Topock Project Executive Abstract

Document Title:

First Quarter 2017 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: April 26, 2017

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
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☐ 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 the First Quarter 2017 reporting period. On July 23, 2010, DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from January 1, 2017 through March 31, 2017. The average pumping rate for the IM extraction system during First Quarter 2017 was 131.1 gallons per minute, and an estimated 57.3 pounds (26.0 kilograms) of chromium were removed in January and February 2017. To date, the IM extraction system has removed 8,850 pounds (4,020 kilograms) of chromium.

Written by: PG&E

Recommendations:
Recommendation to adjust sampling frequency at Arizona monitoring well MW-55-120 presented in Section 6.

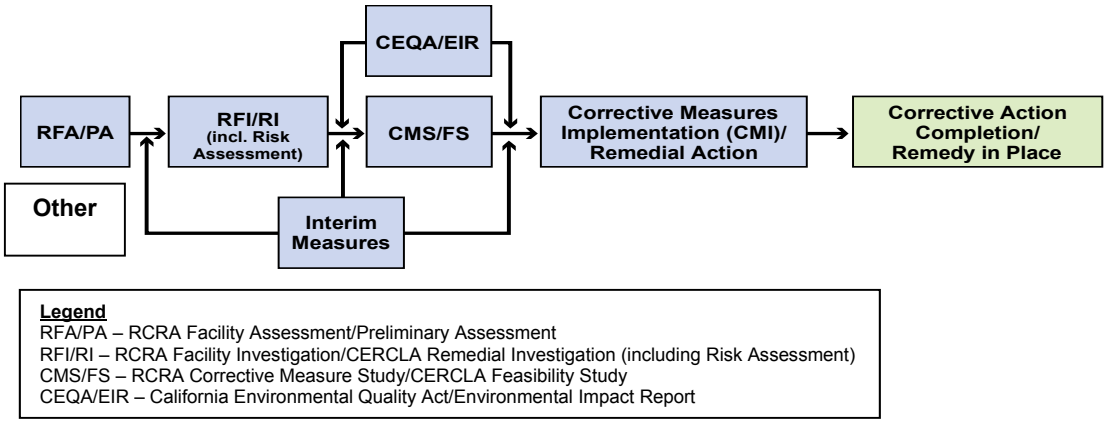
How is this information related to the Final Remedy or Regulatory Requirements:

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).



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April 26, 2017

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

Subject: **First** *Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California* (PGE20170426A)

Dear Mr. Yue:

Enclosed is the First Quarter 2017 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 and the Groundwater Monitoring Program and Surface Water Monitoring Program for the Topock project. This report presents the First Quarter (January through March 2017) 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 the First Quarter 2017 Reporting Period.

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; and July 20, 2015.

Please contact me at (805) 234-2257 if you have any questions on the combined monitoring report.

Sincerely,

Betsy Brunswick on behalf of Yvonne Meeks
Topock Remediation Project Manager

Cc: Chris Guerre/DTSC
Karen Baker/DTSC
Pam Innis/DOI
Susan Young/CA-SLC
Bruce Campbell/AZ-SLD

ARCADIS Design & Consultancy for natural and built assets

Pacific Gas and Electric Company

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

Topock Compressor Station,
Needles, California

April 26, 2017

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

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FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E Topock Compressor Station,

Needles, California

Prepared for:

California Department of Toxic Substances Control

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Date:

April 26, 2017

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ADEQ	Arizona Department of Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	constituent of potential concern
Cr(VI)	hexavalent chromium
CMP	Compliance Monitoring Program
CWG	Consultative Working Group
DOI	U.S. Department of the Interior
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
PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
RCRA	Resource Conservation and Recovery Act
RMP	Surface Water Monitoring Program
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 IM Performance Monitoring Program, the Groundwater Monitoring Program, and the 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 the First Quarter 2017. The average pumping rate for the IM extraction system during First Quarter 2017 was 131.1 gallons per minute, and an estimated 57.3 pounds (26.0 kilograms) of chromium were removed between January 1 and February 28, 2017. To date, the IM extraction system has removed 8,850 pounds (4,020 kilograms) of chromium.

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 No. 3 (IM-3) Performance Monitoring Program (PMP)

This report presents the monitoring data collected from PG&E's GMP, RMP, and PMP between January 1 and March 31, 2017 (hereafter referred to as **First Quarter 2017**). 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 First Quarter 2017 monitoring activities and site operations conducted in support of these programs.

Section 3 presents GMP and RMP monitoring results for the First Quarter 2017 reporting period.

Section 4 presents PMP monitoring results and the IM evaluation for the First Quarter 2017 reporting period.

Section 5 describes upcoming monitoring events for the Second Quarter 2017.

Section 6 lists the references cited throughout this report.

This combined GMP (including 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 Recent Regulatory Communication

- On June 27, 2014, DTSC approved changes to the GMP sampling schedule, sample frequencies, and sampling methods (DTSC 2014b). This approval was based on recommendations documented in

the Fourth Quarter 2013 and Annual edition of the Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report (henceforth referred to as the GMP/PMP Report; CH2M Hill 2014a). Starting in Third Quarter 2014, the groundwater sample collection method for most monitoring wells was conditionally switched from the traditional three-volume method to the low-flow (minimal drawdown) method (following the standard operating procedures detailed in the Sampling and Analysis Field Procedures Topock Program Manual, Revision 1, PG&E, Topock Project [CH2M Hill 2005a] and relevant updates).

- An updated listing of DTSC-approved purge methods and sampling frequencies, as well as a revised set of proposed GMP analytical suite modification, was provided in Table 7-1 of the Fourth Quarter 2014 and Annual GMP/PMP Report (CH2M Hill 2015a). Additional recommendations for updates to the GMP program sampling methods were outlined by PG&E in a letter to DTSC dated August 21, 2015 (PG&E 2015) and in Section 7 of the Fourth Quarter 2015 and Annual GMP/PMP Report (Arcadis 2016a). Recommendations made by PG&E in these documents remain under agency review.
- On June 29, 2015, the Arizona Department of Environmental Quality (ADEQ) recommended that PG&E increase the sampling frequency of MW-55-120 from semiannually to quarterly (ADEQ 2015). This was initiated by PG&E in Third Quarter 2015. On May 18, 2016, ADEQ recommended that quarterly sampling at MW-55-120 be extended for an additional year "where data are within the prescribed hold time and analyzed by an ADHS-certified lab (ADEQ 2016)." This was initiated by PG&E in Second Quarter 2016. Quarterly sampling has continued through First Quarter 2017 at this location. Results of sampling at MW-55-120 were evaluated following the First Quarter 2017 sampling (Section 2.1.4), and a new sampling frequency is proposed in Section 6 of this report. A formal request for this change will be submitted to ADEQ under separate cover.
- On July 20, 2015, DTSC conditionally approved a proposal to evaluate a modification to the IM-3 pumping regime by allowing PE-01 to be shut off with pumping shifted to TW-03D and TW-02D or TW-02S so long as gradient targets are maintained and contingency is not triggered based on hexavalent chromium [Cr(VI)] concentrations in select floodplain wells (DTSC 2015). Because PE-01 pumps water with low concentrations of chromium (typically less than 5 micrograms per liter [µg/L]), shifting the flow from this well to a higher concentration extraction well can increase the rate of chromium removal from the floodplain. After a brief period of testing hydraulic gradients and operating the IM-3 treatment plant with PE-01 off in August and September 2015, PE-01 pumping resumed in September 2015 and remained on through the end of the year. On February 3, 2016, PE-01 was turned off, with the pumping shifted to TW-03D and supplemented by TW-02D. PE-01 remained off

through Second Quarter 2016 except for brief periods to support groundwater sample collection and one week in June, when it was operated to help maintain key well gradients.

- As part of the conditional approval for PE-01 shutoff, GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter 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 DTSC within 40 days after the end of the quarterly GMP sampling event. This notification for Second Quarter GMP sampling results was made to DTSC on June 15, 2016 (with a follow up e-mail for one additional notification sent on August 10, 2016). DTSC replied to PG&E's initial Second Quarter notification with an email on June 15, 2016. DTSC confirmed that monitoring and assessment should continue to evaluate concentration trends, and requested that future notifications be provided in the same format as that of the Second Quarter 2016 submittal.
- During First Quarter 2017, PE-01 was run intermittently in January to maintain groundwater gradients, then continuously in February and March (primarily to support IM-3 maintenance work, which required full PE-01 flow). During the quarter, none of the wells evaluated (i.e., wells within 800 feet of TW-03D, as required as part of the conditional shutdown of PE-01) met the criteria where either Cr(VI) or total dissolved chromium (or both) were detected at concentrations exceeding the notification levels. Therefore, no notification to DTSC for these wells was required for First Quarter 2017.

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 2017).

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 (CH2M Hill 2008), naturally occurring Cr(VI) in groundwater was calculated to exhibit an upper tolerance limit (UTL) concentration of 32 µg/L. 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 in the majority 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

The Topock GMP and RMP were initiated as part of a Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facility investigation/remedial groundwater investigation. The RCRA program is being regulated under a Corrective Action Consent Agreement issued by the DTSC in 1996 for the Topock site (United States Environmental Protection Agency [USEPA] ID No. CAT080011729).

Groundwater monitoring data collected to date have been documented in regular monitoring reports (available on the DTSC website). In addition, data from between July 1997 and October 2007 are summarized in the Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2–Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E, Topock Compressor Station, Needles, California, dated February 11, 2009 (CH2M Hill 2009a). Additional groundwater and surface water monitoring data from November 2007 through September 2008 are presented in the Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2, Addendum–Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E, Topock Compressor Station, Needles, California, dated June 29, 2009 (CH2M Hill 2009b).

In compliance with the requirements for Groundwater and Surface Water Monitoring Program directive of April 2005 (DTSC 2005a), this report presents the First Quarter 2017 GMP and RMP Report for the IM monitoring activities conducted from January 1, 2017 through March 31, 2017.

1.3.2 GMP and RMP Sampling Networks

The GMP monitoring well network and RMP surface water sampling network are shown on Figures 1-2 and 1-3, respectively, and summarized below. The complete GMP network includes more than 100 wells that monitor groundwater in the Alluvial Aquifer and bedrock, and the RMP includes 25 surface water monitoring locations.

GMP Groundwater Monitoring Wells	RMP Surface Water Monitoring Locations
129 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
2 water supply wells	2 other surface water sampling locations (adjacent to the shoreline)
2 IM-3 extraction wells	
5 test wells	

The well construction and sampling methods for wells in the GMP and other monitoring wells at the site are summarized in Appendix A (Table A-1) of the Fourth Quarter 2016 and Annual GMP/PMP report (Arcadis 2017b).

1.4 Interim Measure Performance Monitoring Program

1.4.1 Basis for PMP Program

In compliance with the requirements for IM monitoring and reporting outlined in the DTSC IM performance directive of February 2005, and in subsequent directives from the DTSC in 2007 (DTSC 2005b; 2007a-c), this report presents the First Quarter 2017 PMP evaluation results for the IM monitoring activities from January 1, 2017 through March 31, 2017.

The Topock IM project consists of groundwater extraction for hydraulic control of the plume boundaries in the Colorado River floodplain and management of extracted groundwater. The groundwater extraction, treatment, and injection systems are collectively referred to as IM-3. The IM monitors only the Alluvial Aquifer. Currently, the IM-3 facilities include 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. During First Quarter 2017, extraction wells TW-03D and PE-01 operated at a combined pumping rate of 131.1 gallons per minute (gpm), including periods of planned and unplanned downtime

Figure 1-1 shows the locations of the IM-3 extraction, conveyance, treatment, and injection facilities.

In a letter dated February 14, 2005, DTSC established the criteria for evaluating the performance of the IM (DTSC 2005c). As defined by DTSC, the performance standard for this IM is to *"establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that hexavalent chromium*

[Cr(VI)] concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment" (DTSC 2005b). A Draft Performance Monitoring Plan for Interim Measures in the Floodplain Area, PG&E, Topock Compressor Station, Needles, California (CH2M Hill 2005b) was submitted to DTSC on April 15, 2005 (herein referred to as the Performance Monitoring Plan).

The February 2005 DTSC directive also defined the monitoring and reporting requirements for the IM (DTSC 2005b-c). In October 2007, DTSC modified the reporting requirements for the PMP (DTSC 2007a) to discontinue monthly performance monitoring reports (the quarterly and annual reporting requirements were unchanged). The DTSC approved additional updates and modifications to the PMP in letters dated October 12, 2007; July 14, 2008; July 17, 2008; July 23, 2010; and June 27, 2014 (DTSC 2007a, 2008a-b, 2010a, 2014b). On July 20, 2015, DTSC conditionally approved the 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 (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.

On February 3, 2016, PE-01 was turned off, with the pumping shifted to TW-03D and supplemented by TW-02D. PE-01 remained off through Second Quarter 2016, but was run intermittently during Third Quarter and Fourth Quarter 2016 to help maintain groundwater gradients at key wells. TW-02S and TW-02D did not run during Third or Fourth Quarter 2016 except for brief periods of testing and sampling. TW-03D operated full time in 2016. During First Quarter 2017, PE-01 was run intermittently in January to maintain groundwater gradients, then continuously in February and March (primarily to support IM-3 maintenance work which required full PE-01 flow). TW-02S and TW-02D did not run during First Quarter 2017 except during brief periods of testing and sampling. TW-03D operated full time during First Quarter 2017.

1.4.2 PMP – Aquifer Hydraulics

The PMP monitors hydrogeologic conditions in the Alluvial Aquifer. The wells screened in the unconsolidated alluvial fan and fluvial deposits, which comprise the Alluvial Aquifer, have been separated into three depth intervals to present groundwater quality and groundwater level data. The depth intervals of the Alluvial Aquifer in the floodplain area—designated upper (shallow wells), middle (mid-depth wells), and lower (deep wells)—are based on grouping the monitoring wells screened at common elevations. These divisions do not correspond to any lithostratigraphic layers within the aquifer. The Alluvial Aquifer is considered to be hydraulically undivided. The subdivision of the aquifer into three depth intervals is an

appropriate construct for presenting and evaluating spatial and temporal distribution of groundwater quality data in the floodplain. The three-interval concept is also useful for presenting and evaluating lateral gradients while minimizing effects of vertical gradients and observing the influence of pumping from partially penetrating wells.

1.4.3 PMP Monitoring Network

Figure 1-4 shows the locations of wells used for the PMP. The PMP includes data collection for IM groundwater extraction, IM hydraulic monitoring, the IM Contingency Plan (IMCP), and IM chemical performance monitoring. With approval from DTSC, the list of wells included in the PMP programs was modified beginning on August 1, 2008 (PG&E 2008). The PMP wells and monitoring locations are described in the table below.

PMP Wells and Monitoring Networks

IM Extraction Wells (4 Wells)

- TW-02D
- TW-03D
- TW-02S
- PE-01

Hydraulic Monitoring Network – 53 Wells Total (including 17 shallow, 14 intermediate, and 22 deep)

- Floodplain wells: monitoring wells on the Colorado River floodplain
- Intermediate wells: monitoring wells immediately north, west, and southwest of the floodplain
- Interior wells: monitoring wells upgradient of IM pumping

IMCP Wells (24 Wells)

- 6 Shallow Wells
- 5 Intermediate Wells
- 13 Deep Wells

Chemical Performance Monitoring Locations (11)

- 9 Annual Wells
- 1 River Sampling Location
- 1 Biennial Well

1.4.3.1 IM Extraction Wells

The PMP Program includes four IM extraction wells (Figure 1-4). Three wells (TW-02D, TW-03D, and TW-02S) are located on the MW-20 bench, and one well (PE-01) is located on the floodplain approximately 450 feet east of extraction well TW-03D.

