE OF ALLUVIAL AQUIFER					
MW-20-070	454.37	454.56	454.75	454.56	91
MW-22	455.42	455.71	455.84	455.66	89
MW-25	455.51	455.97	456.19	455.89	91
MW-26	455.20	455.61	INC	INC	68
MW-27-020	456.58	456.62	456.63	456.61	91
MW-28-025	456.49	456.56	456.39	456.48	91
MW-31-060	455.50	455.67	455.75	455.64	91
MW-32-035	456.02	454.57	453.42	454.67	91
MW-33-040	453.89	454.21	455.13	454.41	91
MW-35-060	INC	INC	456.79	INC	24
MW-36-020	456.13	456.24	INC	INC	67
MW-36-040	456.16	456.20	456.06	456.14	91
MW-39-040	455.89	455.93	455.85	455.89	91
MW-42-030	455.89	455.99	455.87	455.92	91
MW-43-025	456.60	456.61	456.42	456.54	91
MW-47-055	456.32	INC	INC	INC	44
WELLS IN MIDDLE ZONE OF ALLUVIAL AQUIFER					
MW-20-100	454.01	453.99	454.20	454.06	91
MW-27-060	456.55	456.57	456.41	456.51	91
MW-30-050	456.02	456.05	456.00	456.02	91
MW-33-090	456.14	456.28	INC	INC	53
MW-34-055	456.62	456.62	456.48	456.57	91
MW-36-050	456.11	456.15	456.05	456.10	91
MW-36-070	456.11	456.15	456.03	456.10	91
MW-39-050	455.76	455.80	455.75	455.77	91
MW-39-060	455.56	455.60	455.59	455.58	91
MW-39-070	454.86	454.86	454.94	454.88	91
MW-42-065	455.96	456.10	455.99	456.02	91
MW-44-070	456.28	456.31	456.18	456.26	91
MW-50-095	INC	INC	456.14	INC	24
MW-51	454.87	INC	INC	INC	33
MW-55-045	457.01	457.13	457.06	457.07	91
WELLS IN DEEP ZONE OF ALLUVIAL AQUIFER					
MW-20-130	453.58	453.48	453.75	453.60	91
MW-27-085	456.44	456.48	456.32	456.42	91
MW-28-090	456.30	456.33	456.20	456.28	91
MW-31-135	454.80	454.84	454.99	454.88	91
MW-33-150	456.05	456.22	456.13	456.13	91
MW-34-080	456.73	456.75	456.60	456.69	91
MW-34-100	456.48	456.50	456.36	456.45	91
MW-35-135	456.07	456.32	456.33	456.24	91
MW-36-090	455.52	455.54	455.51	455.52	91
MW-36-100	455.74	455.79	455.76	455.77	91
MW-39-080	454.87	454.85	454.91	454.88	91
MW-39-100	455.66	455.59	455.66	455.64	91
MW-43-090	INC	INC	INC	INC	0
MW-44-115	INC	INC	INC	INC	0
MW-44-125	456.15	456.19	456.18	456.17	91
MW-45-095a	456.00	456.02	455.94	455.99	91
MW-46-175	456.01	INC	INC	INC	33
MW-47-115	455.73	455.98	455.94	455.88	91

Table 4-3

Interim Measure Hydraulic Monitoring Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Location ID	Groundwater Elevation (ft amsl)				
	April Average	May Average	June Average	Quarterly Average	Days in Quarterly Average
MW-49-135	456.45	456.65	456.53	456.55	91
MW-54-085	456.76	456.76	456.57	456.70	91
MW-54-140	456.20	456.20	456.06	456.15	91
MW-54-195	INC	INC	455.28	INC	26
MW-55-120	INC	INC	INC	INC	91
PT-2D	454.83	454.78	454.86	454.83	91
PT-5D	455.38	455.37	455.41	455.39	91
PT-6D	455.27	455.25	INC	INC	67
SURFACE WATER MONITORING LOCATIONS					
I-3	457.09	457.06	456.88	457.01	91
RRB	INC	INC	INC	INC	2

Notes:

ft amsl = feet above mean sea level.

INC = data are incomplete.

ID = identification.

Table 4-4

Average Hydraulic Gradients Measured at Well Pairs, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well Pair	Reporting Period	Mean Landward Hydraulic Gradient (feet/foot)	Days in Monthly Average	PE-01 Run for Gradient Control?
Overall Average	April	0.0040	NA	no
	May	0.0042	NA	no
	June	0.0036	NA	no
Northern Gradient Pair MW-31-135 / MW-33-150	April	0.0026	30	no
	May	0.0029	31	no
	June	0.0024	30	no
Central Gradient Pair (used when PE-01 is run for gradient control) MW-45-095 / MW-34-100	April	--	--	no
	May	--	--	no
	June	--	--	no
Central Gradient Pair (used when PE-01 is not run for gradient control) MW-20-130 / MW-34-100	April	0.0051	30	no
	May	0.0053	31	no
	June	0.0046	30	no
Southern Gradient Pair (used when PE-01 is run for gradient control) MW-45-095 / MW-27-085	April	--	--	no
	May	--	--	no
	June	--	--	no
Southern Gradient Pair (used when PE-01 is not run for gradient control) MW-20-130 / MW-27-085	April	0.0042	30	no
	May	0.0044	31	no
	June	0.0037	30	no

Notes:

1. The target mean landward hydraulic gradient for the selected well pairs is 0.001 feet/foot.
2. "Days in Monthly Average" refers to the number of days the pressure transducers in both wells were operating correctly.
3. Beginning in August 2017, MW-20-130 was approved for gradient compliance (instead of MW-45-95) at the central and southern well pairs during months when PE-01 is not run for gradient control.
4. MW-45-095 is also known as MW-45-095a.

-- = monthly gradient not applicable for gradient compliance.
ft amsl = feet above mean sea level.
NA = not applicable.

Table 4-5

Interim Measure Contigency Plan Trigger Levels and Results, Second Quarter 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Method	Trigger Level	Q2 2018 Result	Exceeded Trigger Level?
				Hexavalent Chromium (µg/L)	Hexavalent Chromium (µg/L)	
MW-21	Shallow	5/2/2018	LF	20	ND (1)	No
MW-27-085	Deep	4/24/2018	LF	20	ND (1)	No
MW-28-090	Deep	4/25/2018	LF	20	ND (0.2)	No
MW-32-020	--	--	--	20	NS	--
MW-32-035	Shallow	4/23/2018	LF	20	ND (1)	No
MW-33-040	Shallow	4/25/2018	LF	20	ND (1)	No
MW-33-090	Middle	4/24/2018	LF	25	3.3	No
MW-33-150	Deep	4/25/2018	LF	20	5.2	No
MW-33-210	Deep	4/25/2018	LF	20	6	No
MW-34-080	Deep	4/24/2018	LF	20	ND (1)	No
MW-34-100	Deep	4/24/2018	LF	750	ND (1)	No
MW-36-070	--	--	--	20	NS	--
MW-39-040	--	--	--	20	NS	--
MW-42-055	Middle	4/24/2018	LF	20	ND (0.2)	No
MW-42-065	Middle	4/24/2018	LF	20	ND (0.2)	No
MW-43-075	--	--	--	20	NS	--
MW-43-090	--	--	--	20	NS	--
MW-44-070	Middle	4/24/2018	LF	20	ND (0.2)	No
MW-44-115	Deep	4/24/2018	LF	1200	8.9	No
MW-44-125	Deep	4/24/2018	LF	475	ND (0.2)	No
MW-46-175	Deep	4/25/2018	LF	225	7.4	No
MW-46-205	Deep	4/25/2018	LF	20	ND (1)	No
MW-47-055	Shallow	4/26/2018	LF	150	15	No
MW-47-115	Deep	4/25/2018	LF	31	23	No

Notes:

-- = not applicable or not sampled.

µg/L = micrograms per liter.

Deep = deep interval of Alluvial Aquifer.

ID = identification.

LF = Low Flow (minimal drawdown).

Middle = mid-depth interval of Alluvial Aquifer.

ND = not detected at listed reporting limit.

NS = not sampled.

Q2 = second quarter.

Shallow = shallow interval of Alluvial Aquifer.

Table 4-6

Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide

Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Month, Year	Davis Dam Release			Colorado River Elevation at I-3		
	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
January 2013	8,300	8,299	1	453.20	453.28	0.04
February 2013	10,600	10,972	-372	454.30	454.63	0.40
March 2013	15,200	15,545	-345	456.00	456.29	0.30
April 2013	17,600	17,090	510	456.90	456.74	0.10
May 2013	15,800	15,592	208	456.40	456.44	0.00
June 2013	15,700	15,588	112	456.50	456.47	0.00
July 2013	14,400	13,165	1,235	456.00	455.79	0.20
August 2013	13,100	12,185	915	455.40	455.43	0.00
September 2013	11,700	11,446	254	454.80	455.02	0.20
October 2013	12,300	12,497	-197	454.90	455.09	0.20
November 2013	9,700	8,918	782	454.00	453.98	0.00
December 2013	6,400	7,636	-1,236	452.40	452.81	0.40
January 2014	8,300	8,970	-670	452.80	453.27	0.50
February 2014	11,600	11,850	-250	454.30	454.67	0.30
March 2014	16,600	17,473	-873	456.40	456.70	0.30
April 2014	18,200	17,718	482	457.10	457.08	0.00
May 2014	16,700	16,622	78	456.80	456.68	0.10
June 2014	15,900	15,917	-17	456.60	456.64	0.10
July 2014	15,100	14,640	460	456.30	456.24	0.00
August 2014	12,300	11,336	964	455.20	455.26	0.10
September 2014	13,100	12,211	889	455.30	455.30	0.00
October 2014	10,700	10,434	266	454.30	454.81	0.50
November 2014	10,700	10,575	125	454.30	454.22	0.10
December 2014	6,400	7,235	-835	452.40	452.93	0.50
January 2015	10,600	10,740	-140	454.30	454.39	0.09
February 2015	10,500	11,252	-752	454.20	454.52	0.32
March 2015	14,900	15,658	-758	455.90	456.29	0.39
April 2015	18,000	17,170	830	457.10	456.82	0.28
May 2015	16,000	13,890	2110	456.50	456.06	0.50
June 2015	14,500	13,616	884	456.10	455.94	0.16
July 2015	13,400	12,411	989	455.60	455.50	0.10
August 2015	12,100	12,627	-527	455.10	455.45	0.40
September 2015	13,300	12,734	566	455.40	INC	NA
October 2015	11,300	10,653	647	454.70	454.80	0.1
November 2015	10,000	10,066	-66	454.16	453.87	0.29
December 2015	6,200	8,556	-2,356	453.30	453.48	-0.18
January 2016	9,400	9,000	400	453.44	454.05	-0.60
February 2016	11,300	11,700	-400	454.37	454.95	-0.57
March 2016	15,800	15,000	800	455.86	456.51	-0.65
April 2016	15,400	16,400	-1,000	456.77	457.17	-0.40
May 2016	15,800	14,700	1,100	455.98	456.76	-0.78
June 2016	14,400	14,100	300	456.01	456.64	-0.62
July 2016	13,300	13,100	200	455.73	456.38	-0.65
August 2016	11,500	11,600	-100	455.02	455.70	-0.69
September 2016	12,200	11,900	300	455.19	455.83	-0.63
October 2016	10,400	10,400	0	454.25	455.23	-0.98
November 2016	9,900	9,600	300	453.70	454.40	-0.70
December 2016	8,300	7,800	500	453.37	453.55	-0.18
January 2017	8,000	6,600	1,400	453.22	453.36	-0.14
February 2017	9,500	8,700	800	453.91	454.15	-0.24
March 2017	13,900	13,700	200	455.53	456.10	-0.57
April 2017	15,900	16,100	-200	456.40	456.97	-0.57
May 2017	14,000	13,800	200	455.74	456.39	-0.66
June 2017	13,600	14,300	-700	455.95	456.46	-0.51
July 2017	13,300	13,300	0	455.62	456.22	-0.59

Table 4-6

Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide

Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Month, Year	Davis Dam Release			Colorado River Elevation at I-3		
	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
August 2017	11,500	11,500	0	454.91	455.59	-0.68
September 2017	12,700	11,100	1,600	454.39	455.32	-0.93
October 2017	12,000	10,900	1,100	454.01	455.15	-1.14
November 2017	10,400	10,000	400	454.25	454.70	-0.45
December 2017	8,800	9,000	-200	453.51	454.09	-0.58
January 2018	8,100	7,100	1,000	452.50	453.05	-0.55
February 2018	11,100	11,000	100	454.40	454.82	-0.42
March 2018	14,400	13,600	800	455.38	455.94	-0.56
April 2018	16,000	16,800	-800	456.25	457.09	-0.84
May 2018	15,900	16,300	-400	456.80	457.06	-0.26
June 2018	15,600	15,300	300	456.40	456.88	-0.48
July 2018	13,700			455.70		

Notes:

1. Projected river level for each month is calculated based on the preceding month's U.S. Bureau of Reclamation (USBR) projections of Davis Dam release and stage in Lake Havasu.

2. Projected and actual Davis Dam releases are reported monthly by the USBR, available online at https://www.usbr.gov/uc/water/crsp/studies/24Month_07.pdf.

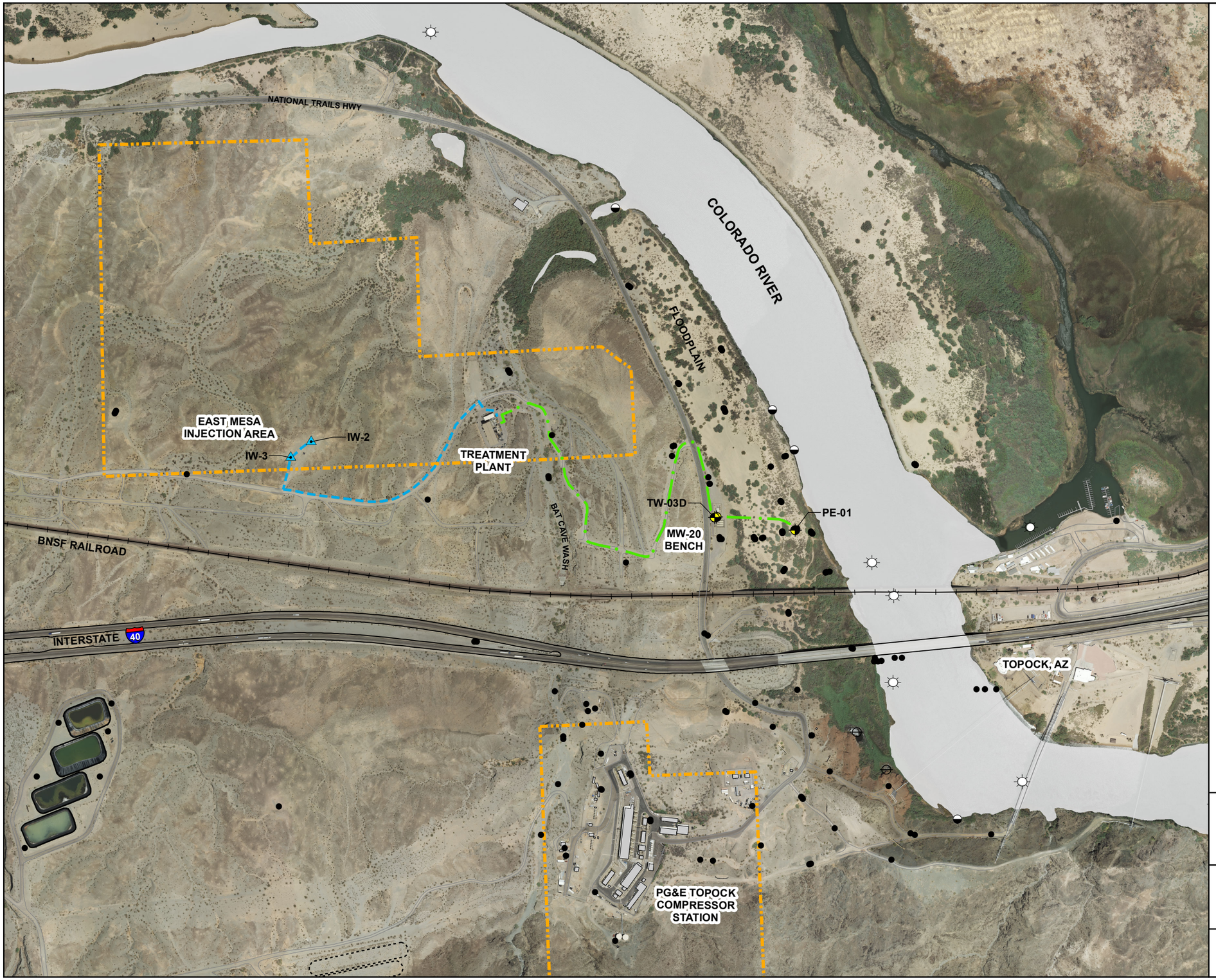
cfs = cubic feet per second.

ft amsl = feet above mean sea level.

INC = incomplete data set for Colorado River elevation at I-3.

NA = difference in predicted and actual river elevation not available due to incomplete dataset.

FIGURES



LEGEND

- IM-3 Extraction Well (Active)
- IM-3 Injection Well
- Monitoring Well in Site-Wide Groundwater Monitoring Program (GMP)
- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location
- Groundwater Extraction/Influent Pipeline
- Treatment Plant Effluent Pipeline
- Property Line

Notes:
1. Location map shows Interim Measure No. 3 (IM-3) active facilities as of current report.
2. See Figures 1-2 and 1-3 for complete monitoring locations and identifications.

0 500 1,000
Feet

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

LOCATIONS OF IM-3 FACILITIES AND MONITORING LOCATIONS

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FIGURE
1-1

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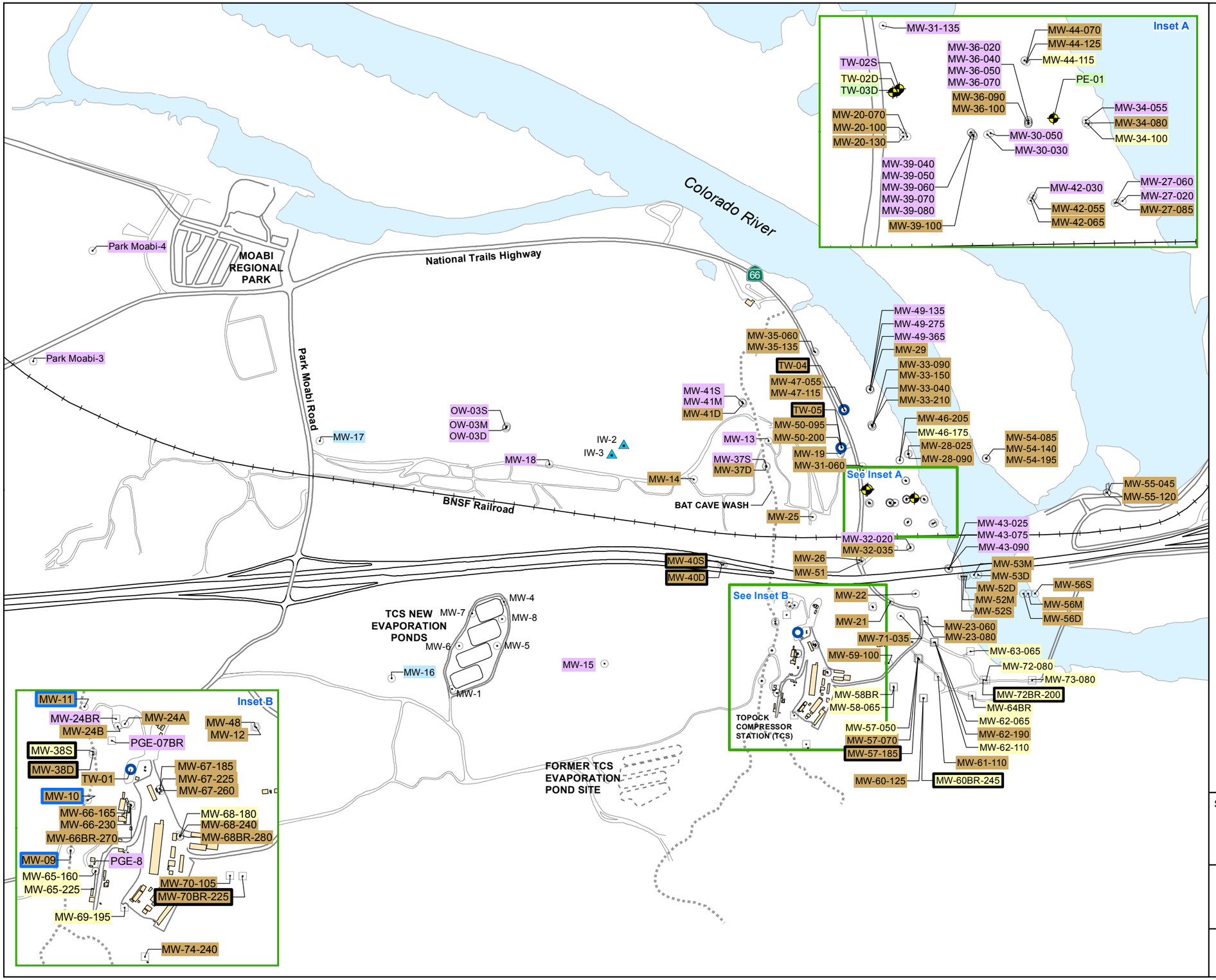

LEGEND

- Groundwater Monitoring Well Completed in Bedrock
- Injection Well
- Groundwater Monitoring Well Completed in Alluvial Aquifer
- Test Well or Supply Well (Inactive)
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)

Sampling Frequency for Groundwater Monitoring Program (GMP)

- MW-17 Biennial sampling
- MW-13 Annual sampling
- MW-09 Collect additional sample in quarter following a runoff event with flow through Bat Cave Wash culverts.
- TW-05 Monitoring well currently being evaluated in Sampling Method Trail.
- MW-21 Semiannual sampling
- MW-38S Quarterly sampling
- TW-3D Monthly sampling

Notes:
1. GMP = Groundwater Monitoring Program
2. TCS = Topock Compressor Station

0 500 1,000
Feet

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR GMP

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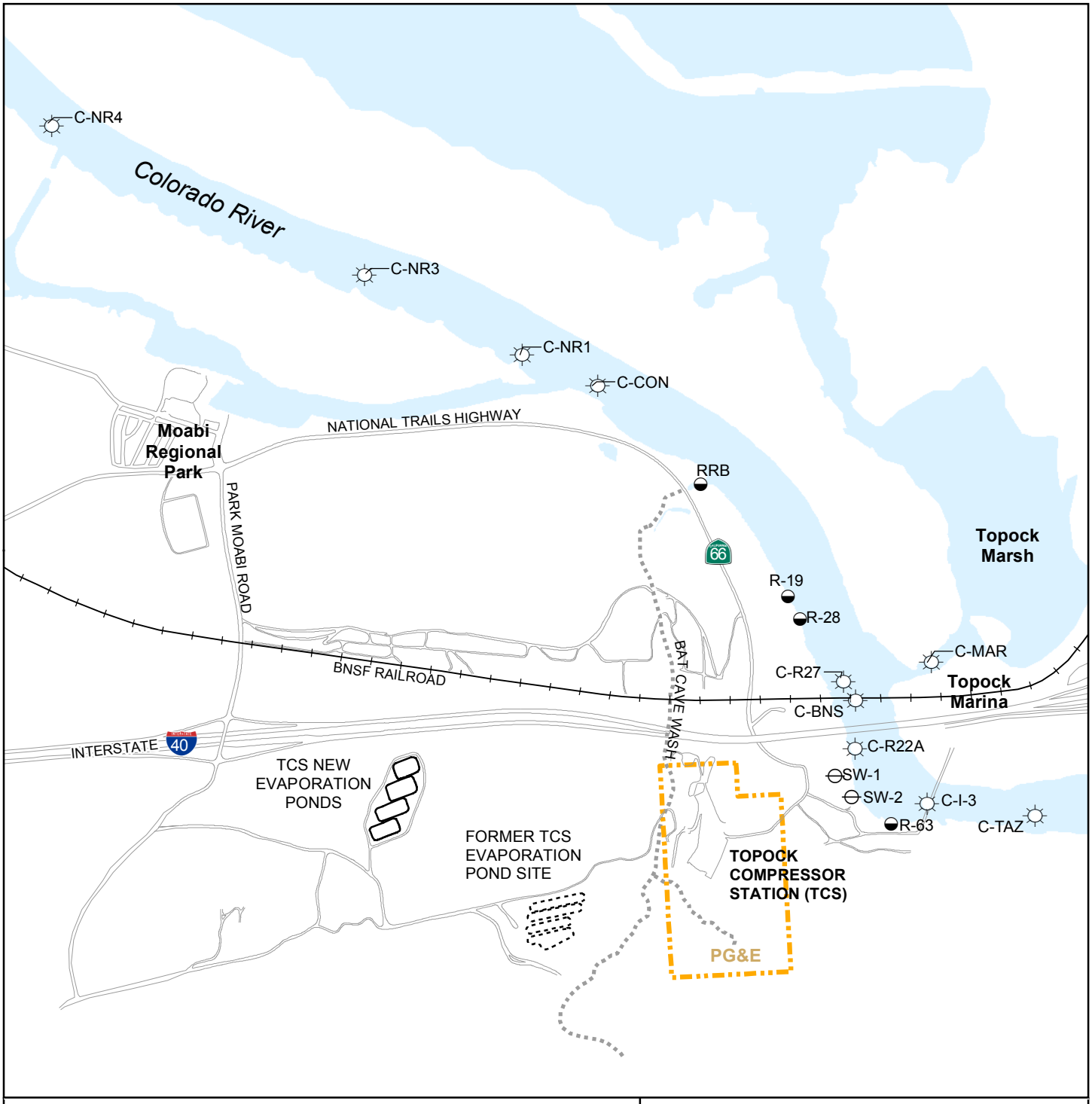
FIGURE 1-2

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE1-2_GMP_SAMPLING_FREQUENCY_2018Q2.MXD 7/26/2018 5:44:51 PM



LEGEND

- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location
- PG&E Property Line

0 600 1,200

Feet

Notes:

1. Shoreline, river channel, and other surface water monitoring locations are sampled quarterly and twice per quarter during periods of low river stage (typically November - January).
2. Location for SW-2 is approximate. GPS coverage was not available.
3. RMP = Surface Water Monitoring Program
4. TCS = Topock Compressor Station

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR RMP

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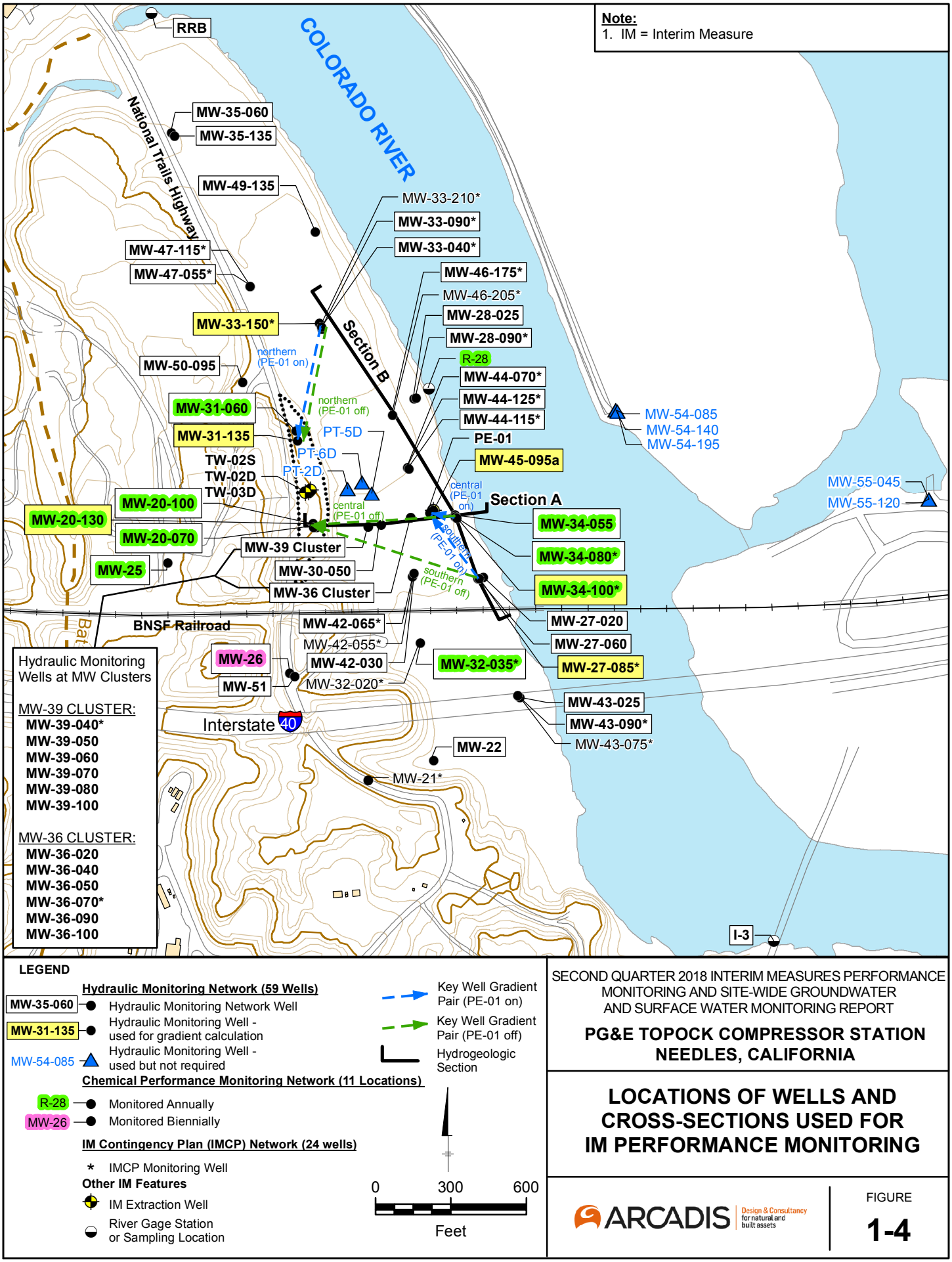
FIGURE

1-3

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE1-3_GMP_RIVER_SWLOCS_2018Q2.MXD 7/16/2018 4:47:07 PM



SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

LOCATIONS OF WELLS AND CROSS-SECTIONS USED FOR IM PERFORMANCE MONITORING

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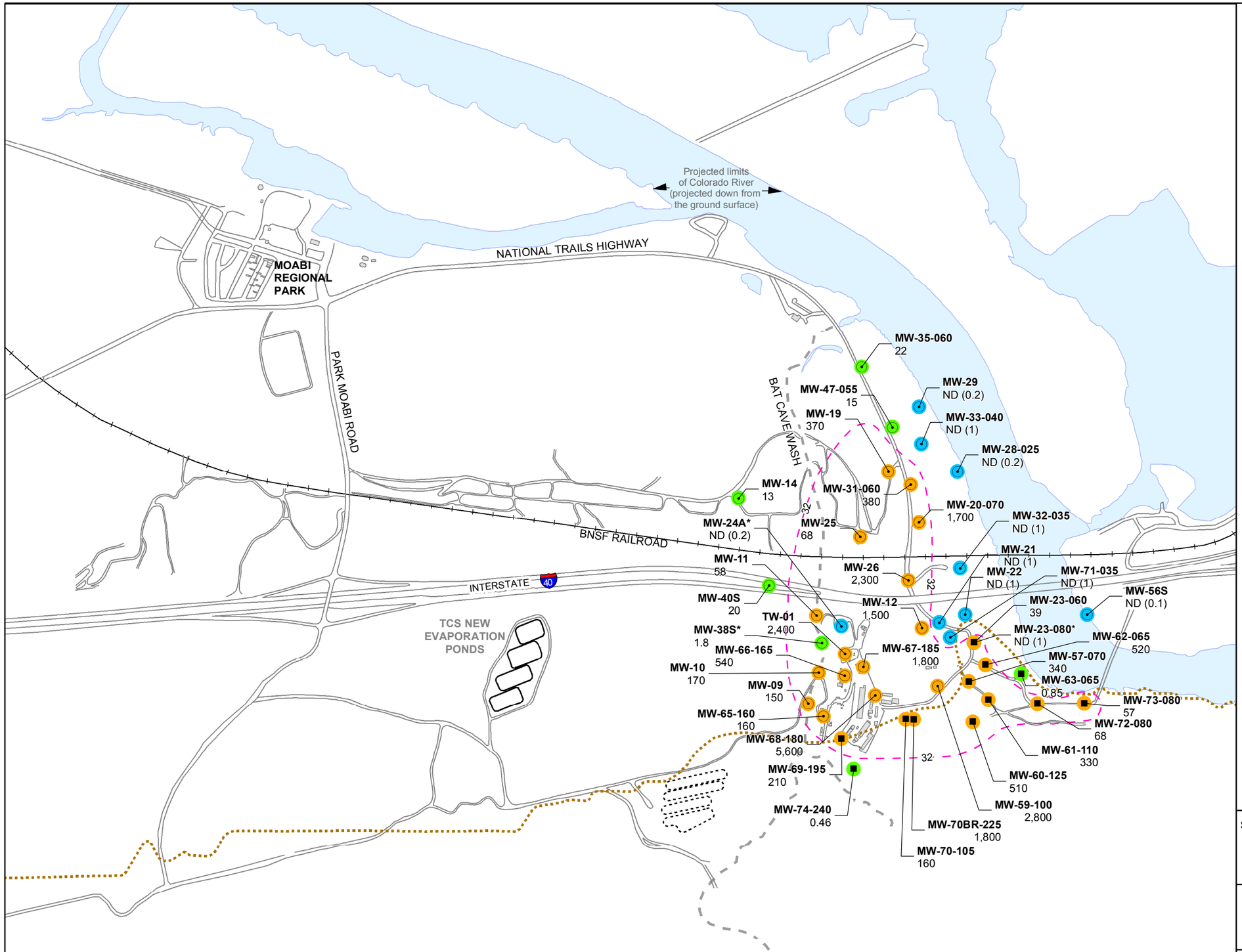
FIGURE **1-4**

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE1-4_IMP_XSECTION_2018Q2.MXD 7/26/2018 6:04:45 PM



LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event

Cr(VI) Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate boundary of "shallow" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 455 feet above mean sea level.

MW-63-065 ——— Sampling Location
0.85 ——— Groundwater Cr(VI) Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. ≥ = greater than or equal to
6. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
7. * = Wells with sampled values less than 32 µg/L shown within footprint of 32 µg/L boundary.
8. Results plotted are maximum concentration from primary and duplicate samples.
9. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.
10. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

Cr(VI) SAMPLING RESULTS, SHALLOW WELLS IN ALLUVIAL AQUIFER AND BEDROCK, SECOND QUARTER 2018

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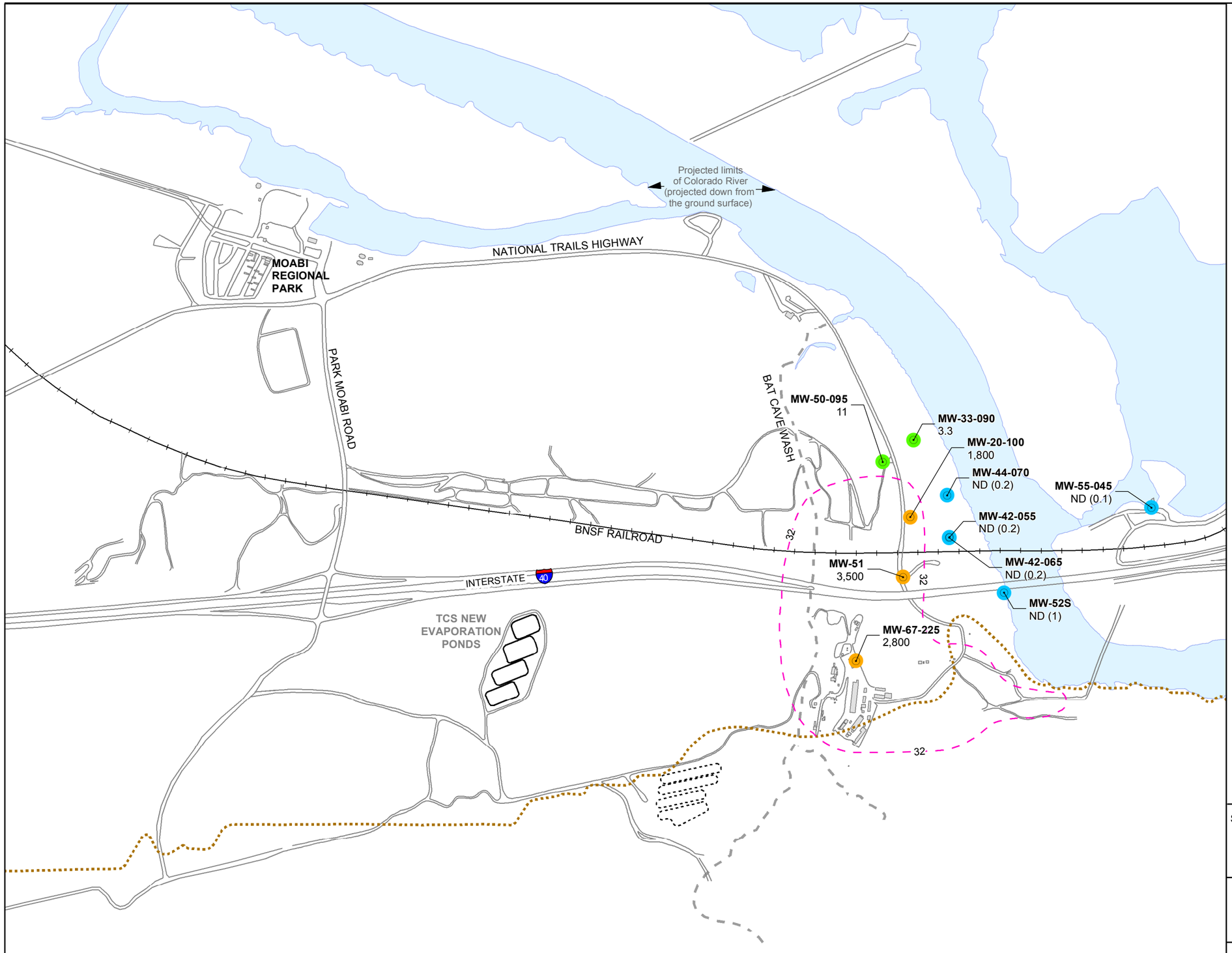
FIGURE **3-1a**

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE3-1A_CRVI_SHALLOW_2018Q2.MXD PSI01045 7/20/2018 2:28:09 PM



LEGEND

- Alluvial Aquifer well sampled during sampling event

Cr(VI) Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate boundary of "mid-depth" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 455 feet above mean sea level.