1.4.3.2 IM Hydraulic Monitoring Network

The IM Hydraulic Monitoring Network consists of 53 wells (shown on Figure 1-4) used to evaluate the performance of the IM and demonstrate compliance of required hydraulic gradients. Section 4.7 of this report presents a summary of the IM hydraulic monitoring results for First Quarter 2017.

In addition to the established IM hydraulic monitoring network, groundwater monitoring wells installed on the Arizona side of the Colorado River (not formally part of the PMP) also provide groundwater elevation data and demonstrate hydraulic gradients on the Arizona side of the river (Figure 1-4).

1.4.3.3 IM Contingency Plan Wells

Twenty-four IMCP wells have been selected as part of an early detection system to detect any increases in chromium concentrations at areas of interest at the site. Following a sampling event, any sampled IMCP wells are evaluated against their established trigger levels. If any exceedances are observed at these wells, a notification process is initiated as outlined in the Revised Contingency Plan Flow Chart (Figure 1; PG&E 2008). Results of IMCP well evaluations following First Quarter 2017 sampling are presented in Section 4.3 of this report.

1.4.3.4 IM Chemical Performance Monitoring Wells

The well network is sampled annually or biennially for an expanded chemistry suite as part of the IM Chemical Performance Monitoring Network, which was most recently amended in 2008 (PG&E 2008). Currently, nine wells are sampled annually as part of this program, one well is sampled biennially, and one river location is sampled annually. Results of chemical performance monitoring were last reported in the Fourth Quarter 2016 Annual GMP-PMP Report (Arcadis 2017b). The next scheduled assessment is planned for Fourth Quarter 2017.

1.4.3.5 Wells Monitored for Conditional Shut-Down of PE-01

As part of the conditional approval for PE-01 shutoff, GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter (i.e., wells within 800 feet of TW-03D) 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 DTSC within 40 days after the end of the quarterly GMP sampling event. Results for this evaluation for First Quarter 2017 are presented in Section 4.3.2.

1.5 Sustainability

The GMP, RMP, and PMP monitoring programs strive to use sustainable sampling and data collection practices. This section briefly describes some of the sustainability practices now in use.

As approved by the California Regional Water Quality Control Board in 2006, groundwater sampling purge water is disposed via the on-site IM-3 treatment plant and injection process, eliminating off-site transport and disposal of sampling purge water. Additionally, the RMP boat contractor has always been a local Lake Havasu City-based business. Benefits of employing local resources for sampling support are reduced fuel consumption and greenhouse gas emissions, and increased local business support. In 2012, the analytical laboratory services supporting Topock monitoring was changed from a Los Angeles-based lab to the current California-certified Las Vegas-based lab, reducing lab courier travel by more than half. In 2007, DTCS approved the use of USEPA Method 218.6, which has a 28-day holding time, in place of USEPA Method SW846 Method 7199 for Cr(VI) analysis, which has a 24-hour holding time. Subsequently, PG&E also adopted the 14-day holding time nitrate method (first used with the Compliance Monitoring Program [CMP]) for Topock GMP to replace the previous 48-hour holding time method. These method changes reduced courier travel mileage and increased field efficiency with less frequent sample pickups. The use of the DTSC website and electronic report submittal has reduced the number of report hard copies and conserved natural resources. The number of report hard copies has been reduced over the years from 16 to 10 for the quarterly reports to conserve resources.

To reduce the potential for impacts to floodplain areas with nesting habitat for sensitive avian species, water level data telemetry systems were installed from 2011 through 2012 at the five key gradient compliance well locations. The telemetry systems are still used. The solar-powered data telemetry systems eliminated the need for weekly download visits (reduced mobilizations of off-site technical support resources) and allows for monthly or less frequent visits for key well transducer calibrations and maintenance.

The DTSC approved the provisional use of low-flow sampling on June 27, 2014 (DTSC 2014b) at most wells screened in the Alluvial Aquifer. Low-flow sampling reduced the volume of purge water and the sampling footprint at most wells. For wells still using the three-volume purge sampling methods (primarily bedrock and long screened wells), pumps and tubing are sized for the optimum purge technique at each

monitoring well. Utility vehicles (e.g., Polaris Ranger or Kawasaki Mule) and one 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. These best practices reduce generator use, impacts from well access, and decontamination water volume to further decrease the monitoring footprint.

More recently, DTSC conditionally approved a modification to the IM-3 pumping regime that allows 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, thereby extending the benefit of additional mass removal by the existing system to the overall site cleanup while maintaining hydraulic control of the plume.

2 FIRST QUARTER 2017 MONITORING ACTIVITIES

This section summarizes the monitoring and sampling activities completed during First Quarter 2017 for the GMP, RMP, and PMP.

2.1 Groundwater Monitoring Program

2.1.1 Monthly Sampling

Groundwater was sampled from the active IM extraction wells (PE-01 and TW-03D) in January, February, and March 2017 and analyzed for Cr(VI), dissolved chromium, total dissolved solids (TDS), pH, and several additional analytes.

2.1.2 Quarterly Sampling

The First Quarter 2017 GMP groundwater monitoring event was conducted between February 6 and February 10, 2017 and included sampling from 22 groundwater monitoring wells.

Samples from these wells were submitted for laboratory analysis of Cr(VI), dissolved chromium, and specific conductance. Additional field-measured parameters consisted of oxidation-reduction potential (ORP) and pH.

In addition, groundwater samples were collected at selected GMP wells for analysis of:

- Arsenic from a subset of wells screened in fluvial sediments, as directed by DTSC in the Corrective Measures Study review comment No. 186 (DTSC 2009b)
- Arsenic from bedrock monitoring wells
- Contaminants of potential concern (COPCs), including molybdenum, nitrate/nitrite as nitrogen (referred to as nitrate hereafter), selenium, and potential in situ byproducts (manganese, iron, and arsenic) from a subset of wells (DTSC 2010b, 2011, 2015).

2.1.3 Flow in Bat Cave Wash

In early January 2017, PG&E was notified of a rainfall event that caused surface water flow in Bat Cave Wash. Therefore, additional sampling locations at MW-9, MW-10, and MW-11 were sampled on February 9, 2017 as part of the First Quarter 2017 GMP sampling event. Additional analytes were added in order to assess any potential effect on groundwater from the surface water flow. Results of this additional sampling are reported in Section 3.2.3.

2.1.4 Sampling Frequency at Arizona Well MW-55-120

On June 29, 2015, the ADEQ recommended that PG&E increase the sampling frequency of MW-55-120 from semiannually to quarterly (ADEQ 2015). This was initiated by PG&E in Third Quarter 2015. On May 18, 2016, ADEQ recommended that quarterly sampling at MW-55-120 be extended for an additional year "where data are within the prescribed hold time and analyzed by an ADHS-certified lab (ADEQ 2016)." This was initiated by PG&E in Second Quarter 2016. Quarterly sampling has continued at this well through First Quarter 2017. Results of sampling at MW-55-120 (Table 3-1) were evaluated following First Quarter 2017. Concentration trends at this location show Cr(VI) and total dissolved chromium stabilizing near 7.5 μg/L. These results suggest that Cr(VI) in groundwater at MW-55-120 is well below the 32 μg/L threshold used to indicate natural background conditions for chromium (see "calculated upper tolerance limit" background concentration presented in PG&E's background study report [CH2M Hill 2008]). Section 6 of this report presents PG&E's recommendation to adjust the monitoring frequency at this location based on these results.

2.1.5 Well Maintenance

PG&E performs quarterly inspections and takes corrective actions as necessary to ensure that the monitoring wells are in good working condition (DTSC 2013, CH2M Hill 2005a-b). Table A-1 in Appendix A summarizes the quarterly inspection log, field observations, and mitigation actions, if any, for well maintenance.

2.1.6 Implementation of Alternative Sampling Methods

2.1.6.1 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 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 First Quarter 2017.

2.1.6.2 Sampling Method Trials at Select Wells

In addition to the low-flow sampling method change, and in conformance with the June 27, 2014 email from DTSC (DTSC 2014b), PG&E began conducting sampling method trials at MW-38S, MW-38D, MW-40S, and MW-40D during Fourth Quarter 2014. The purpose of the method trial is to directly compare two different sampling methods. An assessment of the method trials was performed following Fourth

Quarter 2016 sampling and was included with the Fourth Quarter 2016 Annual GMP/PMP Report (Arcadis 2017b). The annual report presented the results after 2 years of method trials and made recommendations for updates to the trials (currently under agency review). Method trials continued through First Quarter 2017 at these wells. The results from the next assessment will be presented in the Fourth Quarter 2017 Annual GMP/PMP Report.

2.2 Surface Water Monitoring Program

Quarterly surface water sampling for the First Quarter 2017 was conducted February 21 and 22, 2017 from the RMP monitoring network. In addition, the First Quarter 2017 period includes an additional "low river" surface water monitoring event, which was conducted on January 24 and 25, 2017. Samples from both events were analyzed for Cr(VI), dissolved chromium, specific conductance, and pH. Samples were also analyzed for COPCs (molybdenum, nitrate, and selenium), in situ byproducts (manganese, iron, and arsenic), and geochemical indicator parameters (barium and total suspended solids) to develop baseline concentrations for future remedy performance evaluations.

2.3 Performance Monitoring Program

Groundwater samples for the PMP were collected during the First Quarter 2017 GMP sampling event. In addition, PMP pressure transducers, which monitor hydraulic gradients of the Alluvial Aquifer, were downloaded in the first 2 weeks of each month (February, March, and April) to obtain readings for the previous month. The transducers in the key monitoring wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, and MW-45-095; Figure 1-4) are also downloaded via a cellular telemetry system.

In accordance with DTSC conditional approval (DTSC 2015), PE-01 was shut off February 3, 2016, with the pumping shifted to TW-03D and supplemented by TW-02D. Conditional approval included the requirement that PG&E notify DTSC if chromium from individual floodplain monitoring wells within approximately 800 feet of TW-3D exhibited concentrations greater than the maximum detected chromium concentrations from 2014 (or most recent year if a well was not sampled in 2014) when PE-01 is shut down. While PE-01 did run for much of First Quarter 2017 (intermittently in January to help maintain groundwater gradients and continuously in February and March to support IM-3 maintenance), samples were still evaluated in accordance with the DTSC conditional approval (for the shutoff of PE-01) letter. None of the wells monitored during the First Quarter 2017 met the criteria where either Cr(VI) or total dissolved chromium (or both) were detected at concentrations exceeding the notification levels. Therefore, no notification to DTSC was required. A further discussion of these results is presented in Section 4.3.2 of this report.

3 RESULTS FOR SITE-WIDE GROUNDWATER MONITORING AND SURFACE WATER SAMPLING

This section presents the analytical results for groundwater and surface water monitoring conducted during First Quarter 2017.

3.1 Groundwater Results for Cr(VI) and Dissolved Chromium

Table 3-1 presents the First Quarter 2016 through First Quarter 2017 groundwater sample results for Cr(VI) and chromium, among other parameters. The laboratory reports for samples analyzed during First Quarter 2017 are provided in Appendix B.

Figures 3-1a and 3-1b present the First Quarter 2017 Cr(VI) results in plan view for wells monitoring the upper-depth (shallow wells) and lower-depth (deep wells) intervals, respectively, of the Alluvial Aquifer and bedrock (mid-depth wells not sampled during First Quarter 2017). 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 2009a).

During First Quarter 2017, the maximum detected Cr(VI) concentration was 36,000 µg/L in well MW-68-180. The maximum detected dissolved chromium concentration was also in MW-68-180 at 37,000 µg/L (Table 3-1).

3.2 Other Groundwater Monitoring Results

3.2.1 Contaminants of Potential Concern and In Situ Byproducts

Table 3-2 presents the COPCs and in situ byproducts sampling results for groundwater monitoring well samples collected in First Quarter 2017. The wells where maximum concentrations of these analytes were reported are summarized as follows:

- MW-46-175 with a molybdenum concentration of 200 µg/L
- MW-68-180 with a nitrate concentration of 32 milligrams per liter (mg/L)
- MW-68-180 with a selenium concentration of 16 µg/L
- MW-64BR with a manganese concentration of 1,000 µg/L
- MW-72BR-200 with an arsenic concentration of 15 µg/L.

3.2.2 Arsenic Sampling in Monitoring Wells

Select Alluvial Aquifer and bedrock wells were sampled for arsenic during the First Quarter 2017 event. Selected arsenic results are presented with the COPCs and in situ byproducts results in Table 3-2. Additional arsenic results are presented in Appendix C, Table C-1. Arsenic concentrations were within expected ranges for the wells sampled.

3.2.3 Additional Analytes after Flow in Bat Cave Wash

Select Alluvial Aquifer wells (MW-9, MW-10, and MW-11) were sampled for Cr(VI), total dissolved chromium, calcium, magnesium, sodium, dissolved iron, boron, arsenic, manganese, molybdenum, selenium, bromide, chloride, sulfate, TDS, alkalinity, and nitrate/nitrite as nitrogen in the First Quarter 2017 after a rainfall event that caused water to flow in Bat Cave Wash (Appendix C, Table C-2). This list of analytes is consistent with previous post-rainfall sampling for assessment of groundwater quality in Bat Cave Wash. Analytical results were consistent with historical data for all three wells when compared to post-rainfall sampling in Second Quarter 2016 and Third Quarter 2015 (see Appendix C, Table C-2 in previous versions of this report; Arcadis 2016d, CH2M Hill 2015d). These results indicate that the preceding rainfall event(s) did not demonstrate an impact on general groundwater quality in the shallow aquifer beneath Bat Cave Wash based on samples collected during quarterly sampling following the surface water flow event. This conclusion is consistent with observations made following previous flow events.

3.3 Surface Water Results for Cr(VI) and Dissolved Chromium

During the two First Quarter 2017 RMP sampling events, Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water monitoring locations (Table 3-3).

Table 3-4 presents results for the COPCs (molybdenum, nitrate, and selenium), in situ byproducts (manganese, iron, and arsenic), and other geochemical indicator parameters for surface water samples from the two First Quarter 2017 sampling events. The surface water locations where maximum concentrations of these analytes were reported in First Quarter 2017 are summarized below (results for these analytes were within expected ranges for First Quarter 2017):

- C-MAR-S with a molybdenum concentration of 7.7 µg/L
- C-R22A-D with a nitrate concentration of 0.5 mg/L
- C-I-3-S with a selenium concentration of 1.9 µg/L
- C-MAR-S with a manganese concentration of 520 µg/L

- C-MAR-D with a dissolved iron concentration of 230 µg/L
- C-MAR-S with a total iron concentration of 3,100 µg/L
- C-MAR-D with an arsenic concentration of 3 µg/L.

The C-MAR sample location is near the east side of the Colorado River at the mouth of the Topock Marsh area as shown on Figure 1-3. This location is out of the main river channel and adjacent to an area of naturally reducing geochemical conditions in groundwater. Elevated manganese and iron concentrations are typical of reduced geochemical environments.

3.4 Data Validation and Completeness

Laboratory analytical data from the First Quarter 2017 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 First Quarter 2017:

- Two 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.
- Dissolved iron demonstrated relative percent differences that exceed criteria in two field duplicate pairs (C-I-3-D-0117L/MW-905-Q117L and TW-03D-0317/MW-930-Q117). In both cases, dissolved iron was detected at concentrations above the reporting limit in the field duplicate but not the parent sample. The field duplicate was qualified as an estimated detect, “J” flagged and the parent samples were qualified as estimated non-detects, “UJ” flagged.
- 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 First Quarter 2016 sampling events analyzed in a certified lab are considered estimated.

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

In addition, PG&E identified no “suspect” detections of Cr(VI) in surface water samples or any other “suspect” samples requiring reanalysis at the laboratory; therefore, in conformance with the agencies’

April 4, 2014 direction letter (DTSC 2014a), no notifications were made to DTSC and the United States Department of the Interior (DOI).

4 FIRST QUARTER INTERIM MEASURES PERFORMANCE MONITORING PROGRAM EVALUATION

This section presents the quarterly PMP evaluation summary.

4.1 Water Quality Results for Performance Monitoring Program Floodplain Wells

The chemical performance monitoring wells are sampled annually (one well sampled biennially) during the Fourth Quarter sampling events. Figure 1-4 shows the locations of the monitoring wells sampled for the performance monitoring parameters.

In July 2008 and June 2014, DTSC approved modifications to the PMP IM chemical performance monitoring parameters (DTSC 2008b; 2014b). For the complete annual general chemistry results, see Table F-1 in Appendix F of the 2016 GMP/PMP Report (Arcadis 2017b). The next round of Chemical Performance Monitoring sampling is planned for Fourth Quarter 2017.

4.2 Cr(VI) Distribution and Trends in Performance Monitoring Program Wells

The First Quarter 2017 distribution of Cr(VI) in the upper-depth (shallow 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 (mid-depth wells not sampled during First Quarter 2017).[1] Figure 4-2 presents the First Quarter 2017 Cr(VI) results for cross-section B, oriented parallel to the Colorado River. The locations of cross-sections A and B are shown on Figure 4-1.

Analytical results January 2016 through March 2017 are presented in Table 3-1. Appendix D includes graphs of Cr(VI) concentration vs time in selected monitoring well clusters through March 2017. Figure 4-3 presents graphs of Cr(VI) concentration vs time for the following deep monitoring wells in the floodplain area through March 2017: MW-34-100, MW-36-090, MW-36-100, MW-44-115, MW-44-125, and MW-46-175. The locations of these deep wells selected for performance evaluation are shown on Figure 4-1.

[1] On Figures 4-1 and 4-2, the Cr(VI) concentrations are color-coded based on the groundwater background Cr(VI) concentration, which is 32 µg/L (CH2M Hill 2009a). The 20 µg/L and 50 µg/L Cr(VI) concentration contours presented on Figures 4-1 and 4-2 are shown in accordance with DTSC's 2005 IM directive and are not based on the background Cr(VI) concentration for groundwater.

Wells showing marked decreases in concentration are generally located in the floodplain area where IM pumping is removing chromium in groundwater. Wells with historical detections near or at reporting limits remained at these levels during the First Quarter 2017 period. Cr(VI) concentrations have remained relatively steady with respect to historical trends or have decreased in many wells since IM and PE-01 pumping began in 2004 and 2005, respectively (Figure 4-3 and Appendix D).

Key long-term Cr(VI) concentration trends through First Quarter 2017 include:

- Concentrations at the MW-20 cluster (located near the TW-03D pumping well) indicate generally decreasing concentrations at the shallow well MW-20-070 (since 2011), decreasing concentrations at MW-20-100 (since May 2007), and variable concentrations at MW-20-130, but overall decreasing since 2007 (Figure D-3).
- As shown on Figure 4-3 and Figure D-6, well MW-34-100 has shown a seasonally fluctuating trend in Cr(VI) concentration over the past 8 years; since June 2006, concentrations at this well have shown a general decreasing trend. Landward gradients have been present at this location since IM pumping began; therefore, the seasonal fluctuations in concentration observed at MW-34-100 are not considered an indication of any migration of the plume toward the river.
- Deep well MW-36-100 Cr(VI) concentrations initially increased upon the startup of PE-01 pumping, began to decrease in 2007, and have remained lower than 100 µg/L since late 2008, as shown on Figures 4-3 and D-7.
- Deep well MW-39-100 concentrations steadily declined since the start of IM pumping (Figure D-8).
- Deep well MW-44-115 has shown a downward trend since July 2006, as presented on Figures 4-3 and D-10. Well MW-44-125 has also shown an overall downward trend since November 2008, as presented on Figures 4-3 and D-10.
- Concentrations in deep well MW-46-175 have shown a seasonally fluctuating but overall downward trend since 2007, as presented on Figures 4-3 and D-11.
- Well TW-04, a deeper well, has shown a declining trend since March 2007, as presented on Figure D-19.

4.3 Performance Monitoring Program Contingency Plan Cr(VI) Monitoring

4.3.1 Chromium Concentrations in IMCP Wells

The Topock IMCP was developed to detect and control possible migration of the Cr(VI) plume toward the Colorado River (DTSC 2005b). Currently, the IMCP consists of 24 wells that activate contingencies per

criteria in the IMCP plan if their trigger levels are exceeded. Cr(VI) results for the IMCP wells sampled during the First Quarter 2017 reporting period were all lower than their trigger levels. Appendix D includes Cr(VI) concentration graphs for the IMCP wells and select other site monitoring wells.

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

As discussed in Section 1.1, extraction well PE-01 was shut down for a few months in 2016 (starting in February) and has since run intermittently to support groundwater collection or to help maintain landward groundwater gradients at key wells. Conditional approval for shutdown included the requirement that PG&E notify DTSC if chromium from individual floodplain monitoring wells within approximately 800 feet of TW-3D exhibited concentrations greater than the maximum detected chromium concentrations from 2014 (or most recent year if a well was not sampled in 2014) when PE-01 is shut down. In the First Quarter 2017 monitoring event, none of the wells evaluated met the criteria where either Cr(VI) or total dissolved chromium (or both) was detected at concentrations exceeding the notification levels. Therefore, no notification to DTSC for these wells was required during First Quarter 2017.

4.4 Extraction Systems Operations

From January 1, 2017 through March 31, 2017, the volume of groundwater extracted and treated by the IM-3 system was 16,991,019 gallons, and an estimated 57.3 pounds (26.0 kilograms) of chromium was removed from the aquifer between January 1 and February 28, 2017 (Table 4-1). Chromium removal is on a different schedule for reporting from groundwater extraction (i.e., January-February and January-March, respectively. See Table 1-1 and Table 4-1).

During First Quarter 2017, extraction wells TW-03D and PE-01 operated at a combined average pumping rate of 131.1 gpm, including periods of planned and unplanned downtime (PE-01 was only run intermittently in January to help maintain landward gradients and was run continuously in February and March to support IM-3 system maintenance). The average monthly pumping rates were 130.6 gpm (January 2017), 131.4 gpm (February 2017), and 131.4 gpm (March 2017) during the First Quarter 2017. Extraction wells TW-02S and TW-02D were not operated during First Quarter 2017 except for quarterly sampling and brief periods of testing at TW-02D. Table 4-1 shows the average pumping rate and total volume pumped for the system during First Quarter 2017, as well as monthly average pumping rates and total volumes pumped per extraction well during the quarter.

The operational runtime percentage for the IM extraction system was 97.5 percent during this reporting period. The operations log for the extraction system during First Quarter 2017, including planned and unplanned downtime, is included in Appendix E. Additional IM-3 operational data are presented in quarterly (and semiannual) IM-3 Treatment System Monitoring Reports (e.g., CH2M Hill 2016a-b).

The concentrate (i.e., saline water) from the reverse osmosis system was shipped off site as a non-hazardous waste and was transported to Liquid Environmental Solutions in Phoenix, Arizona for treatment and disposal. Four containers of solids from the IM-3 facility were disposed of at the U.S. Ecology Chemical Waste Management facility in Beatty, Nevada during First Quarter 2017. Daily IM-3 inspections included general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained on site.

During the reporting period, Cr(VI) concentrations in TW-03D remained stable, ranging from a maximum value of 620 µg/L in January to a minimum value of 560 µg/L in March, as shown in Table 4-2. TDS concentrations in TW-3D for this reporting period have also remained stable, as shown in Table 4-2.

During the reporting period, Cr(VI) concentrations in PE-01 (on the floodplain) remained stable, ranging from a maximum of 1.9 µg/L in February to a minimum of ND (0.2) µg/L in January, as shown in Table 4-2. PE-01 was operated intermittently in January to help maintain landward groundwater gradients at key wells. PE-01 was then run continuously in February and March, primarily to support IM-3 system maintenance operations. TDS concentrations in PE-1 for this reporting period have remained stable.

With increased use of extraction well TW-02D during First Quarter 2016, PG&E increased sampling frequency at this well from annual to quarterly starting in Second Quarter 2016. TW-02D was only run in First Quarter 2017 for brief periods of sampling and testing. Sampling results at this well during the quarter showed results of 0.44 µg/L Cr(VI) and 110 µg/L total dissolved chromium. Results will continue to be monitored at this location quarterly while this well remains in use for groundwater extraction.

Groundwater samples are currently collected annually at extraction well TW-02S, with the next round of sampling planned for Fourth Quarter 2017.

4.5 Hydraulic Gradient and River Levels during Quarterly Period

During the reporting period, water levels were recorded at intervals of 30 minutes with pressure transducers in 56 wells (excluding five Arizona locations) and two river monitoring stations (I-3 and RRB; Figure 4-4a). The data are typically continuous, with only short interruptions for sampling or maintenance.

It should be noted that data from river monitoring station RRB were rejected for each month during First Quarter 2017, when river levels were too low to achieve proper readings at the RRB monitoring station.

Hydraulic gradients were measured during the First Quarter 2017 for well pairs selected for performance monitoring of the extraction system. Table 4-3 presents the monthly average hydraulic gradients measured for each of the gradient well pairs in January, February, and March 2017 as well as the overall average of all well pairs. Landward gradients exceeding the 0.001 foot per foot (ft/ft) requirement were measured each month as shown in Table 4-3. Figure 4-6 presents graphs of the hydraulic gradients, monthly average pumping rates, and river levels for the quarterly period. The overall monthly average gradients for all well pairs were 0.0063, 0.0112 and 0.0119 ft/ft for January, February, and March, respectively. This is 6.3, 11.2, and 11.9 times greater than the required gradient of 0.001 ft/ft, respectively. The monthly average gradients for the northern well pair were 2.5, 2.5, and 2.7 times the target gradient of 0.001 ft/ft. For the central well pair, the monthly average gradients were 12.7, 23.4, and 24.7 times the target gradient. The southern well pair average gradients were 3.8, 7.6, and 8.2 times the target gradient.

Daily average groundwater and river elevations calculated from the pressure transducer data for the First Quarter 2017 reporting period are summarized in Table F-1 in Appendix F. Groundwater elevations (or total hydraulic heads) are adjusted for temperature and salinity differences among wells (i.e., adjusted to a common freshwater equivalent). The elevation of the Colorado River measured at the I-3 gauge station (location shown on Figure 4-4a) is also shown on the hydrographs in Appendix F.

Average First Quarter 2017 groundwater elevations for the upper-depth, middle-depth, and lower-depth wells are presented and contoured in plan view on Figures 4-4a, 4-4b, and 4-4c. Average groundwater elevations for wells on floodplain cross-section A are presented and contoured on Figure 4-5. Several monitoring wells are significantly deeper than other wells in the lower depth interval. Due to complex vertical gradients present at portions of the Topock site, water levels for some wells are not considered in the contouring in the plan views on Figures 4-4a through 4-4c and in the cross-section on Figure 4-5.

Lower-zone water levels shown on Figure 4-4c indicate that potentiometric levels in monitoring wells in Arizona are higher than those in wells across the river on the California floodplain. This means 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.

For the First Quarter 2017 reporting period, transducer data were recorded in wells located on the Arizona side of the Colorado River. The quarterly average groundwater elevations for wells MW-55-120, MW-54-085, MW-54-140, and MW-54-195 are presented on Figure 4-4c, if available, 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 4-6 illustrates the measured hydraulic gradients during the First Quarter 2017 with the concurrent river elevations and IM-3 pumping rates.

4.6 Projected River Levels during Next Quarter

The Colorado River stage near the Topock Compressor Station is measured at the I-3 location and is 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 largest monthly releases typically in spring and early summer and 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 4-7 shows the river stage measured at 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 April 2017 is based on the March 2017 USBR projections of Davis Dam release and Lake Havasu level, not the actual release and level values. The variability between measured and projected river levels is due to the difference between measured and actual Davis Dam release and Lake Havasu levels. The more recent data (last 4 years; plotted on Figure 4-7) are summarized in Table 4-4. The future projections shown on Figure 4-7 (predicted data points and lines are in different color than actual measurements) are based on USBR long-range projections of Davis Dam releases and Lake Havasu levels from March 2017. There is more uncertainty in these projections at longer times in the future because water demand is based on various elements including climatic factors.

Current USBR projections, presented in Table 4-4, show that the projected Davis Dam release for April 2017 (15,900 cubic feet per second) will be more than the actual release in March 2017 (13,700 cubic feet per second). Based on March 2017 USBR projections, it is anticipated that the Colorado River level

at the I-3 gage location in April 2017 will be approximately 0.3 ft higher compared to the actual levels in March 2017.

4.7 Quarterly Performance Monitoring Program Evaluation Summary

The groundwater elevation and hydraulic gradient data from January, February, and March 2017 performance monitoring indicate that the minimum landward gradient target of 0.001 ft/ft was exceeded each month during the First Quarter 2017. The overall average landward gradients during First Quarter 2017 were 6.3, 11.2, and 11.9 times the required minimum magnitude, respectively, as shown in Table 4-3. The gradient analysis from designated well pairs are an approved line of evidence for assessing hydraulic containment of the Cr(VI) plume created by pumping from the extraction well network (primarily consisting of TW-03D, with other wells as needed). Based on the hydraulic and monitoring data and evaluation presented in this report, the IM performance standard has been met for the First Quarter 2017 reporting period.

A total of 16,991,019 gallons of groundwater was extracted during First Quarter 2017 by the IM-3 treatment facility. The average pumping rate for the IM extraction system during First Quarter 2017, including system downtime, was 131.1 gpm. An estimated 57.3 pounds (26.0 kilograms) of chromium was removed from groundwater during January and February 2017, as presented in Table 4-1. Chromium removal is on a different schedule for reporting from groundwater extraction (i.e., January-February and January-March, respectively. See Table 1-1 and Table 4-1).

The wells monitored to detect trends in Cr(VI) in the IM pumping area (e.g., MW-36-100, MW-39-100, MW-44-115, MW-44-125, and MW-46-175) generally continue to show overall stable or declining Cr(VI) concentrations relative to prior monitoring results, as shown in Appendix D. Presentation and evaluation of the Cr(VI) trends observed in the performance monitoring area during the First Quarter 2017 reporting period are discussed in Section 4.2.