MW-33-090 ——— Sampling Location
3.3 ——— Groundwater Cr(VI) Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. ≥ = greater than or equal to
6. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
7. * = Wells with sampled values less than 32 µg/L shown within footprint of 32 µg/L boundary.
8. Results plotted are maximum concentration from primary and duplicate samples.
9. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.
10. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Cr(VI) SAMPLING RESULTS, MID-DEPTH WELLS IN ALLUVIAL AQUIFER AND BEDROCK, SECOND QUARTER 2018

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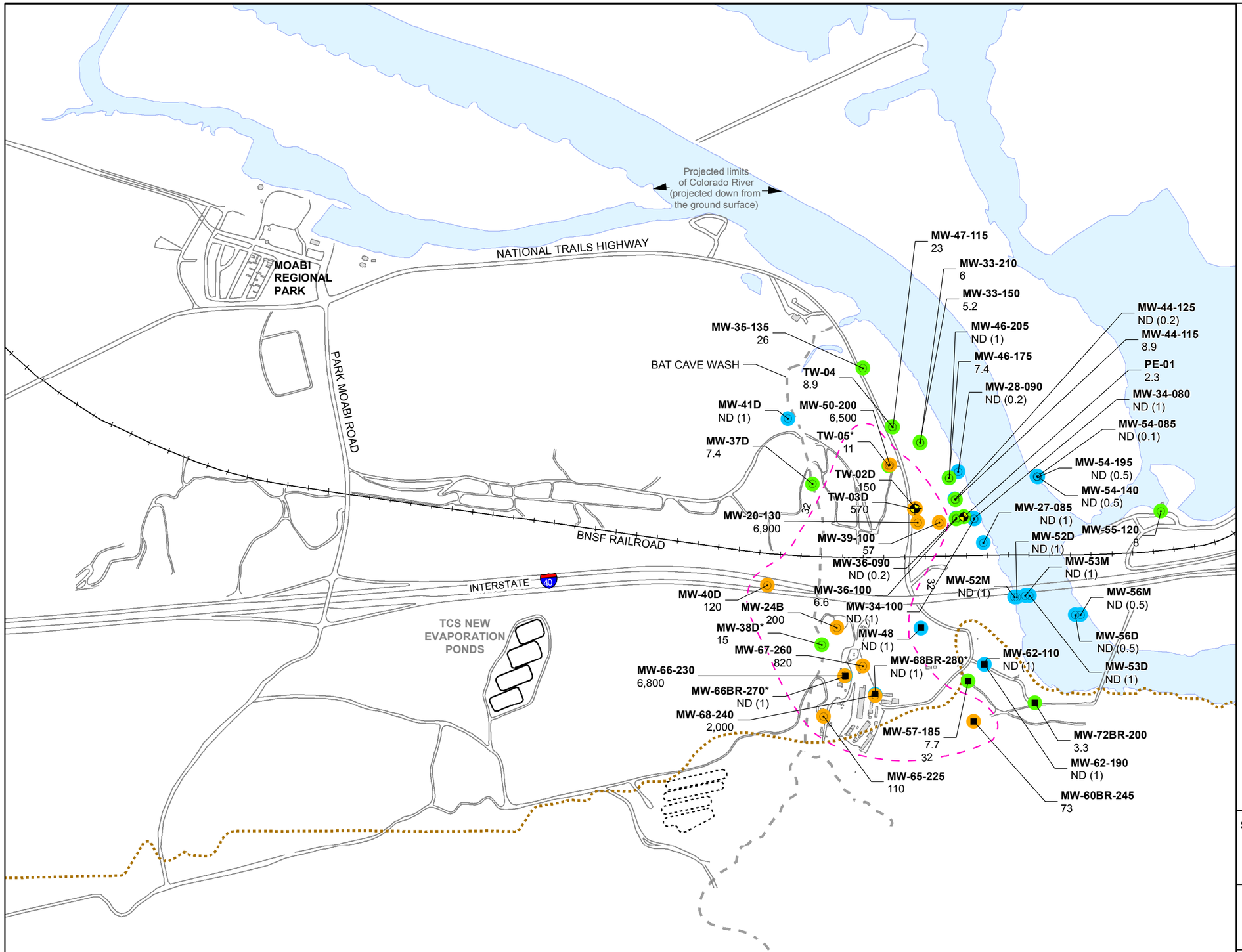
FIGURE
3-1b

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE3-1B_CRVI_MID-DEPTH_2018Q2.MXD PSI01045 7/20/2018 2:54:31 PM



LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event
- Extraction well sampled during sampling event

Cr(VI) Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate boundary of "deep" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 455 feet above mean sea level.

MW-44-115 ——— Sampling Location
8.9 ——— Groundwater Cr(VI) Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. ≥ = greater than or equal to
6. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
7. * = Wells with sampled values less than 32 µg/L shown within footprint of 32 µg/L boundary.
8. Results plotted are maximum concentration from primary and duplicate samples.
9. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.
10. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

Cr(VI) SAMPLING RESULTS, DEEP WELLS IN ALLUVIAL AQUIFER AND BEDROCK, SECOND QUARTER 2018

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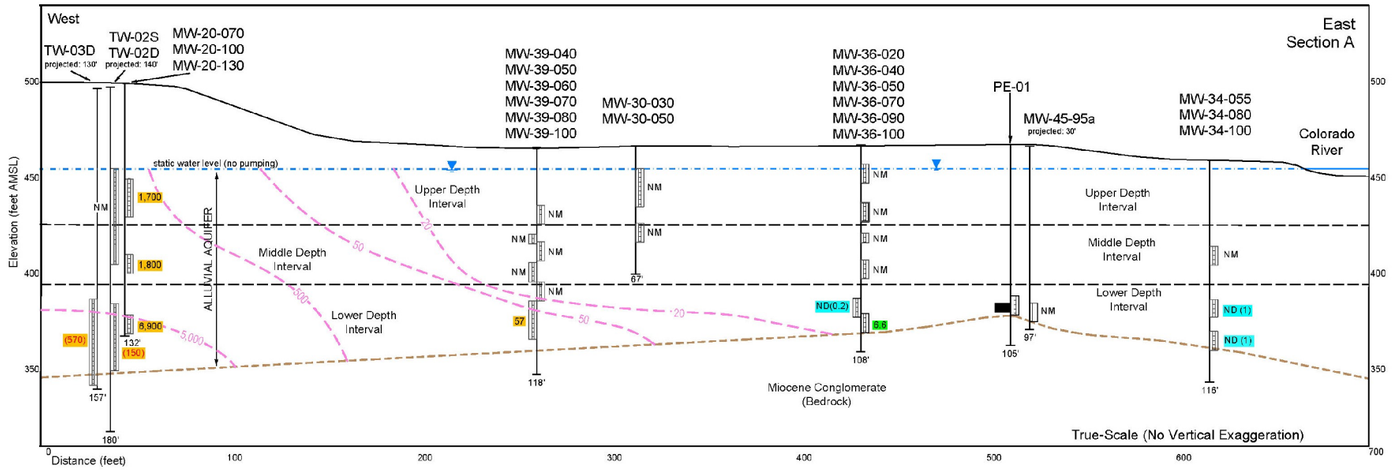
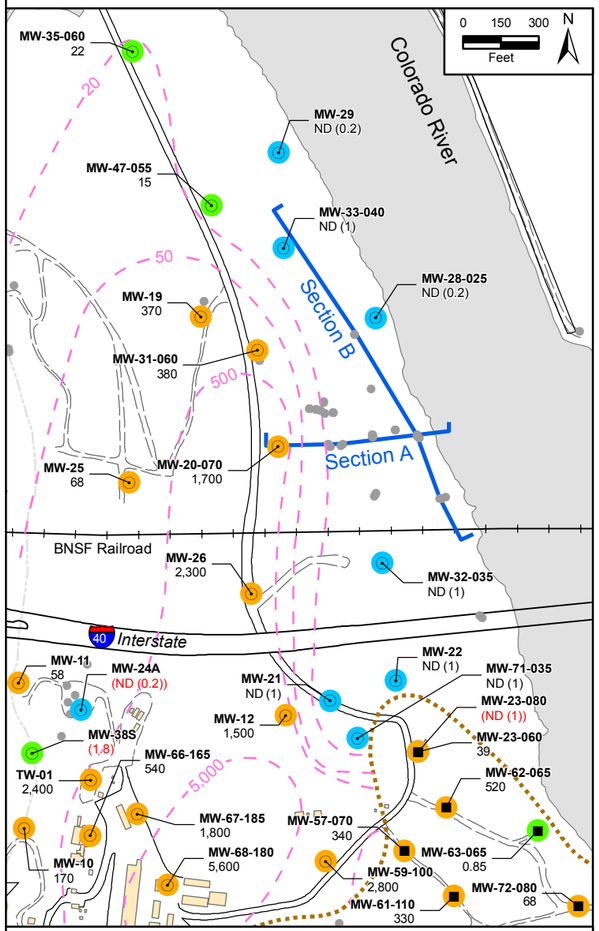
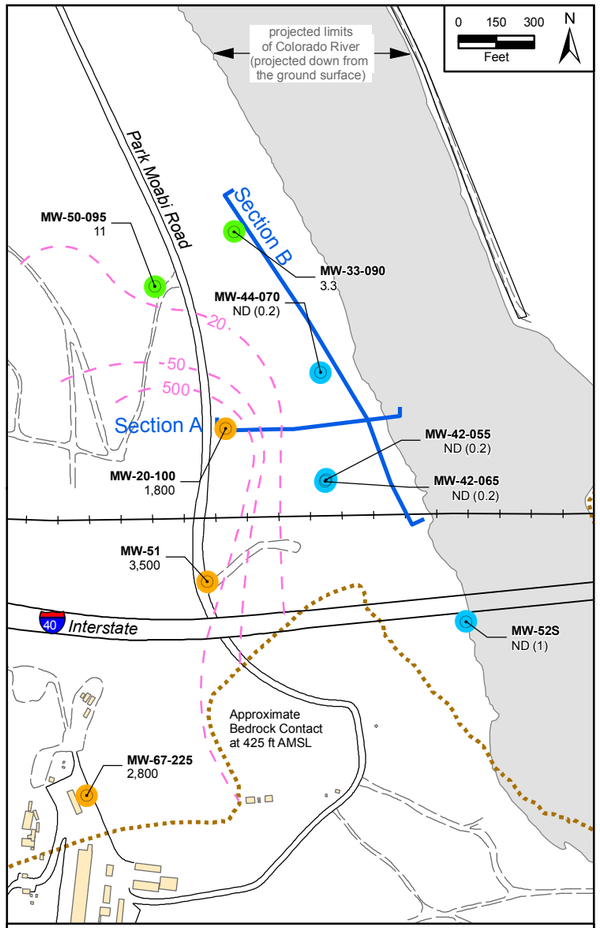
FIGURE 3-1c

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE3-1C_CRVI_DEEP_2018Q2.MXD PSI01045 7/20/2018 1:51:28 PM

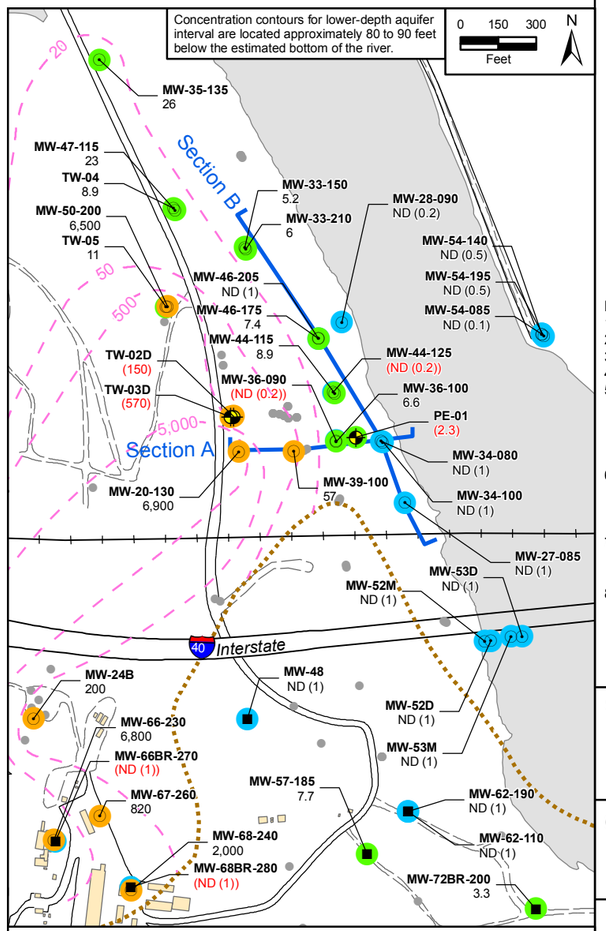




Shallow Wells (Upper Depth Interval)



Mid-Depth Wells (Middle Depth Interval)



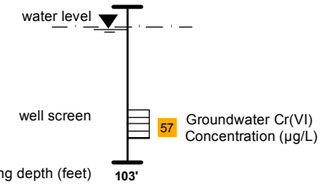
Deep Wells (Lower Depth Interval)

LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event
- Extraction well sampled during sampling event
- Well not sampled during sampling event

Cr(VI) Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Inferred Cr(VI) concentration contour within Alluvial Aquifer depth interval
- Approximate bedrock contact (per depth interval)
- Hydrogeologic Section



MW-11 — Sampling Location
58 — Groundwater Cr(VI) Concentration (µg/L)
(1.8) — Groundwater Cr(VI) Concentration (µg/L) not used for contouring

Notes:

1. "ND" = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. ≥ = greater than or equal to
4. Cr(VI) = Hexavalent Chromium
5. The Cr(VI) concentration contours of 20 and 50 µg/L are shown in accordance with Department of Toxic Substances Control's 2005 Interim Measure performance monitoring directive, which was established for containment of Cr(VI) concentrations greater than 20 µg/L in the floodplain portion of the Alluvial Aquifer.
6. The 20 and 50 µg/L contours for Cr(VI) are estimated based on available groundwater sampling, hydrogeologic and geochemical data. There are no data confirming the existence of Cr(VI) under the Colorado River.
7. Extraction wells PE-01, TW-02S, TW-02D, and TW-03D are not included in contouring. These wells draw water from a larger area and do not represent Cr(VI) concentrations at their specific locations.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER AND BEDROCK, SECOND QUARTER 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4-1

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE4-1_GMP_CR6_2018Q2_MAX.MXD 8/3/2018 12:28:38 PM

North

South
Section B

Cross-Section Parallel to the Colorado River

BNSF
Railroad

MW-33-040
MW-33-090
MW-33-150
MW-33-210

MW-46-175
MW-46-205

MW-28-025
MW-28-090
projected: 110'

MW-44-070
MW-44-115
MW-44-125

MW-34-055
MW-34-080
MW-34-100

MW-27-020
MW-27-060
MW-27-085

water table (average 455' AMSL)

Upper Depth Interval

Middle Depth Interval

Lower Depth Interval

ALLUVIAL AQUIFER

Oldest Alluvium

Fluvial Deposits

Approximate geologic contact between alluvial fan and (0.2) fluvial deposits

ND (1)
3.3
5.2
6
237'

ND (0.2)
ND (0.2)
7.4
ND (1)
216'

ND (0.2)
8.9
ND (0.2)
134'

NM
ND (1)
ND (1)
116'

NM
NM
ND (1)
107'

Miocene Conglomerate
(Bedrock)

Elevation (feet AMSL)

700
600
500
400
300
200
100
0

True-Scale (No Vertical Exaggeration)

-100 0 100 200 300 400 500 600 700 800 900 1,000 1,100 1,200 1,300 1,400

Distance (feet)

Notes:
AMSL = above mean sea level.
NM = not measured.
µg/L = micrograms per liter.
ND = not detected at listed reporting limit
≥ = greater than or equal to
Cr(VI) = hexavalent chromium

1. See Figure 4-1 for location of this cross-section.

Legend

water level

well screen

boring depth (feet)

14 Groundwater Cr(VI) Concentration (µg/L)

103'

20 Inferred hexavalent chromium contours (µg/L) in Alluvial Aquifer.

Cr(VI) Concentrations

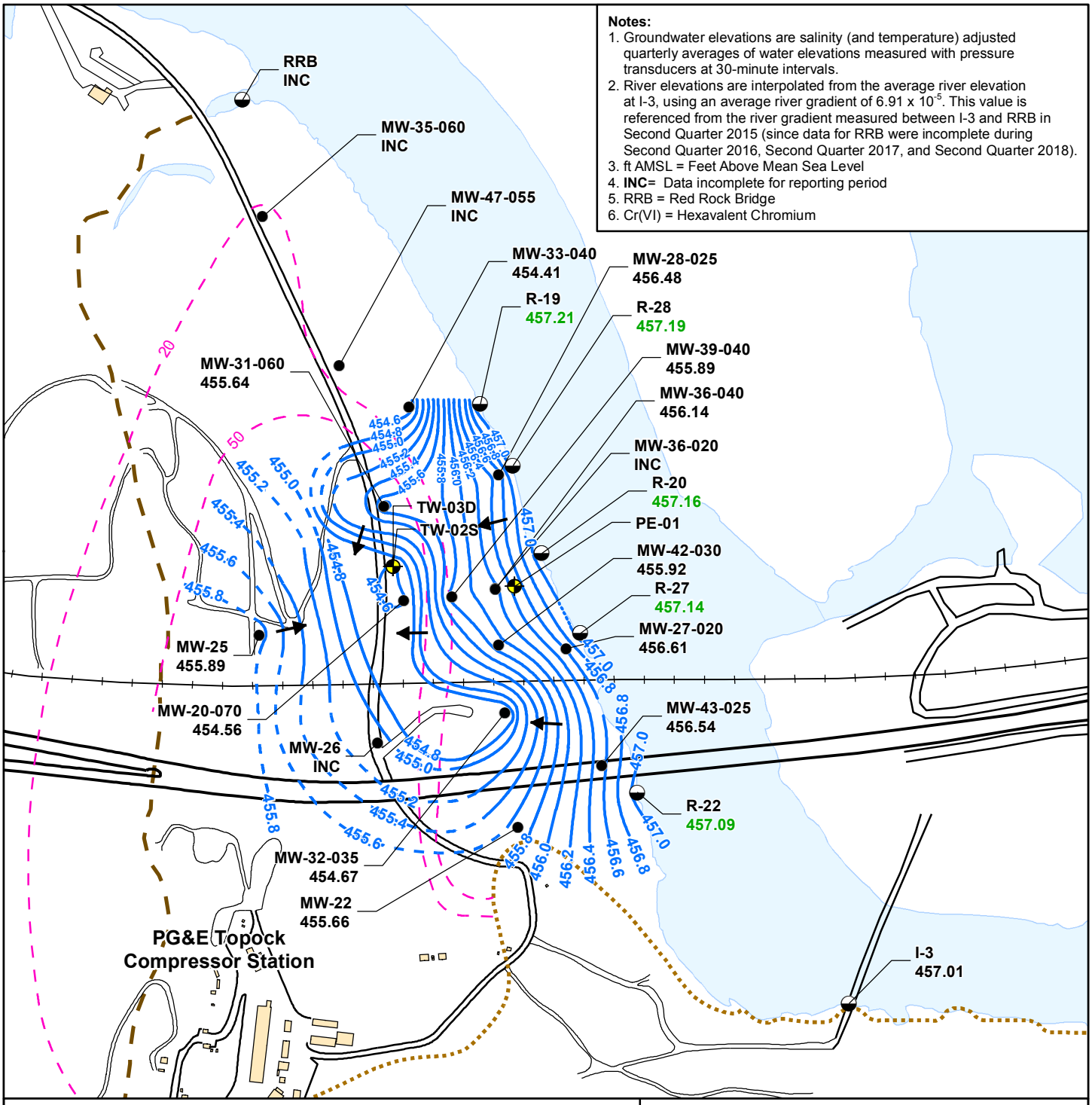
- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Cr(VI) CONCENTRATIONS FLOODPLAIN CROSS-SECTION B, SECOND QUARTER 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-2



Notes:

1. Groundwater elevations are salinity (and temperature) adjusted quarterly averages of water elevations measured with pressure transducers at 30-minute intervals.
2. River elevations are interpolated from the average river elevation at I-3, using an average river gradient of 6.91 x 10^{-5}. This value is referenced from the river gradient measured between I-3 and RRB in Second Quarter 2015 (since data for RRB were incomplete during Second Quarter 2016, Second Quarter 2017, and Second Quarter 2018).
3. ft AMSL = Feet Above Mean Sea Level
4. **INC**= Data incomplete for reporting period
5. RRB = Red Rock Bridge
6. Cr(VI) = Hexavalent Chromium

LEGEND

- Monitoring Well
- River Station
- Extraction Well
- Bedrock Contact at 455 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) concentration (micrograms per liter) contour

0 400 800
Feet

MW-43-025 — Gauging Location
456.54 — Average Groundwater Elevation (ft AMSL)

R-27 — River Station
457.14 — River Elevation (ft AMSL) Interpolated Average

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

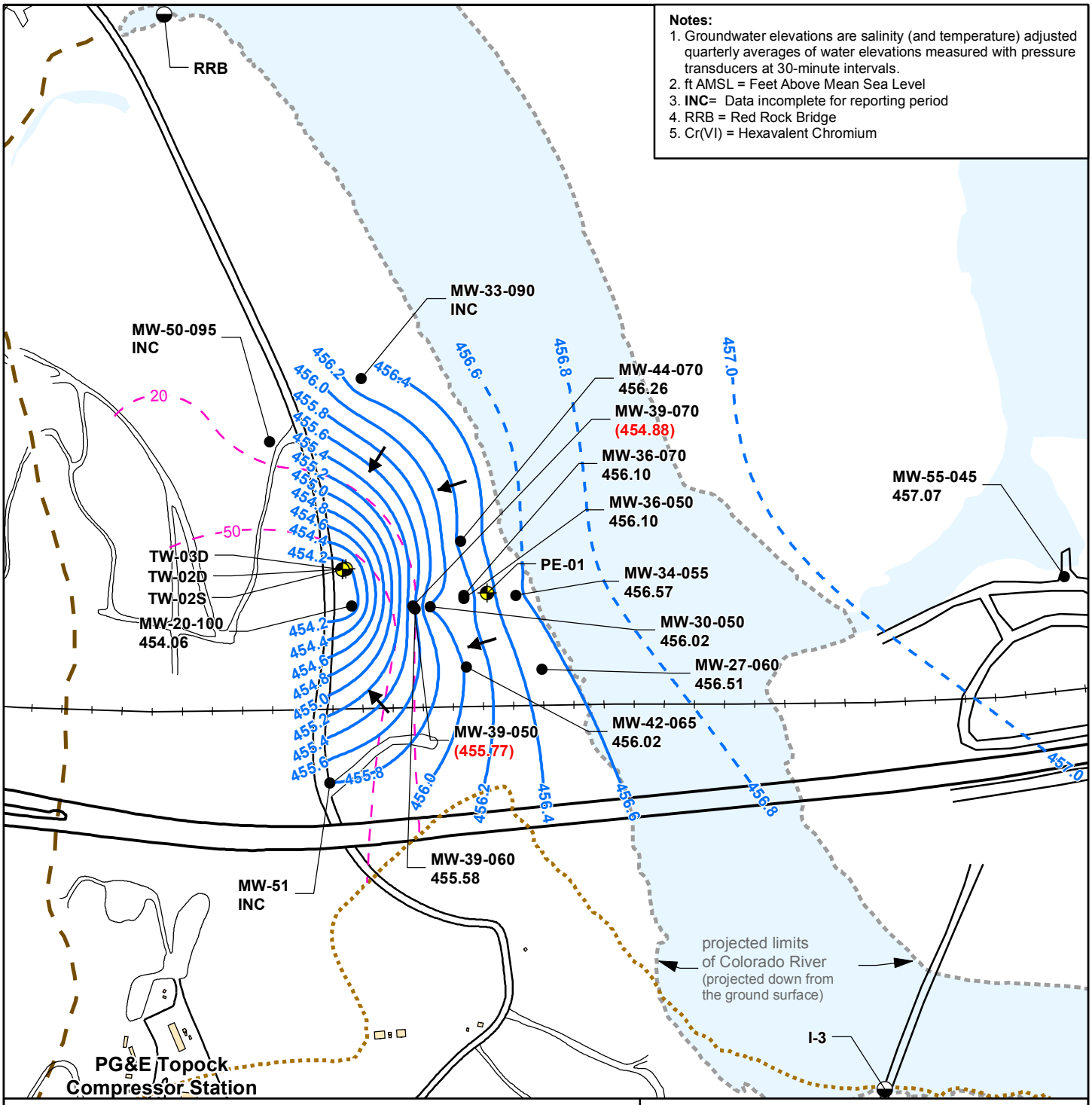
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, SECOND QUARTER 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-3a

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE4-3A_2018Q2_GWE_SHALLOW.MXD 8/1/2018 5:58:32 PM



LEGEND

- Monitoring Well
- River Station
- Extraction Well
- Bedrock Contact at 425 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration (micrograms per liter) Contour

0 400 800
Feet

MW-39-060 — Gauging Location
455.58 — Average Groundwater Elevation (ft AMSL)
(455.77) — Elevation in red parentheses not used for contouring

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

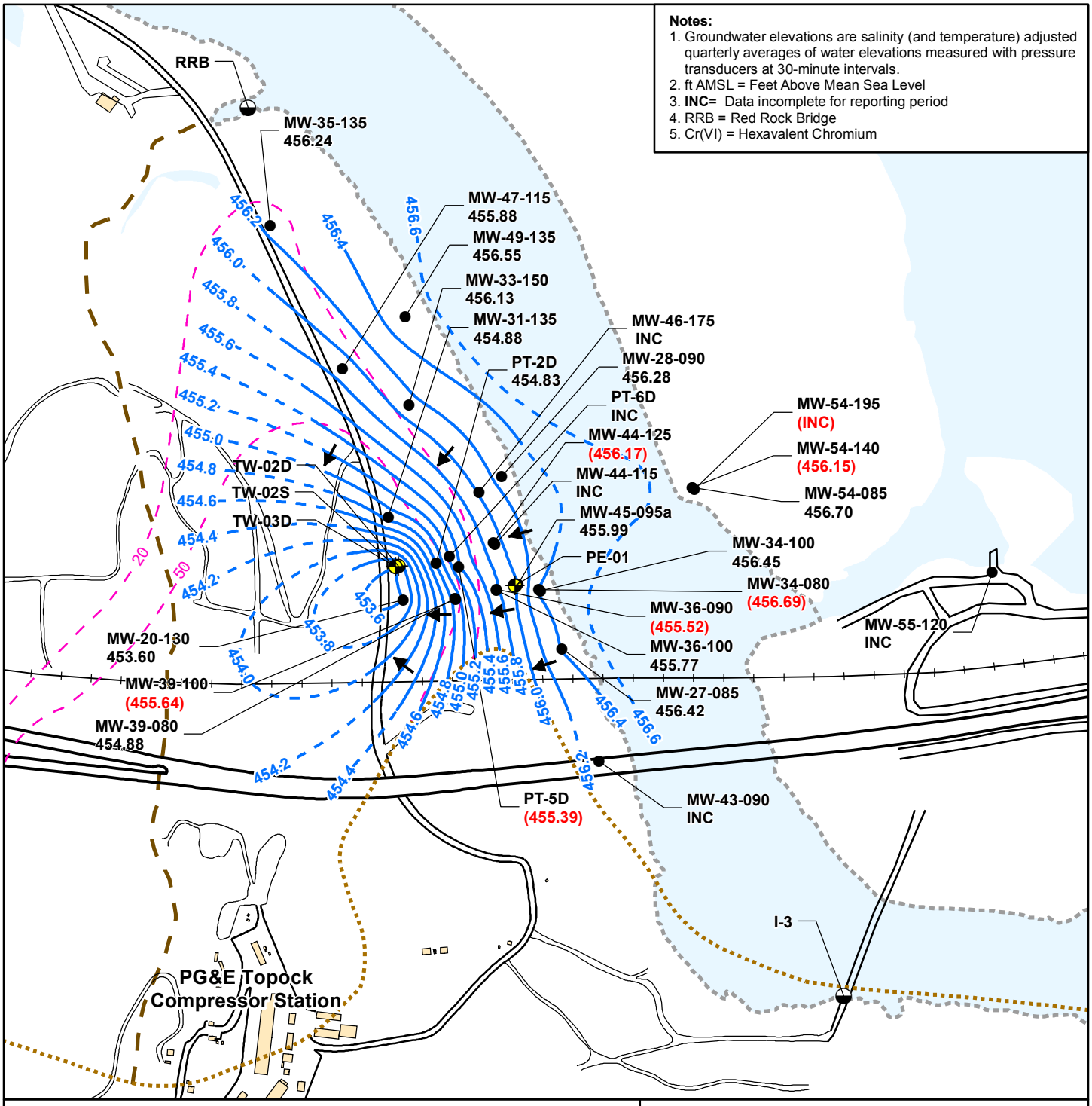
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, SECOND QUARTER 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-3b

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE4-3B_2018Q2_GWE_MIDDEPTH.MXD 8/1/2018 5:58:50 PM



Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\2Q18\FINAL\FIGURE4-3C_2018Q2_GWE_DEEP.MXD 8/1/2018 5:59:07 PM

West

East

Section A

TW-02S
TW-02D
projected: 140'

TW-03D
projected: 130'

MW-20-070
MW-20-100
MW-20-130

MW-39-040
MW-39-050
MW-39-060
MW-39-070
MW-39-080
MW-39-100

MW-30-30
MW-30-050

MW-36-020
MW-36-040
MW-36-050
MW-36-070
MW-36-090
MW-36-100

PE-01

MW-45-095a
projected:30'

MW-34-055
MW-34-080
MW-34-100

Colorado River

Elevation (feet AMSL)

550
500
450
400
350
300
250

static water level (no pumping)

454.4 455.2 455.4 455.6 455.8 456.0 456.2 456.4 456.6 457.0

NM 454.56 454.06 453.60 NM 132' 157' 180'

454.4 454.2 454.0 453.8 453.6 454.6 454.4 454.2 454.8 455.0 5,000 500 50 20

455.89 455.77 455.58 454.88 454.88 (455.64) 118'

NM 67'

456.02

INC 456.14 456.10 456.10 455.52 455.77 108'

NM 105'

455.99 97'

456.57 456.69 456.45 116'

457.16

Miocene Conglomerate
(Bedrock)

True-Scale (No Vertical Exaggeration)

0 Distance (feet) 100 200 300 400 500 600 700

Notes:

1. Results show average groundwater elevations for April through June 2018 measured with pressure transducers at 30-minute intervals.
2. Groundwater elevations are adjusted for salinity and temperature.
3. Colorado River elevation shown as interpolated Second Quarter 2018 average from R-20 river monitoring location.
4. The hexavalent chromium contour lines are from Figure 4-1.

AMSL = above mean sea level.
NM = well not measured or used in contouring.
ppb = concentration in parts per billion
INC = quarterly pressure transducer data incomplete due to malfunction, inaccessibility, or low water level conditions
(455.58) = Elevation in red parentheses not used for contouring.

Legend

MW-030-050
Inferred water table
well screen and associated average groundwater elevation (feet AMSL)
456.02
boring depth (feet)
67'

20
Inferred hexavalent chromium contour (ppb) in Alluvial Aquifer.

Groundwater head contour

453.4
Inferred groundwater head contour

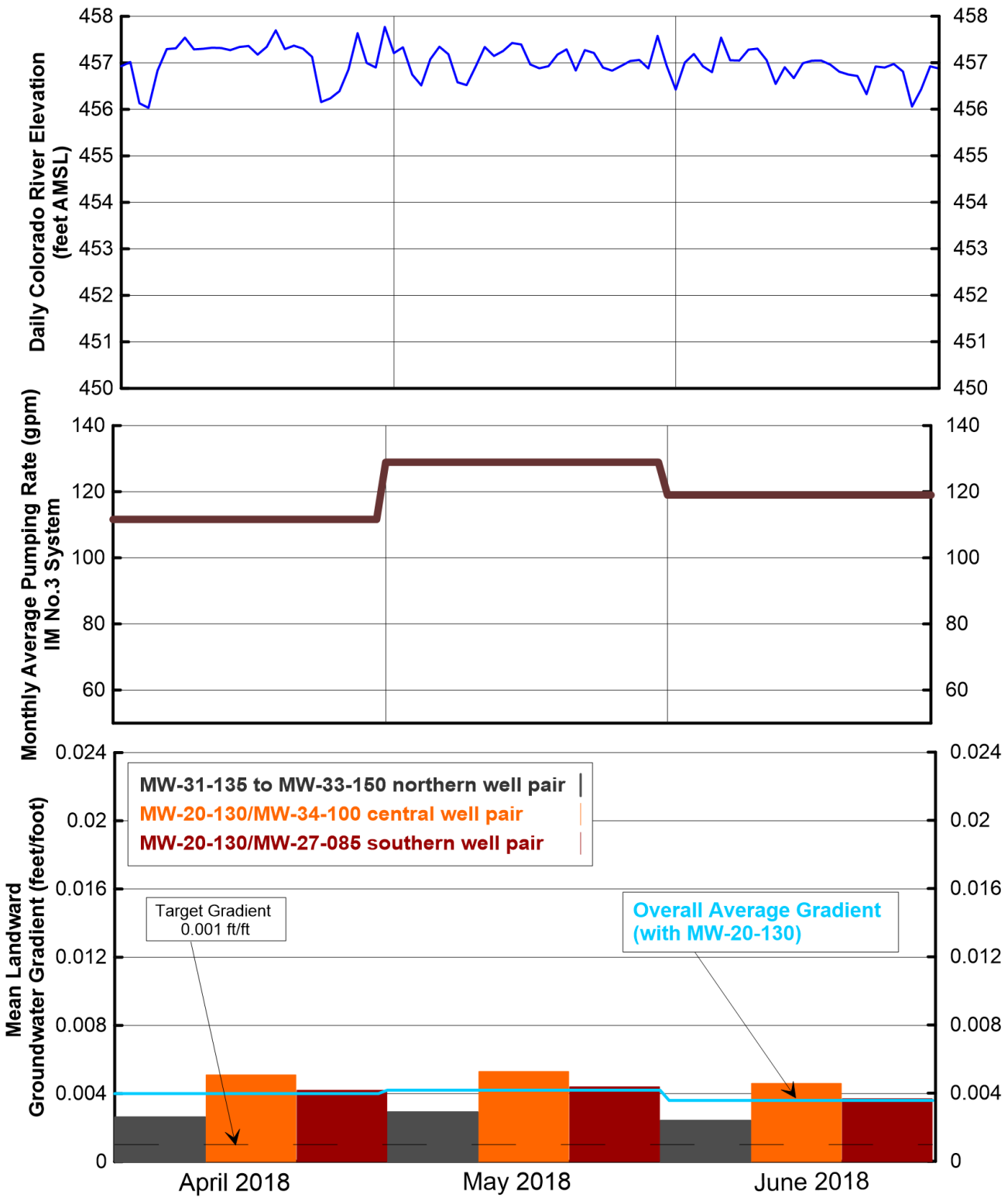
Interpreted groundwater flow direction

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A, SECOND QUARTER 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-4



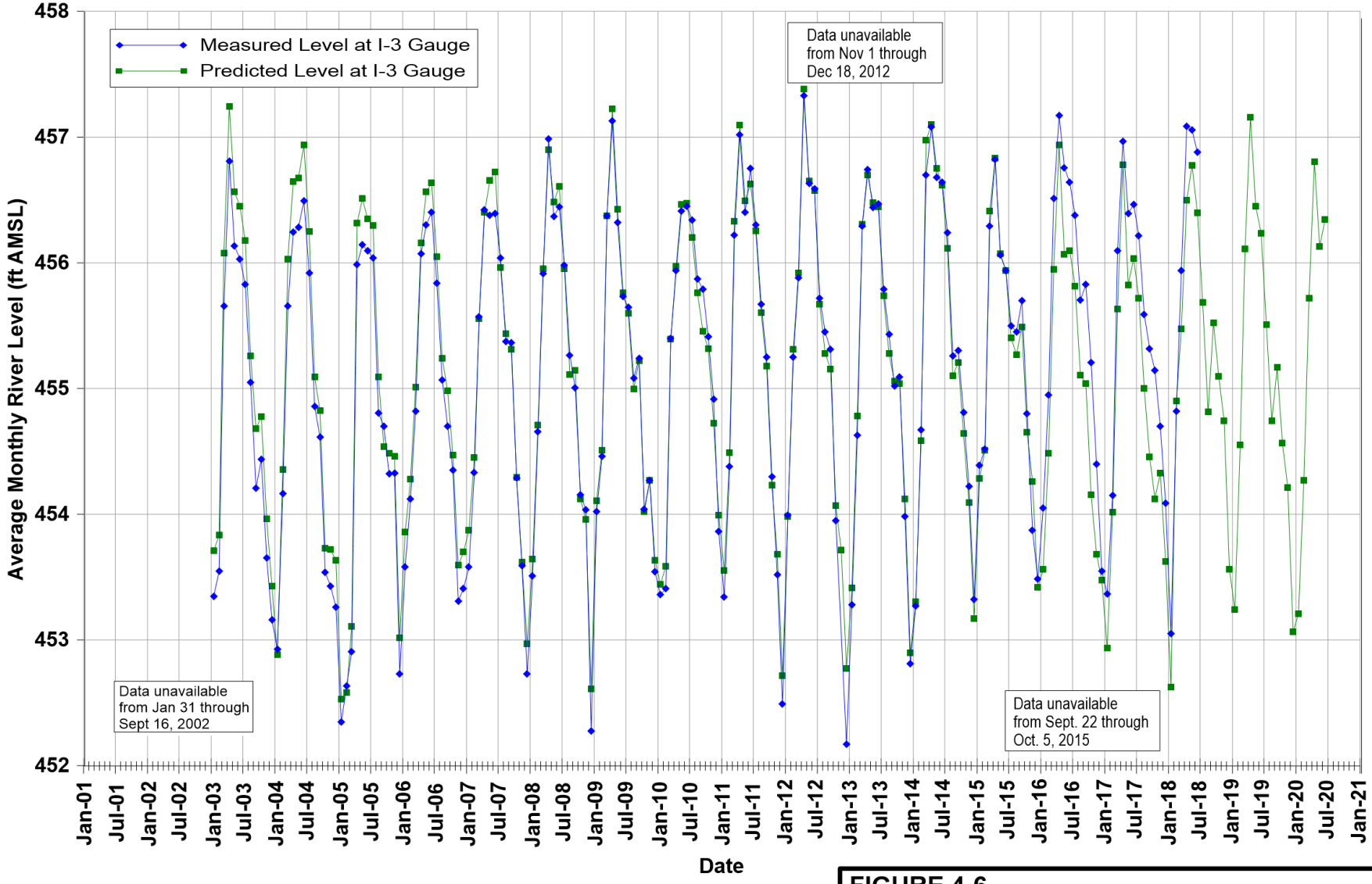
Notes:

1. For Interim Measure (IM) pumping, the target landward gradient for well pairs is 0.001 feet/foot.
2. Pumping rate plotted is the combined rate of extraction wells TW-03D and PE-01 in operation each month.
3. Beginning August 2017, MW-20-130 approved for gradient compliance (instead of MW-45-095) at central and southern well pairs during months when PE-01 is not run for gradient control.
4. AMSL = above mean sea level.
5. gpm = gallons per minute

FIGURE 4-5
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION, AND PUMPING RATE, SECOND QUARTER 2018

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Note:
Projected river level for each month in the past is calculated based on the preceding months United States Bureau of Reclamation (USBR) projections of Davis Dam release and stage in Lake Havasu. Future projections of river level at I-3 are based upon USBR projections presented in the July 24-Month Study (Report dated July 13, 2018). These data are reported monthly by the US Department of Interior, at https://www.usbr.gov/uc/water/crsp/studies/24Month_07.pdf

ft AMSL = feet above mean sea level

FIGURE 4-6
PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION

SECOND QUARTER 2018 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

APPENDIX A

Lab Reports, Second Quarter 2018 (Provided on CD with Hard Copy Submittal)

APPENDIX B

Historical Cr(VI) Concentrations

Appendix B

Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-09	SA	5/3/2017		LF	160	140
MW-09	SA	12/7/2017		LF	150	140
MW-09	SA	2/23/2018		LF	150	150
MW-09	SA	5/2/2018		LF	150	140
MW-10	SA	5/3/2017		LF	190	200
MW-10	SA	12/7/2017		LF	130	130
MW-10	SA	12/7/2017	FD	LF	130	120
MW-10	SA	2/23/2018		LF	160	160
MW-10	SA	5/2/2018		LF	170	160
MW-11	SA	5/3/2017		LF	67	61
MW-11	SA	12/7/2017		LF	64	61
MW-11	SA	2/23/2018		LF	57	56
MW-11	SA	5/2/2018		LF	57	53
MW-11	SA	5/2/2018	FD	LF	58	55
MW-12	SA	5/1/2017		LF	1,900	2,000
MW-12	SA	12/11/2017		LF	1,800	2,100
MW-12	SA	5/1/2018		LF	1,500	1,600
MW-14	SA	5/1/2017		LF	13	13
MW-14	SA	5/1/2017	FD	3V	13	13
MW-14	SA	12/13/2017		LF	12	13
MW-14	SA	5/1/2018		LF	13	14
MW-19	SA	4/28/2017		LF	440	430
MW-19	SA	12/8/2017		LF	340	340
MW-19	SA	4/27/2018		LF	370	380
MW-20-070	SA	4/27/2017		LF	1,800	1,900
MW-20-070	SA	12/7/2017		LF	1,800	1,900
MW-20-070	SA	4/27/2018		LF	1,700	1,700
MW-20-100	MA	4/27/2017		LF	2,000	2,100
MW-20-100	MA	12/8/2017		LF	1,500	1,400
MW-20-100	MA	12/8/2017	FD	LF	1,500	1,400
MW-20-100	MA	4/27/2018		LF	1,800	1,800
MW-20-130	DA	4/27/2017		LF	7,300	8,000
MW-20-130	DA	4/27/2017	FD	LF	7,400	7,600
MW-20-130	DA	12/7/2017		LF	4,100	4,400
MW-20-130	DA	4/27/2018		LF	6,900	7,000
MW-21	SA	5/3/2017		3V	2.1	2.7
MW-21	SA	12/12/2017		LF	2.3	2.7
MW-21	SA	5/2/2018		LF	ND (1)	1
MW-21	SA	5/2/2018	FD	LF	ND (1)	ND (1)
MW-22	SA	4/28/2017		LF	ND (1)	ND (1)
MW-22	SA	12/6/2017		LF	ND (1)	ND (1)
MW-22	SA	4/23/2018		LF	ND (1)	ND (5)

Appendix B

Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-23-060	BR	4/28/2017		LF	38	34
MW-23-060	BR	12/8/2017		LF	40	35
MW-23-060	BR	4/26/2018		LF	39	37 J
MW-23-080	BR	4/28/2017		LF	1.2	ND (1)
MW-23-080	BR	12/8/2017		LF	1.5	1.9
MW-23-080	BR	4/26/2018		LF	ND (1)	1.5
MW-24A	SA	5/3/2017		LF	ND (0.2)	ND (1)
MW-24A	SA	12/7/2017		LF	ND (0.2)	2.7 J
MW-24A	SA	12/7/2017	FD	LF	ND (0.2)	8.7 J
MW-24A	SA	5/2/2018		LF	ND (0.2)	ND (1)
MW-24B	DA	5/3/2017		LF	230	220
MW-24B	DA	5/3/2017	FD	LF	230	210
MW-24B	DA	12/7/2017		LF	250	250
MW-24B	DA	5/2/2018		LF	200	200
MW-25	SA	5/1/2017		LF	76	74
MW-25	SA	12/8/2017		LF	91	90
MW-25	SA	5/1/2018		LF	68	65
MW-26	SA	4/26/2017		LF	2,300	2,600
MW-26	SA	12/11/2017		LF	2,300	2,600
MW-26	SA	12/11/2017	FD	LF	2,400	2,500
MW-26	SA	5/1/2018		LF	2,300	2,400
MW-27-085	DA	4/28/2017		LF	ND (1)	ND (1)
MW-27-085	DA	4/28/2017	FD	LF	ND (1)	ND (1)
MW-27-085	DA	12/4/2017		LF	ND (1)	ND (1)
MW-27-085	DA	4/24/2018		LF	ND (1)	ND (1)
MW-28-025	SA	4/26/2017		LF	ND (0.2)	ND (1)
MW-28-025	SA	12/7/2017		LF	ND (0.2)	ND (1)
MW-28-025	SA	4/25/2018		LF	ND (0.2)	ND (1)
MW-28-025	SA	4/25/2018	FD	LF	ND (0.2)	ND (1)
MW-28-090	DA	4/26/2017		LF	ND (0.2)	1.2
MW-28-090	DA	12/7/2017		LF	ND (0.2)	ND (1)
MW-28-090	DA	4/25/2018		LF	ND (0.2)	ND (1)
MW-29	SA	4/26/2017		LF	ND (0.2)	ND (1)
MW-29	SA	12/7/2017		LF	ND (0.2)	ND (1)
MW-29	SA	4/25/2018		LF	ND (0.2)	ND (1)
MW-31-060	SA	4/27/2017		LF	390	430
MW-31-060	SA	4/27/2017	FD	LF	400	430
MW-31-060	SA	12/12/2017		LF	390	410
MW-31-060	SA	4/27/2018		LF	380	390
MW-32-035	SA	4/27/2017		LF	ND (1)	ND (1)
MW-32-035	SA	12/4/2017		LF	ND (1)	ND (1)
MW-32-035	SA	4/23/2018		LF	ND (1)	ND (1)

Appendix B

Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-33-040	SA	4/26/2017		LF	ND (0.2)	ND (1)
MW-33-040	SA	12/7/2017		LF	ND (1)	1.7
MW-33-040	SA	4/25/2018		LF	ND (1)	1.2
MW-33-090	MA	4/26/2017		LF	5	4.9
MW-33-090	MA	12/7/2017		LF	5.5	5
MW-33-090	MA	4/24/2018		LF	3.3	3.8
MW-33-150	DA	4/26/2017		LF	6.2	5.6
MW-33-150	DA	4/26/2017	FD	LF	5.9	5.5
MW-33-150	DA	12/7/2017		LF	7	7.2
MW-33-150	DA	4/25/2018		LF	5.2	5
MW-33-210	DA	4/26/2017		LF	9.5	8.3
MW-33-210	DA	12/7/2017		LF	14	15
MW-33-210	DA	4/25/2018		LF	6	5.9
MW-34-080	DA	4/27/2017		LF	ND (0.2)	ND (1)
MW-34-080	DA	12/6/2017		LF	ND (0.2)	ND (1)
MW-34-080	DA	4/24/2018		LF	ND (1)	ND (1)
MW-34-100	DA	4/27/2017		LF	0.67	1.8
MW-34-100	DA	10/2/2017		LF	ND (1)	ND (1)
MW-34-100	DA	12/6/2017		LF	ND (1)	ND (1)
MW-34-100	DA	2/20/2018		LF	ND (1)	1.5
MW-34-100	DA	4/24/2018		LF	ND (1)	1.1
MW-34-100	DA	4/24/2018	FD	LF	ND (1)	1.3
MW-35-060	SA	5/1/2017		LF	21	20
MW-35-060	SA	12/8/2017		LF	21	20
MW-35-060	SA	4/27/2018		LF	22	24
MW-35-135	DA	5/1/2017		LF	25	22
MW-35-135	DA	12/8/2017		LF	29	29
MW-35-135	DA	4/27/2018		LF	26	25
MW-36-090	DA	4/27/2017		LF	ND (0.2)	ND (1)
MW-36-090	DA	12/6/2017		LF	ND (0.2)	ND (1)
MW-36-090	DA	4/24/2018		LF	ND (0.2)	ND (1)
MW-36-100	DA	4/27/2017		LF	32	32
MW-36-100	DA	4/27/2017	FD	LF	31	33
MW-36-100	DA	12/6/2017		LF	12	14
MW-36-100	DA	12/6/2017	FD	LF	12	15
MW-36-100	DA	4/24/2018		LF	6.6	11
MW-37D	DA	5/1/2017		LF	6.6	6.3
MW-37D	DA	12/8/2017		LF	5	6.4
MW-37D	DA	5/3/2018		LF	7.4	7.1
MW-38D	DA	5/3/2017		3V	17	15
MW-38D	DA	5/3/2017		LF	16	14
MW-38D	DA	12/7/2017		3V	21	18

Appendix B

Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-38D	DA	12/7/2017		LF	20	18
MW-38D	DA	5/2/2018		3V	15	14
MW-38D	DA	5/2/2018		LF	15	14
MW-38S	SA	5/3/2017		3V	1.2	1.2
MW-38S	SA	5/3/2017		LF	0.34	ND (1)
MW-38S	SA	9/26/2017		3V	3.8 J	4.2
MW-38S	SA	9/26/2017		LF	3.1	3.6
MW-38S	SA	9/26/2017	FD	LF	3.1 J	3.6
MW-38S	SA	12/7/2017		3V	2.9	3.1
MW-38S	SA	12/7/2017		LF	2.3	2.5
MW-38S	SA	2/23/2018		3V	2.8	2.4
MW-38S	SA	2/23/2018		LF	2.8	2.5
MW-38S	SA	5/2/2018		3V	1.1	1.3
MW-38S	SA	5/2/2018		LF	1.8	2
MW-39-100	DA	4/27/2017		LF	71	67
MW-39-100	DA	12/5/2017		LF	71	66
MW-39-100	DA	4/24/2018		LF	57	54
MW-40D	DA	4/25/2018		H	25	31
MW-40D	DA	4/25/2018		LF	120	120
MW-40S	SA	4/25/2018		H	18	17
MW-40S	SA	4/25/2018		LF	20	20
MW-41D	DA	5/1/2017		LF	ND (1)	ND (5)
MW-41D	DA	12/13/2017		LF	ND (1)	ND (1)
MW-41D	DA	12/13/2017	FD	LF	ND (1)	1.2
MW-41D	DA	5/4/2018		LF	ND (1)	ND (1)
MW-42-055	MA	4/28/2017		LF	ND (0.2)	1.3
MW-42-055	MA	12/4/2017		LF	ND (0.2)	1.3
MW-42-055	MA	4/24/2018		LF	ND (0.2)	ND (1)
MW-42-065	MA	4/28/2017		LF	ND (0.2)	ND (1)
MW-42-065	MA	12/4/2017		LF	ND (0.2)	ND (1)
MW-42-065	MA	4/24/2018		LF	ND (0.2)	ND (1)
MW-44-070	MA	4/27/2017		3V	ND (0.2)	ND (1)
MW-44-070	MA	12/6/2017		LF	ND (0.2)	ND (1)
MW-44-070	MA	4/24/2018		LF	ND (0.2)	ND (1)
MW-44-115	DA	4/27/2017		LF	21	19
MW-44-115	DA	10/2/2017		LF	15	13
MW-44-115	DA	12/6/2017		LF	14	13
MW-44-115	DA	2/20/2018		LF	13	12
MW-44-115	DA	2/20/2018	FD	LF	13	12
MW-44-115	DA	4/24/2018		LF	8.9	9.5

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Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-44-125	DA	4/27/2017		LF	ND (0.2)	ND (1)
MW-44-125	DA	12/6/2017		LF	2.9	4.8
MW-44-125	DA	4/24/2018		LF	ND (0.2)	3.1
MW-46-175	DA	4/26/2017		LF	10	9.7
MW-46-175	DA	10/2/2017		LF	7.9	7.2
MW-46-175	DA	12/7/2017		LF	11	11
MW-46-175	DA	2/20/2018		LF	13	12
MW-46-175	DA	4/25/2018		LF	7.4	8.3
MW-46-205	DA	4/26/2017		LF	1.2	1.1
MW-46-205	DA	12/7/2017		3V	ND (1)	ND (1)
MW-46-205	DA	4/25/2018		LF	ND (1)	ND (1)
MW-47-055	SA	4/26/2017		LF	15	15
MW-47-055	SA	4/26/2017	FD	LF	15	15
MW-47-055	SA	12/7/2017		LF	18	20
MW-47-055	SA	12/7/2017	FD	LF	19	20
MW-47-055	SA	4/26/2018		LF	15	15
MW-47-055	SA	4/26/2018	FD	LF	14	14
MW-47-115	DA	4/26/2017		LF	23	22
MW-47-115	DA	12/7/2017		LF	18	16
MW-47-115	DA	4/25/2018		LF	23	23
MW-48	BR	5/3/2017		G	ND (1)	ND (1)
MW-48	BR	12/13/2017		LF	ND (1)	ND (1)
MW-48	BR	5/3/2018		LF	ND (1)	ND (1)
MW-50-095	MA	4/28/2017		LF	10	10
MW-50-095	MA	12/8/2017		LF	13	14
MW-50-095	MA	4/27/2018		LF	11	10
MW-50-200	DA	4/28/2017		LF	7,000	7,400
MW-50-200	DA	12/8/2017		LF	4,100	4,300
MW-50-200	DA	4/27/2018		LF	6,500	6,800
MW-51	MA	4/26/2017		LF	4,000	4,100
MW-51	MA	4/26/2017	FD	LF	4,000	4,200
MW-51	MA	12/11/2017		LF	3,700	4,100
MW-51	MA	5/1/2018		LF	3,500	3,700
MW-52D	DA	4/27/2017		LF	ND (1)	ND (5)
MW-52D	DA	12/5/2017		LF	ND (1)	ND (1)
MW-52D	DA	4/23/2018		LF	ND (1)	ND (5)
MW-52M	DA	4/27/2017		LF	ND (1)	ND (1)
MW-52M	DA	12/5/2017		LF	ND (1)	ND (1)
MW-52M	DA	12/5/2017	FD	LF	ND (1)	ND (1)
MW-52M	DA	4/23/2018		LF	ND (1)	ND (5)

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-52S	MA	4/27/2017		LF	ND (1)	ND (1)
MW-52S	MA	12/5/2017		LF	ND (1)	ND (1)
MW-52S	MA	4/24/2018		LF	ND (1)	ND (1)
MW-53D	DA	4/27/2017		LF	ND (1)	ND (1)
MW-53D	DA	4/27/2017	FD	LF	ND (1)	ND (5)
MW-53D	DA	12/5/2017		LF	ND (1)	ND (5)
MW-53D	DA	4/23/2018		LF	ND (1)	ND (1)
MW-53M	DA	4/27/2017		LF	ND (1)	ND (5)
MW-53M	DA	12/5/2017		LF	ND (0.2)	ND (1)
MW-53M	DA	4/23/2018		LF	ND (1)	ND (1)
MW-54-085	DA	5/4/2017	(a)	LF	ND (0.2) (b)	ND (1) (b)
MW-54-085	DA	12/13/2017	(a)	LF	4.96	ND (1)
MW-54-085	DA	5/4/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-54-140	DA	5/4/2017	(a)	LF	ND (0.2) (b)	ND (1) (b)
MW-54-140	DA	12/13/2017	(a)	LF	4.92	ND (1)
MW-54-140	DA	5/4/2018	(a)	LF	4.95	ND (0.2)
MW-54-195	DA	5/4/2017	(a)	3V	ND (1) (b)	ND (1) (b)
MW-54-195	DA	12/13/2017	(a)	LF	4.97	1.2
MW-54-195	DA	5/4/2018	(a)	LF	5.09	ND (0.2)
MW-55-045	MA	5/2/2017	(a)	LF	ND (0.2) (b)	ND (1) (b)
MW-55-045	MA	12/13/2017	(a)	LF	ND (0.2)	ND (1)
MW-55-045	MA	5/3/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-55-120	DA	5/2/2017	(a)	LF	8.1	8.2
MW-55-120	DA	12/13/2017	(a)	LF	7.11	9.03
MW-55-120	DA	5/3/2018	(a)	LF	8	8.35
MW-56D	DA	5/4/2017	(a)	LF	ND (1) (b)	ND (1) (b)
MW-56D	DA	12/13/2017	(a)	LF	4.93	ND (1)
MW-56D	DA	5/2/2018	(a)	LF	5.03	ND (0.2)
MW-56M	DA	5/4/2017	(a)	LF	ND (1) (b)	ND (1) (b)
MW-56M	DA	12/13/2017	(a)	LF	4.83	ND (1)
MW-56M	DA	5/2/2018	(a)	LF	4.99	ND (0.2)
MW-56S	SA	5/4/2017	(a)	LF	ND (0.2) (b)	ND (1) (b)
MW-56S	SA	12/13/2017	(a)	LF	ND (0.2)	ND (1)
MW-56S	SA	5/2/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-57-070	BR	5/1/2017		LF	350	340
MW-57-070	BR	12/11/2017		LF	420	430
MW-57-070	BR	5/3/2018		LF	340	360
MW-57-185	BR	5/1/2017		3V	5.9	5.2
MW-57-185	BR	12/11/2017		3V	8.2	7.4
MW-57-185	BR	12/11/2017		LF	3.1	3.3
MW-57-185	BR	5/3/2018		3V	7.7	7.5
MW-57-185	BR	5/3/2018		LF	5.3	5.2

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-58BR	BR	5/2/2017		LF	5.4	5.2
MW-58BR	BR	9/27/2017		LF	42	39
MW-58BR	BR	12/11/2017		LF	39	41
MW-58BR	BR	2/19/2018		LF	13	11
MW-58BR	BR	5/3/2018		LF	9.3	9.2
MW-59-100	SA	5/1/2017		LF	2,500	2,600
MW-59-100	SA	12/7/2017		LF	3,600	3,900
MW-59-100	SA	5/3/2018		LF	2,800	3,000
MW-60-125	BR	5/2/2017		LF	830	830
MW-60-125	BR	12/6/2017		LF	770	730
MW-60-125	BR	5/2/2018		LF	510	470
MW-60BR-245	BR	5/3/2017		3V	39	36
MW-60BR-245	BR	9/26/2017		3V	ND (1)	ND (1)
MW-60BR-245	BR	12/13/2017		LF	2.3	12
MW-60BR-245	BR	12/14/2017		3V	690	830
MW-60BR-245	BR	2/21/2018		3V	69	59
MW-60BR-245	BR	2/21/2018		LF	4.1	39
MW-60BR-245	BR	5/2/2018		3V	73	67
MW-60BR-245	BR	5/2/2018		LF	1.2	1.7
MW-61-110	BR	5/2/2017		3V	370	340
MW-61-110	BR	12/6/2017		LF	410	380
MW-61-110	BR	5/4/2018		LF	330	340
MW-62-065	BR	5/2/2017		LF	580	590
MW-62-065	BR	9/25/2017		LF	430	520
MW-62-065	BR	9/25/2017	FD	LF	450	500
MW-62-065	BR	12/6/2017		LF	510	500
MW-62-065	BR	2/19/2018		LF	560	510
MW-62-065	BR	2/19/2018	FD	LF	550	530
MW-62-065	BR	5/1/2018		LF	520	530
MW-62-110	BR	5/3/2017		Tap	ND (1)	1.7
MW-62-110	BR	9/27/2017		Tap	ND (1)	ND (1)
MW-62-110	BR	12/7/2017		Tap	ND (1)	3
MW-62-110	BR	2/21/2018		Tap	ND (1)	ND (1)
MW-62-110	BR	5/3/2018		G	ND (1)	ND (1)
MW-62-190	BR	5/3/2017		Tap	ND (1)	ND (1)
MW-62-190	BR	12/7/2017		Tap	ND (1)	ND (1)
MW-62-190	BR	12/7/2017	FD	Tap	ND (1)	ND (1)
MW-62-190	BR	5/3/2018		G	ND (1)	ND (1)
MW-63-065	BR	5/2/2017		LF	1.1	1.5
MW-63-065	BR	9/28/2017		LF	1.2	3.3
MW-63-065	BR	12/12/2017		LF	1.2	2.6
MW-63-065	BR	2/21/2018		LF	0.53	1.6

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-63-065	BR	4/26/2018		LF	0.85	1.3
MW-64BR	BR	5/2/2017		LF	ND (1)	ND (1)
MW-64BR	BR	9/25/2017		LF	ND (1)	ND (1)
MW-64BR	BR	12/6/2017		LF	ND (1)	ND (1)
MW-64BR	BR	2/19/2018		LF	ND (1)	ND (1)
MW-64BR	BR	2/19/2018	FD	LF	ND (1)	ND (1)
MW-64BR	BR	5/2/2018		LF	ND (1)	ND (1)
MW-65-160	SA	5/4/2017		LF	99	99
MW-65-160	SA	9/26/2017		LF	120	150
MW-65-160	SA	12/5/2017		LF	160	190
MW-65-160	SA	2/22/2018		LF	190	170
MW-65-160	SA	4/30/2018		LF	160	170
MW-65-225	DA	5/4/2017		LF	530	540
MW-65-225	DA	5/4/2017	FD	LF	520	520
MW-65-225	DA	9/26/2017		LF	480	520
MW-65-225	DA	12/5/2017		LF	210	220
MW-65-225	DA	2/22/2018		LF	510	520
MW-65-225	DA	4/30/2018		LF	110	100
MW-66-165	SA	4/25/2017		LF	430	460
MW-66-165	SA	12/5/2017		LF	500	520
MW-66-165	SA	4/30/2018		LF	540	540
MW-66-230	DA	4/25/2017		LF	6,800	7,100
MW-66-230	DA	12/5/2017		LF	6,500	6,900
MW-66-230	DA	4/30/2018		LF	6,700	6,900
MW-66-230	DA	4/30/2018	FD	LF	6,800	6,900
MW-66BR-270	BR	5/4/2017		3V	ND (0.2)	ND (1)
MW-66BR-270	BR	12/14/2017		3V	ND (0.2)	ND (1)
MW-66BR-270	BR	5/2/2018		3V	ND (1)	ND (1)
MW-67-185	SA	5/3/2017		LF	1,600	1,700
MW-67-185	SA	12/4/2017		LF	1,500	1,700
MW-67-185	SA	4/30/2018		LF	1,800	1,700
MW-67-225	MA	5/4/2017		LF	2,700	3,000
MW-67-225	MA	12/4/2017		LF	3,100	3,100
MW-67-225	MA	4/30/2018		LF	2,800	2,800
MW-67-260	DA	5/3/2017		LF	440	400
MW-67-260	DA	12/4/2017		LF	590	630
MW-67-260	DA	4/30/2018		LF	820	830
MW-68-180	SA	5/3/2017		LF	12,000	12,000
MW-68-180	SA	9/26/2017		LF	20,000	24,000
MW-68-180	SA	2/22/2018		LF	24,000	24,000
MW-68-180	SA	5/1/2018		LF	5,600	6,100
MW-68-240	DA	5/3/2017		LF	2,100	2,200

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-68-240	DA	2/22/2018		LF	2,100	2,000
MW-68-240	DA	5/1/2018		LF	2,000	2,100
MW-68BR-280	BR	5/4/2017		3V	ND (1)	ND (5)
MW-68BR-280	BR	5/4/2017	FD	3V	ND (1)	ND (5)
MW-68BR-280	BR	2/22/2018		LF	ND (1)	ND (1)
MW-68BR-280	BR	5/1/2018		LF	ND (1)	ND (5)
MW-69-195	BR	5/3/2017		LF	270	270
MW-69-195	BR	9/26/2017		LF	350	360
MW-69-195	BR	12/4/2017		LF	470	440
MW-69-195	BR	2/22/2018		LF	120	110
MW-69-195	BR	5/1/2018		LF	210	210
MW-70-105	BR	5/2/2017		LF	130	120
MW-70-105	BR	12/11/2017		LF	160	150
MW-70-105	BR	5/3/2018		LF	160	150
MW-70BR-225	BR	5/2/2017		3V	1,800	1,800
MW-70BR-225	BR	12/11/2017		3V	1,700	1,800
MW-70BR-225	BR	12/11/2017		LF	1,400	1,600
MW-70BR-225	BR	5/3/2018		3V	1,800	1,800
MW-70BR-225	BR	5/3/2018		LF	1,300	1,300
MW-71-035	SA	5/3/2017		LF	ND (1)	ND (1)
MW-71-035	SA	12/12/2017		LF	ND (1)	1.5
MW-71-035	SA	5/2/2018		LF	ND (1)	ND (1)
MW-72-080	BR	5/2/2017		LF	71	61
MW-72-080	BR	9/28/2017		LF	110	99
MW-72-080	BR	9/28/2017	FD	Tap	110	97
MW-72-080	BR	12/7/2017		LF	94	95
MW-72-080	BR	2/20/2018		LF	90	78
MW-72-080	BR	4/26/2018		LF	68	62
MW-72BR-200	BR	5/2/2017		3V	2.9	2.6
MW-72BR-200	BR	9/27/2017		3V	3.8	3.6
MW-72BR-200	BR	12/6/2017		3V	4.2	3.8
MW-72BR-200	BR	12/6/2017		LF	1.5	1.7
MW-72BR-200	BR	2/20/2018		3V	4.5	4.4
MW-72BR-200	BR	2/20/2018		LF	1.6	2.1
MW-72BR-200	BR	4/26/2018		3V	3.3	2.6
MW-72BR-200	BR	4/26/2018		LF	ND (1)	2
MW-73-080	BR	5/2/2017		LF	30	27
MW-73-080	BR	9/27/2017		LF	41	41
MW-73-080	BR	12/6/2017		LF	28	29
MW-73-080	BR	2/20/2018		LF	22	21
MW-73-080	BR	5/1/2018		LF	57	58
MW-74-240	BR	4/27/2017		LF	ND (0.2)	ND (1)

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Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-74-240	BR	12/6/2017		LF	ND (0.2)	5.3
MW-74-240	BR	5/2/2018		LF	0.46	ND (1)
PE-01	DA	4/25/2017		Tap	0.53	ND (1)
PE-01	DA	5/4/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	6/7/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	7/18/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	8/2/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	9/7/2017		Tap	9	4.5
PE-01	DA	10/3/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	11/2/2017		Tap	0.52	ND (1)
PE-01	DA	12/7/2017		Tap	ND (0.2)	ND (1)
PE-01	DA	1/4/2018		Tap	ND (0.2)	ND (1)
PE-01	DA	2/7/2018		Tap	0.7	ND (1)
PE-01	DA	3/7/2018		Tap	2.3	2
PE-01	DA	4/3/2018		Tap	ND (0.2)	ND (1)
PE-01	DA	5/4/2018		Tap	ND (0.2)	1.8
PE-01	DA	6/7/2018		Tap	ND (0.2)	ND (1)
TW-01	SA	5/3/2017		LF	2,200	2,400
TW-01	SA	12/13/2017		3V	2,200	2,300
TW-01	SA	12/13/2017	FD	LF	2,200	2,400
TW-01	SA	5/1/2018		3V	2,400	3,100
TW-02D	DA	4/28/2017		Tap	530	540
TW-02D	DA	4/28/2017	FD	Tap	520	530
TW-02D	DA	10/24/2017		Tap	200	190
TW-02D	DA	12/7/2017		Tap	110	93
TW-02D	DA	2/23/2018		LF	140	140
TW-02D	DA	2/23/2018	FD	LF	150	140
TW-02D	DA	5/4/2018		Tap	150	150
TW-02D	DA	5/4/2018	FD	Tap	150	140
TW-03D	DA	4/25/2017		Tap	560	570
TW-03D	DA	5/4/2017		Tap	550	540
TW-03D	DA	6/7/2017		Tap	550	550
TW-03D	DA	7/18/2017		Tap	560	570
TW-03D	DA	8/2/2017		Tap	540	520
TW-03D	DA	9/7/2017		Tap	550	540
TW-03D	DA	10/3/2017		Tap	560	580
TW-03D	DA	11/2/2017		Tap	550	570
TW-03D	DA	12/7/2017		Tap	550	570
TW-03D	DA	1/4/2018		Tap	550	590
TW-03D	DA	2/7/2018		Tap	550	540
TW-03D	DA	3/7/2018		Tap	530	520
TW-03D	DA	4/3/2018		Tap	570	550

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Historical Cr(VI) and Dissolved Chromium Concentrations, April 2017 through June 2018

Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
TW-03D	DA	5/4/2018		Tap	490	490
TW-03D	DA	6/7/2018		Tap	470	480
TW-04	DA	12/14/2017		3V	8.2	8.3
TW-04	DA	12/14/2017		LF	2.8	4
TW-04	DA	4/26/2018		3V	8.9	9.4
TW-04	DA	4/26/2018		LF	ND (1)	ND (5)
TW-05	DA	12/14/2017		3V	14	12
TW-05	DA	12/14/2017		LF	10	13
TW-05	DA	5/1/2018		3V	11	11
TW-05	DA	5/1/2018		LF	8.8	9.1

Notes:

1. Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.

(a) Data were analyzed by an Arizona-certified laboratory.

(b) Results were originally reported to the laboratory's sample-specific limit of detection instead of the sample-specific reporting limit as required. The laboratory sample-specific reporting limit replaced the sample-specific laboratory limit of detection as of January 2018.

-- = data were either not collected, not available or were rejected.
µg/L = micrograms per liter.
3V = three volume.
BR = bedrock.
DA = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
G = Grab sample.
H = HydraSleeve.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown)
MA = mid-depth interval of Alluvial Aquifer.
ND = not detected at listed reporting limit.
SA = shallow interval of Alluvial Aquifer.
Tap = sampled from tap of extraction well.

APPENDIX C

Well Inspection and Maintenance Log, Second Quarter 2018

Appendix C
Well Inspection and Maintenance Log, Second Quarter 2018
Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well/Piezometer	Inspection Date	Survey Mark Present? (Yes/No)	Standing or Ponded Water? (Yes/No)	Lock in Place? (Yes/No)	Evidence of well subsidence? (Yes/No)	Well Labeled on Casing or Pad? (Yes/No)	Traffic Poles Intact? (Yes/No)	Concrete Pad Intact? (Yes/No)	Erosion Around Wellhead? (Yes/No)	Steel Casing Intact? (Yes/No)	PVC Cap Present? (Yes/No)	Standing Water in Annulus? (Yes/No)	Well Casing Intact? (Yes/No)	Photo Taken? (Yes/No)	Action Completed? (Yes/No)
MW-09	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-10	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-11	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-12	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-14	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	--	--
MW-19	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	--	--
MW-20-070	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-20-100	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No
MW-20-130	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No
MW-21	05/01/2018	--	No	--	No	Yes	No	--	No	--	Yes	No	Yes	Yes	No
MW-22	04/23/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-23-060	04/26/2018	Yes	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	--
MW-23-080	04/26/2018	No	No	Yes	No	Yes	--	--	No	--	Yes	No	Yes	Yes	--
MW-24A	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-24BR	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-25	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	--	--
MW-26	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-27-085	04/24/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-28-025	04/25/2018	Yes	Yes	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-28-090	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-29	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-31-060	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No
MW-32-020	04/23/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	--
MW-32-035	04/23/2018	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-040	04/25/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-090	04/24/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-150	04/25/2018	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-210	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-34-080	04/24/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-34-100	04/24/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-35-060	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	--	--
MW-35-135	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-090	04/24/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	No	No	Yes	Yes	--
MW-36-100	04/24/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-37D	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-38D	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-38D-SMT	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-38S	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-38S-SMT	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-39-100	04/24/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-40D	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-40D-SMT	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-40S	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-40S-SMT	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-41D	05/04/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-42-055	04/24/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	--
MW-42-065	04/24/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-44-070	04/24/2018	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	--
MW-44-115	04/24/2018	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-44-125	04/24/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-46-175	04/25/2018	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-46-205	04/25/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-47-055	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-47-055	04/26/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-47-115	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-48	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-50-095	04/27/2018	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-50-200	04/27/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-51	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-52D	04/23/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-52D	04/23/2018	Yes	No	Yes	No	Yes	--	No	No	Yes	No	No	Yes	Yes	--
MW-52M	04/23/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-52S	04/24/2018	Yes	No	No	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-53D	04/23/2018	Yes	No	Yes	No	Yes	--	--	No	Yes	Yes	No	Yes	No	No
MW-53M	04/23/2018	Yes	No	Yes	No	Yes	--	--	No	Yes	Yes	--	Yes	No	--
MW-54-085	05/04/2018	--	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	No
MW-54-140	05/04/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-54-195	05/04/2018	--	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	No
MW-55-045	05/03/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--

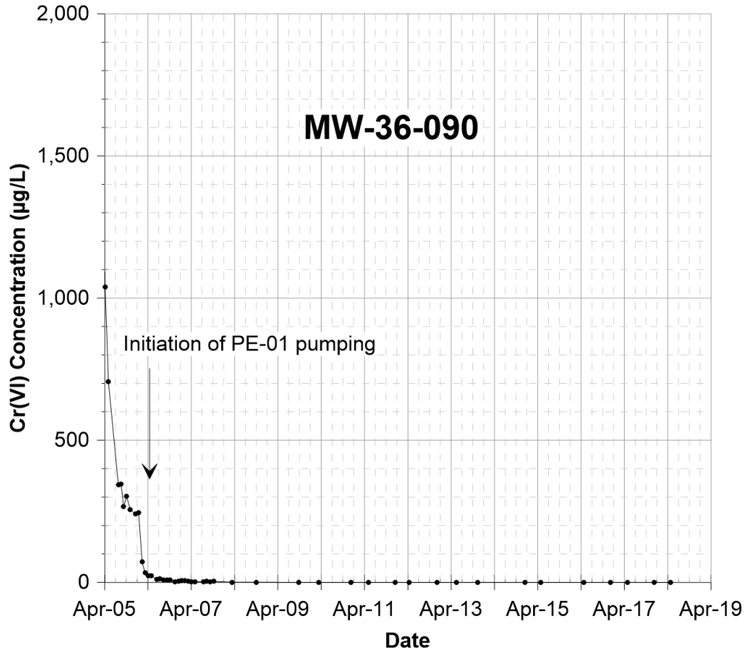
Appendix C
Well Inspection and Maintenance Log, Second Quarter 2018
Second Quarter 2018 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

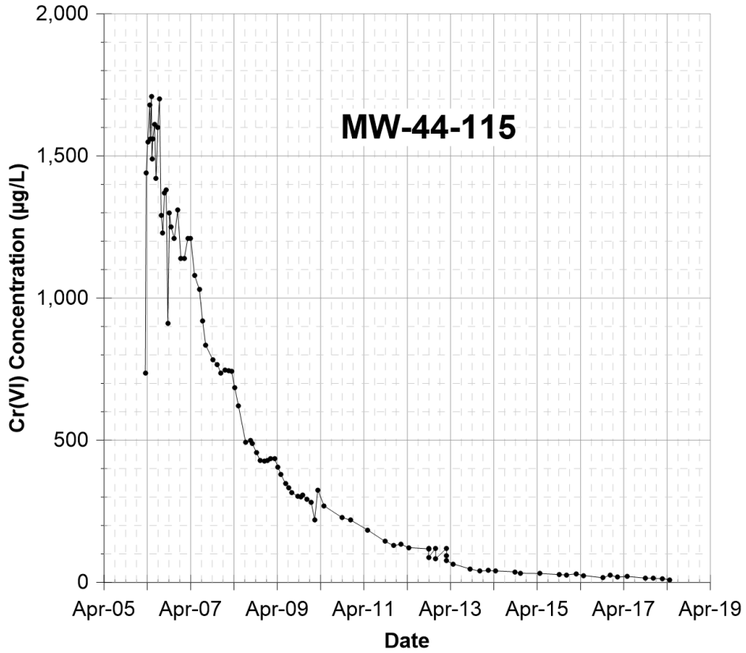
Well/Piezometer	Inspection Date	Survey Mark Present? (Yes/No)	Standing or Ponded Water? (Yes/No)	Lock in Place? (Yes/No)	Evidence of well subsidence? (Yes/No)	Well Labeled on Casing or Pad? (Yes/No)	Traffic Poles Intact? (Yes/No)	Concrete Pad Intact? (Yes/No)	Erosion Around Wellhead? (Yes/No)	Steel Casing Intact? (Yes/No)	PVC Cap Present? (Yes/No)	Standing Water in Annulus? (Yes/No)	Well Casing Intact? (Yes/No)	Photo Taken? (Yes/No)	Action Completed? (Yes/No)
MW-55-120	05/03/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-56D	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-56M	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-56S	05/02/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-57-050	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-57-070	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-57-185-3V	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-57-185-LF_D	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-57-185-LF_S	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-58-065	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-58BR	05/03/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-59-100	05/03/2018	Yes	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-60-125	05/02/2018	--	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	No
MW-60BR-245-3V	05/02/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-60BR-245-LF_D	05/02/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-60BR-245-LF_S	05/02/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-61-110	05/04/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-62-065	05/01/2018	--	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	No
MW-62-110	05/02/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-62-190	05/02/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-63-065	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-64BR	05/02/2018	Yes	No	Yes	No	Yes	No	Yes	No	--	Yes	No	Yes	Yes	--
MW-65-160	04/30/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-65-225	04/30/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-66-165	04/30/2018	No	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	No
MW-66-230	04/30/2018	No	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	No
MW-66BR-270	04/30/2018	No	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	No
MW-67-185	04/30/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-67-225	04/30/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-67-260	04/30/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-68-180	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-68-240	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-68BR-280	05/01/2018	Yes	No	Yes	No	Yes	--	Yes	Yes	--	Yes	No	Yes	--	--
MW-69-195	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-70-105	05/03/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-70BR-225-3V	05/03/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-70BR-225-LF	05/03/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-71-035	05/01/2018	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
MW-72-080	04/26/2018	Yes	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	No
MW-72BR-200-3V	04/26/2018	Yes	No	Yes	No	Yes	No	Yes	No	--	Yes	No	Yes	Yes	--
MW-72BR-200-LF_D	04/26/2018	Yes	No	Yes	No	Yes	No	Yes	No	--	Yes	No	Yes	Yes	--
MW-72BR-200-LF_S	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-73-080	05/01/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	--	--
MW-74-240	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
PE-01	04/03/2018	--	--	--	--	Yes	--	Yes	--	--	--	--	Yes	--	--
PE-01	05/04/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PE-01	06/07/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW-01	05/01/2018	No	No	--	No	Yes	--	--		--	--	No	Yes	Yes	No
TW-02D	05/04/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW-03D	04/03/2018	--	--	--	--	Yes	--	Yes	--	Yes	--	--	Yes	No	--
TW-03D	05/04/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW-03D	06/07/2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW-04	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
TW-04-3V	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	
TW-04-LF	04/26/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
TW-05-3V	05/01/2018	--	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
TW-05-LF	05/01/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	No
C-I-3-S	04/25/2018	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--