5 UPCOMING OPERATION AND MONITORING EVENTS

Reporting of the IM extraction and monitoring activities will continue as described in the PMP and under direction from DTSC. Monitoring results, operations, and performance monitoring data will be further reported in the Second Quarter 2017 GMP/PMP Report, which will be submitted by August 15, 2017.

5.1 Groundwater Monitoring Program

5.1.1 Quarterly Monitoring

Consistent with the July 23, 2010 DTSC sampling schedule approval (DTSC 2010a), the Second Quarter 2017 groundwater monitoring event is scheduled for late April to early May 2017. This event includes groundwater sampling at 103 wells. Results will be reported in the Second Quarter 2017 Quarterly Monitoring Report.

5.1.2 Monthly Monitoring

Monthly sampling of TW-03D and PE-01 will continue during the first 2 weeks of each month in coordination with IM-3 staff. Results will be reported in the Second Quarter 2017 Quarterly Monitoring Report.

5.1.3 Well Inspections

Monitoring wells will be inspected during each regularly scheduled sampling event but not less frequently than quarterly (DTSC 2013; CH2M Hill 2005a-b). Necessary repairs will be conducted in a timely manner.

5.2 Surface Water Monitoring Program

The Second Quarter 2017 surface water monitoring event is planned for mid-May 2017 at 25 locations in the RMP monitoring network. Results will be reported in the Second Quarter 2017 Quarterly Monitoring Report.

5.3 Performance Monitoring Program

5.3.1 Extraction

The IM-3 extraction system will continue operating in compliance with the DTSC letter dated July 20, 2015 (DTSC 2015) giving conditional approval for PE-01 pumping modifications. PG&E will continue to operate both TW-03D and PE-01 with a target combined pumping rate of 135 gpm, except for periods of planned or unplanned downtime, to maintain appropriate hydraulic gradients across the Alluvial Aquifer.

Extraction will be primarily from TW-03D, coupled with PE-01 (primarily used 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.

In 2016, PE-01 was shut off in February and remained off through Second Quarter 2016, then resumed pumping as river levels dropped during Third and Fourth Quarter 2016. In 2017, PE-01 was operated intermittently in January (to help maintain groundwater gradients), and continuously in February and March (to support IM-3 maintenance operations). When PE-01 is shut off, pumping is supplemented as needed by TW-02D to maintain total flow. During Second Quarter 2017, hydraulic gradients will continue to be monitored at key well pairs to ensure that 0.001 ft/ft landward gradients are met.

5.3.2 PMP Monitoring and Notifications

Quarterly GMP monitoring results from IMCP wells will continue to be compared to their respective Cr(VI) trigger levels. If any exceedances are observed, a notification process will be initiated as outlined in the Revised Contingency Plan Flow Chart (Figure 1, PG&E 2008).

Quarterly GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter for conditional PE-01 shutoff (DTSC 2015) will continue to be compared to maximum Cr(VI) and total dissolved chromium concentrations measured in 2014 (or for biennial sampling frequency, the 2013 maximum concentrations), and results that exceed the previous maximum will be reported to DTSC within 40 days after the end of the quarterly GMP sampling event.

The IM hydraulic monitoring network (shown on Figure 1-4) will continue to be used to evaluate the performance of the IM and demonstrate compliance of required hydraulic gradients.

5.3.3 Transducer Downloads

Downloads of the transducers in the key gradient control wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, and MW-45-095) and the MW-33 cluster will continue during Second Quarter 2017 via telemetry at monthly or more frequent intervals, as needed to support IM-3 pumping operations. Downloads of the remainder of the transducers will continue to occur monthly during the first 2 weeks of each month.

5.3.4 Monthly IM-3 Updates

As requested at the July 2015 Consultative Working Group (CWG) meeting, monthly IM-3 hydraulic performance data continue to be shared with agencies, Tribes, and stakeholders. The next monthly data snapshot for March 2017 will be submitted by April 21, 2017.

6 RECOMMENDATIONS

This section presents the recommended modifications to the sampling program(s).

6.1 Groundwater Monitoring Program

6.1.1 Recommendation to reduce sampling frequency at MW-55-120

On June 29, 2015, ADEQ recommended that PG&E increase the sampling frequency of MW-55-120 from semiannually to quarterly (ADEQ 2015). This was initiated by PG&E in Third Quarter 2015. On May 18, 2016, ADEQ recommended that quarterly sampling at MW-55-120 be extended for an additional year "where data are within the prescribed hold time and analyzed by an ADHS-certified lab (ADEQ 2016)." This was initiated by PG&E in Second Quarter 2016. Quarterly sampling has continued through First Quarter 2017 at this location.

Results of sampling at MW-55-120 were evaluated following the First Quarter 2017. Concentration trends at this location show Cr(VI) and total dissolved chromium stabilizing near 7.5 µg/L. These results suggest that Cr(VI) in groundwater at MW-55-120 is well below the "calculated upper tolerance limit" background concentration for Cr(VI) of 32 µg/L presented in PG&E's background study report (CH2M Hill 2008). Therefore, PG&E recommends that the sampling frequency at this location be changed to "semi-annual" frequency for continued monitoring. PG&E plans to make this recommendation to ADEQ in a letter report following submittal of the First Quarter 2017 GMP report. PG&E will plan to adjust the sampling frequency at MW-55-120 based on the response from ADEQ because the change from semi-annual to quarterly sampling was initiated at ADEQ request.

Recommendations provided herein are additional (and do not take the place of) existing recommendations already under agency review.

7 REFERENCES

Arcadis. 2016a. Fourth Quarter 2015 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 15.

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Arcadis. 2016d. Second Quarter 2016 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

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TABLES

Table 1-1

Topock Monitoring Reporting Schedule

First Quarter 2017 Interim Measures Performance Monitoring and
Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Time Period	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Groundwater Monitoring Program	January - March	April - June	July - October	November - December
Surface Water Monitoring Program	January - March	April - June	July - October	November - December
Performance Monitoring Program	January - March	April - June	July - October	November - December
IM-3 Monitoring (Chromium removed)	January - February	March - May	June - September	October - December

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters		
									ORP (mV)	Field pH	Turbidity
MW-09	SA	5/3/2016		LF	190	200 J	---	---	64	7.6	2
MW-09	SA	12/7/2016		LF	160	160	---	3,000	20	7.5	1
MW-09	SA	2/9/2017		LF	160	150	---	---	-65	7.5	9
MW-10	SA	5/3/2016		LF	220	220	---	---	42	7.3	5
MW-10	SA	12/7/2016		LF	180	200	---	2,400	18	7.5	11
MW-10	SA	2/9/2017		LF	160	150	---	---	-34	7.4	20
MW-11	SA	5/3/2016		LF	110	110	---	---	90	7.5	2
MW-11	SA	5/3/2016	FD	LF	110	110	---	---	---	---	---
MW-11	SA	12/7/2016		LF	79	84	---	2,300	1.9	7.6	3
MW-11	SA	12/7/2016	FD	LF	80	81	---	2,400	---	---	---
MW-11	SA	2/9/2017		LF	60	60	---	---	-35	7.5	4
MW-12	SA	5/2/2016		LF	1,900	2,000	---	---	-11	7.9	3
MW-12	SA	12/7/2016		3V	1,900	2,000	---	7,100	-100	8.2	14
MW-13	SA	12/8/2016		LF	21	21	---	2,300	-89	7.6	1
MW-14	SA	4/27/2016		LF	13	15	---	---	63	7.6	22
MW-14	SA	12/8/2016		LF	14	16	---	2,300	23	7.6	3
MW-15	SA	12/12/2016		LF	12	13	---	1,800	100	7.7	5
MW-18	SA	12/8/2016		LF	20	20	---	1,500	26	7.7	1
MW-19	SA	4/27/2016		LF	450	500	---	---	83	7.3	5
MW-19	SA	12/8/2016		LF	59	57	---	2,000	47	7.5	3
MW-20-070	SA	4/27/2016		LF	2,000	2,300	---	---	100	7.8	5
MW-20-070	SA	12/9/2016		LF	1,800	1,900	---	1,800	41	7.8	2
MW-20-100	MA	4/27/2016		LF	2,200	2,300	---	---	110	7.4	2
MW-20-100	MA	12/9/2016		LF	1,400	1,600	---	2,200	60	7.4	4
MW-20-130	DA	4/27/2016		LF	9,100	9,400	---	---	69	7.7	4
MW-20-130	DA	12/9/2016		LF	7,600	7,500	---	11,000	60	7.7	6
MW-20-130	DA	12/9/2016	FD	LF	7,800	7,900	---	11,000	---	---	---
MW-21	SA	5/3/2016		G	ND (1)	1.8	---	---	-4.1	6.6	9
MW-21	SA	12/14/2016		LF	1.3	1.3	---	16,000	25	7.2	15

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-22	SA	4/25/2016		LF	ND (1)	ND (1)	---	---	-95	6.7	8
MW-22	SA	12/6/2016		LF	ND (1)	ND (5)	---	21,000	-96	6.7	43
MW-23-060	BR	5/2/2016		3V	37	36	---	---	-57	9.8	2
MW-23-060	BR	12/14/2016		LF	39	34	---	18,000	76	9.7	1
MW-23-080	BR	5/2/2016		3V	2.7	3.8	---	---	-160	10	2
MW-23-080	BR	12/14/2016		LF	2.2	2.5	---	18,000	24	10	2
MW-23-080	BR	12/14/2016	FD	LF	2	2.3	---	18,000	---	---	---
MW-24A	SA	5/3/2016		LF	0.47	ND (1)	---	---	-200	8.3	1
MW-24A	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,600	-180	8.4	2
MW-24B	DA	5/3/2016		LF	11	12	---	---	-100	7.7	1
MW-24B	DA	5/3/2016	FD	LF	12	12	---	---	---	---	---
MW-24B	DA	12/6/2016		LF	ND (1)	1	---	19,000	-190	7.8	4
MW-24BR	BR	12/7/2016		3V	ND (1)	ND (1)	---	15,000	-220	8.2	3
MW-25	SA	4/27/2016		LF	77	77	---	---	87	7.0	3
MW-25	SA	12/8/2016		LF	120	120	---	1,800	47	7.3	4
MW-26	SA	4/28/2016		LF	2,500	2,700	---	---	96	7.5	5
MW-26	SA	12/8/2016		LF	2,500	2,500	---	3,900	56	7.4	3
MW-26	SA	12/8/2016	FD	LF	2,500	2,100	---	4,000	---	---	---
MW-27-020	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	40	7.6	3
MW-27-060	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	960	-63	7.6	2
MW-27-060	MA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	950	---	---	---
MW-27-085	DA	4/25/2016		LF	ND (1)	ND (1)	---	---	-0.50	7.2	4
MW-27-085	DA	4/25/2016	FD	LF	ND (1)	ND (1)	---	---	---	---	---
MW-27-085	DA	12/6/2016		LF	ND (0.2)	ND (1)	---	9,400	32	7.3	5
MW-28-025	SA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-15	7.2	3
MW-28-025	SA	12/8/2016		LF	ND (0.2)	ND (1)	---	1,200	51	7.3	2
MW-28-090	DA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-75	7.2	2
MW-28-090	DA	12/8/2016		LF	ND (0.2)	ND (1)	---	4,500	-46	7.2	4
MW-29	SA	4/26/2016		LF	ND (0.2)	ND (1 J)	---	---	-140	7.2	2

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

								Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-29	SA	12/8/2016		LF	ND (0.2)	ND (1)	---	2,200	-37	7.3	3
MW-30-030	SA	12/6/2016		LF	ND (1)	ND (1)	---	17,000	-140	7.6	8
MW-30-050	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	49	7.6	1
MW-31-060	SA	4/27/2016		LF	710	740	---	---	110	7.6	2
MW-31-060	SA	12/9/2016		LF	590	590	---	2,800	-72	7.6	9
MW-31-060	SA	12/9/2016	FD	LF	580	590	---	2,900	---	---	---
MW-31-135	DA	12/9/2016		LF	12	11	---	11,000	-91	7.7	17
MW-32-020	SA	12/6/2016		LF	ND (1)	ND (5)	---	36,000	-93	7.0	3
MW-32-035	SA	4/25/2016		LF	ND (1)	ND (1)	---	---	-150	6.9	9
MW-32-035	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	10,000	-82	7.0	8
MW-33-040	SA	4/26/2016		LF	ND (1)	ND (1)	---	---	78	8.0	6
MW-33-040	SA	4/26/2016	FD	LF	ND (0.2)	ND (1)	---	---	---	---	---
MW-33-040	SA	12/8/2016		LF	ND (1)	ND (1)	---	17,000	32	7.7	6.9
MW-33-090	MA	4/26/2016		3V	5.6	5.2	---	---	-17	7.0	5
MW-33-090	MA	12/8/2016		LF	5.2	4.8	---	9,600	22	7.2	3.1
MW-33-150	DA	4/26/2016		LF	6.1	5.2	---	---	11	7.2	3
MW-33-150	DA	12/8/2016		LF	4.6	5.2	---	15,000	57	7.4	2
MW-33-210	DA	4/26/2016		LF	10	10	---	---	52	7.4	3
MW-33-210	DA	12/8/2016		3V	11	12	---	19,000	55	7.4	5
MW-34-055	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	21	7.7	1
MW-34-080	DA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-190	7.2	3
MW-34-080	DA	12/6/2016		LF	ND (0.2)	ND (1)	---	6,800	-4.4	7.2	1
MW-34-080	DA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	6,800	---	---	---
MW-34-100	DA	2/25/2016		LF	41	31	---	---	-36	7.7	2
MW-34-100	DA	4/26/2016		LF	4.2	4.6	---	---	-29	7.4	4
MW-34-100	DA	10/6/2016		LF	1.3	1.7	---	---	---	---	---
MW-34-100	DA	12/6/2016		LF	18	17	---	16,000	-53	7.6	4
MW-34-100	DA	2/6/2017		LF	45	43	---	---	-47	7.8	4
MW-34-100	DA	2/6/2017	FD	---	44	40	---	---	---	---	---

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-35-060	SA	4/27/2016		LF	24	23	---	---	60	7.2	8
MW-35-060	SA	4/27/2016	FD	LF	25	24	---	---	---	---	---
MW-35-060	SA	12/9/2016		LF	20	20	---	7,100	46	7.3	6
MW-35-135	DA	4/27/2016		LF	25	27	---	---	22	7.4	7
MW-35-135	DA	12/9/2016		LF	31	28	---	10,000	48	7.7	5
MW-35-135	DA	12/9/2016	FD	LF	30	28	---	10,000	---	---	---
MW-36-020	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	9,400	-99	7.3	4.2
MW-36-040	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,300	-150	7.8	1
MW-36-050	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,100	-52	7.6	1
MW-36-070	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,000	66	7.9	1
MW-36-090	DA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-170	7.7	4
MW-36-090	DA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,100	-4.1	8.2	1
MW-36-100	DA	4/26/2016		LF	38	42	---	---	-81	7.2	8
MW-36-100	DA	12/7/2016		LF	28	28	---	7,500	-40	7.4	4
MW-37D	DA	4/27/2016		LF	7.7	7.7	---	---	-4.6	7.5	6
MW-37D	DA	12/8/2016		LF	4.4	ND (5)	---	14,000	-71	7.7	8
MW-37S	MA	12/8/2016		LF	11	11	---	6,100	-98	7.6	19
MW-38D	DA	5/3/2016		3V	18	17	---	---	---	---	---
MW-38D	DA	5/3/2016		LF	19	18	---	---	-120	7.8	8
MW-38D	DA	9/29/2016		LF	---	---	---	---	-62	7.8	1
MW-38D	DA	12/7/2016		3V	21	21	---	22,000	-71	7.9	3
MW-38D	DA	12/7/2016		LF	20	21	---	23,000	-140	8.0	9
MW-38S	SA	2/24/2016		3V	ND (0.2)	ND (1)	---	---	---	---	---
MW-38S	SA	2/24/2016		LF	ND (0.2)	ND (1)	---	---	-210	7.8	4
MW-38S	SA	5/3/2016		3V	ND (0.2)	ND (1)	---	---	---	---	---
MW-38S	SA	5/3/2016		LF	ND (0.2)	ND (1)	---	---	-180	7.6	1
MW-38S	SA	9/29/2016		3V	0.99	2.3	---	---	-80	7.8	1
MW-38S	SA	9/29/2016		LF	ND (0.2)	1.4	---	---	---	---	---
MW-38S	SA	12/7/2016		3V	2.7	2.3	---	1,500	-100	8.0	2

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters		
									ORP (mV)	Field pH	Turbidity
MW-38S	SA	12/7/2016		LF	2.2	2.1	---	1,600	-87	8.0	3
MW-38S	SA	12/7/2016	FD	3V	2.5	2.5	---	1,600	---	---	---
MW-38S	SA	2/9/2017		3V	3.8	3.6	---	---	-120	8.0	3
MW-38S	SA	2/9/2017		LF	0.57	ND (1)	---	---	-100	8.0	4
MW-39-040	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,200	-150	8.0	4.8
MW-39-050	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,100	12	7.6	1
MW-39-060	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,200	23	7.7	1
MW-39-070	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,800	77	7.7	2
MW-39-080	DA	12/7/2016		LF	ND (0.2)	ND (1)	---	2,200	33	7.9	1
MW-39-100	DA	4/26/2016		LF	81	79	---	---	-120	6.7	5
MW-39-100	DA	4/26/2016	FD	LF	77	79	---	---	---	---	---
MW-39-100	DA	12/7/2016		LF	77	67	---	15,000	87	6.8	1
MW-40D	DA	5/4/2016		H	120	110	---	---	---	---	---
MW-40D	DA	5/4/2016		LF	130	110	---	---	25	7.3	2
MW-41D	DA	4/27/2016		LF	1.3	1.3	---	---	23	7.6	2
MW-41D	DA	12/8/2016		LF	ND (1)	ND (5)	---	22,000	-130	7.7	3
MW-41M	DA	12/8/2016		LF	9.2	8.9	---	15,000	-120	7.6	30
MW-41S	SA	12/8/2016		LF	15	14	---	5,900	-120	7.8	47
MW-42-030	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	2,700	-110	7.9	8.2
MW-42-055	MA	4/26/2016		LF	0.44	1.6	---	---	-110	8.3	6
MW-42-055	MA	12/6/2016		LF	ND (0.2)	1.4	---	1,100	26	8.5	2
MW-42-065	MA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-120	7.5	8
MW-42-065	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	4,500	52	7.5	1
MW-42-065	MA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	4,500	---	---	---
MW-43-025	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,400	-71	7.4	2
MW-43-075	DA	12/9/2016		LF	ND (1)	ND (1)	---	10,000	-110	7.2	5
MW-43-090	DA	12/9/2016		LF	ND (1)	ND (5)	---	16,000	22	7.3	4.6
MW-44-070	MA	4/26/2016		LF	ND (0.2)	15	---	---	-160	18	10
MW-44-070	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,700	-39	7.7	2

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-44-115	DA	2/25/2016		LF	30	28	---	---	-110	7.9	2
MW-44-115	DA	2/25/2016	FD	LF	29	27	---	---	---	---	---
MW-44-115	DA	4/26/2016		LF	24	23	---	---	14	7.8	6
MW-44-115	DA	10/6/2016		LF	16	18	---	---	---	---	---
MW-44-115	DA	10/6/2016	FD	LF	16	18	---	---	---	---	---
MW-44-115	DA	12/7/2016		LF	25	24	---	12,000	25	7.9	225
MW-44-115	DA	2/6/2017		LF	18	16	---	---	-62	7.9	5
MW-44-125	DA	4/26/2016		LF	5.9	14	---	---	-37	7.4	2
MW-44-125	DA	4/26/2016	FD	LF	6.3	14	---	---	---	---	---
MW-44-125	DA	12/7/2016		LF	10	9.4	---	12,000	-45	7.7	1
MW-44-125	DA	12/7/2016	FD	LF	10	11	---	11,000	---	---	---
MW-46-175	DA	2/25/2016		LF	18	19	---	---	77	8.2	1
MW-46-175	DA	4/26/2016		LF	11	11	---	---	-40	8.3	2
MW-46-175	DA	10/6/2016		LF	9.1	10	---	---	---	---	---
MW-46-175	DA	12/8/2016		LF	16	16	---	19,000	-11	8.3	5
MW-46-175	DA	2/7/2017		LF	21	18	---	---	-26	8.4	5
MW-46-205	DA	4/26/2016		LF	1.2	ND (5)	---	---	-91	8.1	3
MW-46-205	DA	12/8/2016		LF	ND (1)	ND (5)	---	23,000	31	8.3	2
MW-47-055	SA	4/26/2016		3V	16	15	---	---	120	7.1	8
MW-47-055	SA	12/8/2016		LF	17	16	---	5,200	25	7.5	6.2
MW-47-115	DA	4/26/2016		LF	24	22	---	---	150	7.6	7
MW-47-115	DA	12/8/2016		LF	17	18	---	14,000	52	7.5	5
MW-48	BR	5/4/2016		G	ND (1)	1.1	---	---	6.9	7.6	8
MW-48	BR	12/14/2016		G	ND (1)	ND (1)	---	20,000	48	8.1	5
MW-49-135	DA	12/8/2016		3V	1.5	ND (5)	---	13,000	-54	7.8	5
MW-49-135	DA	12/8/2016	FD	3V	1.4	1.2	---	13,000	---	---	---
MW-49-275	DA	12/8/2016		LF	ND (1)	ND (5)	---	26,000	2.0	8.0	2
MW-49-365	DA	12/8/2016		LF	ND (1)	ND (5)	---	38,000	-100	7.8	1
MW-50-095	MA	4/27/2016		LF	13	13	---	---	45	7.6	8

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-50-095	MA	12/9/2016		LF	9.2	9.1	---	5,500	-98	7.8	9
MW-50-200	DA	4/27/2016		LF	6,900	7,600	---	---	81	7.5	5
MW-50-200	DA	12/9/2016		LF	6,000	5,900	---	21,000	-93	7.5	14
MW-51	MA	4/27/2016		LF	4,800	5,000	---	---	100	7.5	1
MW-51	MA	12/9/2016		LF	4,200	4,100	---	13,000	62	7.4	1
MW-52D	DA	4/25/2016		LF	ND (1)	ND (5)	---	---	-150	7.6	2
MW-52D	DA	12/5/2016		LF	ND (1)	ND (5)	---	22,000	-90	7.0	2
MW-52M	DA	4/25/2016		LF	ND (1)	ND (1)	---	---	-180	7.2	2
MW-52M	DA	12/5/2016		LF	ND (1)	ND (1)	---	16,000	-120	7.0	1
MW-52S	MA	4/25/2016		LF	ND (1)	ND (1)	---	---	-120	6.9	5
MW-52S	MA	12/5/2016		LF	ND (1)	ND (1)	---	9,800	-87	7.1	15
MW-52S	MA	12/5/2016	FD	LF	ND (0.2)	ND (1)	---	9,300	---	---	---
MW-53D	DA	4/27/2016		LF	ND (5)	ND (5)	---	---	-140	8.0	2
MW-53D	DA	12/5/2016		LF	ND (1)	ND (5)	---	27,000	-82	6.9	2
MW-53M	DA	4/27/2016		LF	ND (1)	ND (1)	---	---	-120	7.4	3
MW-53M	DA	12/5/2016		LF	ND (1)	ND (1)	---	5,700	-150	8.0	2
MW-54-085	DA	4/29/2016		LF	---	---	---	---	-12	7.4	5
MW-54-085	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-54-085	DA	12/15/2016		3V	---	---	---	---	-110	7.4	3
MW-54-085	DA	12/15/2016	(a)	3V	ND (0.5)	ND (0.2)	---	---	---	---	---
MW-54-140	DA	4/29/2016		LF	---	---	---	---	-59	7.5	2
MW-54-140	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-54-140	DA	12/15/2016		3V	---	---	---	---	-120	7.7	24
MW-54-140	DA	12/15/2016	(a)	3V	ND (0.5)	ND (0.2)	---	---	---	---	---
MW-54-195	DA	4/29/2016		LF	---	---	---	---	-210	7.8	3
MW-54-195	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-54-195	DA	12/15/2016		LF	---	---	---	---	-97	8.2	1
MW-54-195	DA	12/15/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-54-195	DA	12/15/2016	FD(a)	LF	ND (0.5 J)	ND (1)	---	---	---	---	---

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-55-045	MA	5/5/2016		LF	---	---	---	---	-190	7.6	15
MW-55-045	MA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-55-045	MA	12/15/2016		LF	---	---	---	---	-14	7.8	22
MW-55-045	MA	12/15/2016	(a)	LF	ND (0.1)	ND (0.2)	---	---	---	---	---
MW-55-120	DA	2/24/2016		LF	7.6	8.1	---	---	-87	8.0	8
MW-55-120	DA	2/24/2016	(a)	LF	7.2 J	ND (10)	---	---	---	---	---
MW-55-120	DA	5/5/2016		LF	---	---	---	---	-20	7.9	8
MW-55-120	DA	5/5/2016	(a)	LF	11.1	10.6	---	---	---	---	---
MW-55-120	DA	9/30/2016		LF	---	---	---	---	140	8.0	1
MW-55-120	DA	9/30/2016	(a)	LF	6.39	6.83	---	---	---	---	---
MW-55-120	DA	12/15/2016		3V	---	---	---	---	-110	7.9	13
MW-55-120	DA	12/15/2016	(a)	3V	8.4	8.17	---	---	---	---	---
MW-55-120	DA	2/10/2017		LF	---	---	---	---	-130	8.1	5
MW-55-120	DA	2/10/2017	(a)	LF	7.5	8.3	---	---	---	---	---
MW-55-120	DA	2/10/2017	FD(a)	---	7.33	8.28	---	---	---	---	---
MW-56D	DA	5/5/2016		LF	---	---	---	---	-140	7.5	1
MW-56D	DA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56D	DA	12/14/2016		LF	---	---	---	---	-34	7.6	2
MW-56D	DA	12/14/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-56M	DA	5/5/2016		LF	---	---	---	---	-140	7.1	1
MW-56M	DA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56M	DA	12/14/2016		LF	---	---	---	---	-110	7.2	6
MW-56M	DA	12/14/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-56S	SA	5/5/2016		LF	---	---	---	---	-130	6.9	1
MW-56S	SA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56S	SA	12/14/2016		LF	---	---	---	---	-110	6.9	2
MW-56S	SA	12/14/2016	(a)	LF	ND (0.1)	ND (0.2)	---	---	---	---	---
MW-57-070	BR	4/28/2016		3V	470	510	---	---	87	7.2	8
MW-57-070	BR	12/13/2016		LF	400	420	---	2,400	85	7.2	28

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-57-185	BR	4/28/2016		3V	4.6	5.6	---	---	-36	9.8	5
MW-57-185	BR	12/13/2016		3V	7.1	7.3	---	20,000	32	8.9	1
MW-58BR	BR	2/24/2016		LF	4.1	4.5	---	---	40	7.4	5
MW-58BR	BR	4/28/2016		LF	0.56	ND (1)	---	---	-7.4	7.6	1
MW-58BR	BR	4/28/2016	FD	LF	0.6	ND (1)	---	---	---	---	---
MW-58BR	BR	9/27/2016		LF	2.7	2.7	---	---	-170	7.2	6
MW-58BR	BR	12/13/2016		LF	4.3	3.9	---	8,600	66	7.6	2
MW-58BR	BR	2/7/2017		LF	4.3	4	---	---	-24	7.7	4
MW-59-100	SA	4/29/2016		LF	3,300	3,400	---	---	100	7.0	4
MW-59-100	SA	12/7/2016		LF	3,600	3,500	---	9,500	77	7.0	5
MW-59-100	SA	12/7/2016	FD	LF	3,400	3,500	---	9,300	---	---	---
MW-60-125	BR	4/28/2016		3V	940	990	---	---	64	7.2	8
MW-60-125	BR	12/14/2016		LF	880	840	---	9,100	84	7.4	18
MW-60BR-245	BR	2/23/2016		3V	ND (1)	ND (5)	---	---	-81	8.1	2
MW-60BR-245	BR	4/29/2016		G	ND (1)	ND (5)	---	---	-150	8.0	10
MW-60BR-245	BR	9/29/2016		3V	ND (1)	37	---	---	-150	8.0	1
MW-60BR-245	BR	12/14/2016		3V	ND (1)	ND (1)	---	19,000	-65	8.2	1
MW-60BR-245	BR	2/8/2017		3V	ND (1)	ND (1)	---	---	-110	8.1	40
MW-61-110	BR	4/29/2016		LF	410	400	---	---	-55	7.5	5
MW-61-110	BR	12/13/2016		3V	520	500	---	17,000	-67	7.4	7
MW-62-065	BR	2/23/2016		3V	560	620	---	---	-34	7.4	5
MW-62-065	BR	5/2/2016		3V	670	690	---	---	-47	7.4	4
MW-62-065	BR	9/28/2016		LF	350	340	---	---	-46	7.4	5
MW-62-065	BR	12/13/2016		LF	600	550	---	6,500	-70	7.4	14
MW-62-065	BR	2/9/2017		3V	550	560	---	---	-52	7.4	16.5
MW-62-110	BR	2/24/2016		3V	ND (1)	ND (1)	---	---	-99	7.6	12
MW-62-110	BR	5/3/2016		Tap	1.2	ND (1)	---	---	-150	7.6	5
MW-62-110	BR	9/28/2016		Flute	ND (1)	ND (1)	---	---	-130	8.0	31
MW-62-110	BR	12/14/2016		G	ND (1)	ND (1)	---	10,000	20	7.3	4