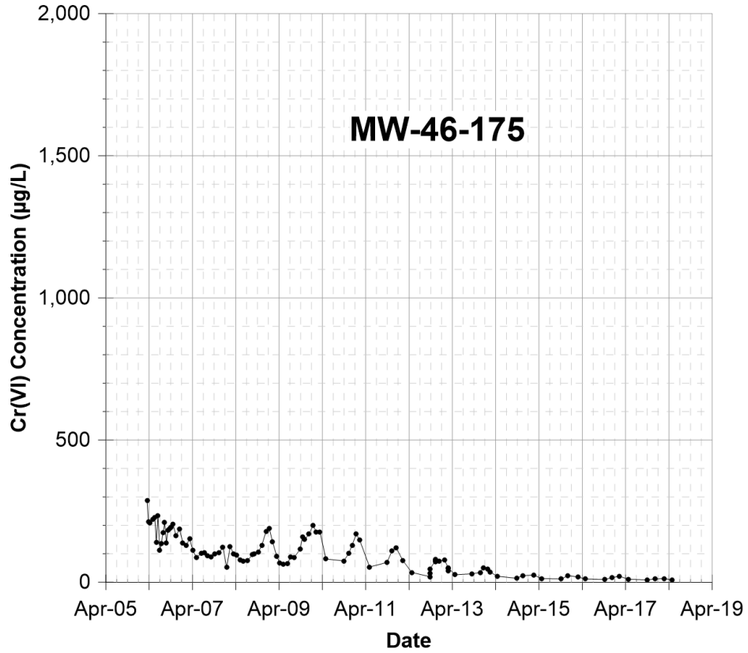
Notes:
-- = not applicable

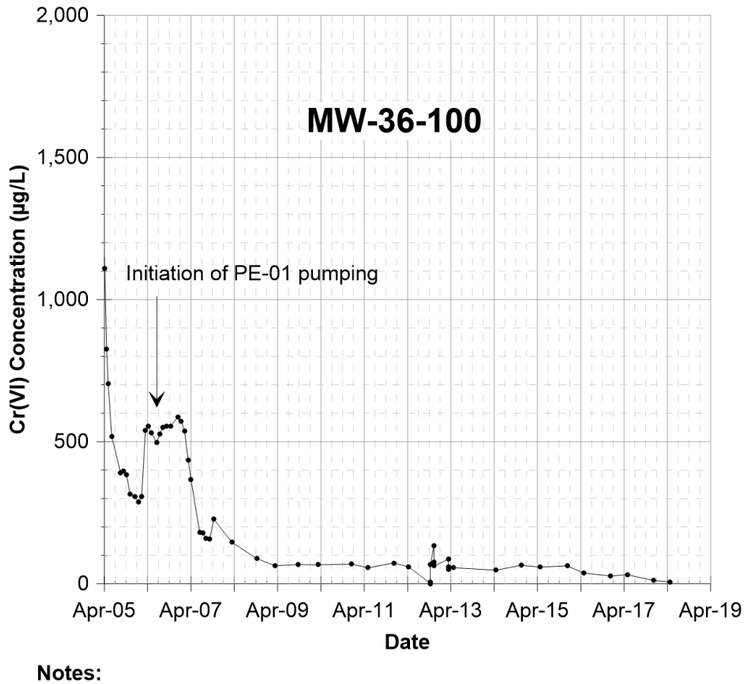
APPENDIX D

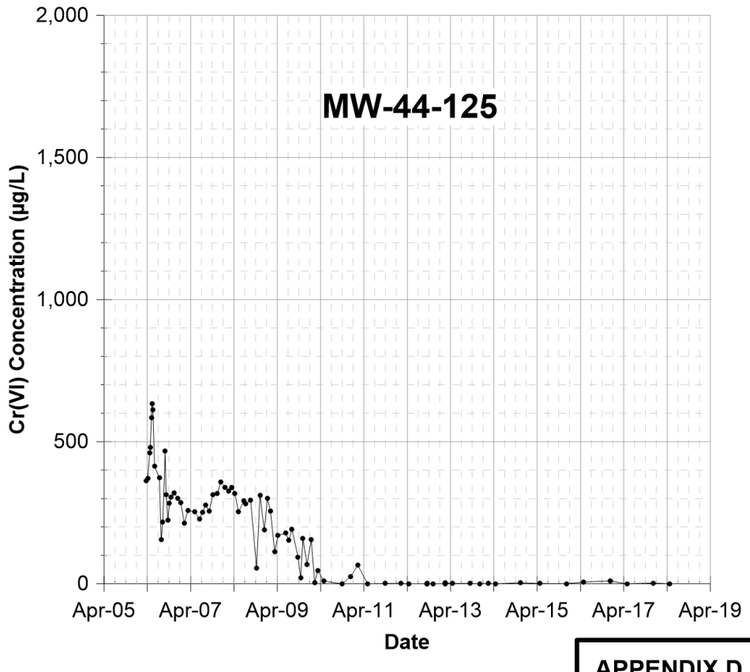
Cr(VI) Concentration Time Series Charts, Second Quarter 2018

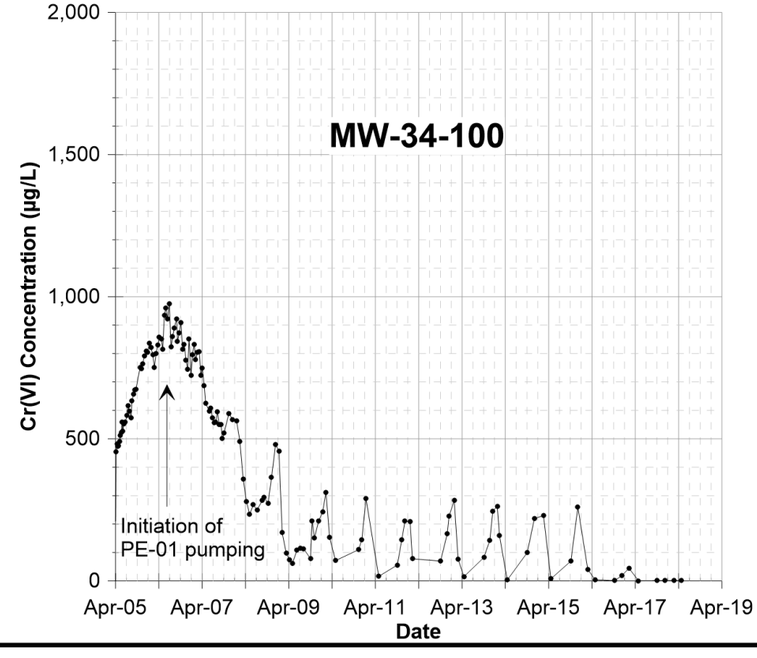












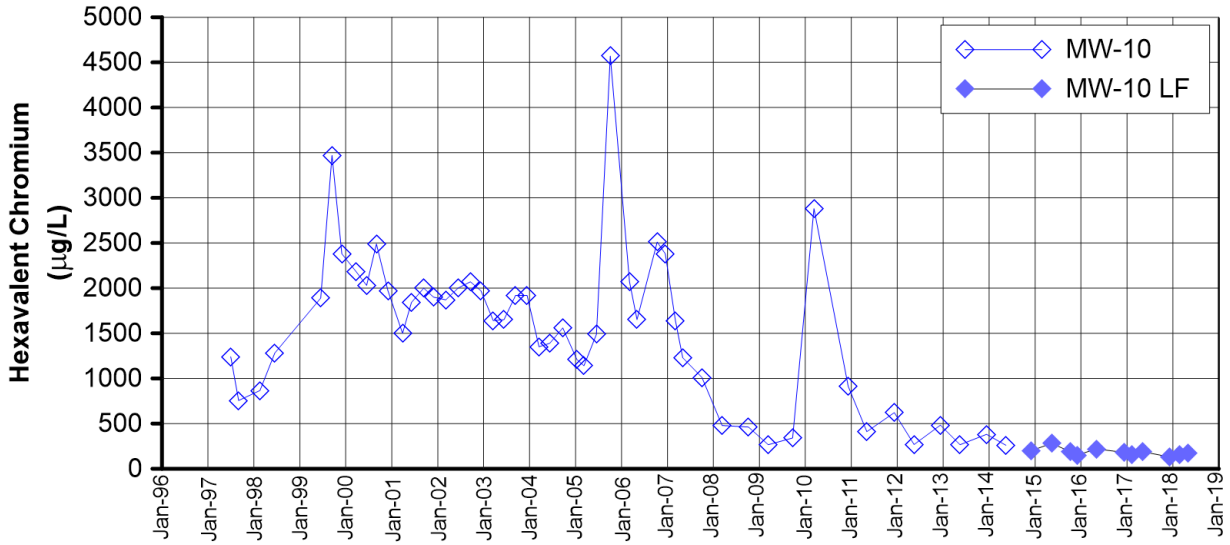
Notes:

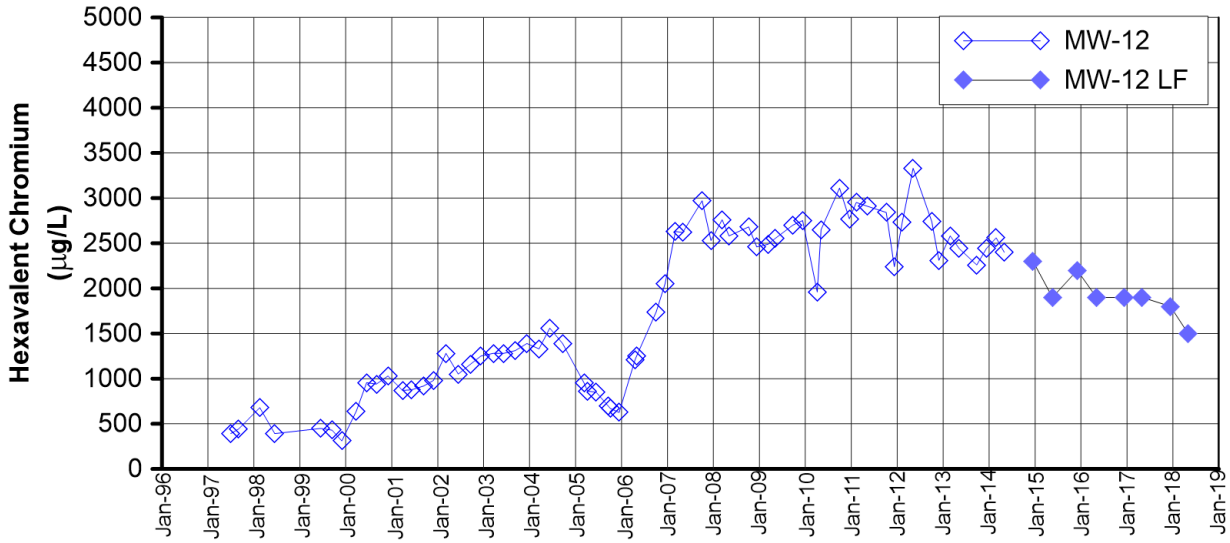
1. Hexavalent chromium [Cr(VI)] results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Results plotted are maximum concentrations from primary and duplicate samples; see Table 3-1 for complete results.
3. MW-36 wells selected to monitor effects of PE-01 pumping on plume west of PE-01. MW-44 wells, MW-46-175, and MW-34-100 selected to monitor concentrations within the plume.

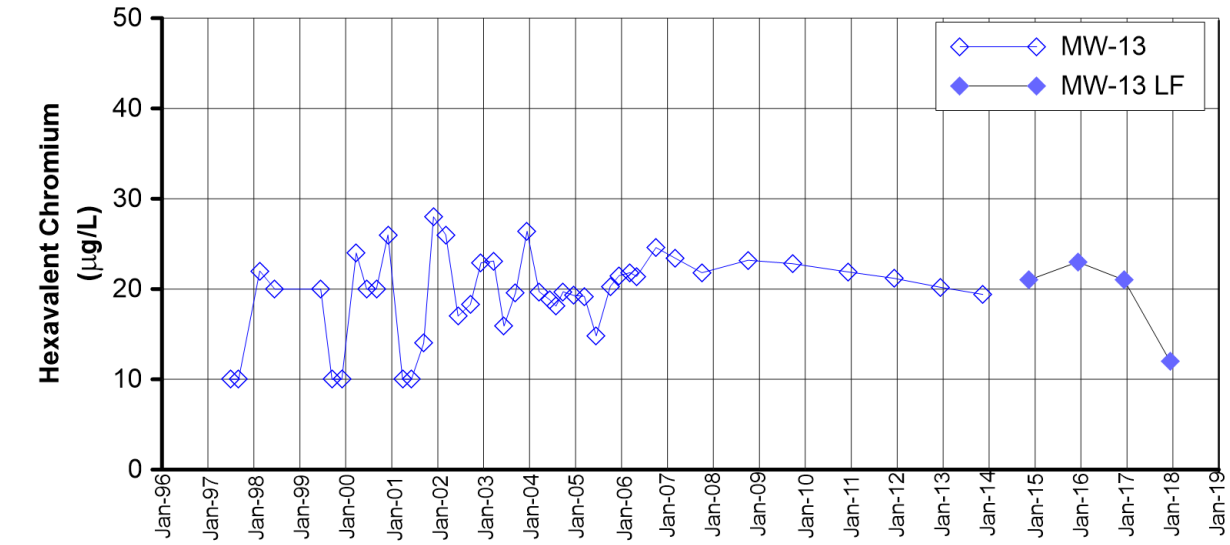
APPENDIX D
Cr(VI) CONCENTRATION TRENDS IN SELECTED PERFORMANCE MONITORING WELLS, APRIL 2005 THROUGH JUNE 2018

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS





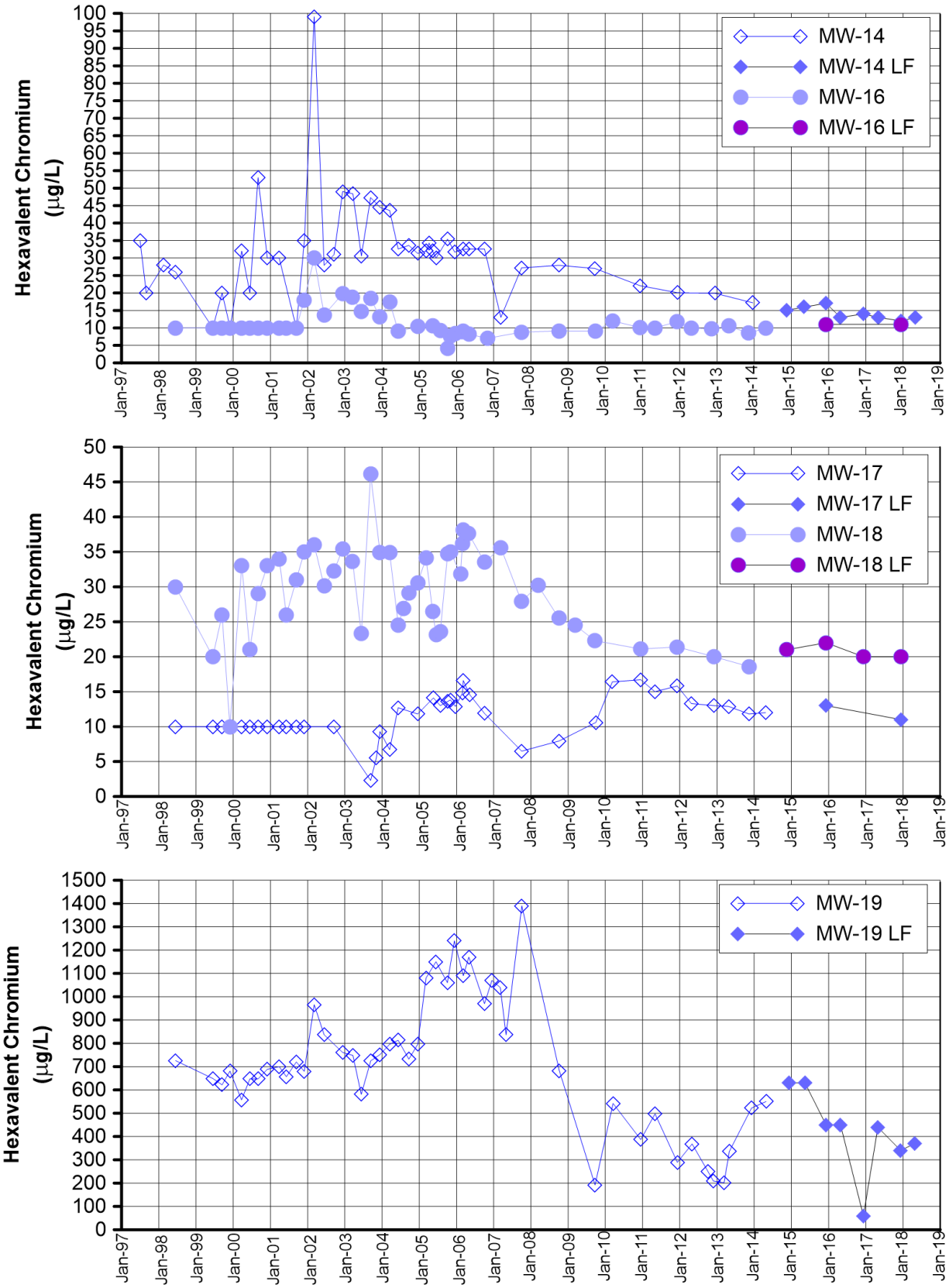


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-1
HEXAVALENT CHROMIUM
IN MW-10, MW-12, AND MW-13
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

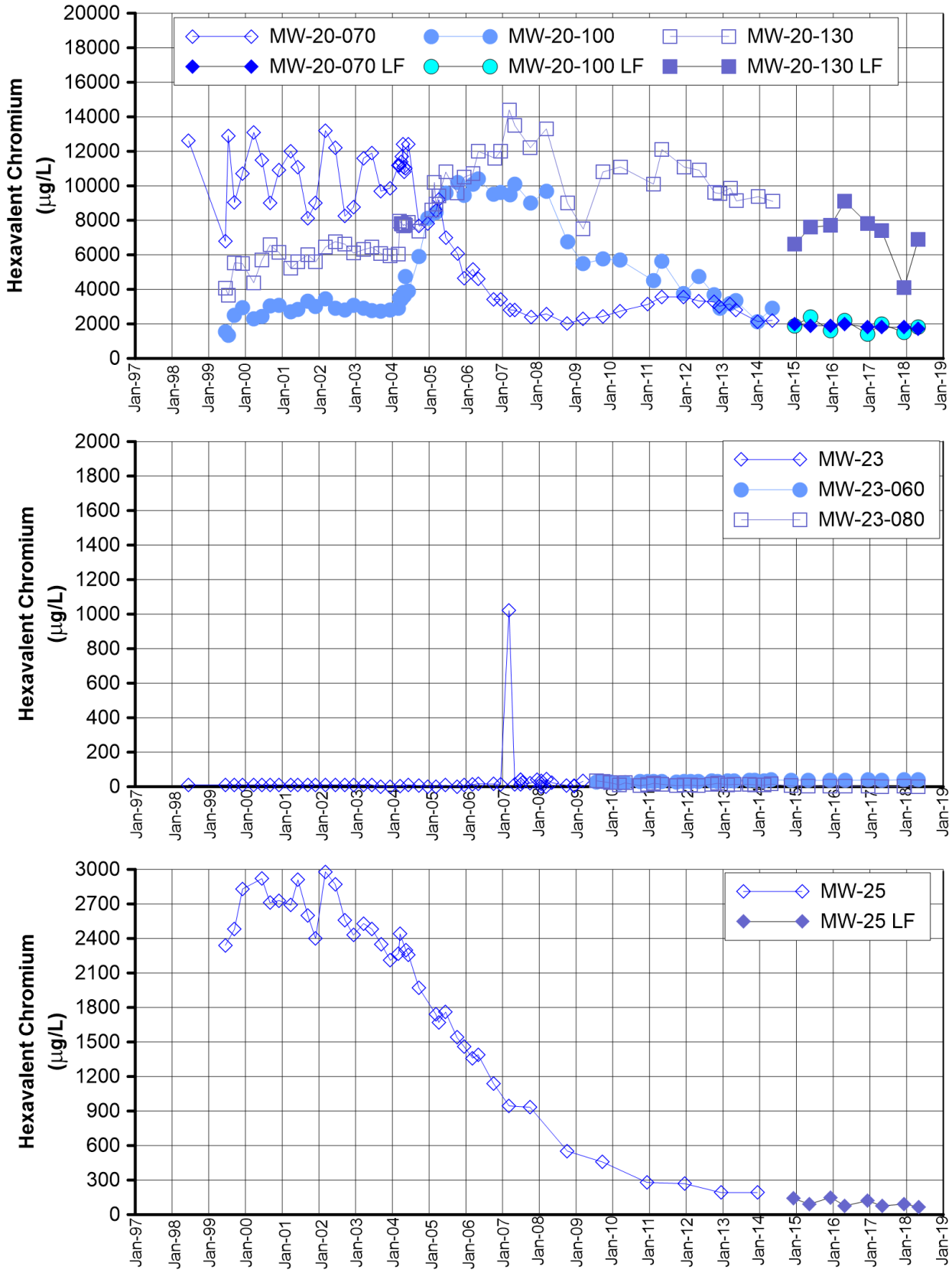


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-2
HEXAVALENT CHROMIUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-3
HEXAVALENT CHROMIUM
IN MW-20 AND MW-23 CLUSTERS AND MW-25
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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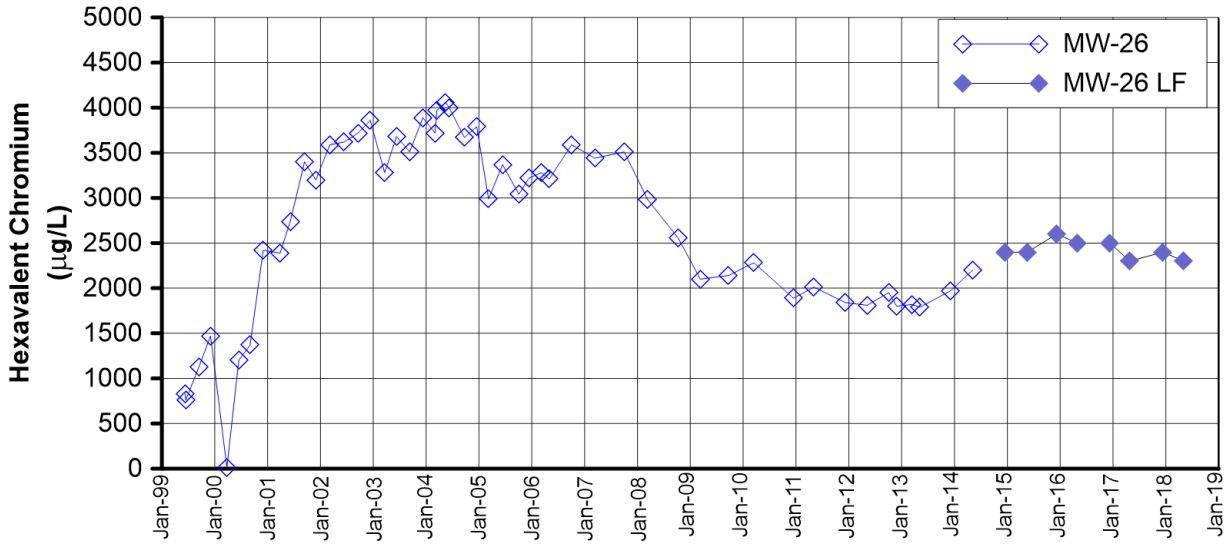

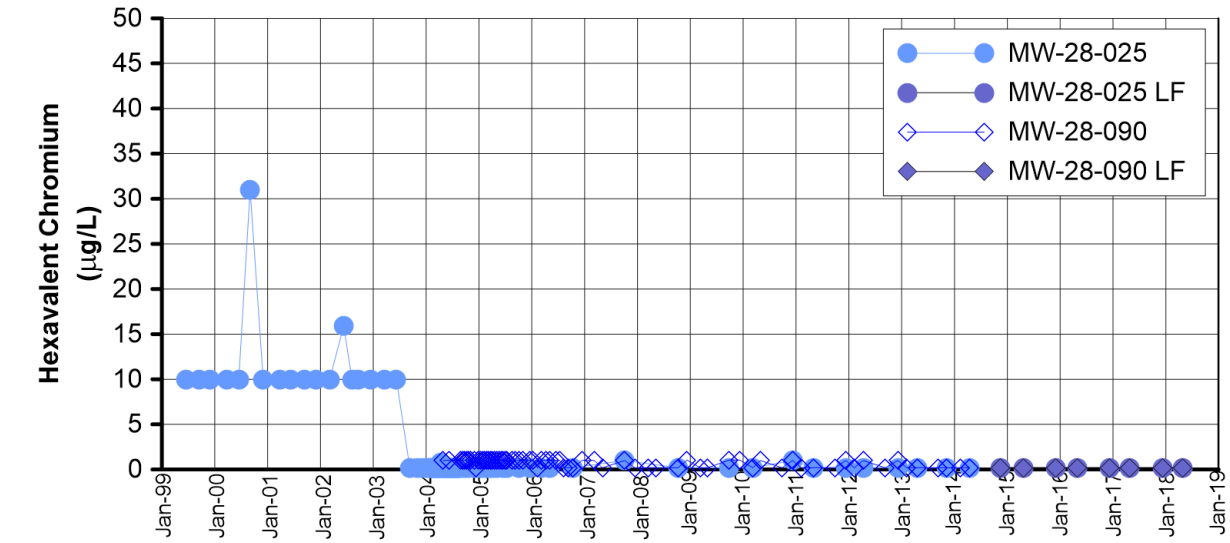

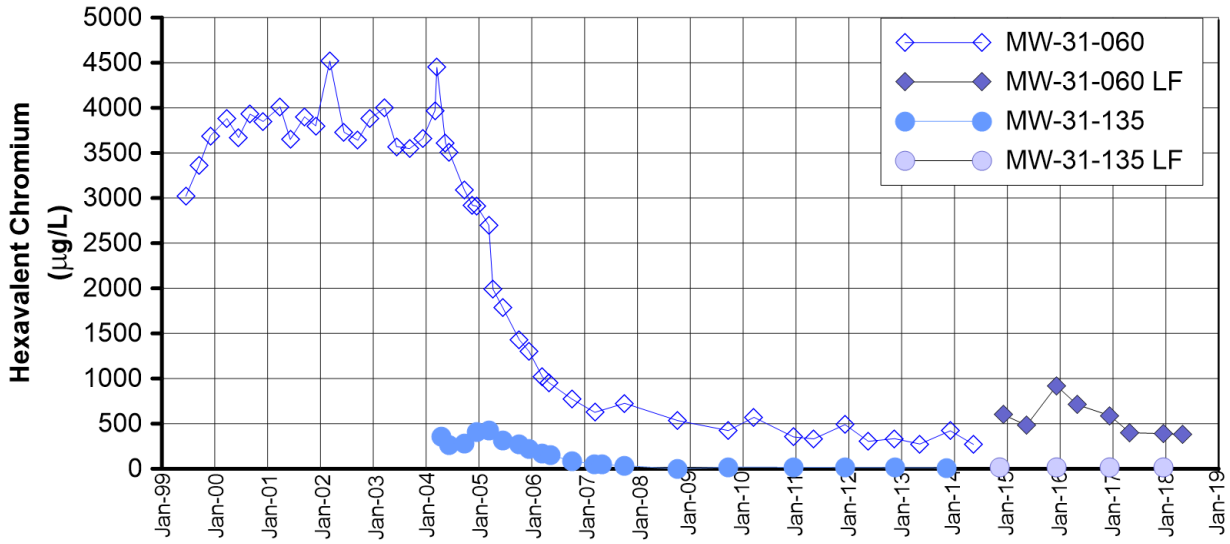

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-28-090 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-4
HEXAVALENT CHROMIUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
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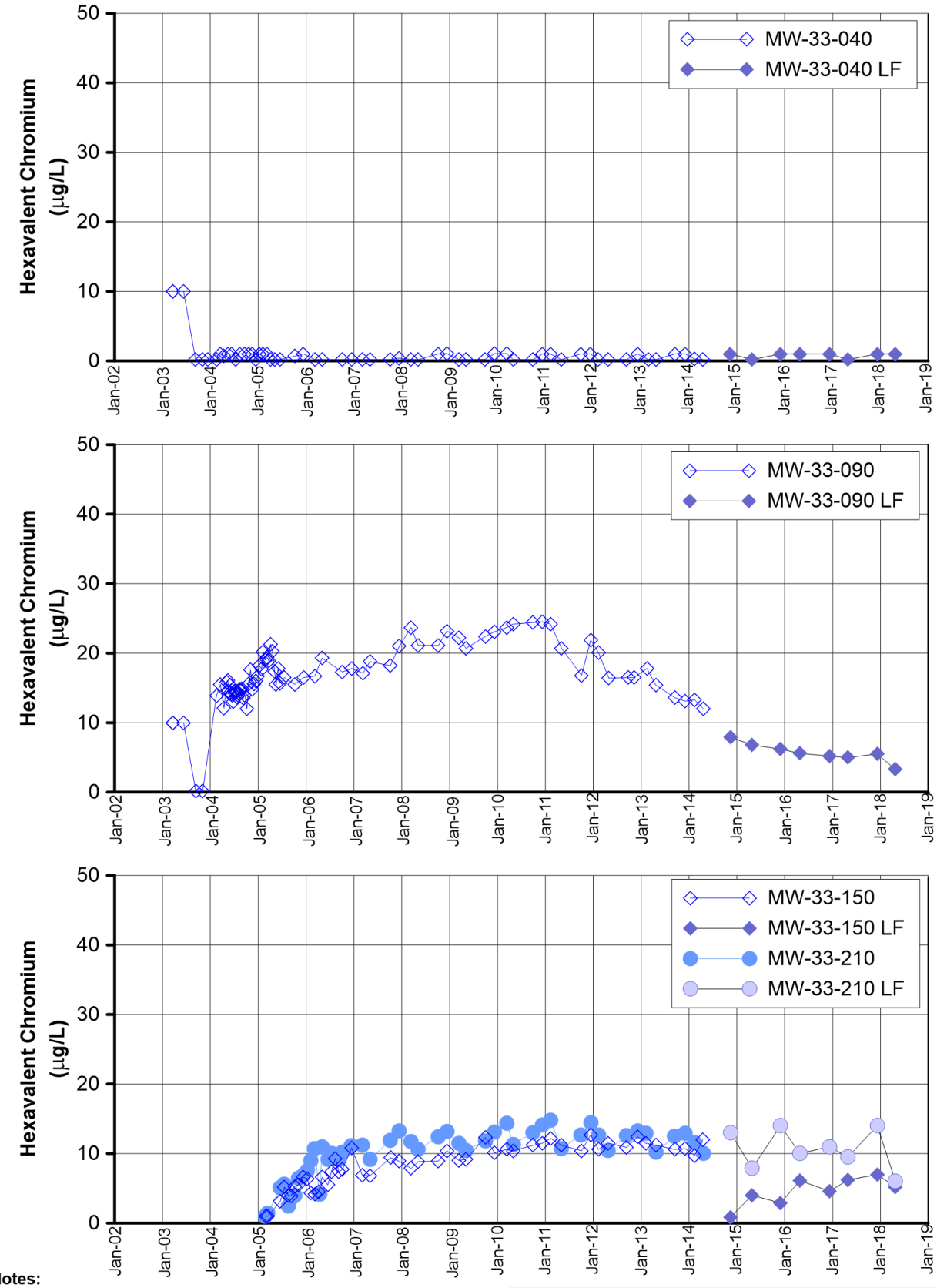

Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-33-040 is 20 µg/L.
3) The trigger level for MW-33-090 is 25 µg/L.
4) The trigger level for MW-33-150 is 20 µg/L.
5) The trigger level for MW-33-210 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-5
HEXAVALENT CHROMIUM
IN MW-33 CLUSTER

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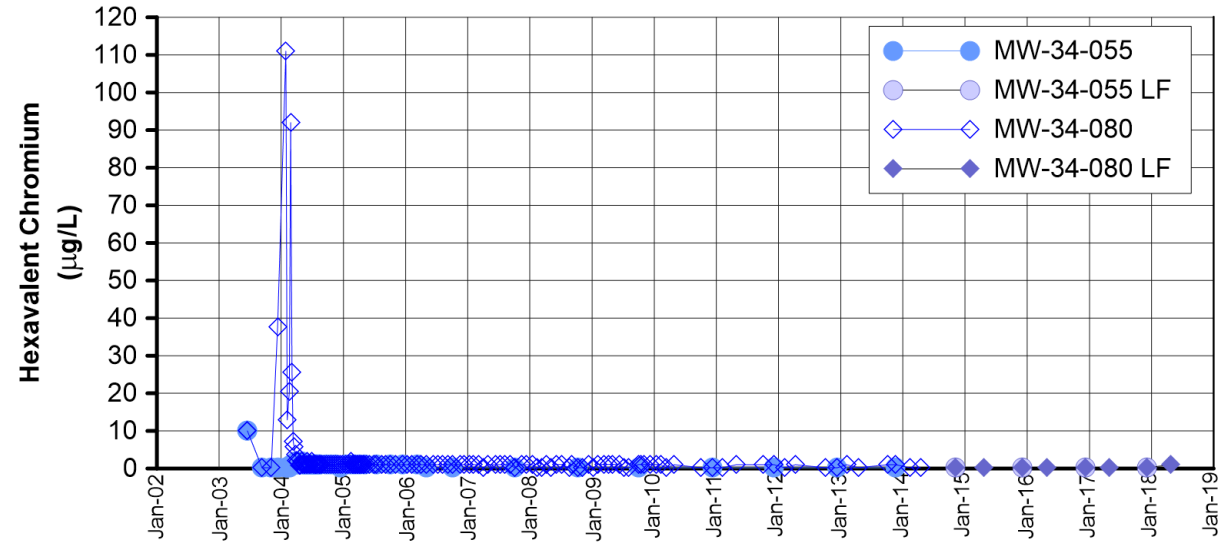

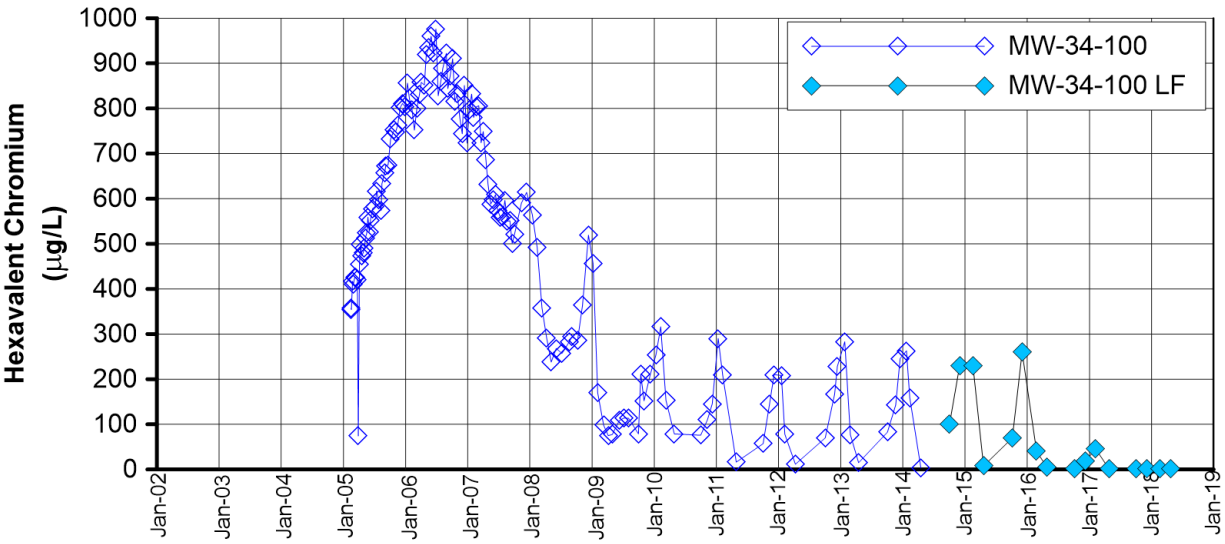

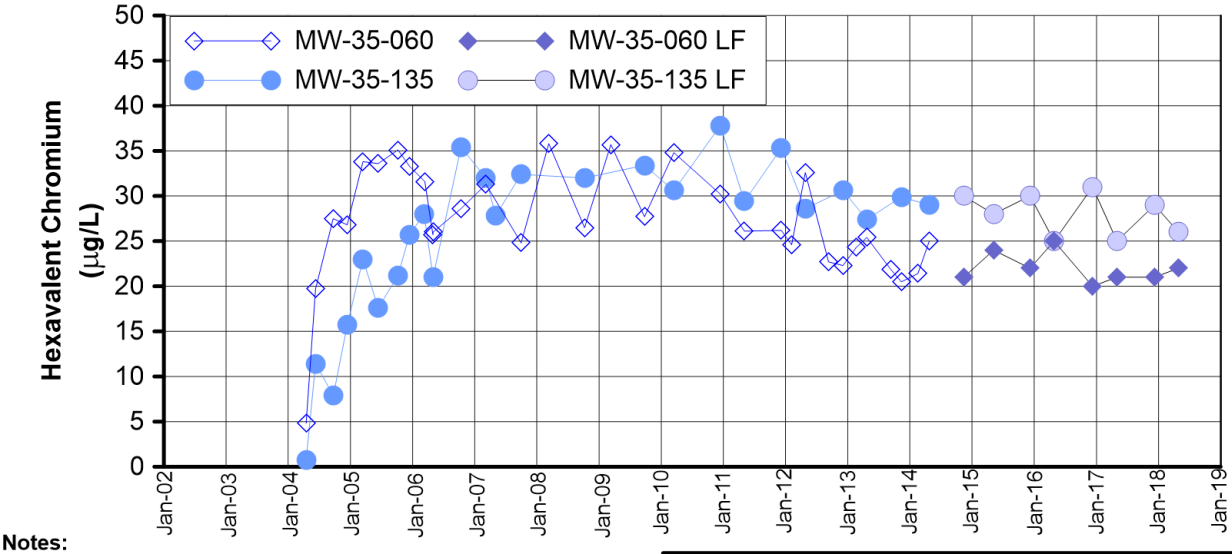

Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-34-080 is 20 µg/L.
3) The trigger level for MW-34-100 is 750 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-6
HEXAVALENT CHROMIUM
IN MW-34 AND MW-35 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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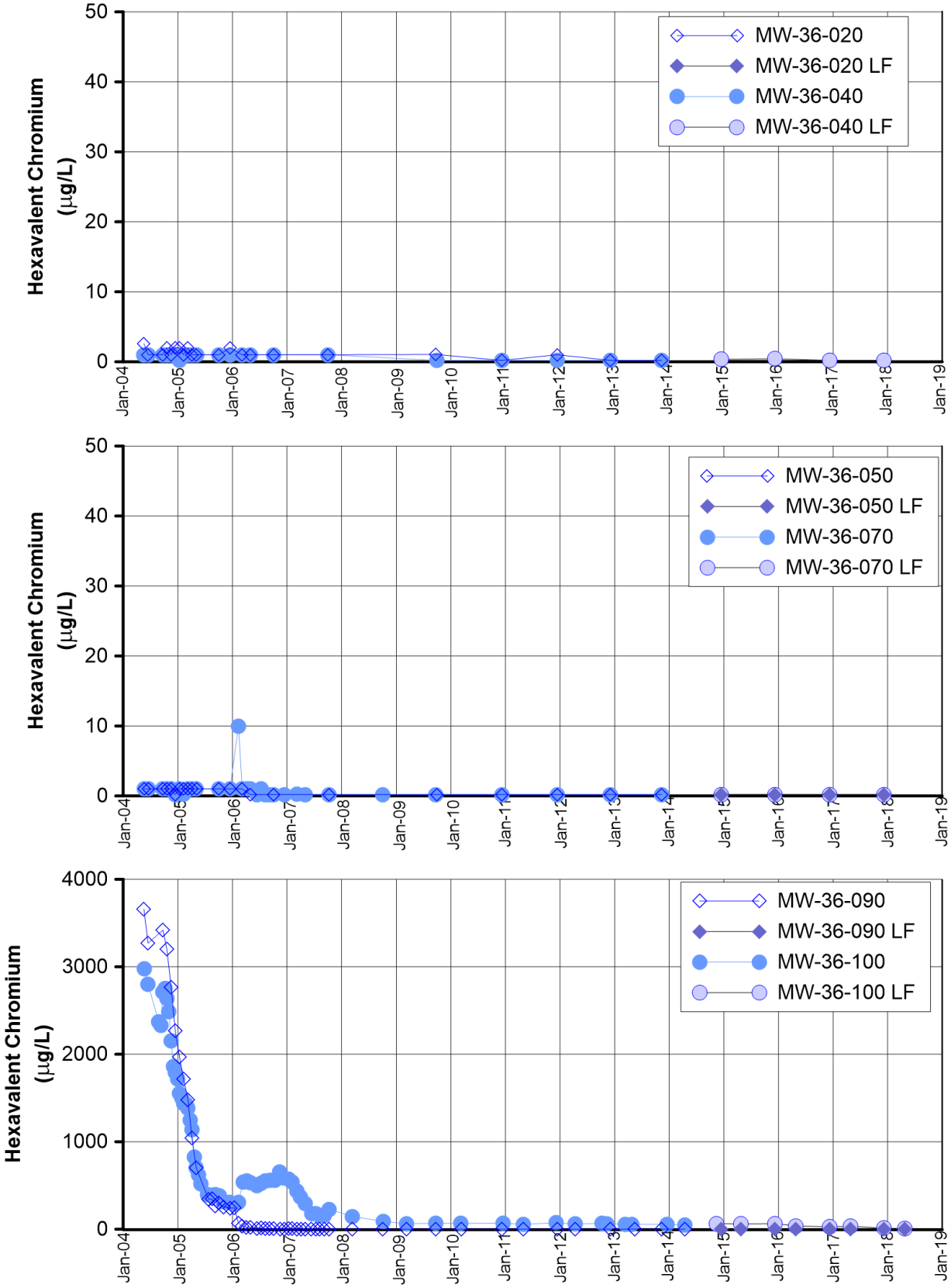

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-36-070 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-7
HEXAVALENT CHROMIUM IN MW-36 CLUSTER
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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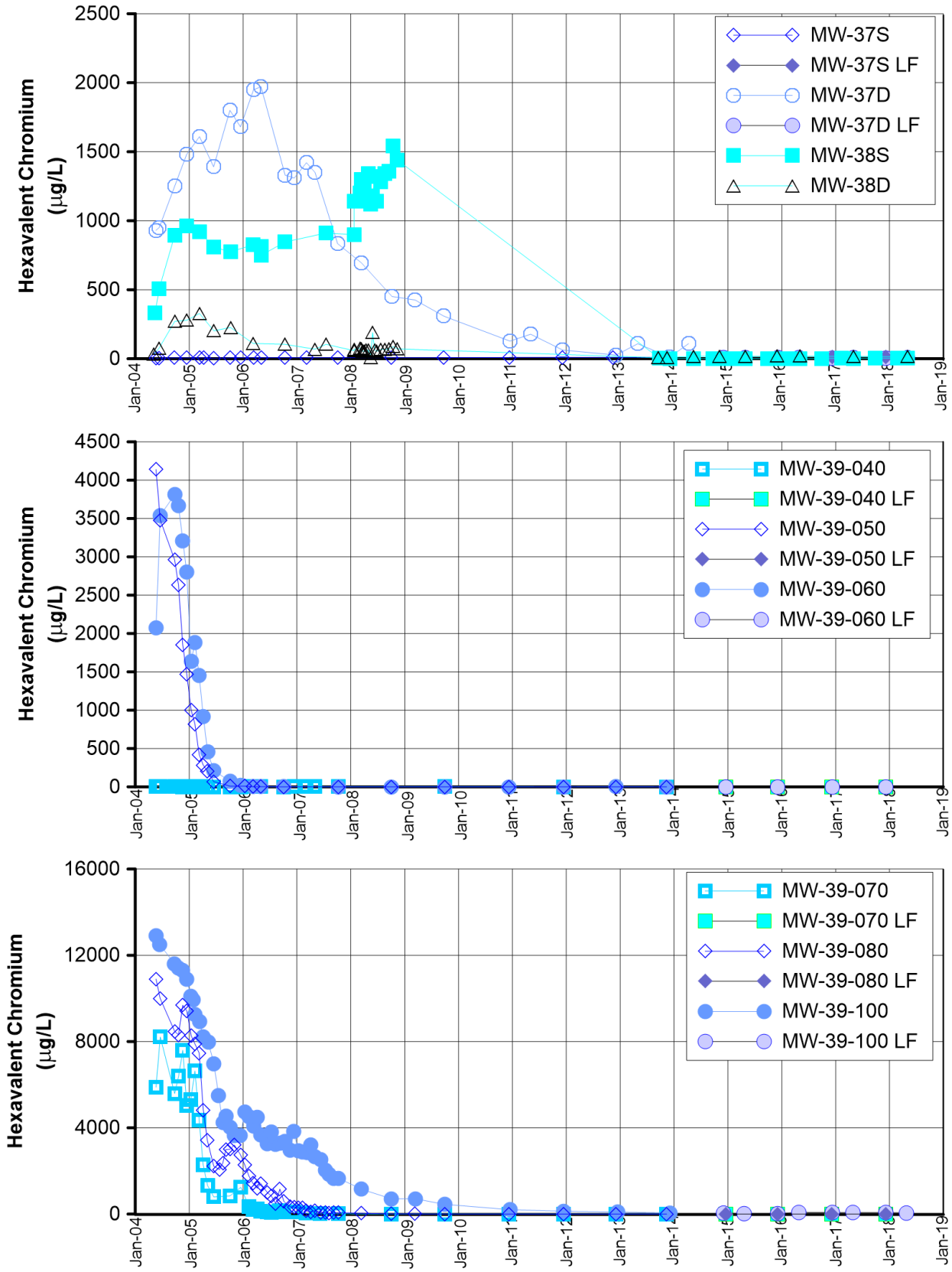

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-39-040 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-8
HEXAVALENT CHROMIUM
IN MW-37, MW-38 AND MW-39 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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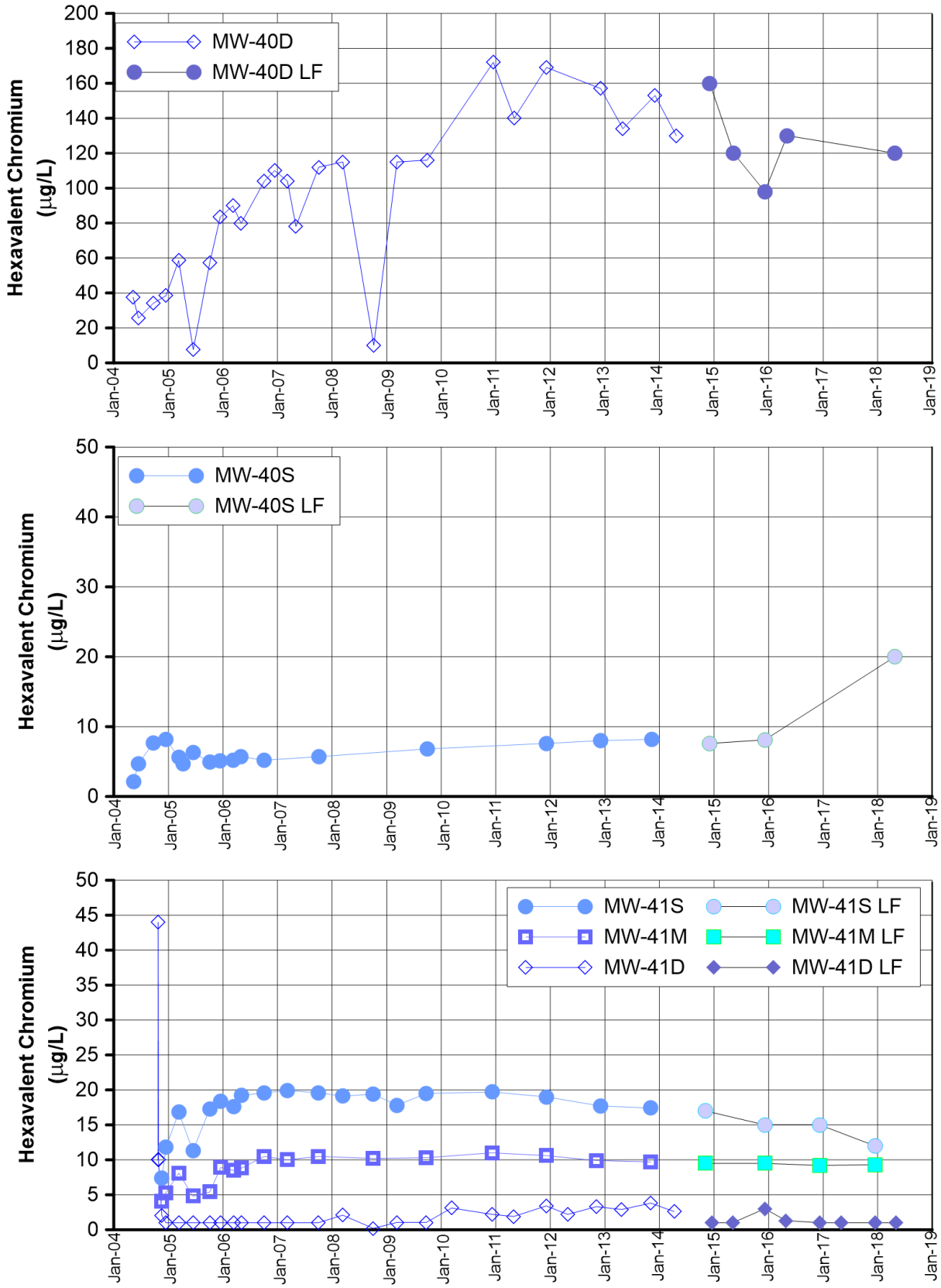

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-9
HEXAVALENT CHROMIUM
IN MW-40 AND MW-41 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
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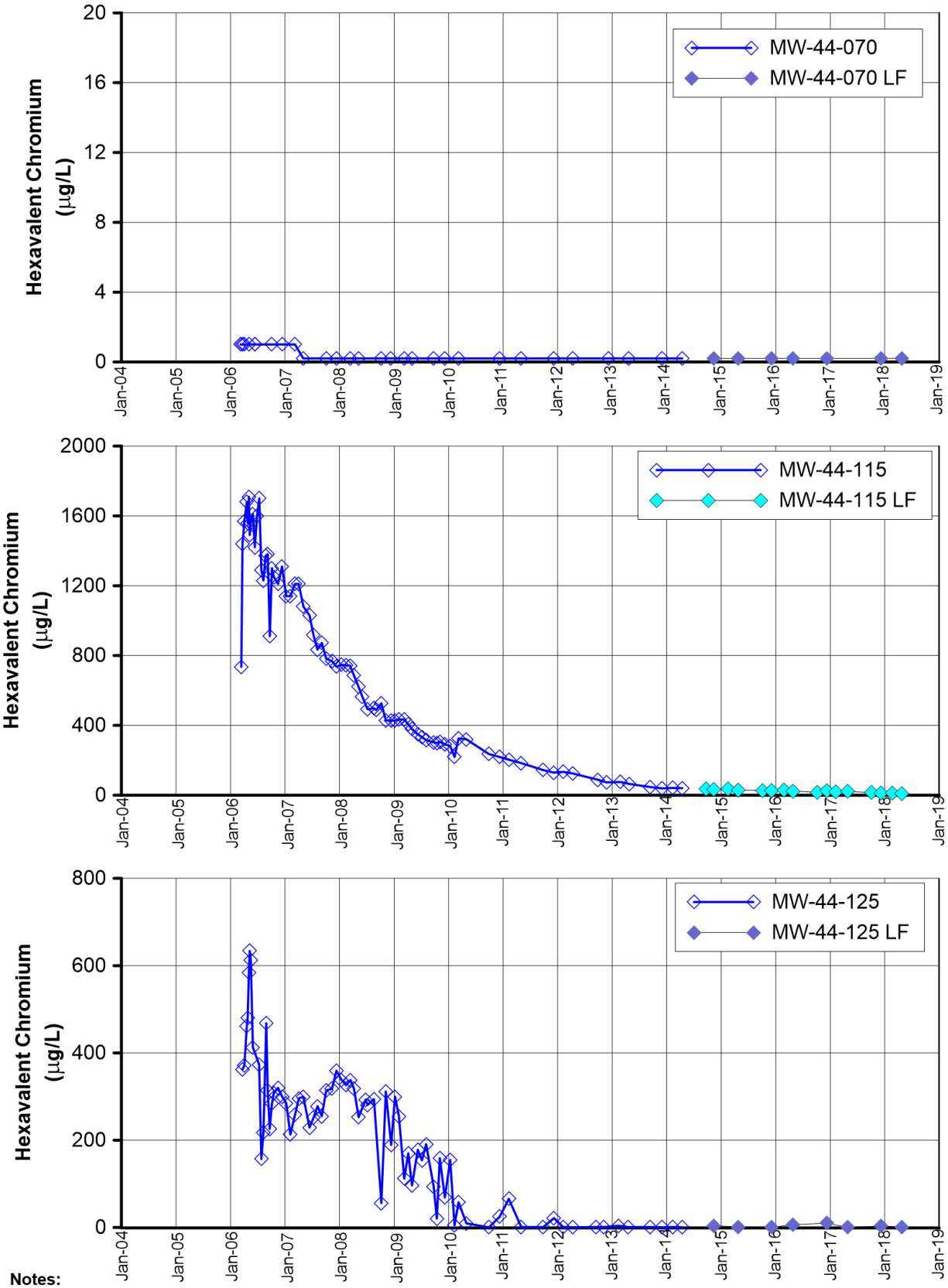

Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-44-070 is 20 µg/L.
3) The trigger level for MW-44-115 is 1,200 µg/L.
4) The trigger level for MW-44-125 is 475 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-10
HEXAVALENT CHROMIUM IN MW-44 CLUSTER

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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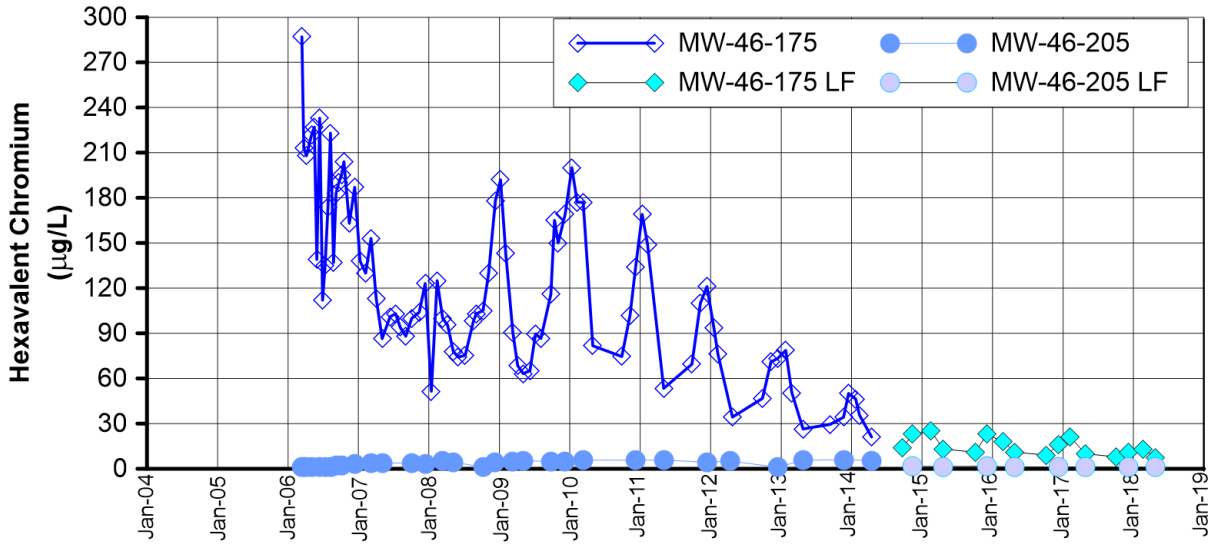

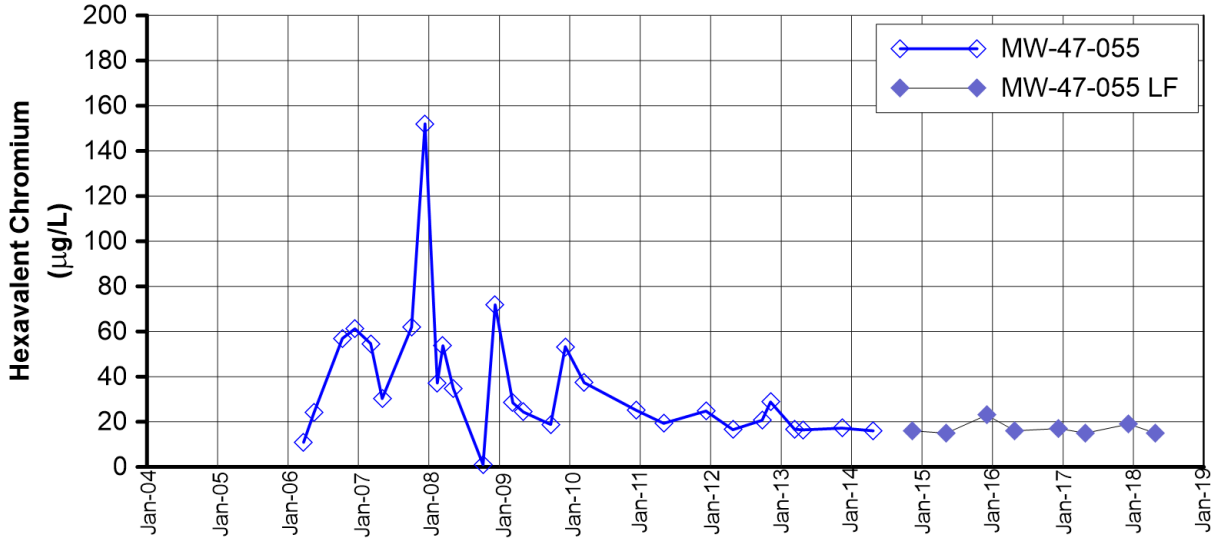

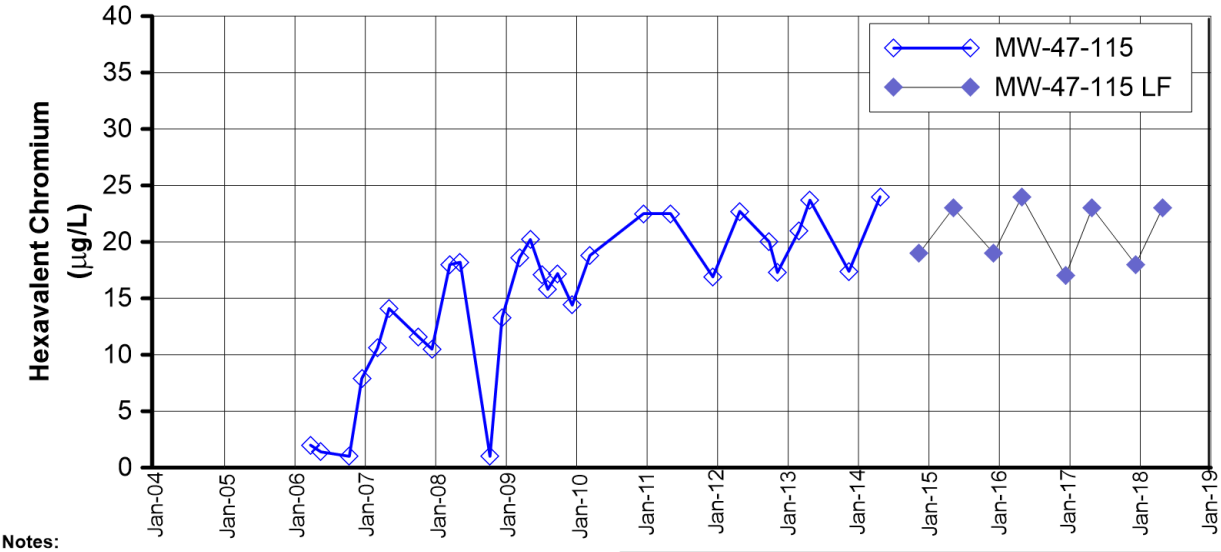

Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-46-175 is 225 µg/L.
3) The trigger level for MW-46-205 is 20 µg/L.
4) The trigger level for MW-47-055 is 475 µg/L.
5) The trigger level for MW-47-115 is 31 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-11
HEXAVALENT CHROMIUM
IN MW-46 AND MW-47 CLUSTERS

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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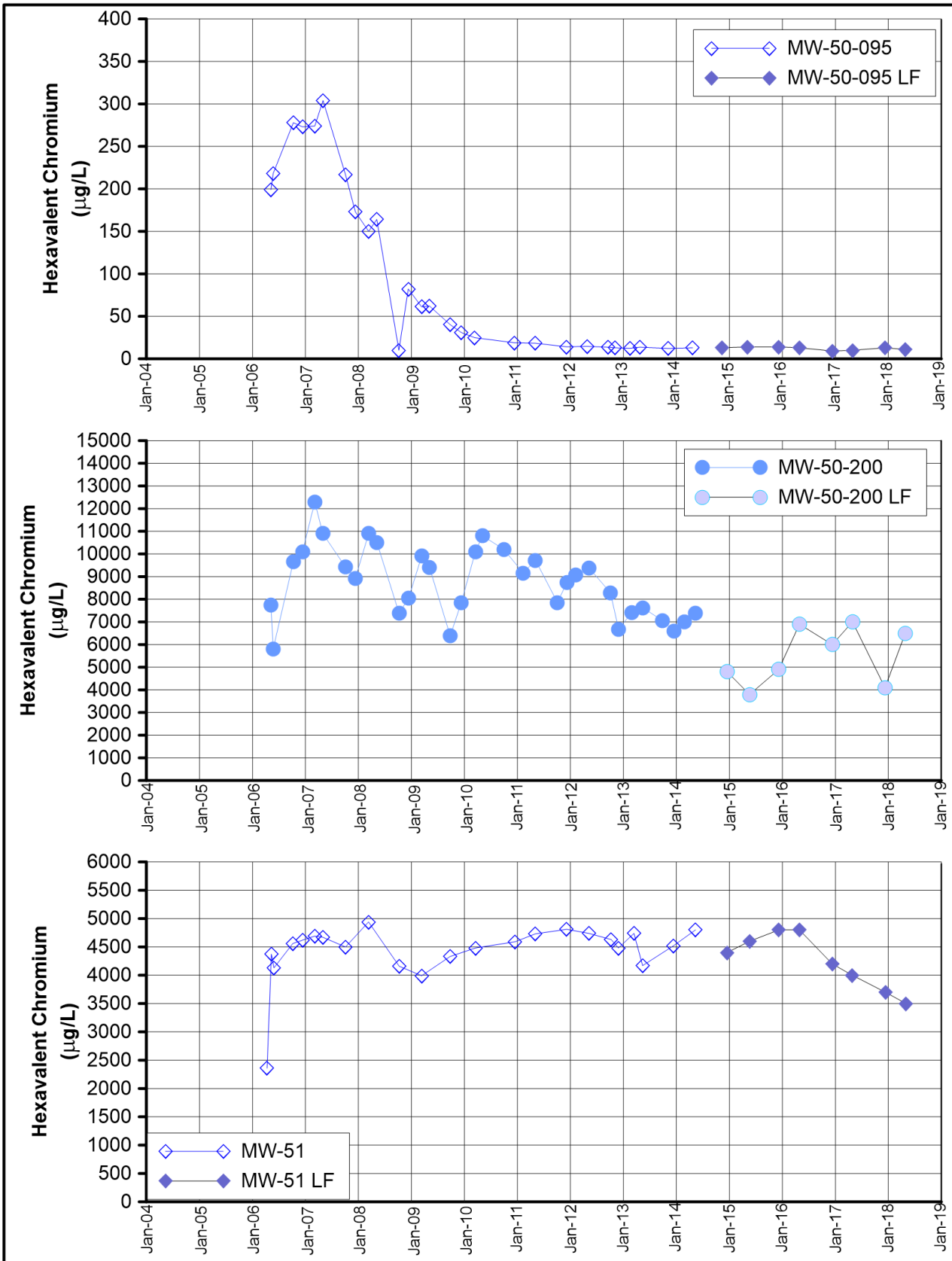

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-12
HEXAVALENT CHROMIUM
IN MW-50 AND MW-51 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
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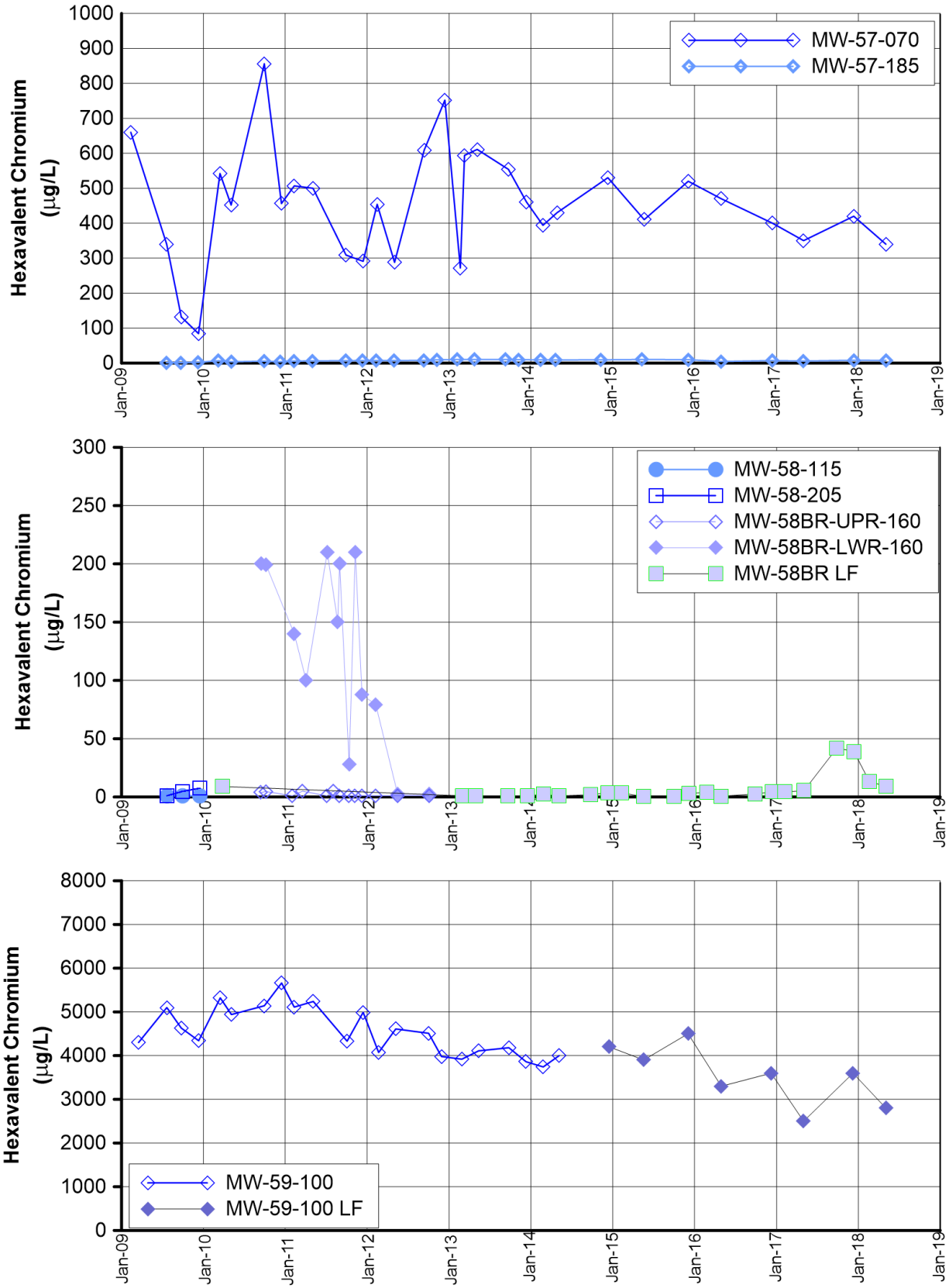

Note:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-13
HEXAVALENT CHROMIUM
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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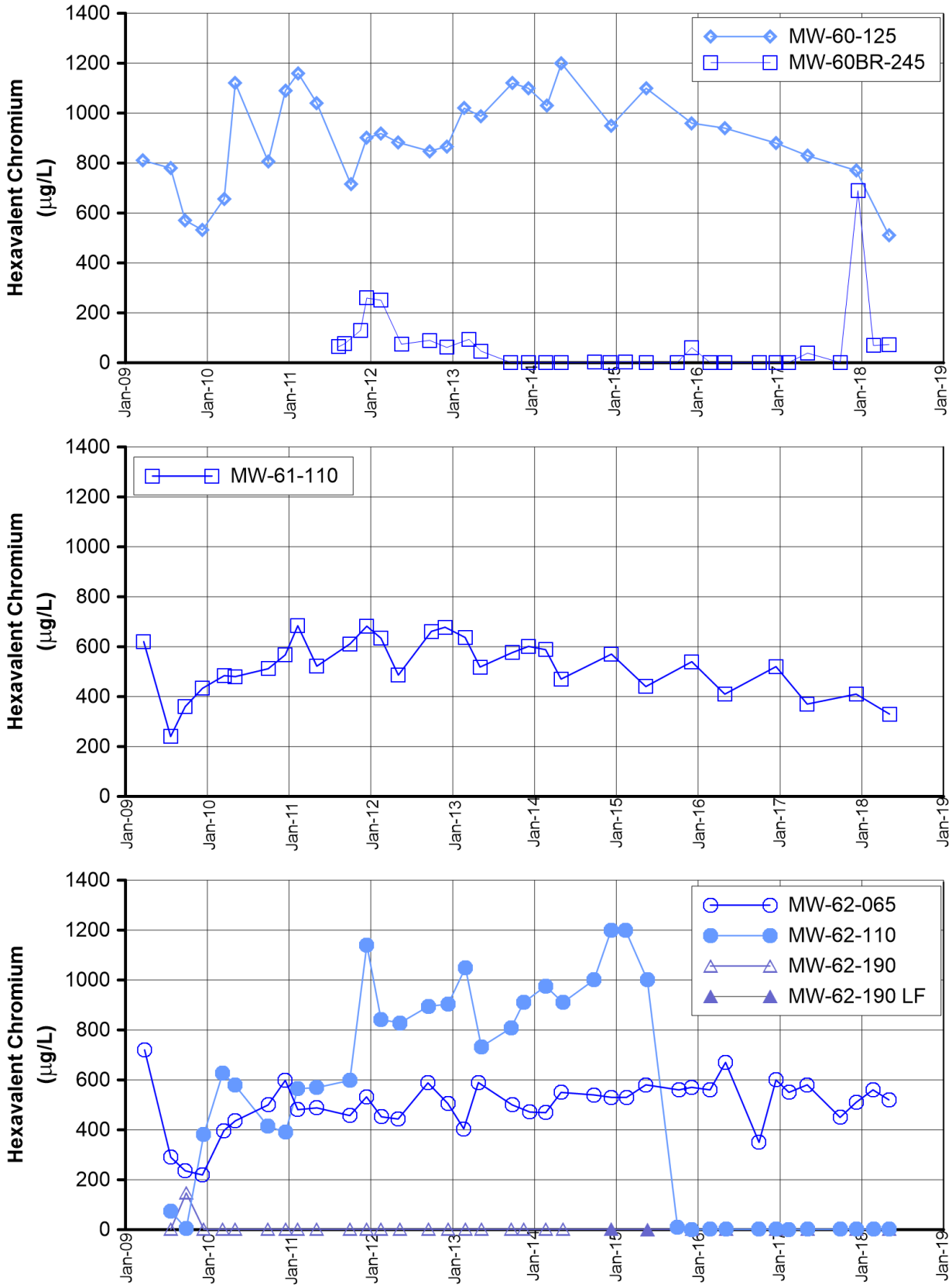

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-14
HEXAVALENT CHROMIUM
IN MW-60 CLUSTER, MW-61-110 AND MW-62 CLUSTER
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
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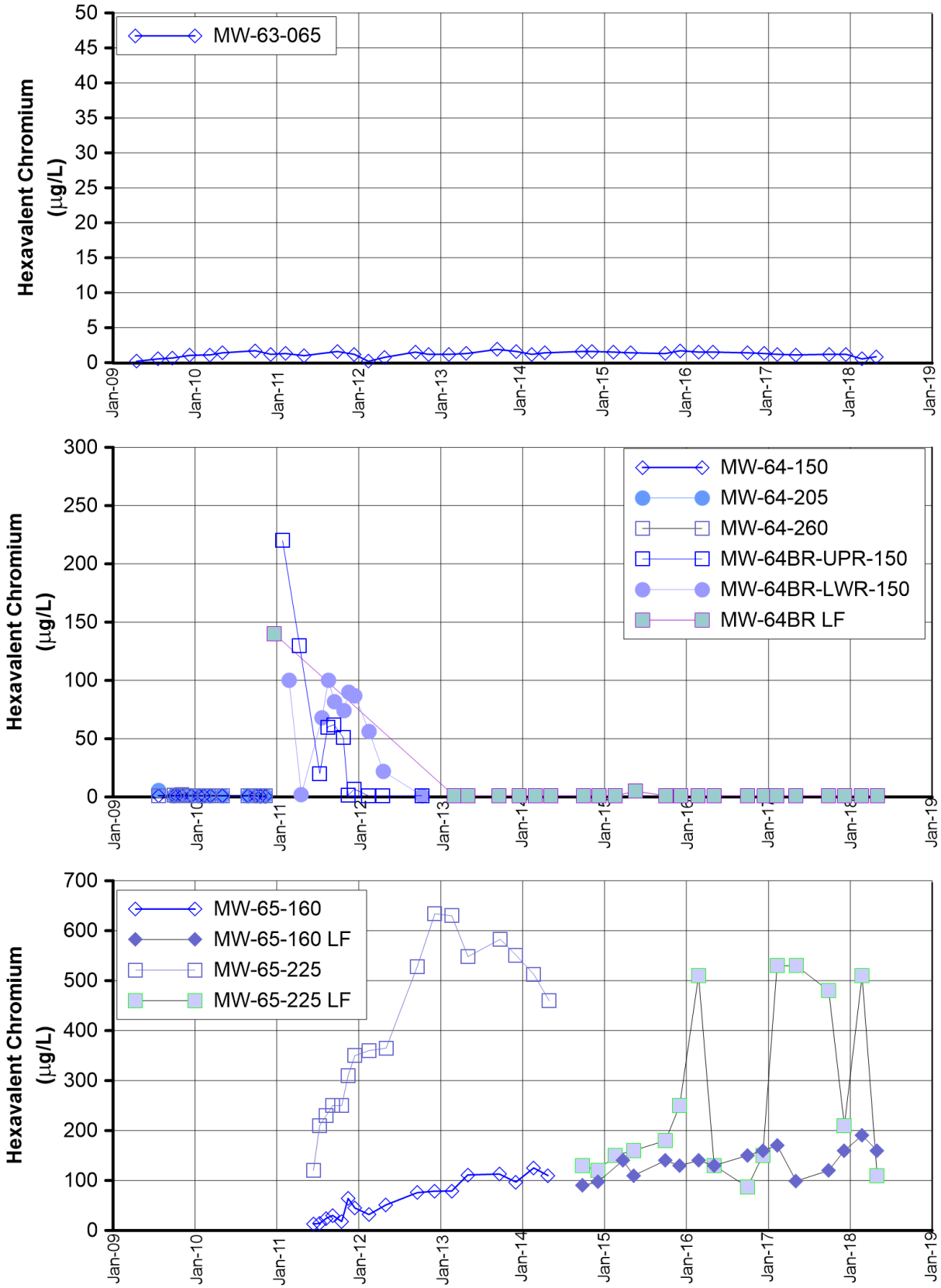