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

								Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-62-110	BR	2/8/2017		3V	0.45	ND (1)	---	---	-140	7.9	31
MW-62-190	BR	5/3/2016		Tap	ND (1)	ND (5)	---	---	-130	7.9	5
MW-62-190	BR	12/14/2016		G	ND (1)	ND (5)	---	20,000	-210	7.4	4
MW-63-065	BR	2/23/2016		3V	1.5	2.1	---	---	-41	7.1	8
MW-63-065	BR	4/28/2016		3V	1.5	2.2	---	---	76	6.9	6
MW-63-065	BR	9/30/2016		LF	1.4	1.7	---	---	-12	7.4	5
MW-63-065	BR	12/13/2016		LF	1.3	2.2	---	7,000	-260	7.5	4
MW-63-065	BR	2/9/2017		3V	1.2	1.7	---	---	-77	7.2	9.1
MW-64BR	BR	2/22/2016		LF	ND (1)	ND (1)	---	---	-74	7.3	70
MW-64BR	BR	9/28/2016		LF	ND (1)	ND (1)	---	---	-59	7.5	2
MW-64BR	BR	12/13/2016	FD	LF	ND (1)	ND (5)	---	14,000	-270	8.0	4
MW-64BR	BR	2/7/2017		LF	ND (1)	ND (1)	---	---	-48	7.4	18
MW-65-160	SA	2/24/2016		LF	140	150	---	---	-25	7.2	29
MW-65-160	SA	9/29/2016		LF	150	160	---	---	-210	7.8	3
MW-65-160	SA	2/8/2017		LF	170	170	---	---	-180	7.7	3
MW-65-225	DA	2/24/2016		LF	510	490 J	---	---	-71	7.3	10
MW-65-225	DA	5/3/2016		LF	130	130	---	---	4.9	7.5	7
MW-65-225	DA	9/29/2016		LF	87	110	---	---	-45	7.5	10
MW-65-225	DA	2/8/2017		LF	530	550	---	---	-190	7.6	15
MW-66-165	SA	12/5/2016		LF	460	450	---	3,900	-150	7.7	9
MW-66-230	DA	4/25/2016		LF	7,500	6,700	---	---	63	7.8	1
MW-66-230	DA	12/5/2016		LF	7,000	7,300	---	18,000	51	7.9	4
MW-66BR-270	BR	5/4/2016		3V	ND (0.2)	ND (1)	---	---	-350	8.1	8
MW-66BR-270	BR	12/15/2016		3V	ND (0.2)	ND (1)	---	5,400	---	---	---
MW-67-185	SA	5/3/2016		LF	1,800	1,800	---	---	120	7.2	5
MW-67-185	SA	12/5/2016		LF	1,600	1,600	---	6,900	-26	7.2	9
MW-67-225	MA	5/3/2016	FD	LF	3,500	3,300	---	---	-20	7.9	8
MW-67-260	DA	5/3/2016		LF	620	670	---	---	140	8.0	1
MW-67-260	DA	12/5/2016	FD	LF	1,000	1,000	---	18,000	-280	7.7	3

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-68-180	SA	2/24/2016		LF	37,000	42,000	---	---	2.7	7.4	40
MW-68-180	SA	5/4/2016		LF	12,000	11,000	---	---	64	7.3	3
MW-68-180	SA	12/6/2016		LF	38,000	42,000	---	4,700	-140	7.5	1
MW-68-180	SA	2/8/2017	FD	---	36,000	37,000	---	---	-240	7.2	2
MW-68-240	DA	5/4/2016		LF	2,100	2,100	---	---	26	7.2	9
MW-68-240	DA	12/6/2016		LF	2,100	2,200	---	16,000	-99	7.5	10
MW-68BR-280	BR	12/6/2016		3V	ND (1)	ND (1)	---	21,000	-140	7.1	1
MW-69-195	BR	2/24/2016	FD	3V	610	660	---	---	-260	7.0	1
MW-69-195	BR	4/25/2016		3V	660	660	---	---	130	7.2	3
MW-69-195	BR	9/29/2016		LF	640	680	---	---	81	7.3	1
MW-69-195	BR	2/9/2017		LF	180	160	---	---	-130	6.9	1
MW-70-105	BR	4/28/2016		LF	120	140	---	---	11	7.9	29
MW-70-105	BR	12/14/2016		LF	140	140	---	3,700	-85	7.7	13
MW-70BR-225	BR	4/28/2016		3V	2,000	2,100	---	---	79	7.4	25
MW-70BR-225	BR	12/14/2016		3V	1,900	1,800	---	14,000	-57	7.3	2
MW-70BR-225	BR	12/14/2016	FD	3V	1,900	1,800	---	14,000	---	---	---
MW-71-035	SA	5/3/2016		LF	ND (1)	ND (5)	---	---	-49	6.6	92
MW-71-035	SA	5/3/2016	FD	LF	ND (1)	ND (1)	---	---	---	---	---
MW-71-035	SA	12/14/2016		G	ND (1)	ND (1)	---	15,000	50	6.7	48
MW-72-080	BR	2/23/2016		3V	120	110	---	---	-86	7.7	29
MW-72-080	BR	4/29/2016		3V	100	89	---	---	-12	7.5	8
MW-72-080	BR	9/28/2016		LF	86	84	---	---	-120	7.8	5
MW-72-080	BR	12/12/2016		LF	---	120	---	17,000	-94	7.7	15
MW-72-080	BR	12/15/2016		LF	120	---	---	---	---	---	---
MW-72-080	BR	2/7/2017		3V	120	110	---	---	-0.60	7.8	23
MW-72BR-200	BR	2/23/2016		3V	6	5.6	---	---	-300	8.3	2
MW-72BR-200	BR	4/28/2016		3V	3.9	3.6	---	---	-150	8.0	3
MW-72BR-200	BR	9/28/2016		3V	4.2	4.3	---	---	-170	8.2	1
MW-72BR-200	BR	12/12/2016		3V	5.3	4.8	---	15,000	-120	8.2	4

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters		
									ORP (mV)	Field pH	Turbidity
MW-72BR-200	BR	2/8/2017		3V	6.1	6.7	---	---	-110	8.3	35
MW-73-080	BR	2/23/2016		3V	53	49	---	---	-29	7.4	11
MW-73-080	BR	4/29/2016		3V	20	20	---	---	100	7.7	120
MW-73-080	BR	9/28/2016		G	23	22	---	---	-100	7.3	7
MW-73-080	BR	12/12/2016		LF	26	25 J	---	11,000	-80	7.4	34
MW-73-080	BR	12/12/2016	FD	LF	29	33 J	---	11,000	---	---	---
MW-73-080	BR	2/8/2017		3V	31	29	---	---	-70	7.5	20
MW-74-240	BR	4/27/2016		LF	ND (0.2)	ND (1)	---	---	-74	8.6	61
MW-74-240	BR	12/8/2016		LF	0.38	ND (1)	---	850	150	8.4	19
OW-03D	DA	12/8/2016		LF	12	13	---	9,800	28	8.9	1
OW-03M	MA	12/8/2016		LF	15	16	---	6,300	22	7.9	7
OW-03S	SA	12/8/2016		3V	21	22	---	1,500	28	7.8	2
PE-01	DA	1/6/2016		Tap	3.8	3.6	---	4,300	---	---	---
PE-01	DA	2/2/2016		Tap	3.9	3.3	---	4,100	---	---	---
PE-01	DA	2/3/2016		Tap	---	---	---	---	220	7.3	1.91
PE-01	DA	3/2/2016		Tap	0.79	ND (1)	---	4,100	200	7.1	2.02
PE-01	DA	4/27/2016		Tap	1.2	1.1	---	3,600	35	7.5	4
PE-01	DA	5/10/2016		Tap	ND (0.2)	ND (1)	---	3,400	25	7.3	3
PE-01	DA	6/7/2016		Tap	0.83	ND (1)	---	3,700	---	---	---
PE-01	DA	7/6/2016		Tap	ND (0.2)	ND (1)	---	4,100	---	---	---
PE-01	DA	8/3/2016		Tap	0.8	ND (1)	---	4,000	---	---	---
PE-01	DA	9/8/2016		Tap	1.1	1.1	---	4,200	-5.3	7.3	1
PE-01	DA	10/6/2016		Tap	0.57	ND (1)	---	4,500	---	---	---
PE-01	DA	10/6/2016	FD	Tap	0.82	ND (1)	---	4,500	---	---	---
PE-01	DA	11/2/2016		Tap	2	1.7	---	4,700	---	---	---
PE-01	DA	12/6/2016		Tap	1.2	1.1	---	4,400	7.3	7.6	3
PE-01	DA	1/4/2017		Tap	ND (0.2)	ND (1)	---	4,500	-9.6	7.7	24
PE-01	DA	2/7/2017		Tap	1.9	1.8	---	4,600	---	---	---
PE-01	DA	2/7/2017	FD	Tap	1.9	1.9	---	4,500	---	---	---

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

								Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
PE-01	DA	3/8/2017		Tap	1.7	2.1	---	4,300	70	7.8	4.39
PGE-07BR	BR	12/7/2016		3V	ND (1)	ND (1)	---	20,000	-280	7.3	38
PGE-08	BR	12/7/2016		3V	ND (1)	ND (1)	---	19,000	-190	8.3	5
PM-03	0	4/5/2016		Tap	9.5	9.2	9.3	1,500	---	---	---
PM-03	0	12/9/2016		Tap	9.4	9.4	8.7	1,500	46	7.5	2
PM-04	0	4/5/2016		Tap	17	17	17	---	---	---	---
PM-04	0	12/9/2016		Tap	4.8	4.1	15	1,900	42	8.0	4
PM-04	0	12/9/2016	FD	Tap	4.9	4.4	14	1,900	---	---	---
TW-01	SA	5/3/2016		Tap	2,400	2,100	---	---	31	7.0	4
TW-02D	DA	5/10/2016		Tap	46	47	---	7,600	87	7.1	2
TW-02D	DA	7/6/2016		Tap	52	57	---	6,200	---	---	---
TW-02D	DA	12/13/2016		Tap	ND (0.2)	ND (1)	---	6,800	120	7.2	3
TW-02D	DA	3/8/2017		Tap	0.44	110	---	5,900	---	---	---
TW-02S	SA	12/13/2016		Tap	64	93	---	3,900	130	7.7	1
TW-03D	DA	1/6/2016		Tap	740	740	---	8,300	---	---	---
TW-03D	DA	2/2/2016		Tap	730	720	---	7,800	200	7.3	4.33
TW-03D	DA	3/2/2016		Tap	790	840	---	7,800	190	7.2	6.27
TW-03D	DA	4/27/2016		Tap	620	660	---	8,100	30	7.2	4
TW-03D	DA	5/10/2016		Tap	610	620	---	7,400	4.0	7.1	4
TW-03D	DA	6/7/2016		Tap	630	610	---	7,400	---	---	---
TW-03D	DA	7/6/2016		Tap	610	650	---	7,800	---	---	---
TW-03D	DA	8/3/2016		Tap	530	630	---	7,300	---	---	---
TW-03D	DA	9/8/2016		Tap	600	580	---	7,400	12	6.9	2
TW-03D	DA	10/6/2016		Tap	580	650	---	7,700	---	---	---
TW-03D	DA	11/2/2016		Tap	590	630	---	8,100	---	---	---
TW-03D	DA	11/2/2016	FD	Tap	590	620	---	8,000	---	---	---
TW-03D	DA	12/6/2016		Tap	630	610	---	7,800	16	7.4	4
TW-03D	DA	1/4/2017		Tap	620	620	---	7,800	-3.7	7.4	9
TW-03D	DA	2/7/2017		Tap	600	630	---	7,800	---	---	---

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	**Aquifer Zone**	**Sample Date**		**Sample Method**	**Hexavalent Chromium (µg/L)**	**Dissolved Chromium (µg/L)**	**Total Chromium (µg/L)**	**Specific Conductance (µS/cm)**	**ORP (mV)**	**Field pH**	**Turbidity**
TW-03D	DA	3/8/2017		Tap	560	630	---	7,600	---	---	---
TW-03D	DA	3/8/2017	FD	Tap	570	580	---	7,800	---	---	---

Notes:

(a) = ADHS approved lab
--- = data were either not collected, not available or were rejected
ADHS = Arizona Department of Health Services
FD = field duplicate sample.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
mV = millivolts.
ND = not detected at listed RL.
ORP = oxidation-reduction potential.
RL = reporting limit.
UF = unfiltered.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.

Sample Methods:
3V = three volume.
Flute = flexible liner underground technologies sampling system.
G = Grab sample.
H = HydraSleeve
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump.
SS = System Sample
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.

Table 3-1

Groundwater Sampling Results, January 2016 through March 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

								Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity

MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

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

The RLs for certain hexavalent chromium results from Method E218.6 analyses have been elevated above the standard RL of 0.2 ug/L due to required sample dilution to accommodate matrix interferences.

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

ORP is reported to two significant figures. Specific conductance is reported to three significant figures.

Table 3-2

Groundwater COPCs and In Situ Byproducts Sampling Results, First Quarter 2017

First Quarter 2017 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	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-09	SA	2/9/2017		LF	1.7	3.9	4.6	ND (0.5)	11
MW-10	SA	2/9/2017		LF	--	22	5.4	--	11
MW-11	SA	2/9/2017		LF	1.4	6.1	4.1	ND (0.5)	5.8
MW-34-100	DA	2/6/2017		LF	1.2	52	ND (2.5)	25	0.19
MW-34-100	DA	2/6/2017	FD	--	1.4	53	ND (2.5)	24	0.18
MW-38S	SA	2/9/2017		3V	8.4	46	0.54	110	1.6
MW-38S	SA	2/9/2017		LF	8.6	45	0.86	120	1.9
MW-44-115	DA	2/6/2017		LF	5.2	75	ND (2.5)	4.5	0.15
MW-46-175	DA	2/7/2017		LF	--	200	ND (2.5)	--	1.2
MW-58BR	BR	2/7/2017		LF	1.4	26	1.2	380	0.35
MW-60BR-245	BR	2/8/2017		3V	6.4	62	ND (2.5)	13	0.16
MW-62-065	BR	2/9/2017		3V	1.3	13	3.6	0.58	4.8
MW-62-110	BR	2/8/2017		3V	7.2	48	ND (0.5)	97	ND (0.05)
MW-63-065	BR	2/9/2017		3V	1.4	19	0.77	1.5	1.1
MW-64BR	BR	2/7/2017		LF	3.8	65	ND (2.5)	1,000	ND (0.05)
MW-65-160	SA	2/8/2017		LF	0.6	32	7.6	110	12
MW-65-225	DA	2/8/2017		LF	2.1	33	6.6	4.3	9.4
MW-68-180	SA	2/8/2017		LF	2.6	52	16	ND (0.5)	30
MW-68-180	SA	2/8/2017	FD	--	2.4	51	15	ND (0.5)	32
MW-69-195	BR	2/9/2017		LF	2.2	75	12	0.96	16
MW-72-080	BR	2/7/2017		3V	11	78	ND (2.5)	24	0.89
MW-72BR-200	BR	2/8/2017		3V	15	79	ND (2.5)	9	0.13
MW-73-080	BR	2/8/2017		3V	1.6	25	4.3	1.7	3.9
PE-01	DA	1/4/2017		Tap	--	--	--	150	ND (0.05)
PE-01	DA	2/7/2017		Tap	--	--	--	94	ND (0.05)
PE-01	DA	2/7/2017	FD	Tap	--	--	--	92	ND (0.05)
PE-01	DA	3/8/2017		Tap	--	--	--	92	ND (0.05)
TW-02D	DA	3/8/2017		Tap	--	--	--	84	ND (0.05)
TW-03D	DA	1/4/2017		Tap	--	--	--	11	3.4
TW-03D	DA	2/7/2017		Tap	--	--	--	11	3.1
TW-03D	DA	3/8/2017		Tap	--	--	--	13	3
TW-03D	DA	3/8/2017	FD	Tap	--	--	--	12	2.9

Notes:

(a) = data were analyzed by an Arizona certified laboratory.
--- = data were either not collected, not available or were rejected
COPC = contaminants of potential concern.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
ug/L = micrograms per liter.
USEPA = United States Environmental Protection Agency

Sample Methods:
3V = three volume.
Flute = flexible liner underground technologies sampling system.
G = Grab sample.
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.
MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

Nitrate samples were analyzed using USEPA Method 4500NO3, except for TW-3D and PE-1, which were analyzed using USEPA Method 300.0. USEPA Method 4500NO3 reports a combination of nitrate and nitrite as nitrogen. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for USEPA Method 4500NO3 are expected to be essentially the same as previous samples analyzed using USEPA Method 300.0 and reported as nitrate as nitrogen.