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-15
HEXAVALENT CHROMIUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
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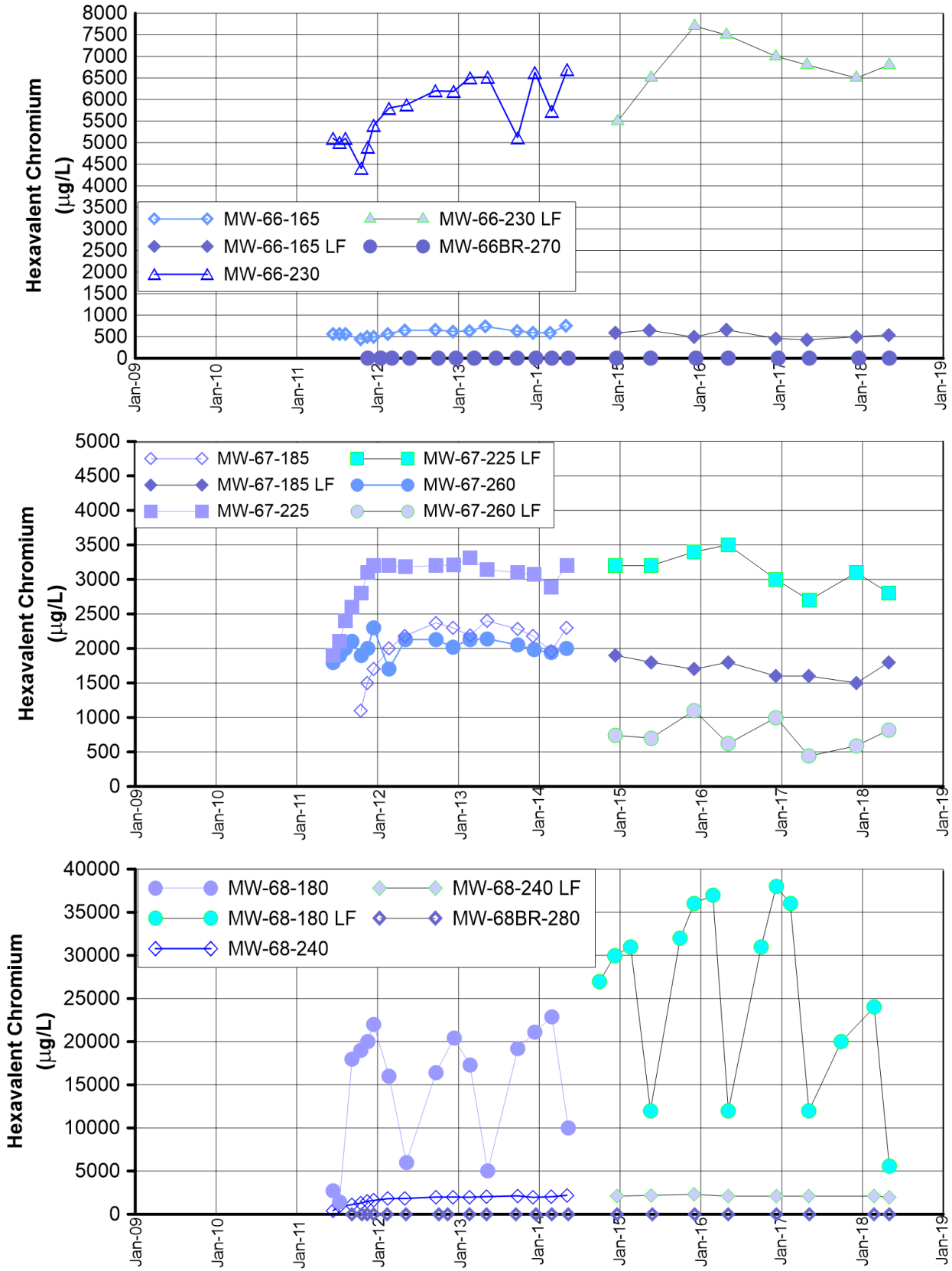

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-16
HEXAVALENT CHROMIUM
IN MW-66, MW-67, AND MW-68 CLUSTERS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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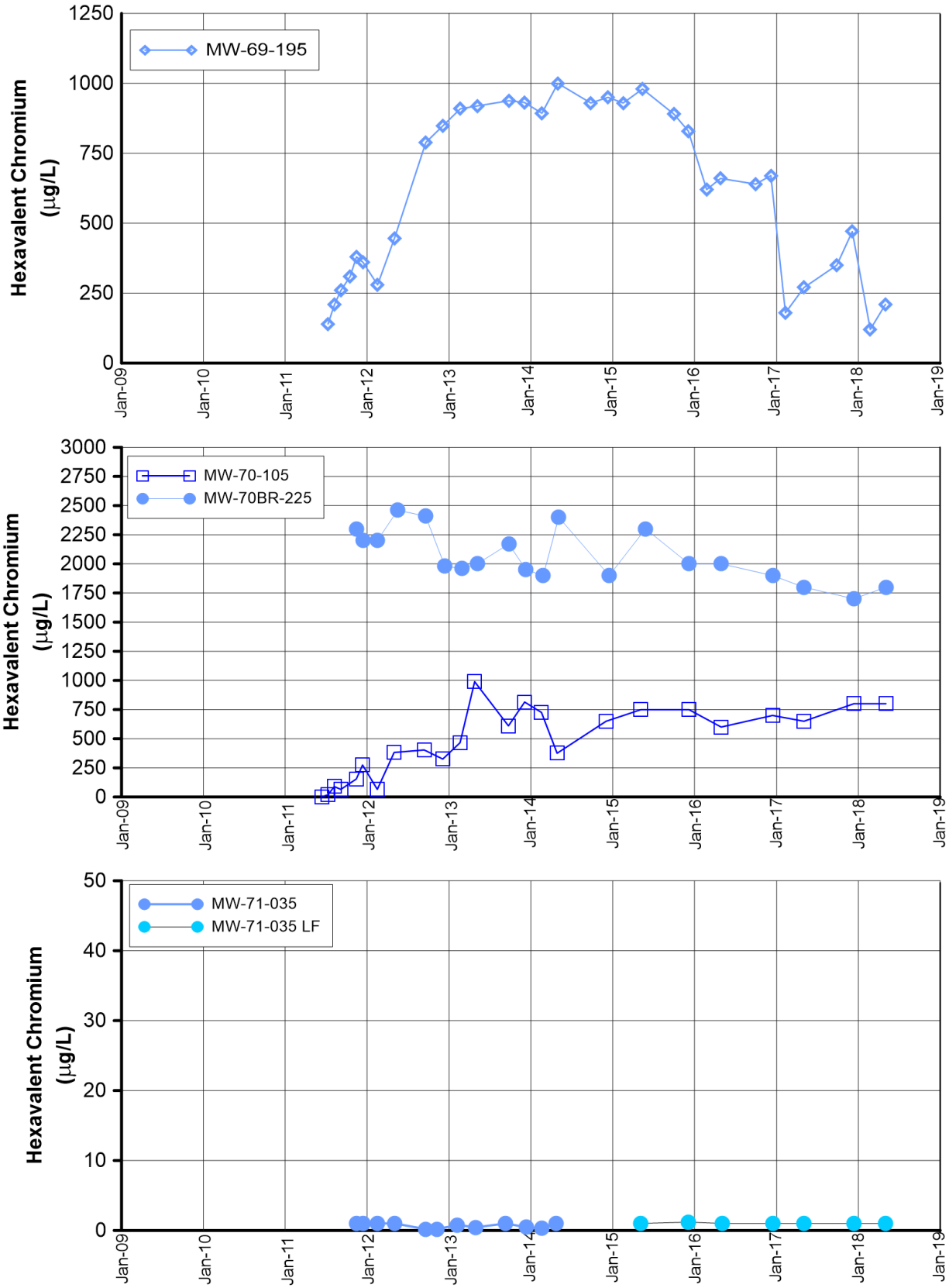

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE D-17
HEXAVALENT CHROMIUM
IN MW-69-195, MW-70 CLUSTER, AND MW-71-035
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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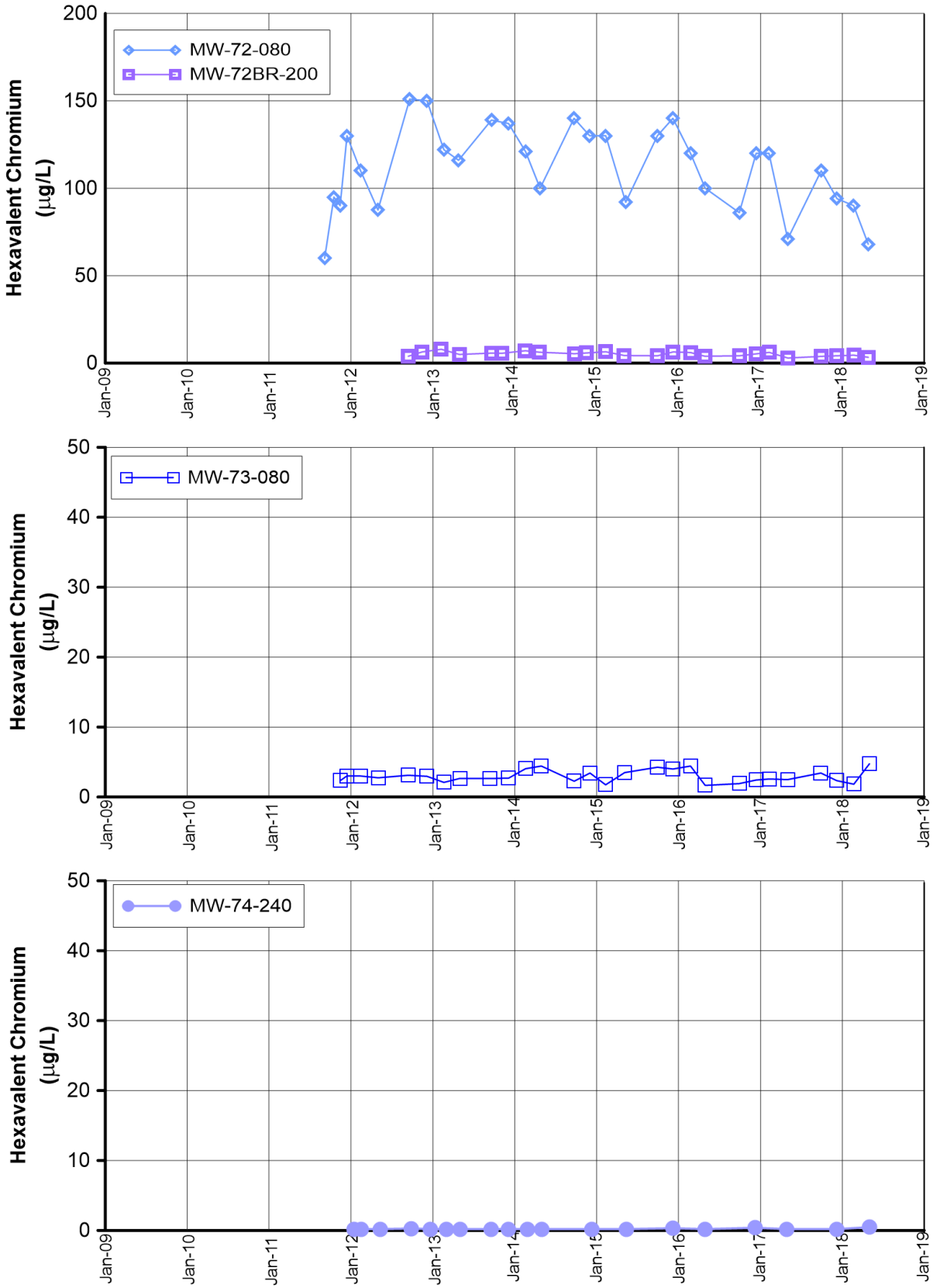

FIGURE D-18
HEXAVALENT CHROMIUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
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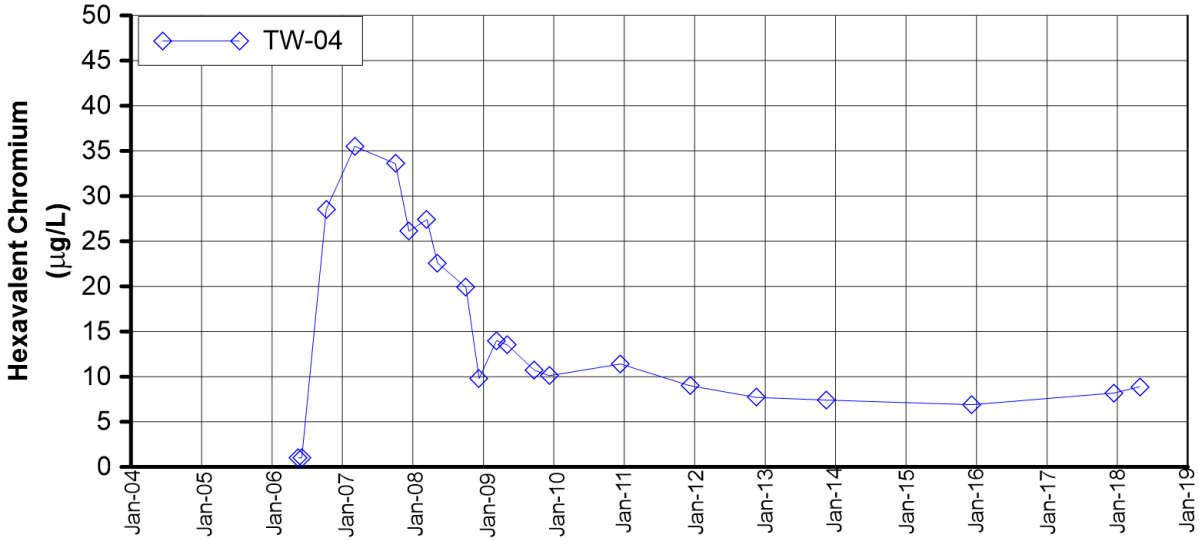

FIGURE D-19
HEXAVALENT CHROMIUM
IN TW-04

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
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APPENDIX E

Interim Measures Extraction System Operations Log, Second Quarter 2018

APPENDIX E

Interim Measures Extraction System Operations Log, Second Quarter 2018, PG&E Topock Performance Monitoring Program

During Second Quarter 2018 (April through June), extraction well TW-03D operated at a target pump rate of 135 gallons per minute, excluding periods of planned and unplanned downtime. Extraction wells TW-02D and PE-01 were only operated to collect a sample during Second Quarter 2018. Extraction well TW-02S was not operated during Second Quarter 2018. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 88.7 percent during Second Quarter 2018.

The Interim Measure Number 3 (IM-3) facility treated approximately 15,716,666 gallons of extracted groundwater during Second Quarter 2018. The IM-3 facility also treated approximately 2,020 gallons of injection well backwashing/re-development water and 1,030 gallons of purge water from site sampling activities. Three containers of solids (sludge) were transported offsite from the IM-3 facility during the reporting period.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 11.3 percent of downtime during Second Quarter 2018) are summarized below. The times shown are in Pacific Standard Time to be consistent with other data collected (for example, water level data) at the site.

E.1 April 2018

- **April 2 - 6, 2018 (planned):** The extraction well system was offline from 6:36 a.m. on April 2, 2018 to April 3, 2018 6:50 a.m. and again from April 3, 2018 7:00 a.m. to April 6, 2018 2:02 p.m. and again from April 6, 2018 4:16 p.m. to 5:48 p.m., for semiannual scheduled maintenance. Extraction system downtime was 4 days, 8 hours 48 minutes.
- **April 6-7, 2018 (planned):** The extraction well system was offline from 8:42 p.m. to 4:44 a.m. on April 7, 2018 because the plant was put in recirculation. Extraction system downtime was 8 hours 2 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 6:48 a.m. to 6:50 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 2 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 7:44 a.m. to 8:14 a.m. due to replacing a failed pneumatic valve on the microfilter. Extraction system downtime was 30 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 8:54 a.m. to 12:22 p.m. to maintain appropriate water levels in the Raw Water Storage Tank (T-100). Extraction system downtime was 3 hour 28 minutes.
- **April 11, 2018 (unplanned):** The extraction well system was offline from 1:34 a.m. to 2:20 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 46 minutes.
- **April 11, 2018 (planned):** The extraction well system was offline from 9:50 a.m. to 10:54 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 4 minutes.
- **April 12, 2018 (unplanned):** The extraction well system was offline from 11:08 a.m. to 12:06 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 58 minutes.

- **April 14, 2018 (unplanned):** The extraction well system was offline from 6:06 a.m. to 7:14 a.m. due to the microfilter basket strainer being plugged. The plant was shut down to clean the strainer. Extraction system downtime was 1 hour 8 minutes.
- **April 23, 2018 (unplanned):** The extraction well system was offline from 12:50 p.m. to 2:18 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 1 hour 28 minutes.
- **April 24, 2018 (unplanned):** The extraction well system was offline from 10:40 a.m. to 11:42 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 2 minutes.
- **April 30, 2018 (unplanned):** The extraction well system was offline from 7:50 a.m. to 9:58 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 2 hours 8 minutes.
- **April 30, 2018 (unplanned):** The extraction well system was offline from 2:38 p.m. to 3:44 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 6 minutes.

E.2 May 2018

- **May 5, 2018 (unplanned):** The extraction well system was offline from 3:22 p.m. to 4:26 p.m. to maintain appropriate water levels in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 4 minutes.
- **May 7, 2018 (unplanned):** The extraction well system was offline from 1:02 a.m. to 9:14 a.m. due to replacing a failed pneumatic valve on the microfilter. Extraction system downtime was 8 hours 12 minutes.
- **May 9-10, 2018 (unplanned):** The extraction well system was offline from May 9, 2018 11:36 p.m. to May 10, 2018 1:34 a.m. because a check valve on the microfilter failed due to scaling. It was cleaned and placed back into service. Extraction system downtime was 1 hour 58 minutes.
- **May 10, 2018 (unplanned):** The extraction well system was offline from 3:24 p.m. to 4:10 p.m. due to the microfilter basket strainer being plugged. The plant was shut down to clean the strainer. Extraction system downtime was 46 minutes.
- **May 13, 2018 (unplanned):** The extraction well system was offline from 4:04 p.m. to 5:16 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 12 minutes.
- **May 14-15, 2018 (unplanned):** The extraction well system was offline from May 14, 2018 11:58 p.m. to May 15, 2018 12:54 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 56 minutes.
- **May 16, 2018 (unplanned):** The extraction well system was offline from 4:08 a.m. to 5:26 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 18 minutes.
- **May 16, 2018 (unplanned):** The extraction well system was offline from 10:14 a.m. to 11:02 a.m. to change out the microfilter modules on the west side due to high transmembrane pressure. Extraction system downtime was 48 minutes.
- **May 17, 2018 (planned and unplanned):** The extraction well system was offline from 7:14 a.m. to 2:48 p.m. due to testing of the pipeline critical alarms and leak detection system and also to clean a blockage in the pipe causing a high level at the Iron Oxidation Reactor (T-301) tank. Extraction system downtime was 7 hours 34 minutes.

- **May 22, 2018 (unplanned):** The extraction well system was offline from 5:28 p.m. to 5:58 p.m. due to loss of power from the City of Needles. Extraction system downtime was 30 minutes.
- **May 23, 2018 (unplanned):** The extraction well system was offline from 6:58 a.m. to 12:00 p.m. to clean off sludge from the Clarifier and fix a leaking seal at the Chemical Mixing Pump (P-200). Extraction system downtime was 5 hour 2 minutes.
- **May 26, 2018 (unplanned):** The extraction well system was offline from 4:06 p.m. to 4:20 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 14 minutes.
- **May 27, 2018 (unplanned):** The extraction well system was offline from 12:24 a.m. to 1:28 a.m. to maintain appropriate water levels in T-100 and to clean the microfilter strainer. Extraction system downtime was 1 hour 4 minutes.
- **May 31, 2018 (unplanned):** The extraction well system was offline from 8:02 a.m. to 10:58 a.m. to change out the microfilter modules due to high transmembrane pressure and to change out the reverse osmosis pre-filters. Extraction system downtime was 2 hours 56 minutes.

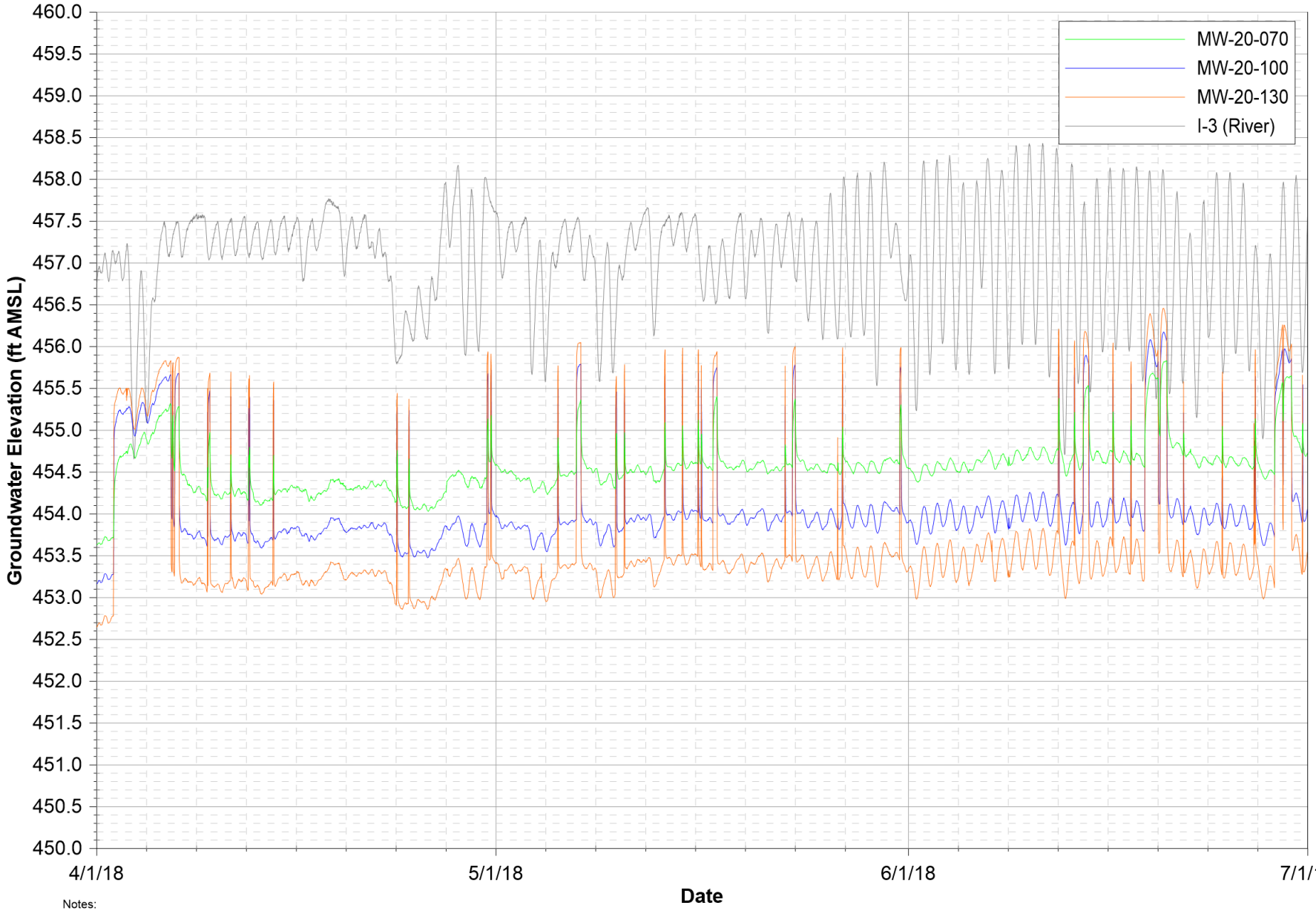
E.3 June 2018

- **June 8, 2018 (planned and unplanned):** The extraction well system was offline from 12:42 p.m. to 12:58 p.m. due to testing of the pipeline critical alarms and leak detection system and due to a high level in Iron Oxidation Reactor (T-301) tank including investigating the cause. Extraction system downtime was 16 minutes.
- **June 12, 2018 (unplanned):** The extraction well system was offline from 6:12 a.m. to 7:46 a.m. due to loss of power from the City of Needles. Extraction system downtime was 1 hour 34 minutes.
- **June 13, 2018 (unplanned):** The extraction well system was offline from 10:54 a.m. to 11:56 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 2 minutes.
- **June 14, 2018 (planned and unplanned):** The extraction well system was offline from 3:10 a.m. to 1:10 p.m. due to a high level in T-301 and investigating the cause. Operators cleaned a blockage in the piping between the oxidation tanks. Extraction system downtime was 10 hours.
- **June 16, 2018 (unplanned):** The extraction well system was offline from 8:28 a.m. to 9:32 a.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 4 minutes.
- **June 17, 2018 (unplanned):** The extraction well system was offline from 4:46 p.m. to 6:00 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 14 minutes.
- **June 18 - 20, 2018 (unplanned):** The extraction well system was offline from 6:16 p.m. June 18, 2018 to 6:40 p.m. June 19, 2018 and from 9:50 p.m. June 19, 2018 to 10:16 a.m. June 20, 2018 due to a bad batch of ferrous chloride chemical that resulted in poor conversion of Cr6 to Cr3. This required the plant to be set in recirculation mode to troubleshoot the cause. Once the cause was determined the ferrous chloride was replaced. The bad batch also resulted in excess solids that flocculated poorly and accumulated in the piping, the tanks between the pipe reactor, the clarifier, the microfilters, and the Pre-Treated Water Tank (T-500). A power outage also occurred during this shutdown. Some of the accumulated solids were removed from the equipment. Later plant outages in June were caused by this situation. Extraction system downtime was 1 day 12 hours 50 minutes.
- **June 21, 2018 (unplanned):** The extraction well system was offline from 4:04 p.m. to 4:36 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 32 minutes.

- **June 24, 2018 (unplanned):** The extraction well system was offline from 1:36 p.m. to 2:30 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 54 minutes.
- **June 26, 2018 (unplanned):** The extraction well system was offline from 11:14 p.m. to 11:38 p.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 24 minutes.
- **June 27, 2018 (unplanned):** The extraction well system was offline from 12:18 a.m. to 12:36 a.m. because the seal water line failed on the Raw Water Feed Pump (P-200). Extraction system downtime was 18 minutes.
- **June 27, 2018 (unplanned):** The extraction well system was offline from 1:04 a.m. to 2:04 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour.
- **June 28 - 29, 2018 (unplanned):** The extraction well system was offline from 12:22 p.m. June 28, 2018 to 2:58 a.m. June 29, 2018 to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 14 hours 36 minutes.
- **June 29, 2018 (unplanned):** The extraction well system was offline from 4:04 a.m. to 7:04 p.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 15 hours.
- **June 30, 2018 (unplanned):** The extraction well system was offline from 2:24 p.m. to 3:08 p.m. due to P-200 shutting off and to maintain appropriate water levels in T-100. Extraction system downtime was 44 minutes.

APPENDIX F

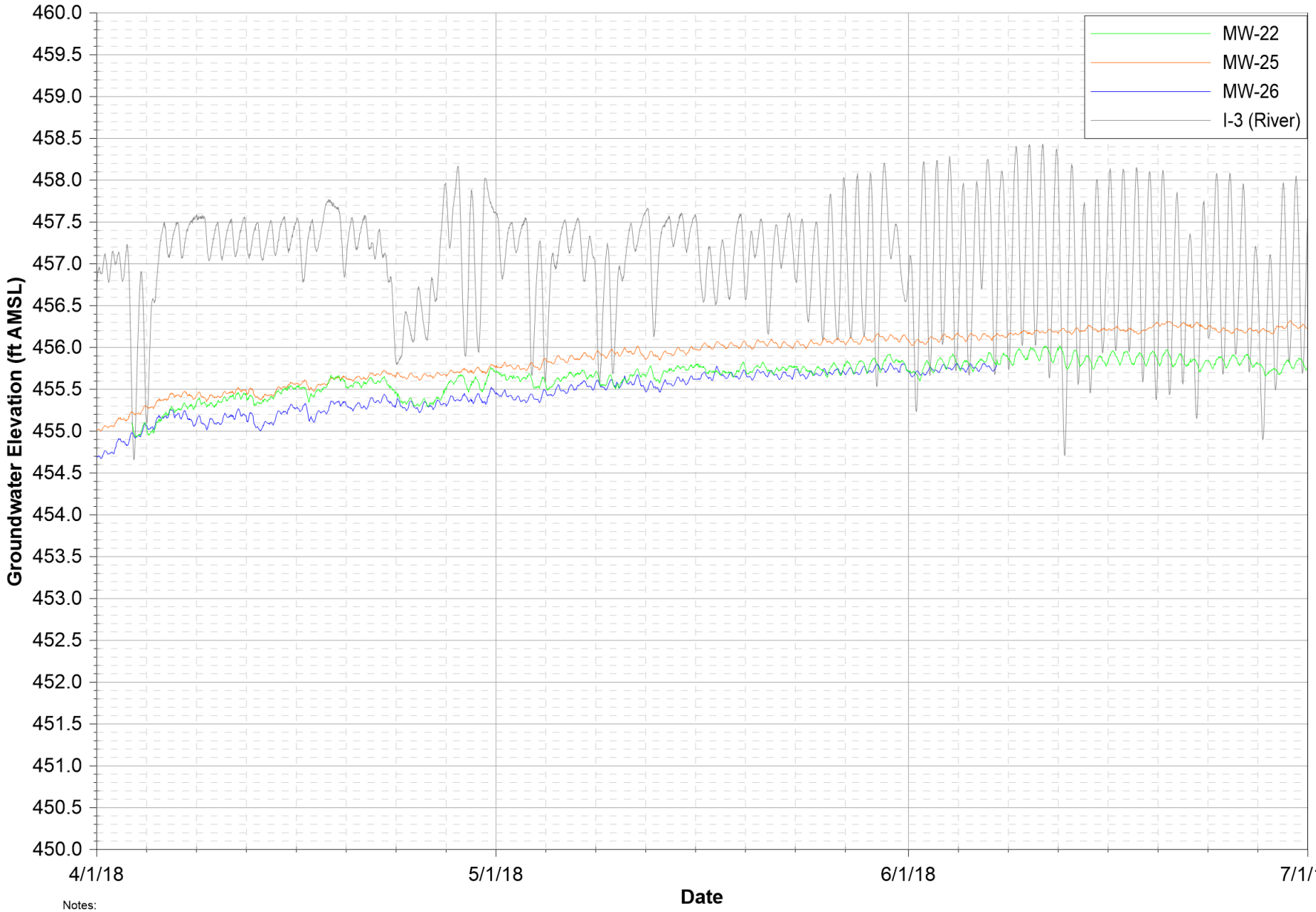
Hydrographs, Second Quarter 2018



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1A
MW-20 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



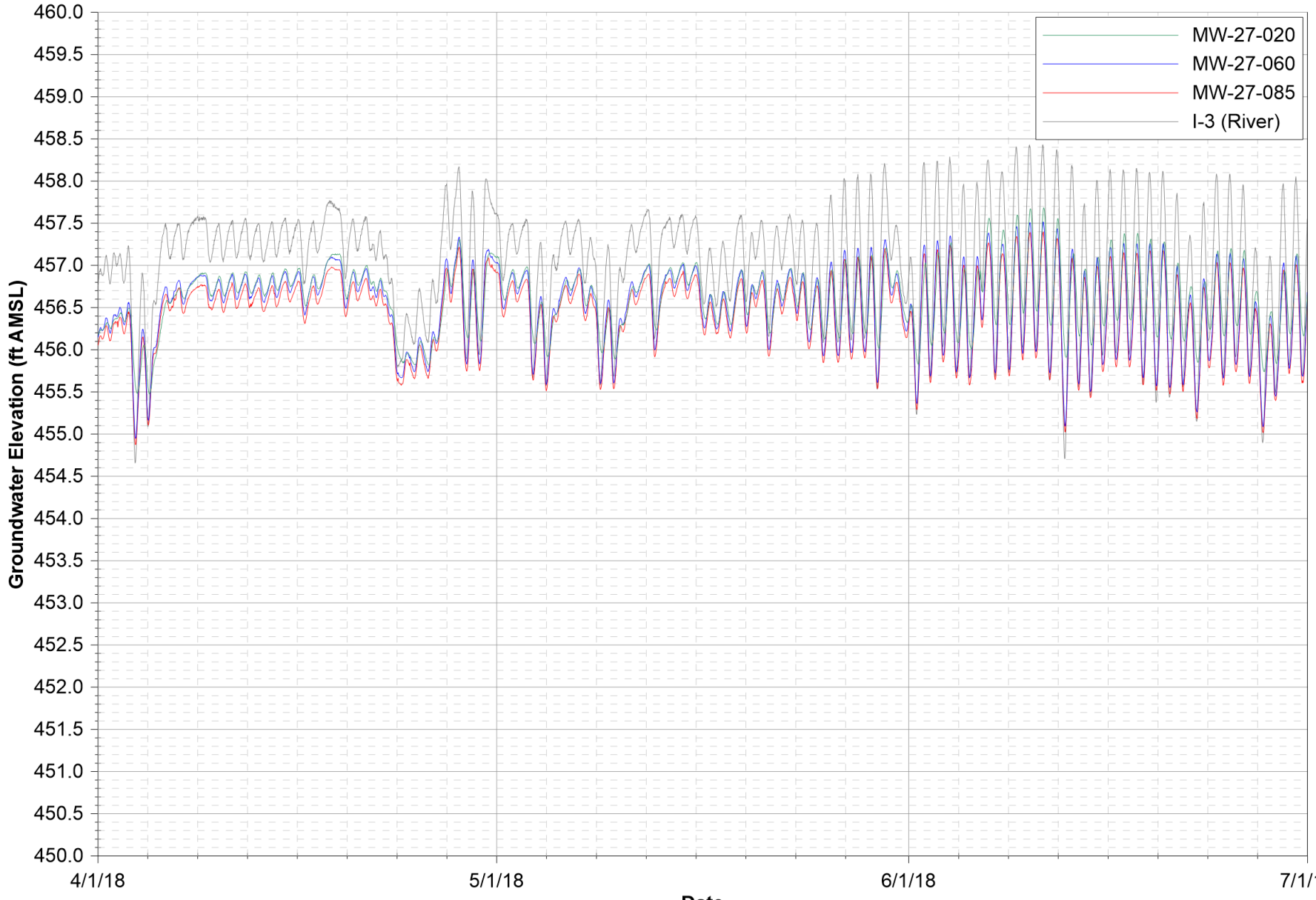
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-22 data unavailable from April 1, 2018 through April 2, 2018 due to transducer malfunction.
4. MW-26 data unavailable from June 7, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1B

MW-22, MW-25, AND MW-26 HYDROGRAPHS

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

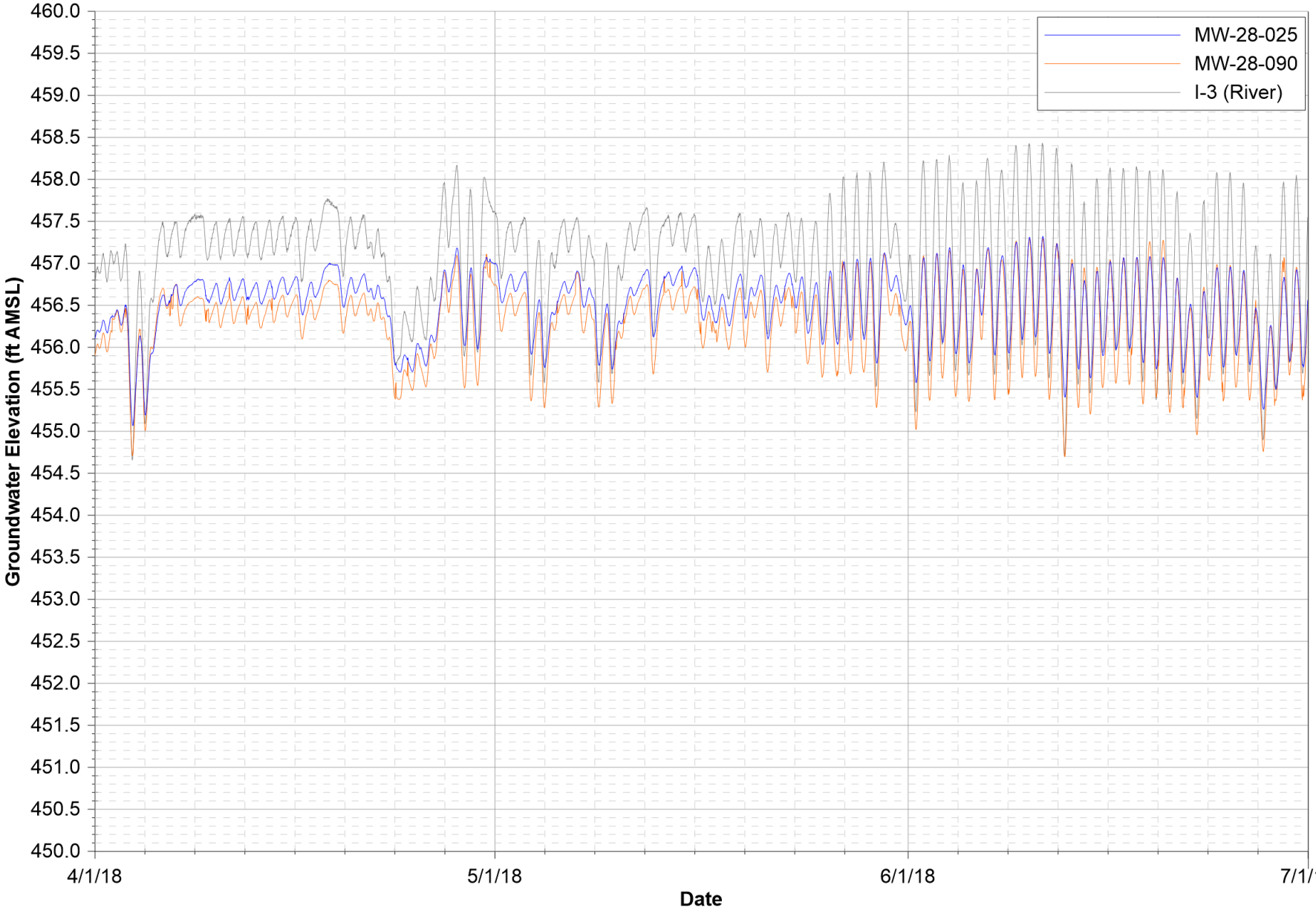
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level

FIGURE F-1C
MW-27 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

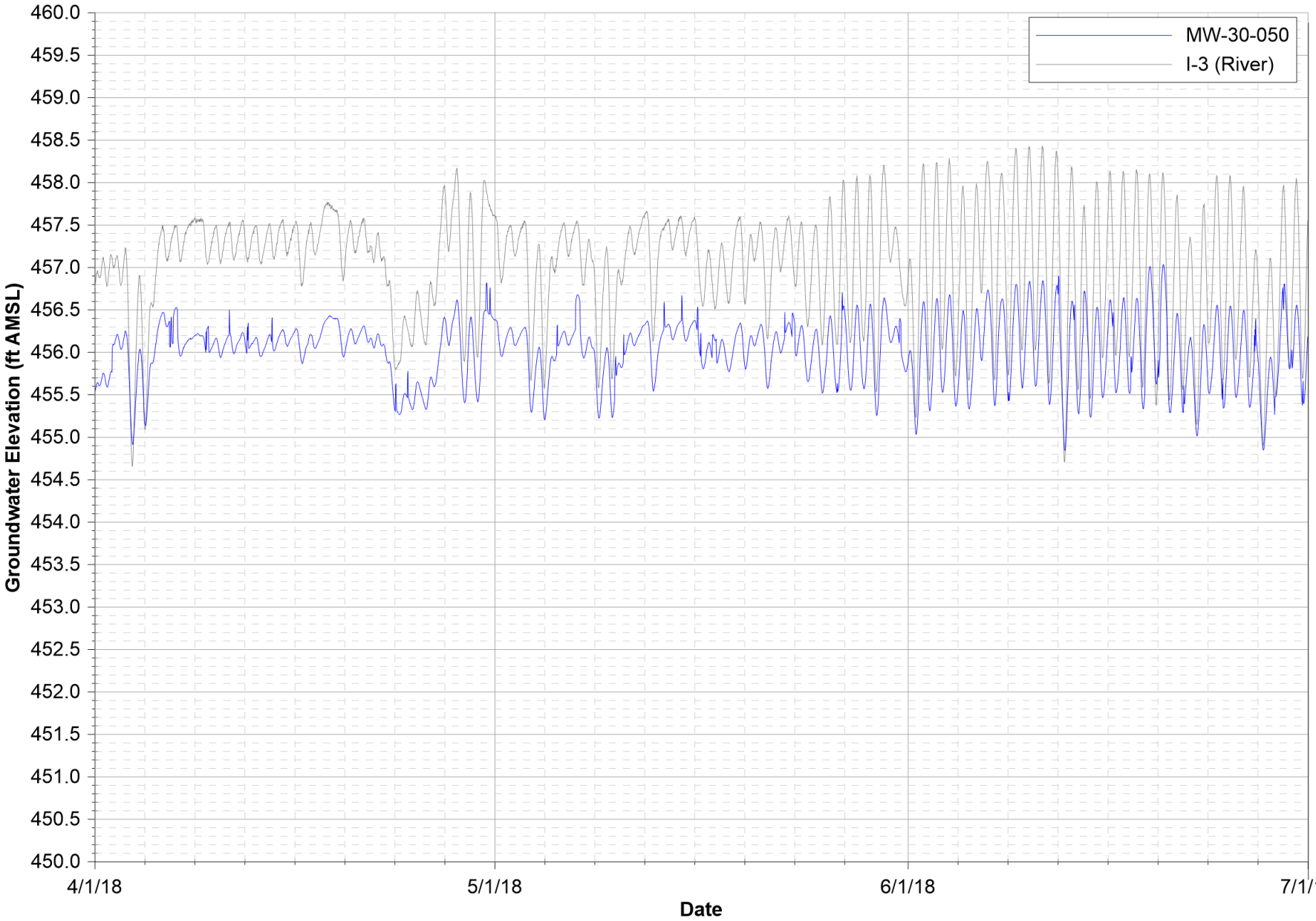
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1D
MW-28 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

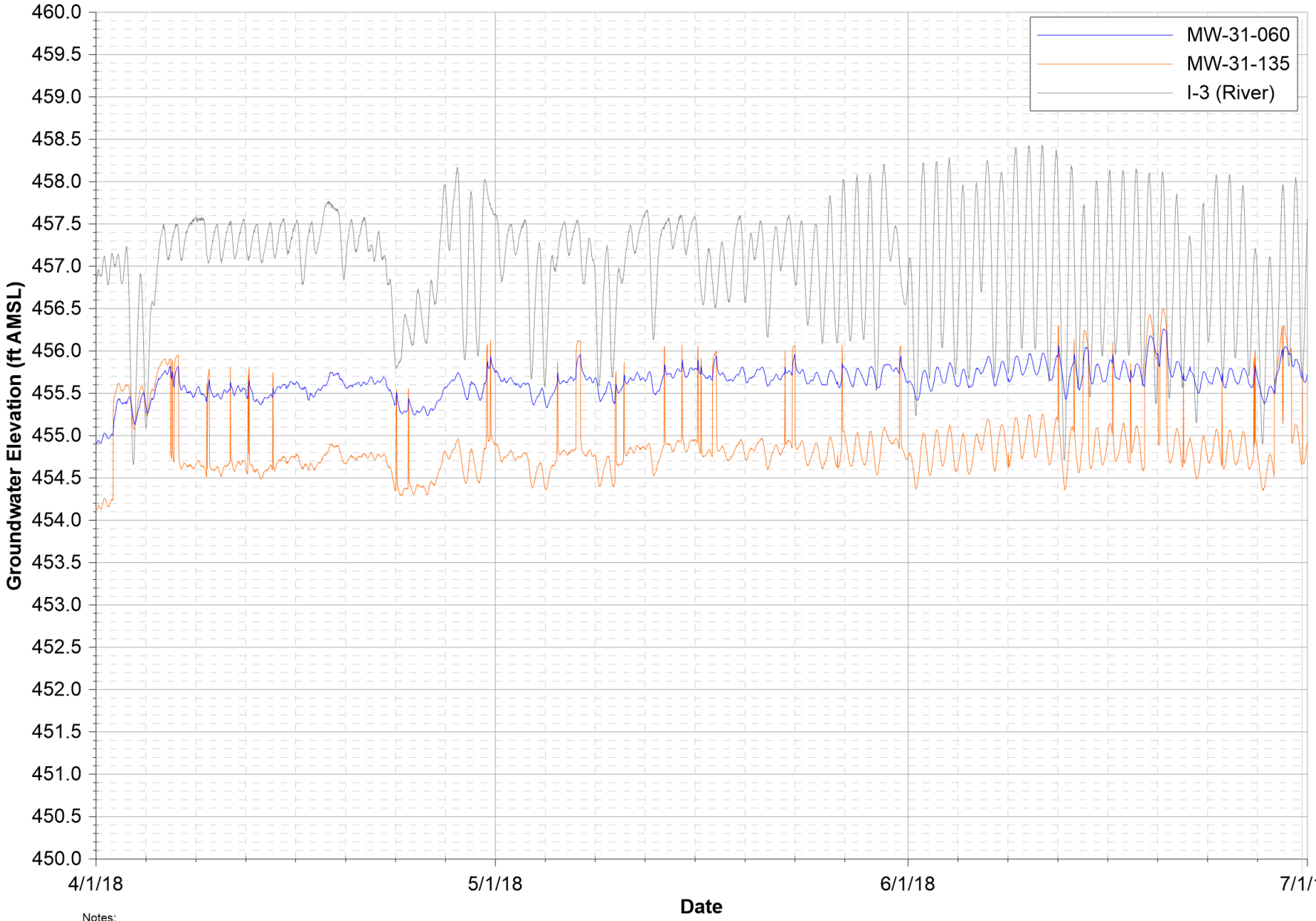
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1E
MW-30-050 HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

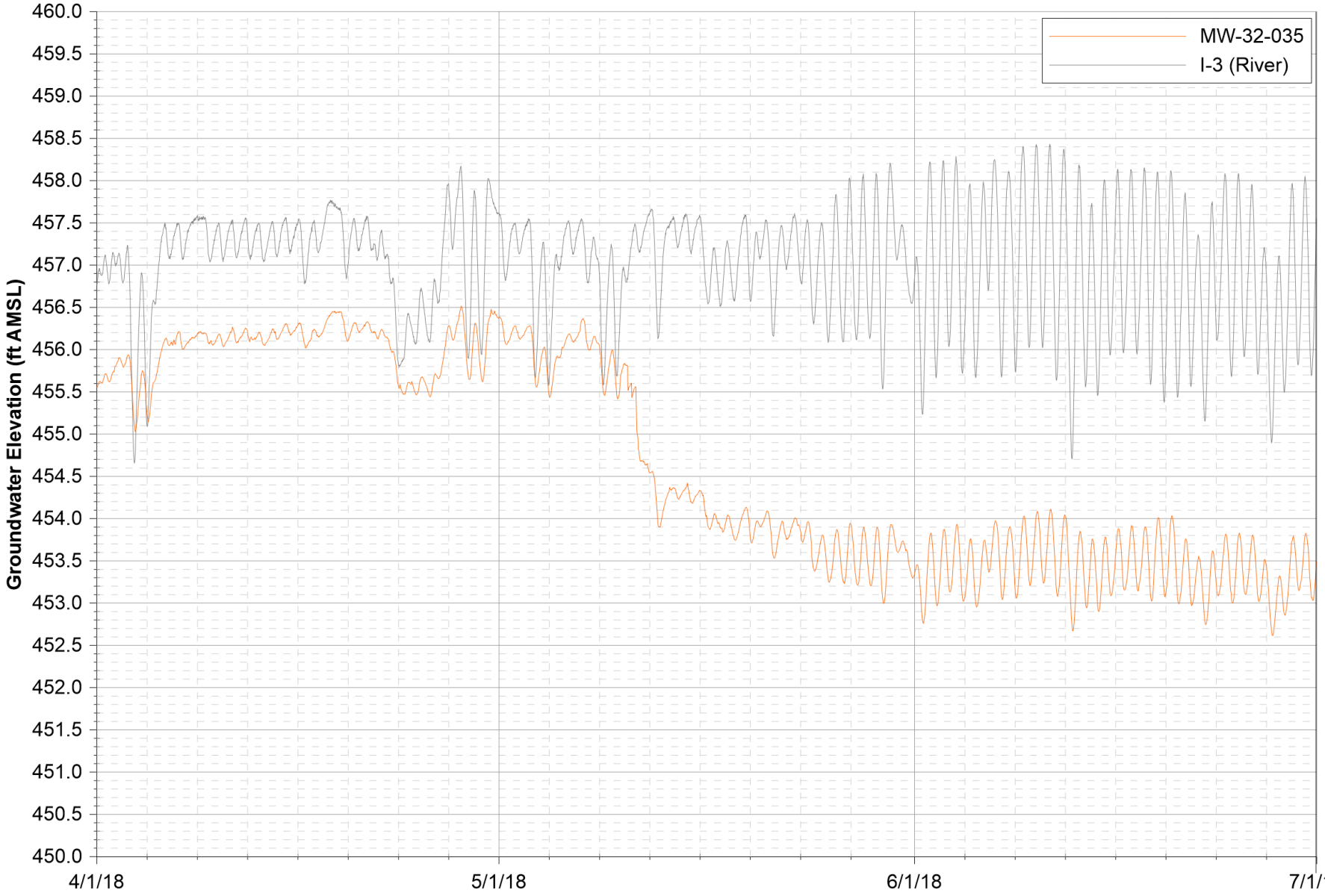
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1F
MW-31 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

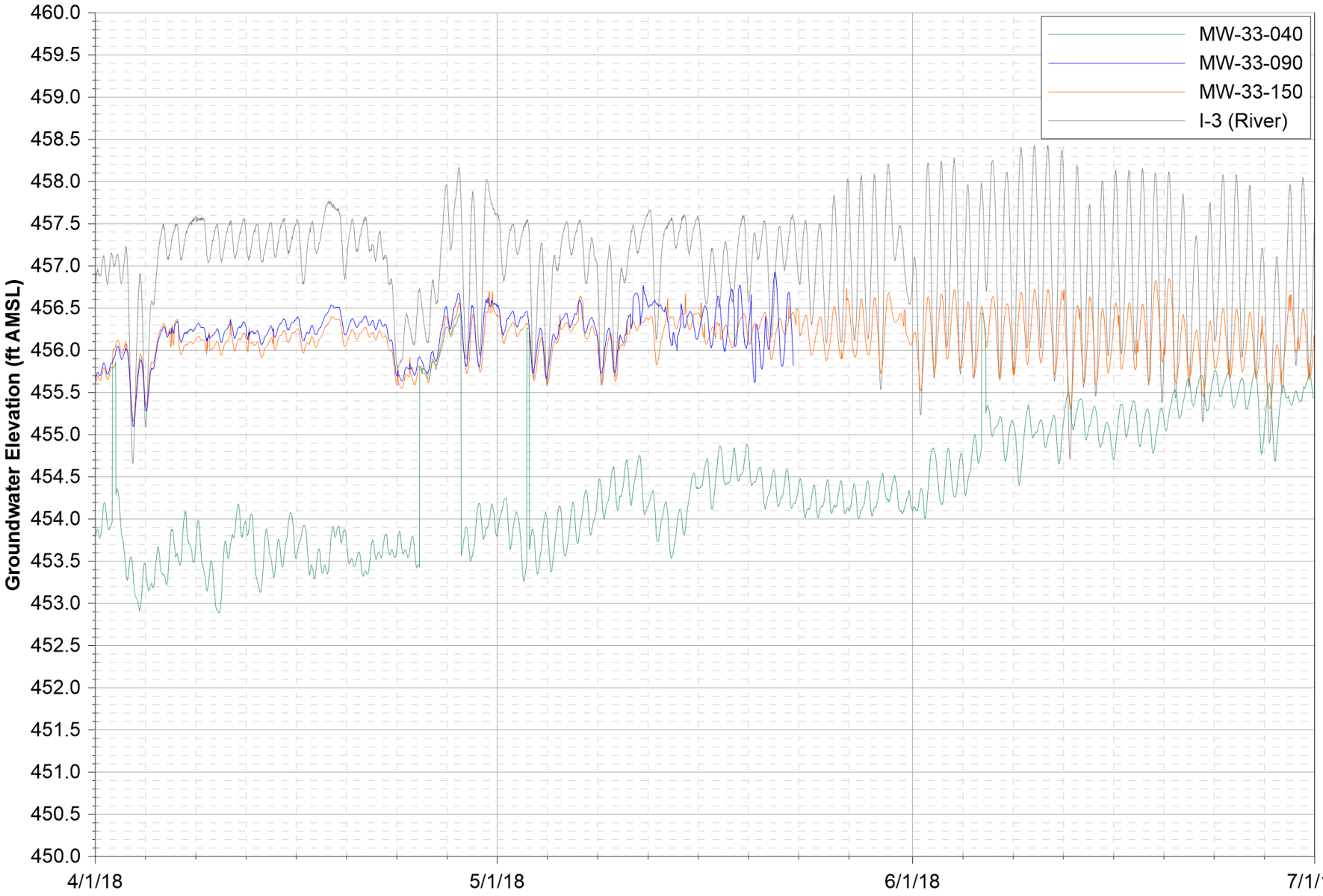
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1G
MW-32 HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

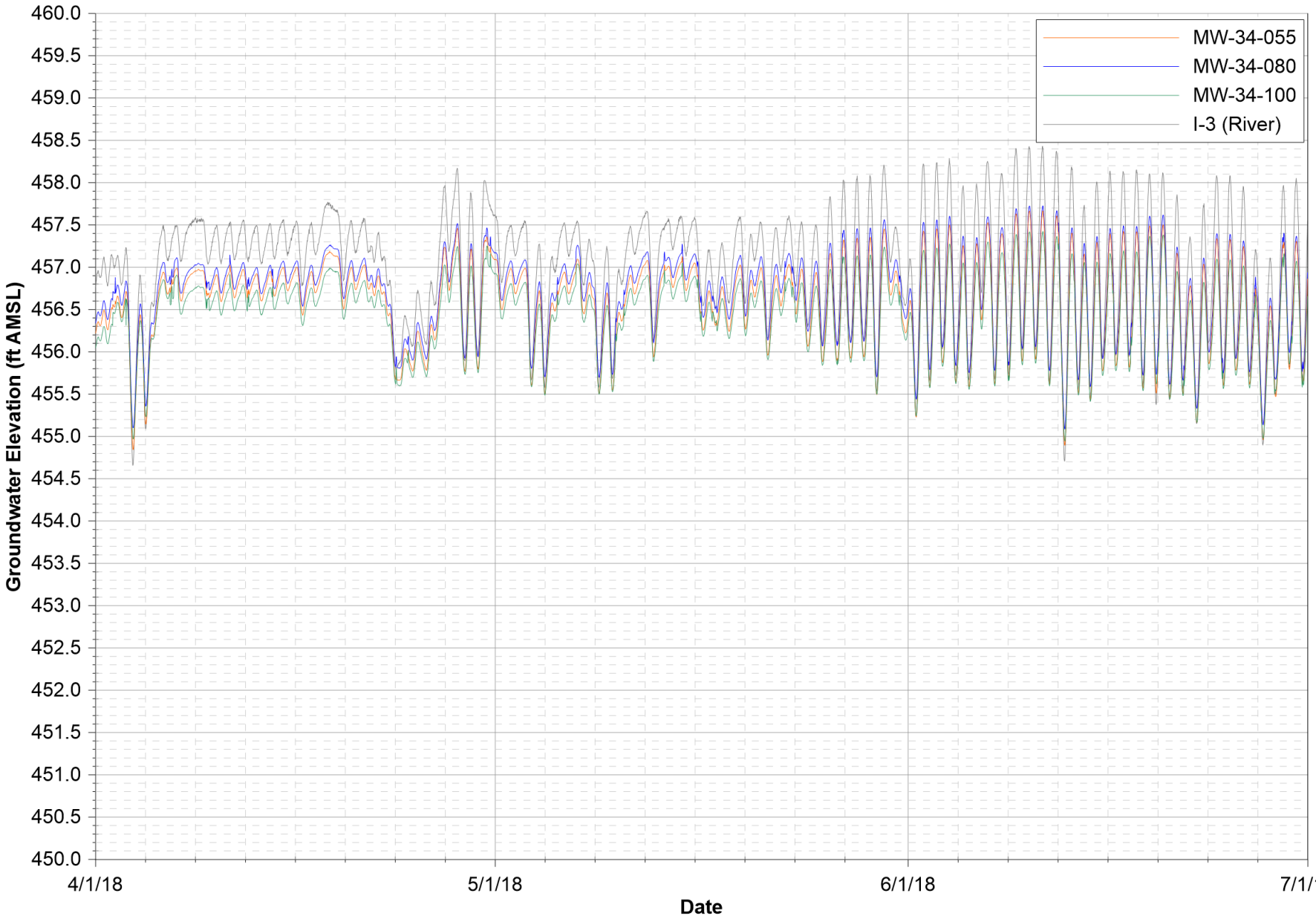


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-33-090 data unavailable from May 23, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1H
MW-33 CLUSTER HYDROGRAPHS

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

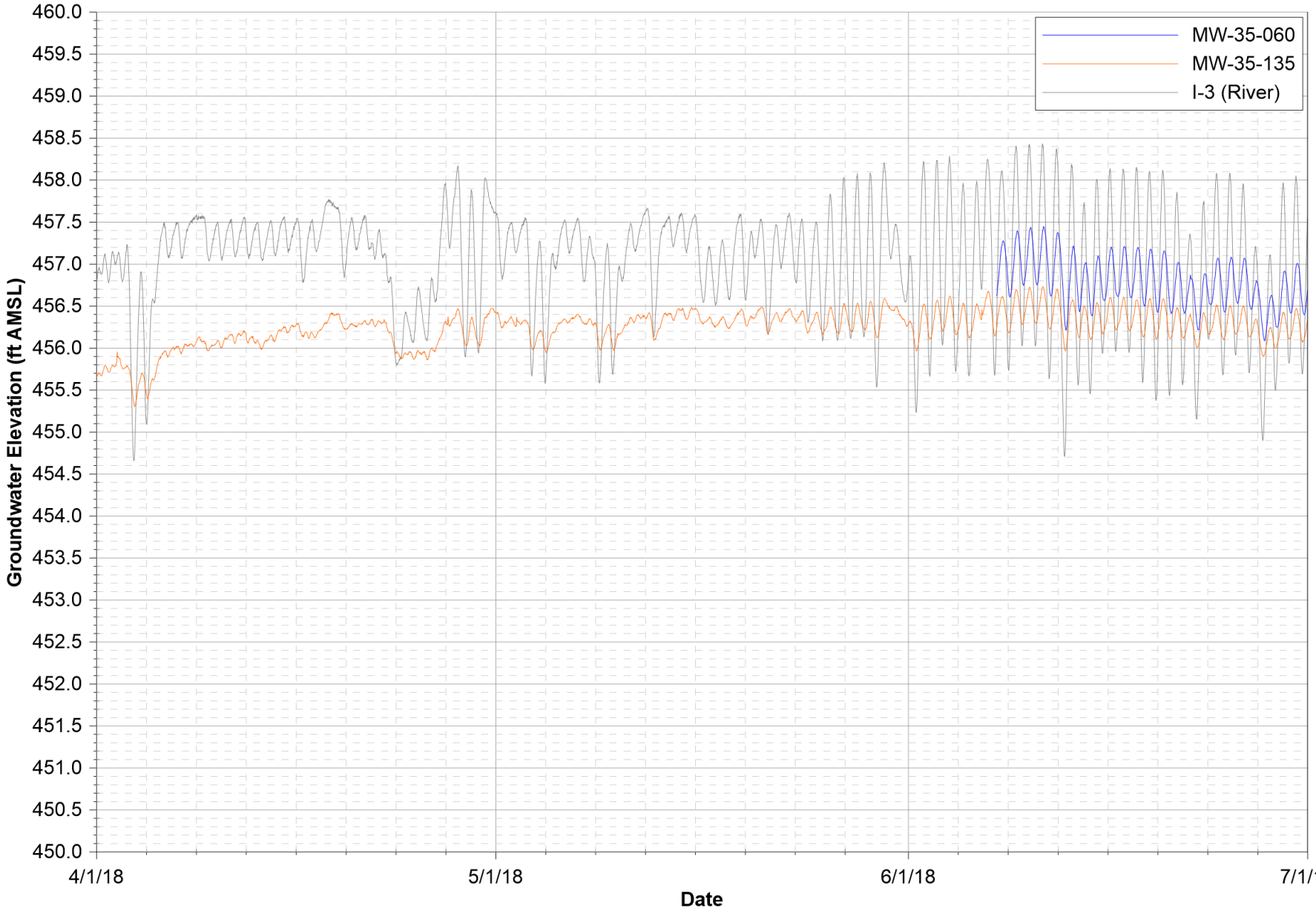
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1I
MW-34 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

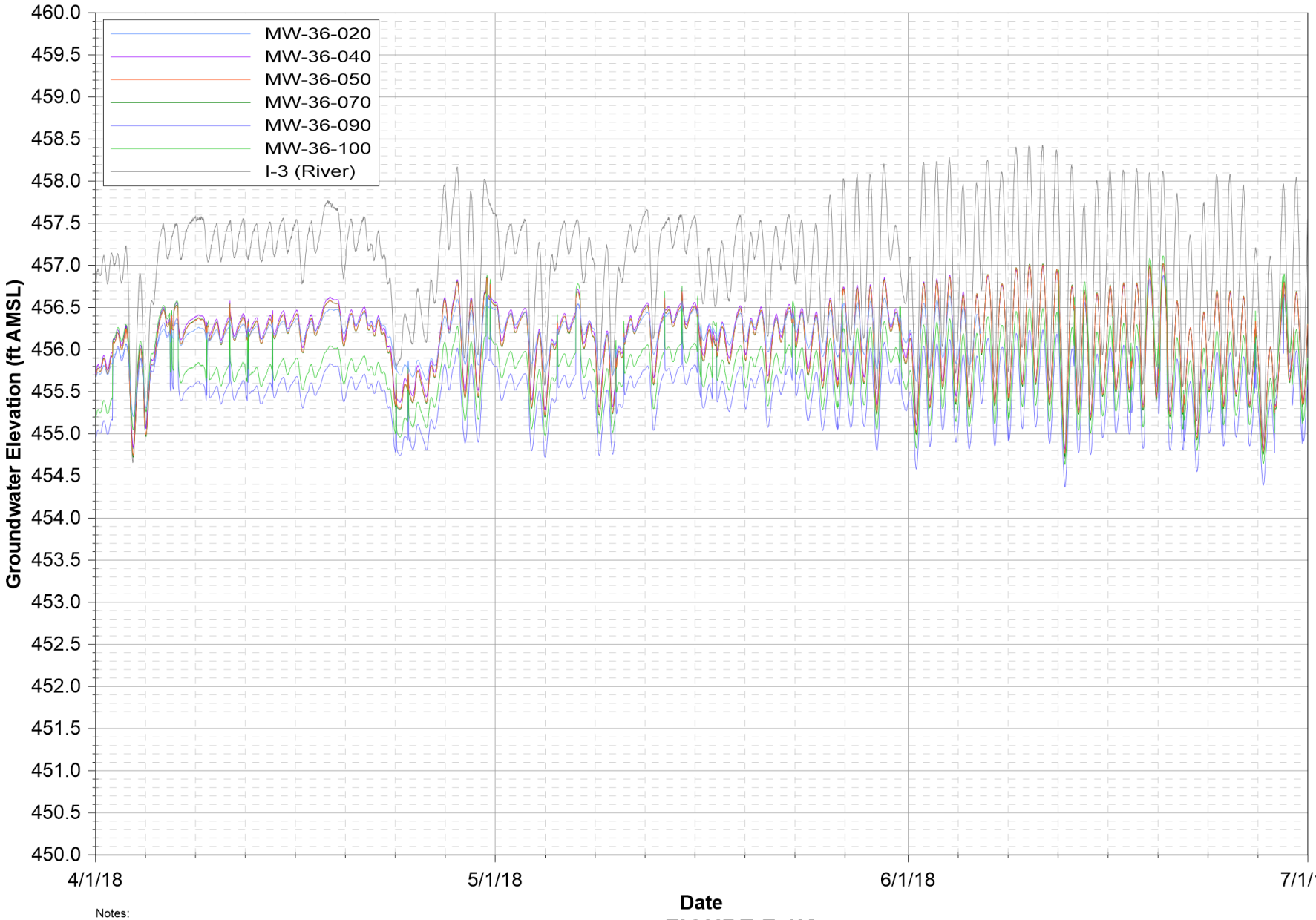
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-35-060 data unavailable from April 1, 2018 through June 7, 2018 due to transducer malfunction.

FIGURE F-1J
MW-35 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

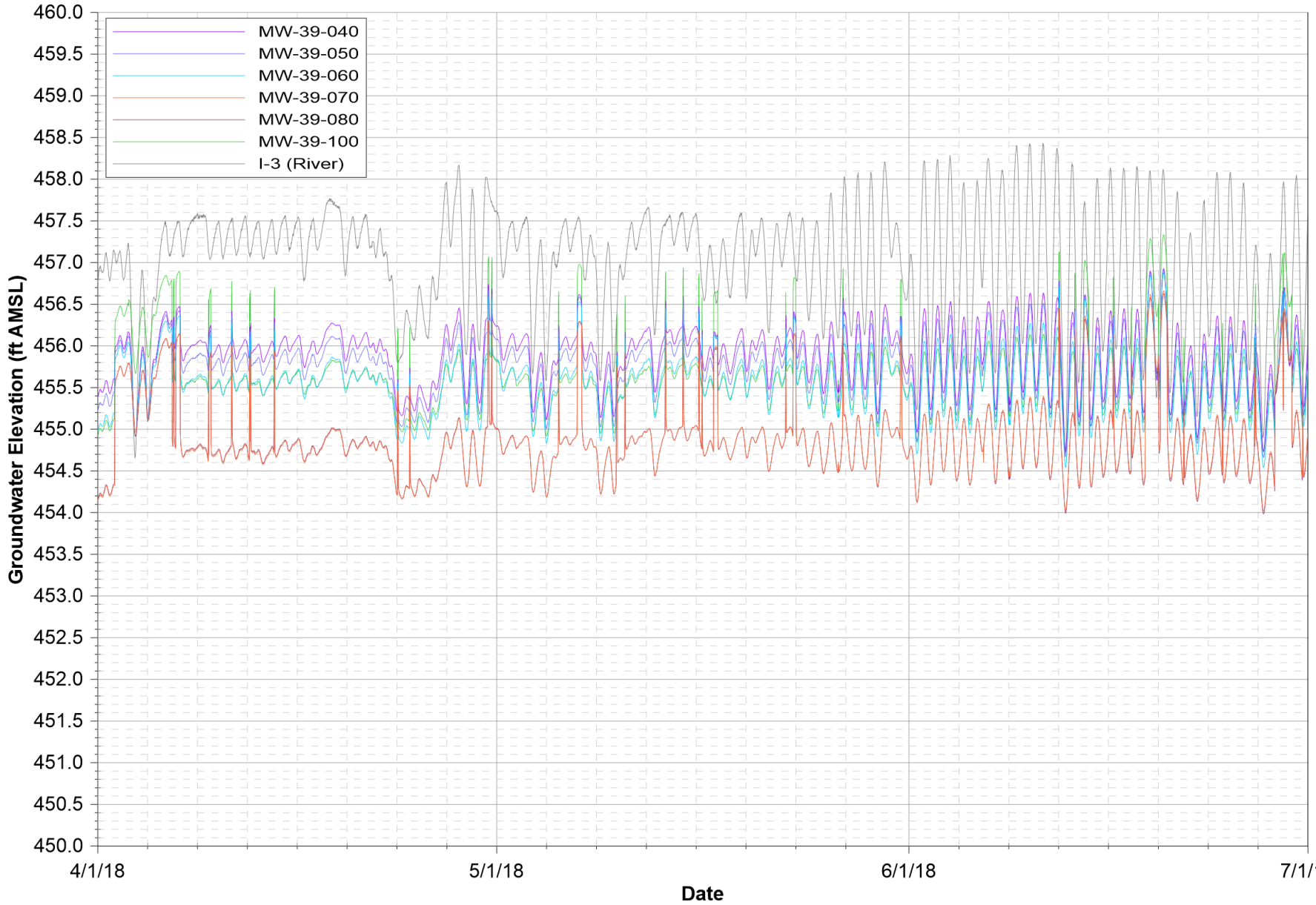
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-36-020 data unavailable from June 6, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1K
MW-36 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

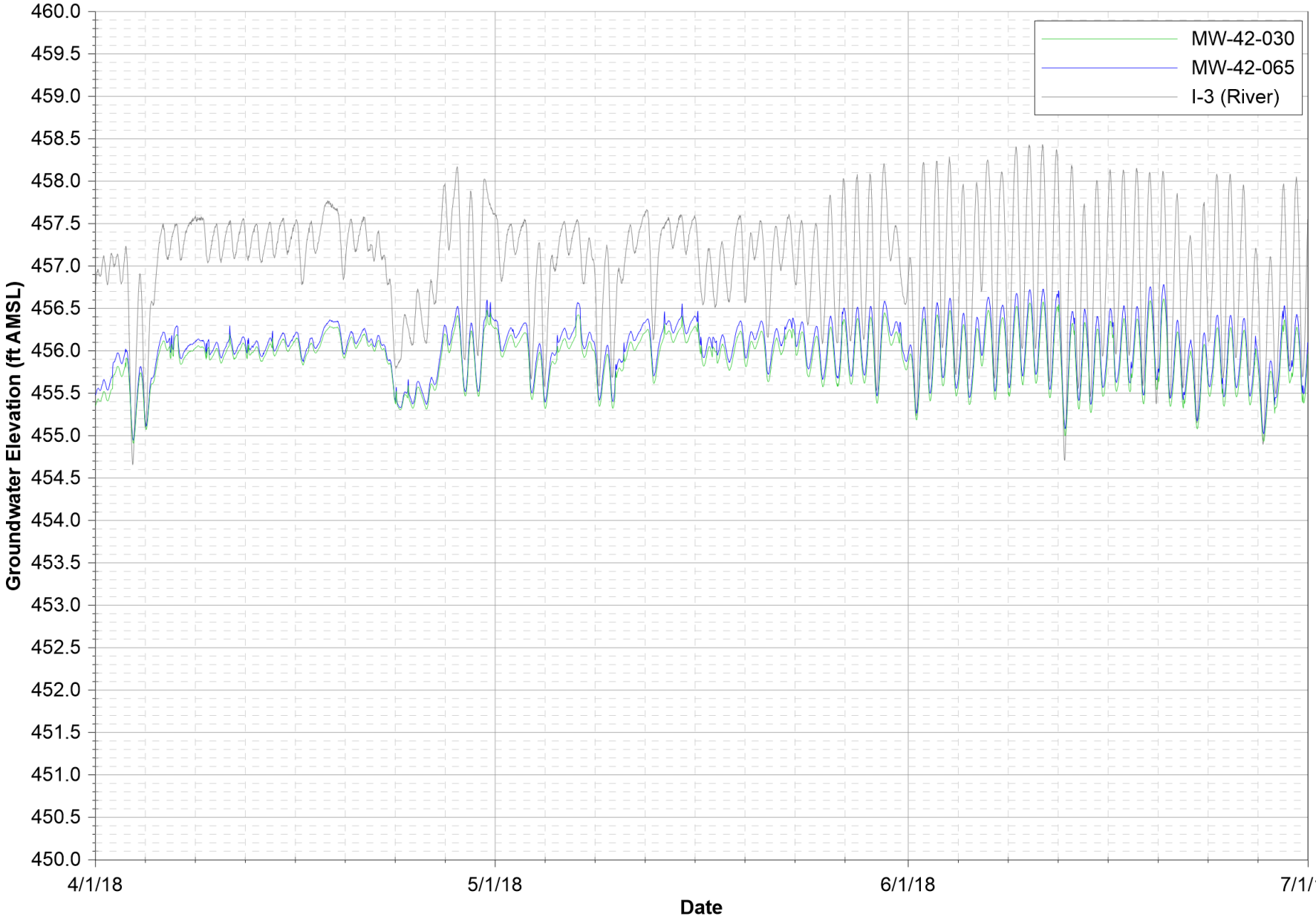
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1L
MW-39 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

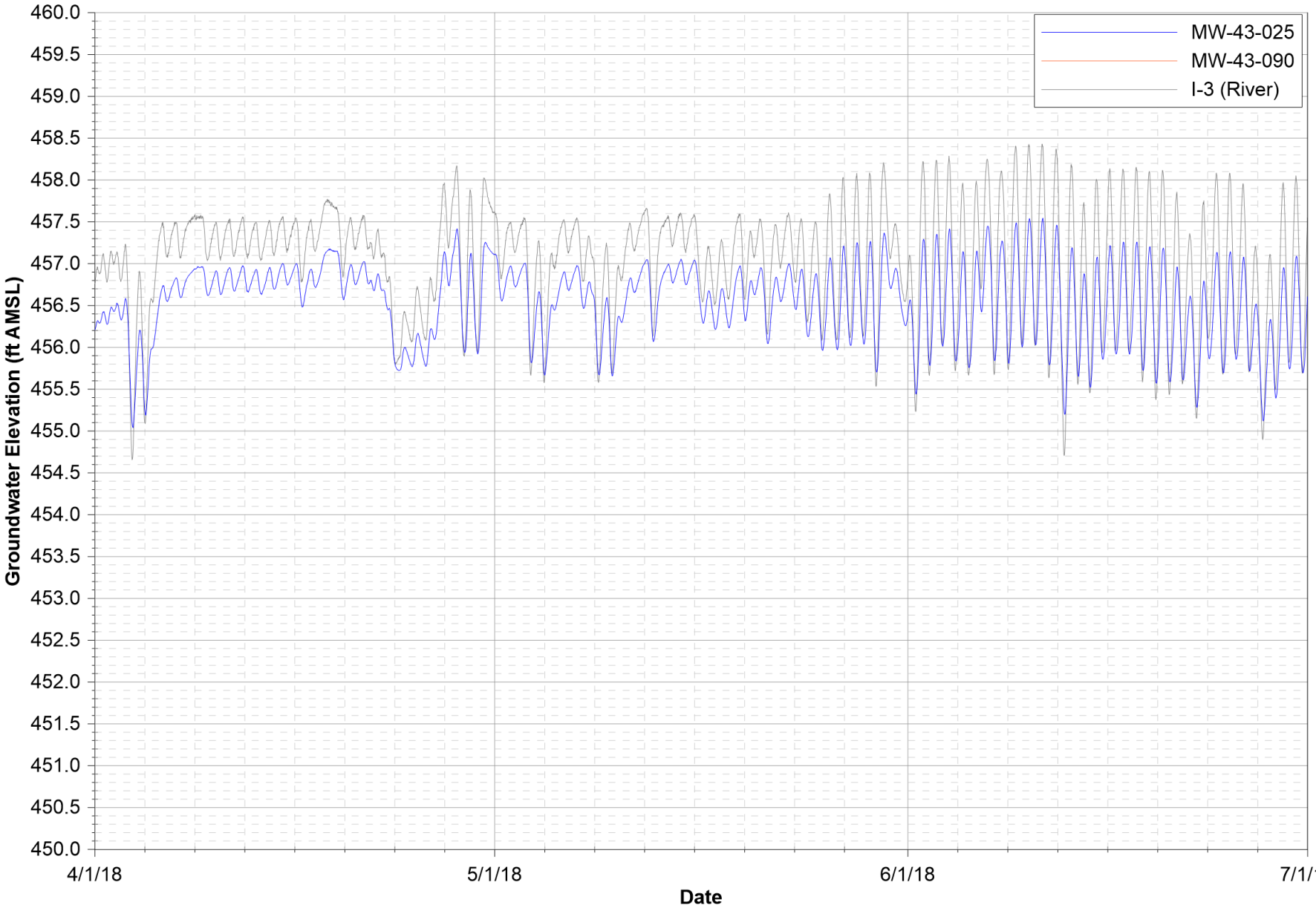


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1M
MW-42 CLUSTER HYDROGRAPHS