Table 3-2

Groundwater COPCs and In Situ Byproducts Sampling Results, First Quarter 2017

First Quarter 2017 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	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

The background study upper tolerance limit (UTL) for arsenic is 24.3 µg/L.
The USEPA and California maximum contaminant level (MCL) for arsenic is 10 µg/L.
The background study UTL for molybdenum is 36.3 µg/L.
There is no USEPA or California MCL for molybdenum.
The background study UTL for selenium is 10.3 µg/L.
The USEPA and California MCL for selenium is 50.0 µg/L.
The secondary USEPA and California MCL for manganese is 50 ug/L.
The background study UTL for nitrate as nitrogen is 5.03 mg/L.
The USEPA and California MCL for nitrate as nitrogen is 10 mg/L.
The background study UTL for fluoride is 7.1 mg/L.
The USEPA MCL for fluoride is 4 mg/L, and the California MCL for fluoride is 2 mg/L.

Table 3-3

Surface Water Sampling Results, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*
In-channel Locations						
C-BNS	1/24/2017		ND (0.2)	ND (1)	964	8.2
C-BNS	2/21/2017		ND (0.2)	ND (1)	--	8.3
C-CON-D	1/25/2017		ND (0.2)	ND (1)	977	8.1
C-CON-D	2/22/2017		ND (0.2)	ND (1)	--	8.3
C-CON-S	1/25/2017		ND (0.2)	ND (1)	970	8.2
C-CON-S	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-I-3-D	1/24/2017		ND (0.2)	ND (1)	972	8.3
C-I-3-D	1/24/2017	FD	ND (0.2)	ND (1)	--	8.3
C-I-3-D	2/21/2017		ND (0.2)	ND (1)	--	8.3
C-I-3-S	1/24/2017		ND (0.2)	ND (1)	964	8.3
C-I-3-S	2/21/2017		ND (0.2)	ND (1)	--	8.4
C-MAR-D	1/25/2017		ND (0.2)	ND (1)	1,010	8.2
C-MAR-D	2/22/2017		ND (0.2)	ND (1)	--	8.0
C-MAR-S	1/25/2017		ND (0.2)	ND (1)	1,010	8.0
C-MAR-S	2/22/2017		ND (0.2)	ND (1)	--	8.0
C-MAR-S	2/22/2017	FD	ND (0.2)	ND (1)	--	8.0
C-NR1-D	1/25/2017		ND (0.2)	ND (1)	972	8.2
C-NR1-D	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-NR1-S	1/25/2017		ND (0.2)	ND (1)	969	8.3
C-NR1-S	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-NR3-D	1/25/2017		ND (0.2)	ND (1)	976	8.2
C-NR3-D	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-NR3-S	1/25/2017		ND (0.2)	ND (1)	966	8.2
C-NR3-S	1/25/2017	FD	ND (0.2)	ND (1)	--	8.2
C-NR3-S	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-NR4-D	1/25/2017		ND (0.2)	ND (1)	967	8.2
C-NR4-D	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-NR4-S	1/25/2017		ND (0.2)	ND (1)	969	8.2
C-NR4-S	2/22/2017		ND (0.2)	ND (1)	--	8.2
C-R22A-D	1/24/2017		ND (0.2)	ND (1)	964	8.3
C-R22A-D	2/21/2017		ND (0.2)	ND (1)	--	8.3
C-R22A-S	1/24/2017		ND (0.2)	ND (1)	962	8.2
C-R22A-S	2/21/2017		ND (0.2)	ND (1)	--	8.4
C-R27-D	1/24/2017		ND (0.2)	ND (1)	965	8.3
C-R27-D	2/21/2017		ND (0.2)	ND (1)	--	8.4
C-R27-S	1/24/2017		ND (0.2)	ND (1)	965	8.3
C-R27-S	2/21/2017		ND (0.2)	ND (1)	--	8.4
C-TAZ-D	1/24/2017		ND (0.2)	ND (1)	971	8.3
C-TAZ-D	1/24/2017	FD	ND (0.2)	ND (1)	--	8.3
C-TAZ-D	2/21/2017		ND (0.2)	ND (1)	--	8.4
C-TAZ-S	1/24/2017		ND (0.2)	ND (1)	969	8.3
C-TAZ-S	2/21/2017		ND (0.2)	ND (1)	--	8.4
Shoreline Samples						
R-19	1/25/2017		ND (0.2)	ND (1)	985	8.2
R-19	2/22/2017		ND (0.2)	ND (1)	--	8.3
R-28	1/24/2017		ND (0.2)	ND (1)	983	8.3
R-28	2/21/2017		ND (0.2)	ND (1)	--	8.4

Table 3-3

Surface Water Sampling Results, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*
R63	1/24/2017		ND (0.2)	ND (1)	989	8.3
R63	2/21/2017		ND (0.2)	ND (1)	--	8.3
RRB	1/25/2017		ND (0.2)	ND (1)	973	8.2
RRB	2/22/2017		ND (0.2)	ND (1)	--	8.3
SW1	1/24/2017		ND (0.2)	ND (1)	874	8.0
SW1	2/21/2017		ND (0.2)	ND (1)	--	7.7
SW2	1/24/2017		ND (0.2)	ND (1)	1,070	7.3
SW2	1/24/2017	FD	ND (0.2)	ND (1)	--	7.3
SW2	2/21/2017		ND (0.2)	ND (1)	--	7.3

Notes:

* Lab pH Values were all J flagged by the lab for being out of holding time.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
ND = not detected at listed reporting limit.
USEPA = United States Environmental Protection Agency
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.

Hexavalent chromium analytical Method USEPA 218.6 (reporting limit 0.2 ug/L for undiluted samples).

Other analytical methods: dissolved chromium - Method SW6020A; specific conductance - USEPA 120.1; pH -SM4500-HB.

pH is reported to two significant figures.

Table 3-4

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
In-channel locations											
C-BNS	1/24/2017		2.2	130	240	ND (20)	ND (0.5)	5.3	0.4	1.7	ND (10)
C-BNS	2/21/2017		2.2	120	53	43	ND (0.5)	5.4	0.45	1.7	ND (10)
C-CON-D	1/25/2017		2.2	130	63	ND (20)	ND (0.5)	5.4	0.39	1.6	ND (10)
C-CON-D	2/22/2017		2.2	130	29	ND (20)	ND (0.5)	5.4	0.44	1.6	ND (10)
C-CON-S	1/25/2017		2.2	120	58	ND (20)	ND (0.5)	5.1	0.4	1.5	ND (10)
C-CON-S	2/22/2017		2.1	130	23	ND (20)	ND (0.5)	5.4	0.44	1.6	ND (10)
C-I-3-D	1/24/2017		2.2	120	220	ND (20 J)	0.83	5.6	0.42	1.7	ND (10)
C-I-3-D	1/24/2017	FD	2.2	120	260	50 J	0.7	5.1	0.42	1.5	ND (10)
C-I-3-D	2/21/2017		2.2	120	51	ND (20)	ND (0.5)	5.3	0.46	1.7	ND (10)
C-I-3-S	1/24/2017		2.2	120	210	33	0.61	5.2	0.41	1.6	ND (10)
C-I-3-S	2/21/2017		2.3	130	49	ND (20)	ND (0.5)	5.5	0.48	1.9	ND (10)
C-MAR-D	1/25/2017		2.1	130	560	ND (20)	43	5.3	0.38	1.4	ND (10)
C-MAR-D	2/22/2017		3	210	1,600	230	440	7	0.23	0.98	39
C-MAR-S	1/25/2017		2	130	890	22	69	5.5	0.4	1.7	41
C-MAR-S	2/22/2017		2.1	230	3,100	ND (20)	520	7.7	0.12	0.64	87
C-MAR-S	2/22/2017	FD	2.2	210	3,000	ND (20)	460	7.4	0.14	0.7	85
C-NR1-D	1/25/2017		2.2	120	75	ND (20)	ND (0.5)	5.2	0.43	1.5	ND (10)
C-NR1-D	2/22/2017		2.1	130	33	ND (20)	ND (0.5)	5.3	0.47	1.5	ND (10)
C-NR1-S	1/25/2017		2.2	120	100	ND (20)	ND (0.5)	5.2	0.42	1.7	ND (10)
C-NR1-S	2/22/2017		2.3	130	54	ND (20)	ND (0.5)	5.4	0.41	1.7	ND (10)
C-NR3-D	1/25/2017		2.3	130	77	ND (20)	ND (0.5)	5.5	0.41	1.6	ND (10)
C-NR3-D	2/22/2017		2.1	130	52	ND (20)	0.56	5.4	0.44	1.5	ND (10)
C-NR3-S	1/25/2017		2.1	120	58	ND (20)	ND (0.5)	5.1	0.39	1.7	ND (10)
C-NR3-S	1/25/2017	FD	2.3	130	60	ND (20)	ND (0.5)	5.4	0.39	1.7	ND (10)
C-NR3-S	2/22/2017		2.2	120	34	ND (20)	0.63	5.2	0.46	1.7	ND (10)
C-NR4-D	1/25/2017		2.2	120	52	ND (20)	ND (0.5)	5.3	0.41	1.7	ND (10)
C-NR4-D	2/22/2017		2.2	130	24	ND (20)	0.75	5.5	0.43	1.6	ND (10)
C-NR4-S	1/25/2017		2.1	120	45	ND (20)	ND (0.5)	5.1	0.41	1.6	ND (10)
C-NR4-S	2/22/2017		2.2	130	27	31	0.72	5.4	0.45	1.6	ND (10)
C-R22A-D	1/24/2017		2.1	120	150	62	1.7	5	0.41	1.5	ND (10)
C-R22A-D	2/21/2017		2.3	130	53	ND (20)	ND (0.5)	5.6	0.5	1.6	ND (10)
C-R22A-S	1/24/2017		2.1	120	160	ND (20)	0.79	5	0.4	1.4	ND (10)
C-R22A-S	2/21/2017		2.2	120	120	ND (20)	0.89	5.3	0.48	1.7	ND (10)
C-R27-D	1/24/2017		2.2	120	250	68	2.2	5.2	0.4	1.6	ND (10)
C-R27-D	2/21/2017		2.2	120	100	78	ND (0.5)	5.4	0.45	1.7	ND (10)
C-R27-S	1/24/2017		2.1	130	210	ND (20)	ND (0.5)	5.5	0.38	1.5	ND (10)
C-R27-S	2/21/2017		2.1	120	66	ND (20)	ND (0.5)	5.2	0.47	1.7	ND (10)
C-TAZ-D	1/24/2017		2.2	130	120	ND (20)	0.56	5.3	0.41	1.5	ND (10)
C-TAZ-D	1/24/2017	FD	2.2	130	100	ND (20)	ND (0.5)	5.4	0.39	1.6	ND (10)

Table 3-4

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide
Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
C-TAZ-D	2/21/2017	2.1	120	68	ND (20)	ND (0.5)	5	0.48	1.7	ND (10)
C-TAZ-S	1/24/2017	2.1	120	110	ND (20)	ND (0.5)	5.1	0.39	1.5	ND (10)
C-TAZ-S	2/21/2017	2.1	120	55	ND (20)	ND (0.5)	5.3	0.46	1.7	ND (10)
Shoreline Samples										
R-19	1/25/2017	2.2	130	36	ND (20)	0.6	5.2	0.39	1.7	ND (10)
R-19	2/22/2017	2.2	130	66	ND (20)	1.8	5.8	0.44	1.6	ND (10)
R-28	1/24/2017	2.2	130	140	ND (20)	0.78	5.4	0.38	1.6	ND (10)
R-28	2/21/2017	2.2	130	94	28	0.89	5.4	0.46	1.8	ND (10)
R63	1/24/2017	2.1	120	120	ND (20)	1.4	5.3	0.38	1.7	ND (10)
R63	2/21/2017	2.1	120	83	25	0.64	5.3	0.47	1.6	ND (10)
RRB	1/25/2017	2.4	130	38	ND (20)	0.57	5.5	0.4	1.6	ND (10)
RRB	2/22/2017	2.2	130	140	ND (20)	2.7	5.5	0.43	1.6	ND (10)

Notes:

--- = data were either not collected, not available or were rejected
COPC = contaminants of potential concern (molybdenum, selenium, and nitrate).
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
TSS = total suspended solids.
ug/L = micrograms per liter.
USEPA = United States Environmental Protection Agency.

Geochemical indicator parameters (TSS and alkalinity).
In situ byproducts (arsenic, iron and manganese).

USEPA Methods:
Alkalinity - SM2320B.
Metals - SW6010B/SW6020A.
Nitrate - SM4500NO3.
Total Suspended Solids - SM2540D.

TABLE 4-1
Pumping Rate and Extracted Volume for IM System, First Quarter 2017
First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Extraction Well ID	January 2017		February 2017		March 2017		First Quarter 2017	
	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	0	0.00	33	0.00	33
TW-03D	121.34	5,416,573	110.09	4,438,816	108.77	4,855,462	113.40	14,710,851
PE-01	9.21	411,245	21.34	860,252	22.59	1,008,638	17.71	2,280,134
TOTAL	**130.6**	**5,827,818**	**131.4**	**5,299,068**	**131.4**	**5,864,133**	**131.1**	**16,991,019**

Chromium Removed This Quarter (kg)	26.0
Chromium Removed Project to Date (kg)	4020
Chromium Removed This Quarter (lb)	57.3
Chromium Removed Project to Date (lb)	8850

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 January 1, 2017 through February 28, 2017. DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from January 1, 2017 through February 28, 2017.

Table 4-2

Analytical Results for Extraction Wells, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Dissolved Solids (mg/L)	Lab pH*
PE-01	1/4/2017	ND (0.2)	ND (1)	2,600	7.6
PE-01	2/7/2017	1.9	1.8	2,700	7.6
PE-01	2/7/2017	1.9	1.9	2,600	7.6
PE-01	3/8/2017	1.7	2.1	2,600	7.6
TW-02D	3/8/2017	0.44	110	3,500	7.2
TW-03D	1/4/2017	620	620	4,400	7.3
TW-03D	2/7/2017	600	630	4,700	7.3
TW-03D	3/8/2017	560	630	4,600	7.4
TW-03D	3/8/2017	570	580	4,600	7.4

Notes:

* Lab pH Values were all J flagged by the lab for being out of holding time.
--- = data were either not collected, not available or were rejected
FD = sample is a field duplicate.
J = concentration or reporting limit estimated by laboratory or data validation.
LF = lab filtered.
mg/L = milligrams per liter.
ug/L = micrograms per liter.