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

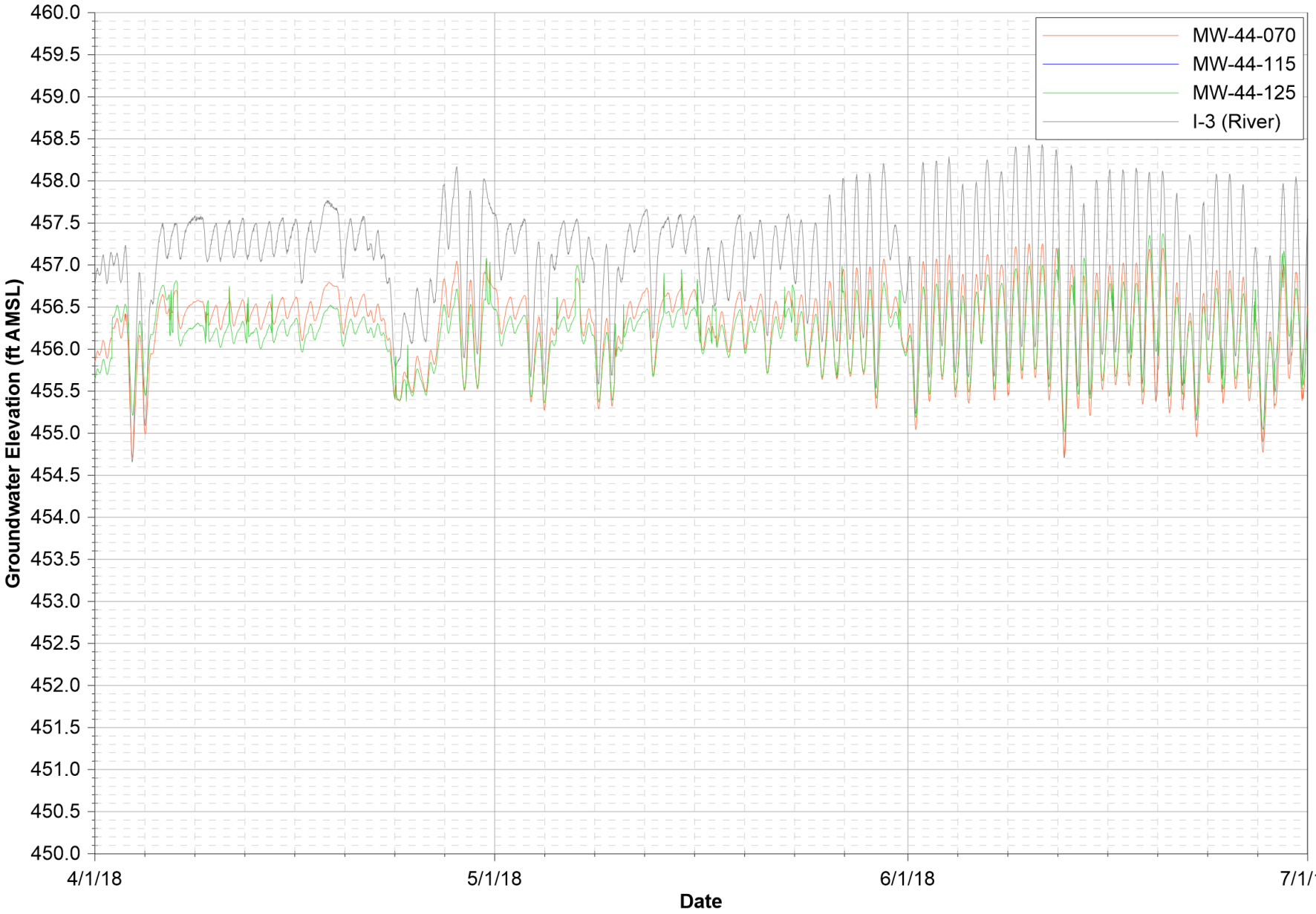
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-43-090 data unavailable from April 1, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1N
MW-43 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

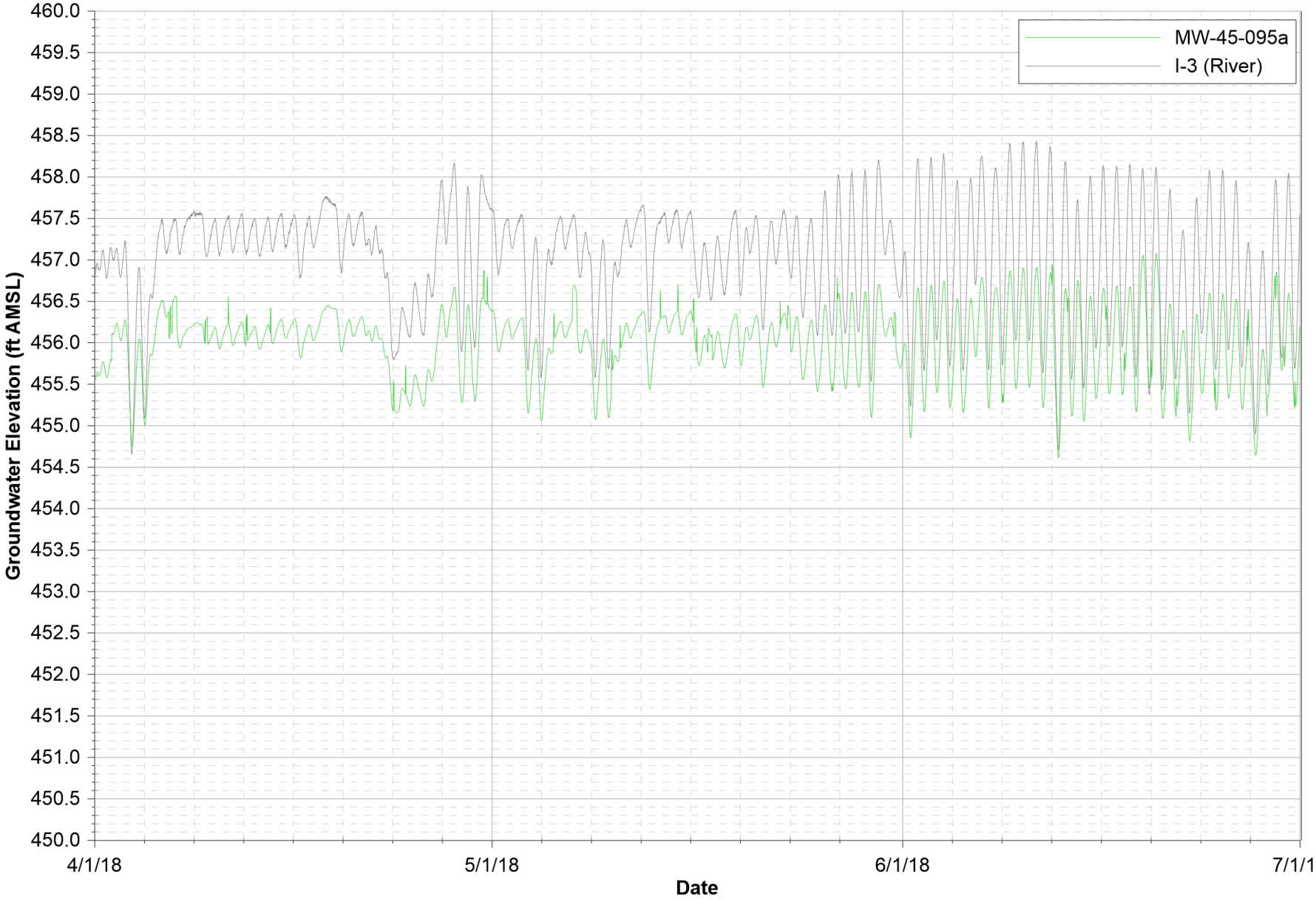
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-44-115 data unavailable from April 1, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1O
MW-44 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1P
MW-45-095a HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

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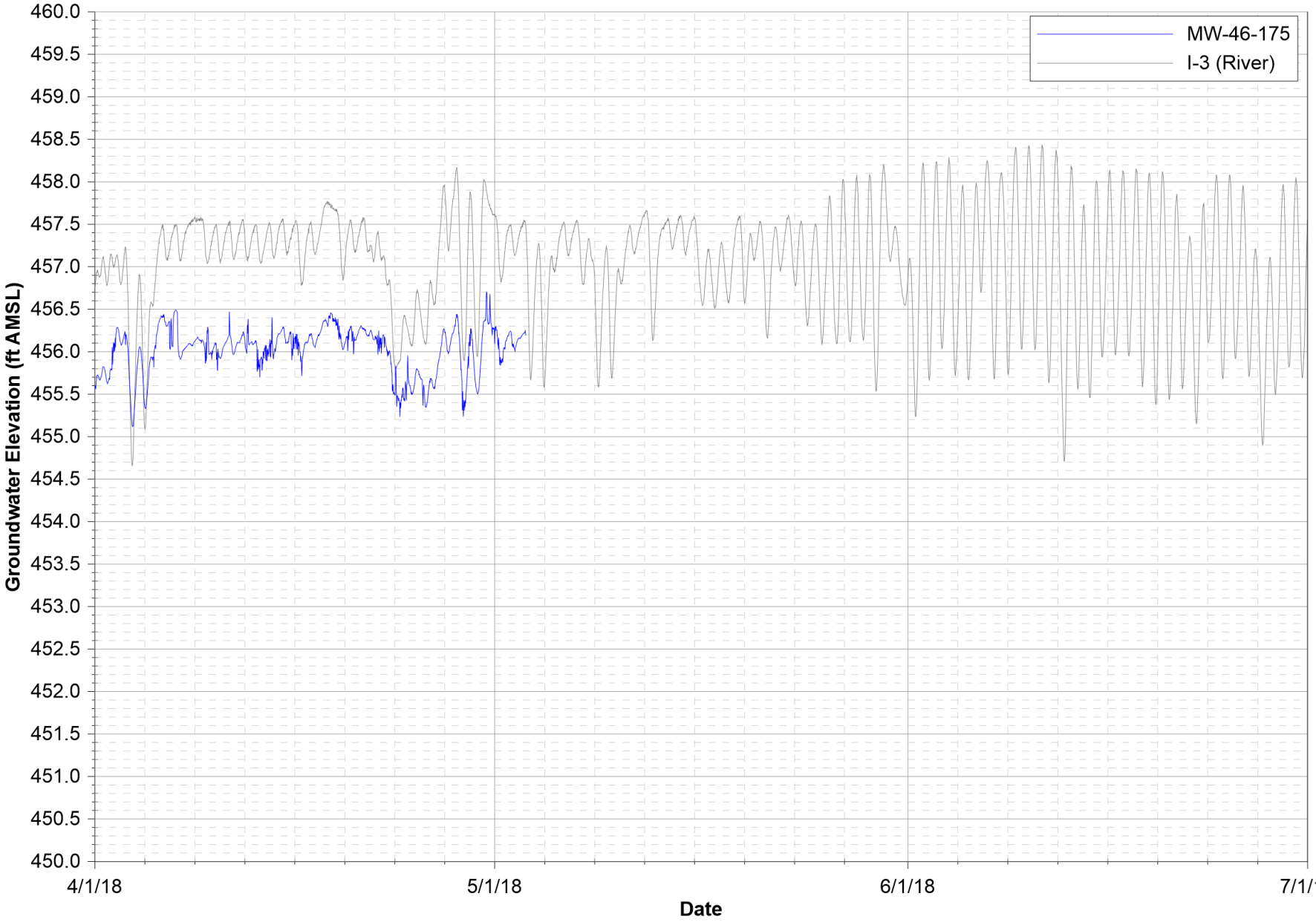
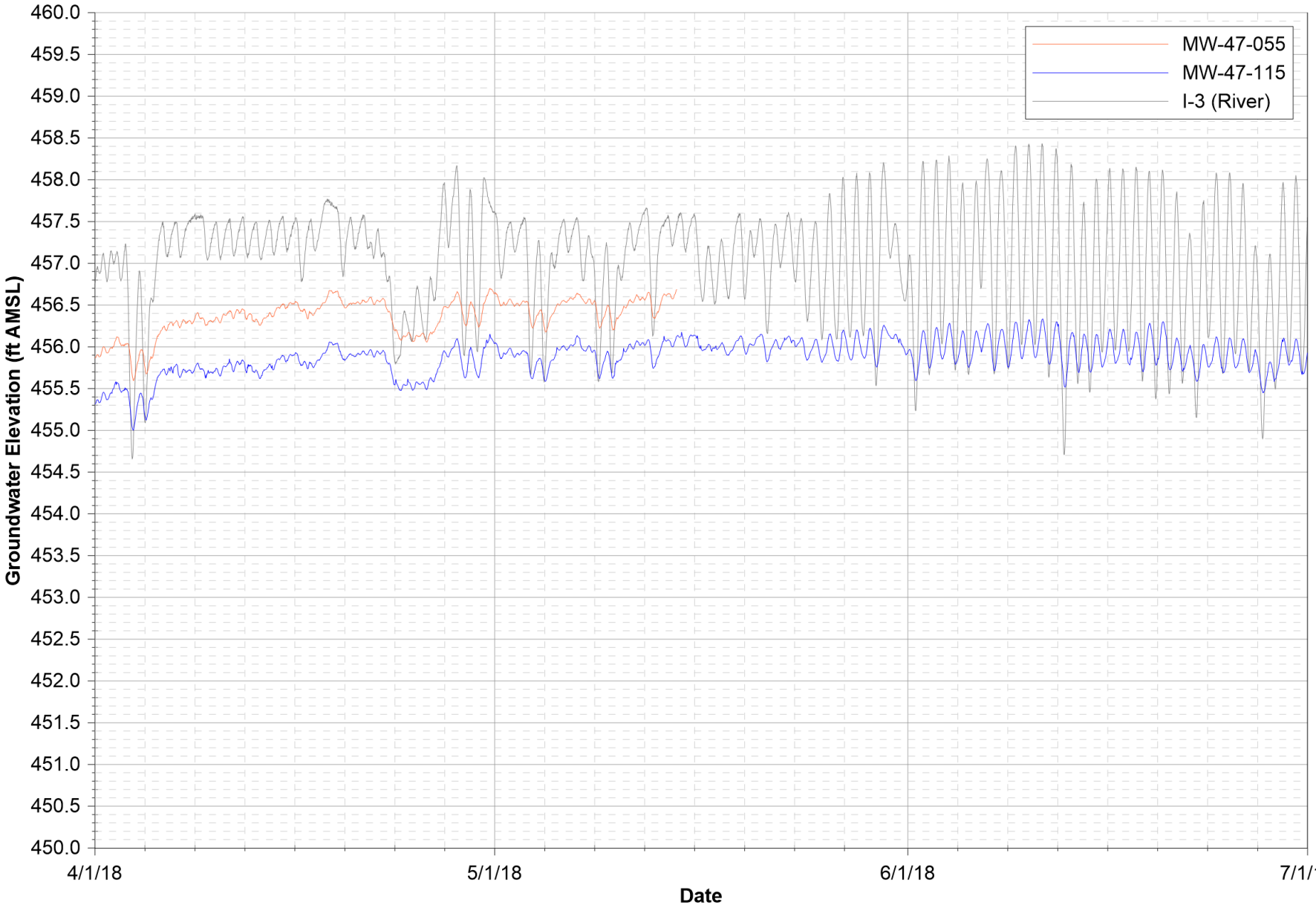


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-46-175 data unavailable from May 3, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1Q
MW-46 HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-47-055 data unavailable from May 14, 2018 through June 30, 2018 due to transducer malfunction.

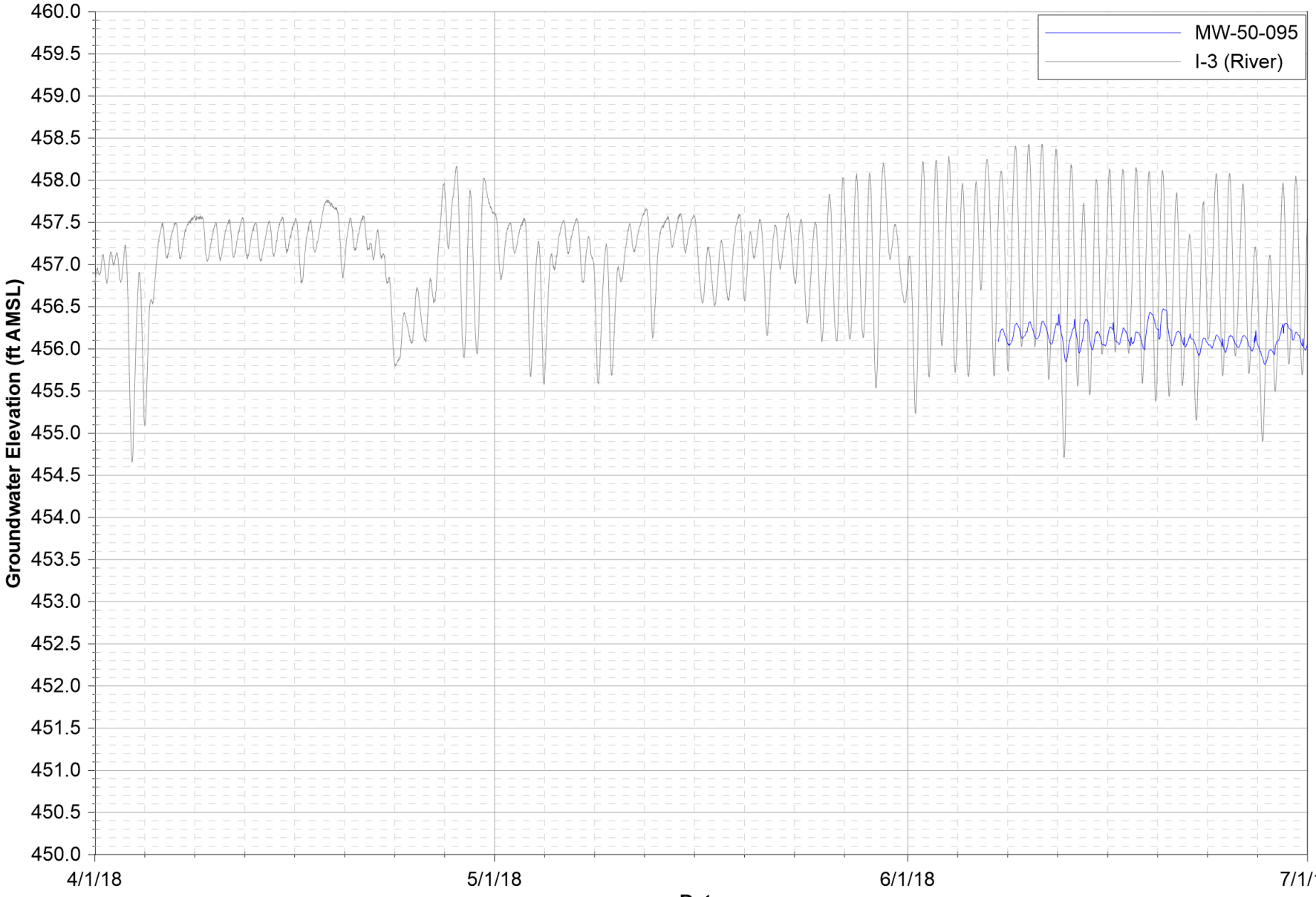
FIGURE F-1R
MW-47 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1S
MW-49 HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



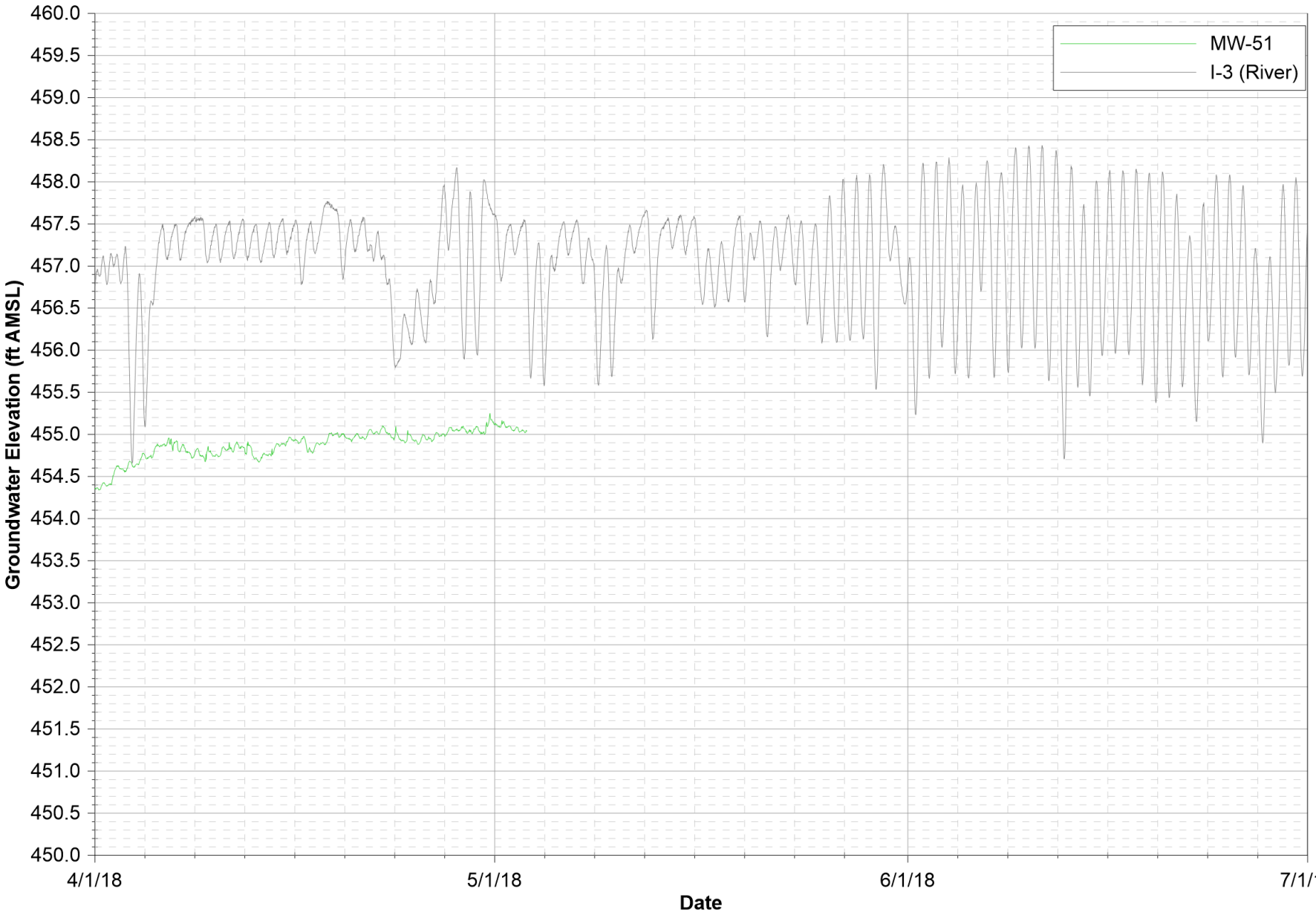
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-50-095 data unavailable from April 1, 2018 through June 7, 2018 due to transducer malfunction.

FIGURE F-1T

MW-50 HYDROGRAPH

SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

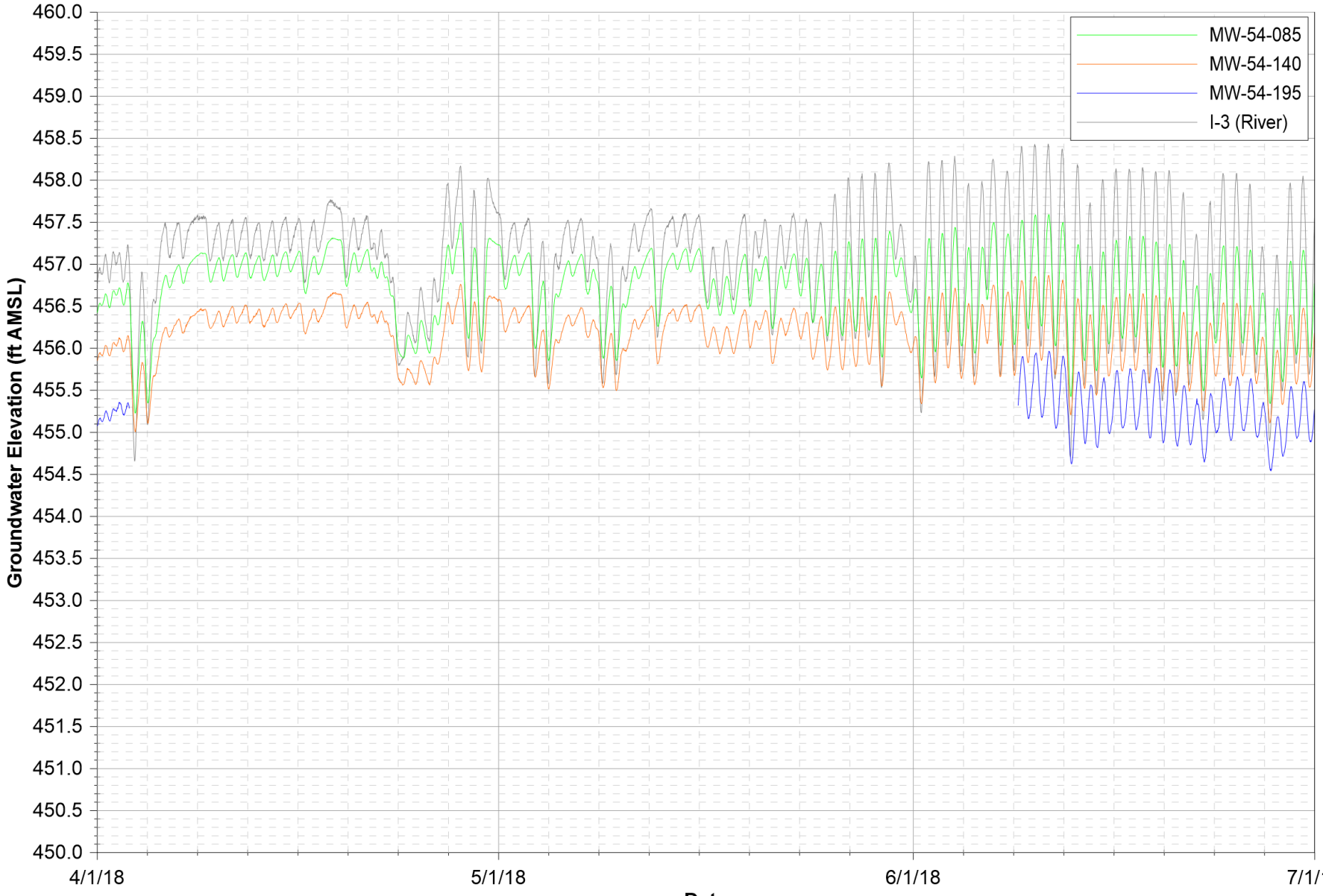
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-51 data unavailable from May 3, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1U
MW-51 HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

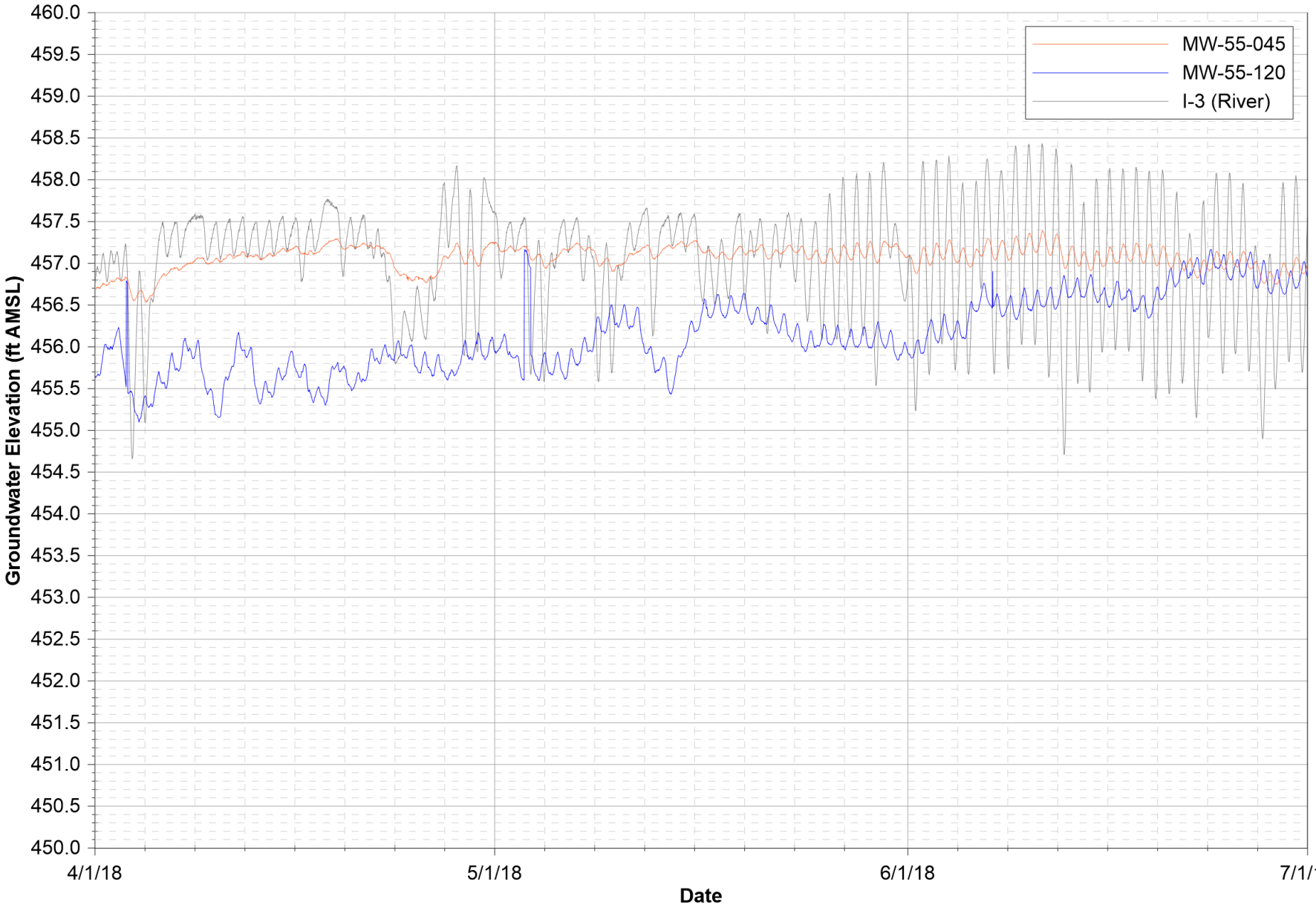
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-54-195 data unavailable from April 3, 2018 through June 8, 2018 due to transducer malfunction.

FIGURE F-1V
MW-54 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

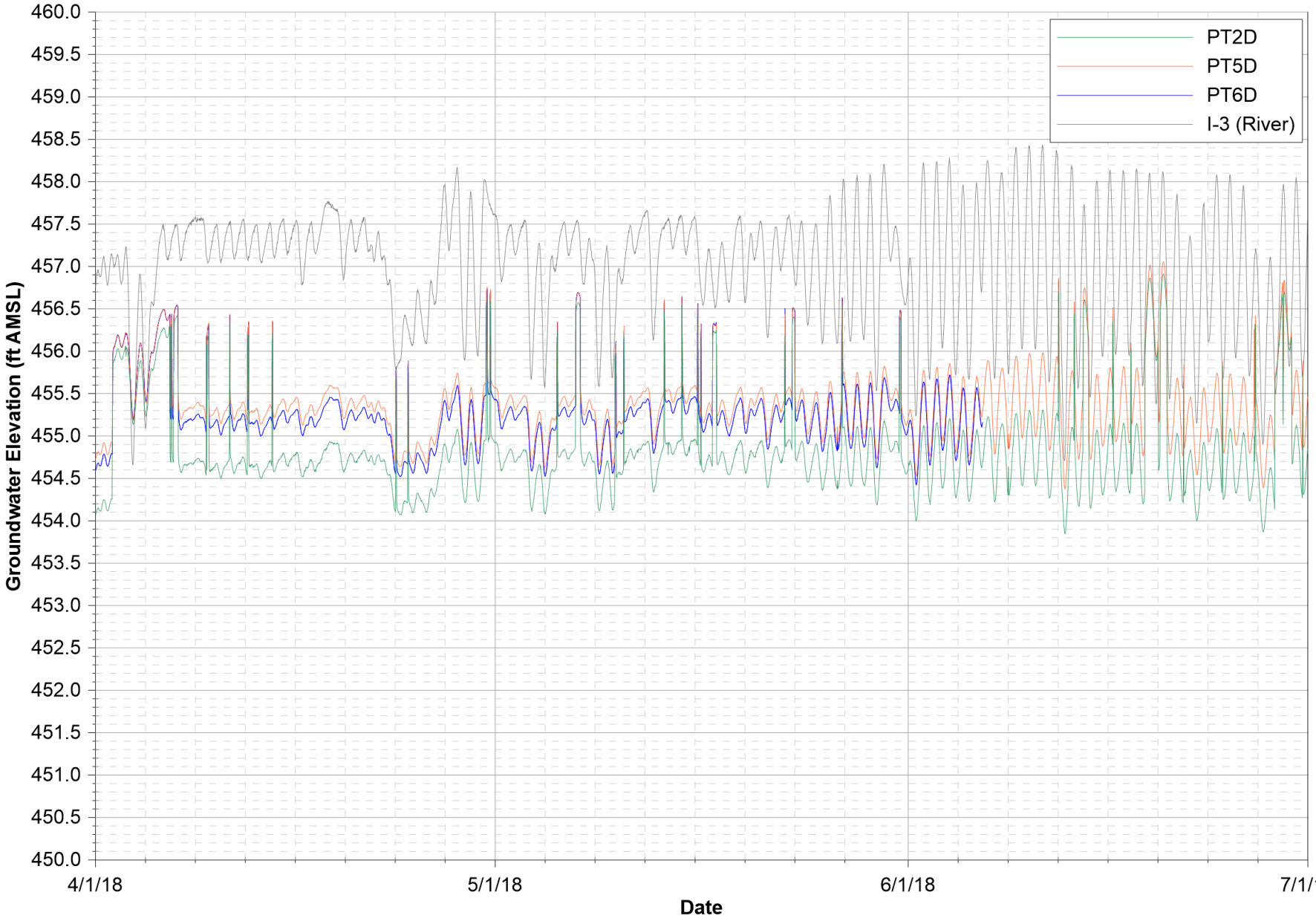
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1W
MW-55 CLUSTER HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

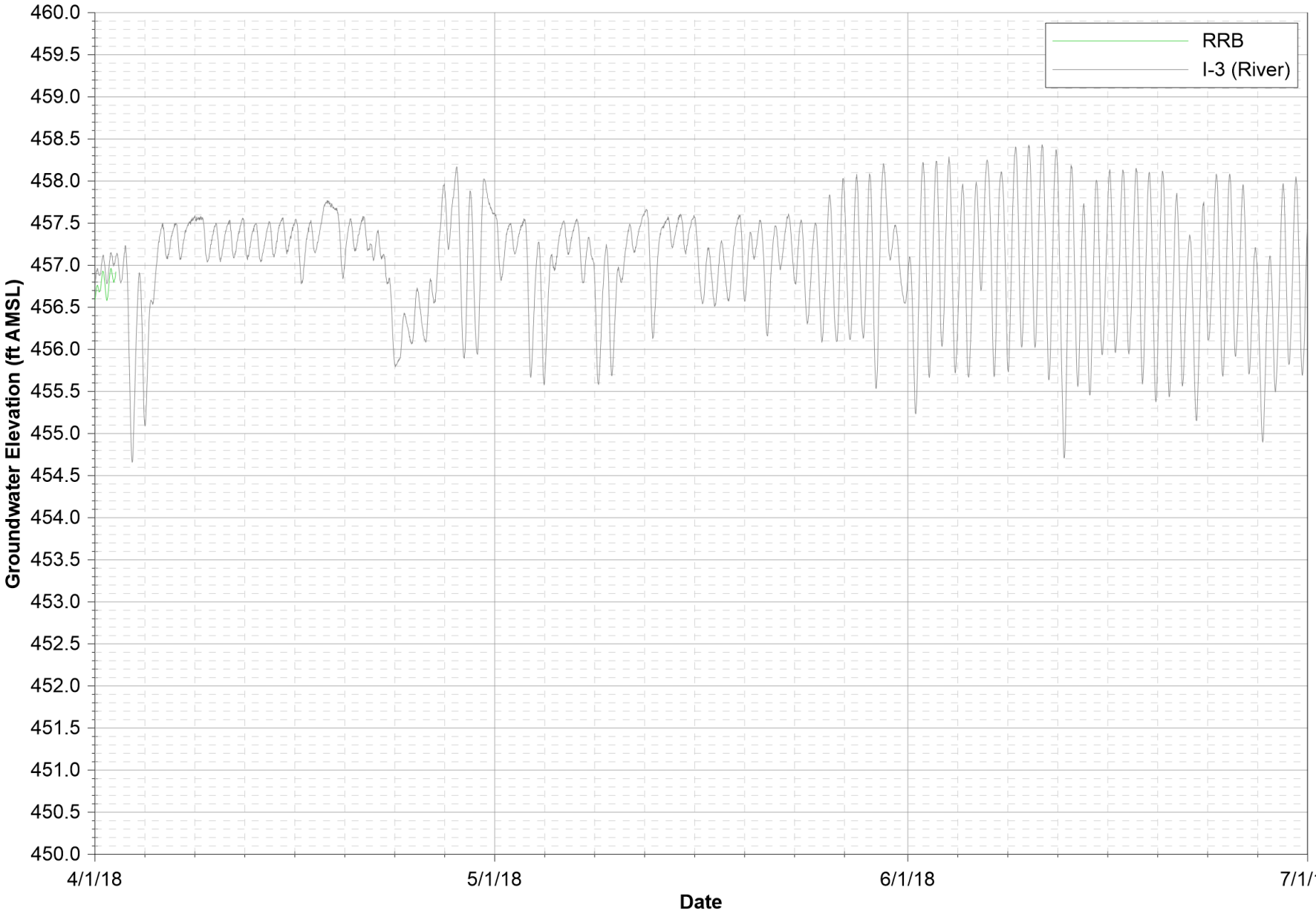
ARCADIS



Note:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. PT6D data unavailable from June 6, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1X
INSITU PILOT STUDY WELL HYDROGRAPHS
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. RRB data unavailable from April 2, 2018 through June 30, 2018 due to transducer malfunction.

FIGURE F-1Y
RRB HYDROGRAPH
SECOND QUARTER 2018 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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