Groundwater samples from active extraction wells are taken at sample taps in Valve Vault 1 on the MW-20 bench.

Dissolved chromium was analyzed by Method SW6020A or USEPA200.8 or USEPA200.7, hexavalent chromium analyzed by Method SM3500-CrB or USEPA218.6, and total dissolved solids were analyzed by Method SM2540C.

Table 4-3

Average Hydraulic Gradients Measured at Well Pairs, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Well Pair[a]	Reporting Period	Mean Landward[b] Hydraulic Gradient (feet/foot)	Days in[c] Monthly Average
Overall Average	January	0.0063	NA
	February	0.0112	NA
	March	0.0119	NA
Northern Gradient Pair MW-31-135 / MW-33-150	January	0.0025	31
	February	0.0025	28
	March	0.0027	31
Central Gradient Pair MW-45-095[d] / MW-34-100	January	0.0127	31
	February	0.0234	28
	March	0.0247	31
Southern Gradient Pair MW-45-095[d] / MW-27-085	January	0.0038	31
	February	0.0076	28
	March	0.0082	31

Notes:

NA = All available data used in calculating overall average except where noted.

[a] Refer to Figure 1-4 for location of well pairs.

[b] For IM pumping, the target landward gradient for the selected well pairs is 0.001 feet/foot.

[c] Number of days transducers in both wells were operating correctly / total number of days in month.

[d] MW-45-095 is also known as MW-45-095a.

TABLE 4-4

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

First Quarter 2017 Interim Measures Performance Monitoring and
Sitewide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Davis Dam Release			**Colorado River Elevation at I-3**		
Month	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
January 2013	8,300	8,299	1	453.2	453.28	0.04
February 2013	10,600	10,972	-372	454.3	454.63	0.4
March 2013	15,200	15,545	-345	456.0	456.29	0.3
April 2013	17,600	17,090	510	456.9	456.74	-0.1
May 2013	15,800	15,592	208	456.4	456.44	0.0
June 2013	15,700	15,588	112	456.5	456.47	0.0
July 2013	14,400	13,165	1,235	456.0	455.79	-0.2
August 2013	13,100	12,185	915	455.4	455.43	0.0
September 2013	11,700	11,446	254	454.8	455.02	0.2
October 2013	12,300	12,497	-197	454.9	455.09	0.2
November 2013	9,700	8,918	782	454.0	453.98	0.0
December 2013	6,400	7,636	-1,236	452.4	452.81	0.4
January 2014	8,300	8,970	-670	452.8	453.27	0.5
February 2014	11,600	11,850	-250	454.3	454.67	0.3
March 2014	16,600	17,473	-873	456.4	456.70	0.3
April 2014	18,200	17,718	482	457.1	457.08	0.0
May 2014	16,700	16,622	78	456.8	456.68	-0.1
June 2014	15,900	15,917	-17	456.6	456.64	0.1
July 2014	15,100	14,640	460	456.3	456.24	0.0
August 2014	12,300	11,336	964	455.2	455.26	0.1
September 2014	13,100	12,211	889	455.3	455.30	0.0
October 2014	10,700	10,434	266	454.3	454.81	0.5
November 2014	10,700	10,575	125	454.3	454.22	-0.1
December 2014	6,400	7,235	-835	452.4	452.93	0.5
January 2015	10,600	10,740	-140	454.3	454.39	0.1
February 2015	10,500	11,252	-752	454.2	454.52	0.3
March 2015	14,900	15,658	-758	455.9	456.29	0.4
April 2015	18,000	17,170	830	457.1	456.82	-0.3
May 2015	16,000	13,890	2110	456.5	456.06	-0.5
June 2015	14,500	13,616	884	456.1	455.94	-0.2
July 2015	13,400	12,411	989	455.6	455.50	-0.1
August 2015	12,100	12,627	-527	455.1	455.45	0.4

TABLE 4-4
Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3
First Quarter 2017 Interim Measures Performance Monitoring and
Sitewide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Davis Dam Release			**Colorado River Elevation at I-3**		
Month	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
September 2015	13,300	12,734	566	455.4	INC	NA
October 2015	11,300	10,653	647	454.7	454.80	0.1
November 2015	10,000	10,066	-66	454.2	453.87	0.29
December 2015	6,200	8,556	-2356	453.3	453.48	-0.18
January 2016	9,400	9,000	400	453.4	454.05	-0.60
February 2016	11,300	11,700	-400	454.4	454.95	-0.57
March 2016	15,800	15,000	800	455.9	456.51	-0.65
April 2016	15,400	16,400	-1000	456.8	457.17	-0.40
May 2016	15,800	14,700	1100	456.0	456.76	-0.78
June 2016	14,400	14,100	300	456.0	456.64	-0.62
July 2016	13,300	13,100	200	455.7	456.38	-0.65
August 2016	11,500	11,600	-100	455.0	455.70	-0.69
September 2016	12,200	11,900	300	455.2	455.83	-0.63
October 2016	10,400	10,400	0	454.2	455.23	-0.98
November 2016	9,900	9,600	300	453.7	454.40	-0.70
December 2016	8,300	7,800	500	453.4	453.55	-0.18
January 2017	8,000	6,600	1400	453.2	453.36	-0.14
February 2017	9,500	8,700	800	453.9	454.15	-0.24
March 2017	13,900	13,700	200	455.5	456.10	-0.57
April 2017	15,900			456.4		

NOTES:
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 data set

Predicted river levels for each month are calculated based on the preceding month's U.S. Bureau of Reclamation (USBR) projection of Davis Dam release and stage in Lake Havasu. The Predicted river level at I-3 for April 2017 is based upon USBR predictions presented in the 24 Month Report posted April 17, 2017. This report is posted monthly by the U.S. Department of Interior at https://www.usbr.gov/uc/water/crsp/studies/.
The difference in I-3 elevations shown in this table are the difference between the predicted I-3 elevations and the actual measured elevations.

FIGURES

ARCADIS Design & Consultancy for natural and built assets

NATIONAL TRAILS HWY
COLORADO RIVER
FLOODPLAIN
EAST MESA INJECTION AREA
IW-2
IW-3
TREATMENT PLANT
TW-3D
PE-1
MW-20 BENCH
BAT CAVE WASH
BNSF RAILROAD
INTERSTATE 40
TOPOCK, AZ
PG&E TOPOCK COMPRESSOR STATION

LEGEND

- IM-3 Extraction Well (Active)
- IM-3 Injection Well
- Monitoring Well in Site-Wide Groundwater Monitoring Program (GMP)
- Monitoring Well in IM-3 Compliance Monitoring Program
- 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.

N

0 300 600
Feet

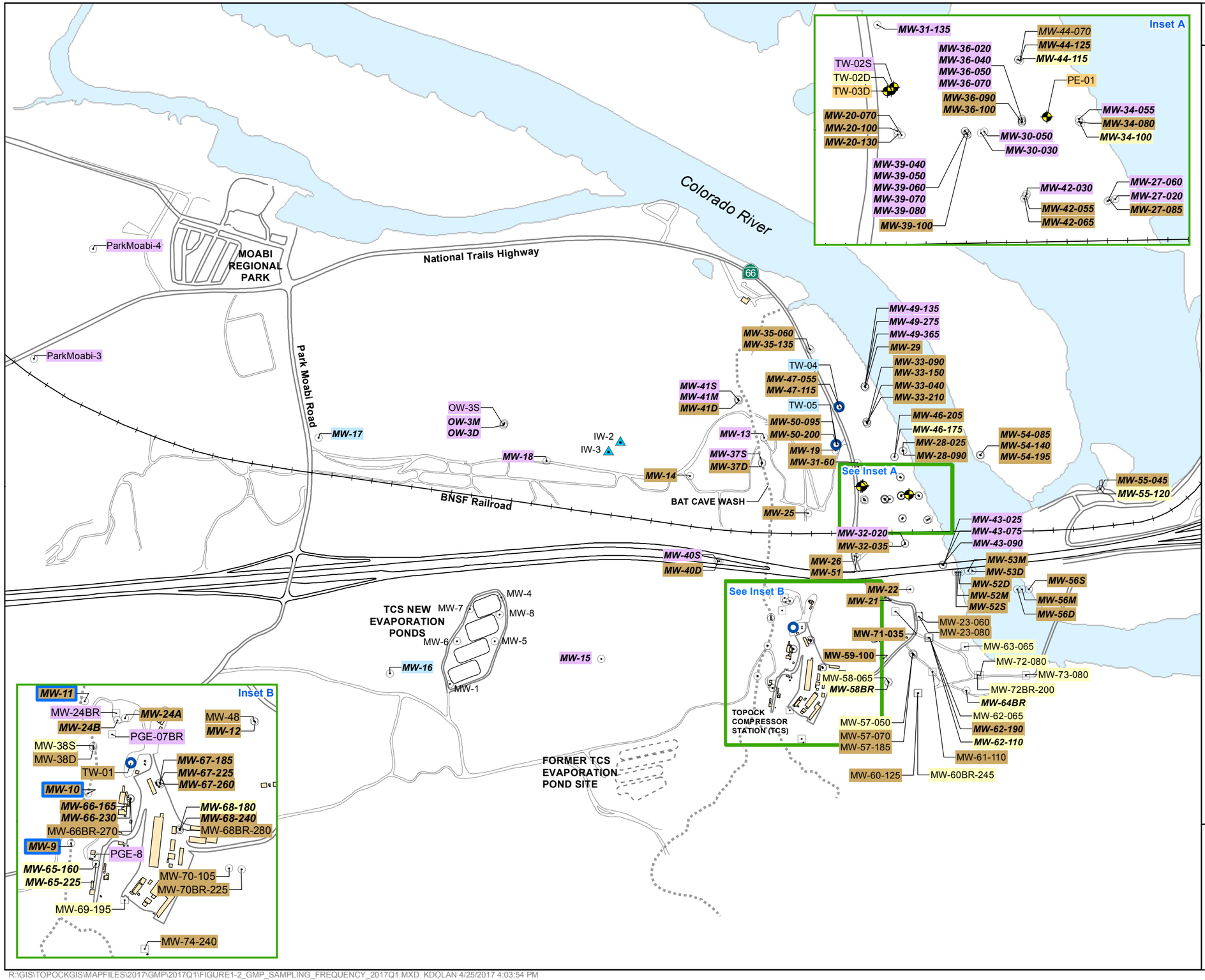
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom

FIGURE 1-1
LOCATIONS OF IM-3 FACILITIES AND MONITORING LOCATIONS

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2017\GMP\2017Q1\FIGURE1-1_IM3_GMP_LOCS_2017Q1.MXD 3/27/2017 11:26:53 AM



ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Groundwater Monitoring Well Completed in Bedrock
- Injection Well
- Groundwater Monitoring Well
- 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.
- MW-21 Semiannual sampling
- MW-38S Quarterly sampling
- TW-3D Monthly sampling

Notes:
Bold/Italicized labels indicate sample collected using low flow sampling method; otherwise, sample collected using the three-volume purge sampling method.

N

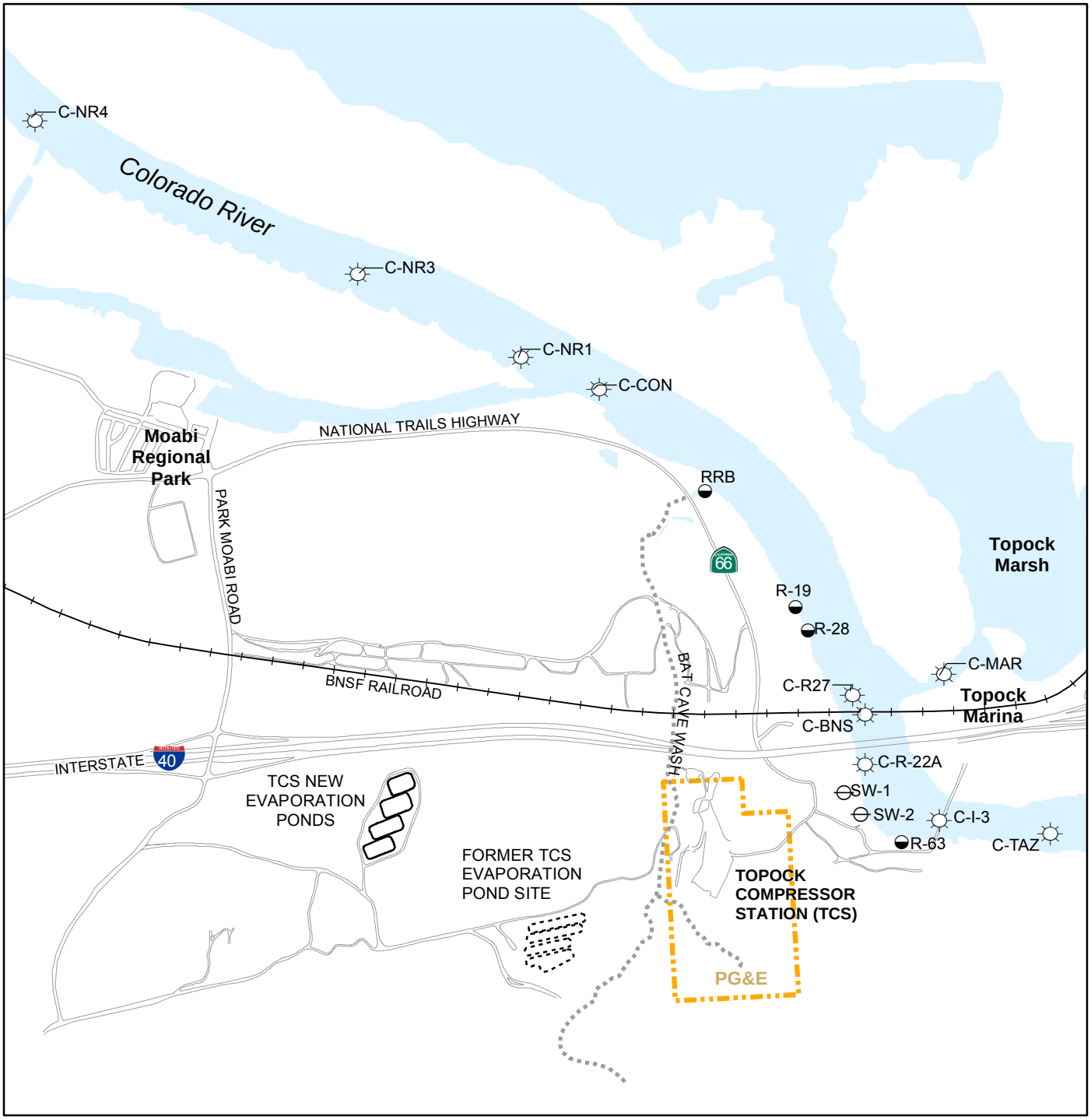
0 500 1,000
Feet

FIGURE 1-2
MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR GMP

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2017\GMP\2017Q1\FIGURE1-2_GMP_SAMPLING_FREQUENCY_2017Q1.MXD KDOLAN 4/25/2017 4:03:54 PM



LEGEND

- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location

N

0 800 1,600
Feet

FIGURE 1-3
MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR RMP

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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

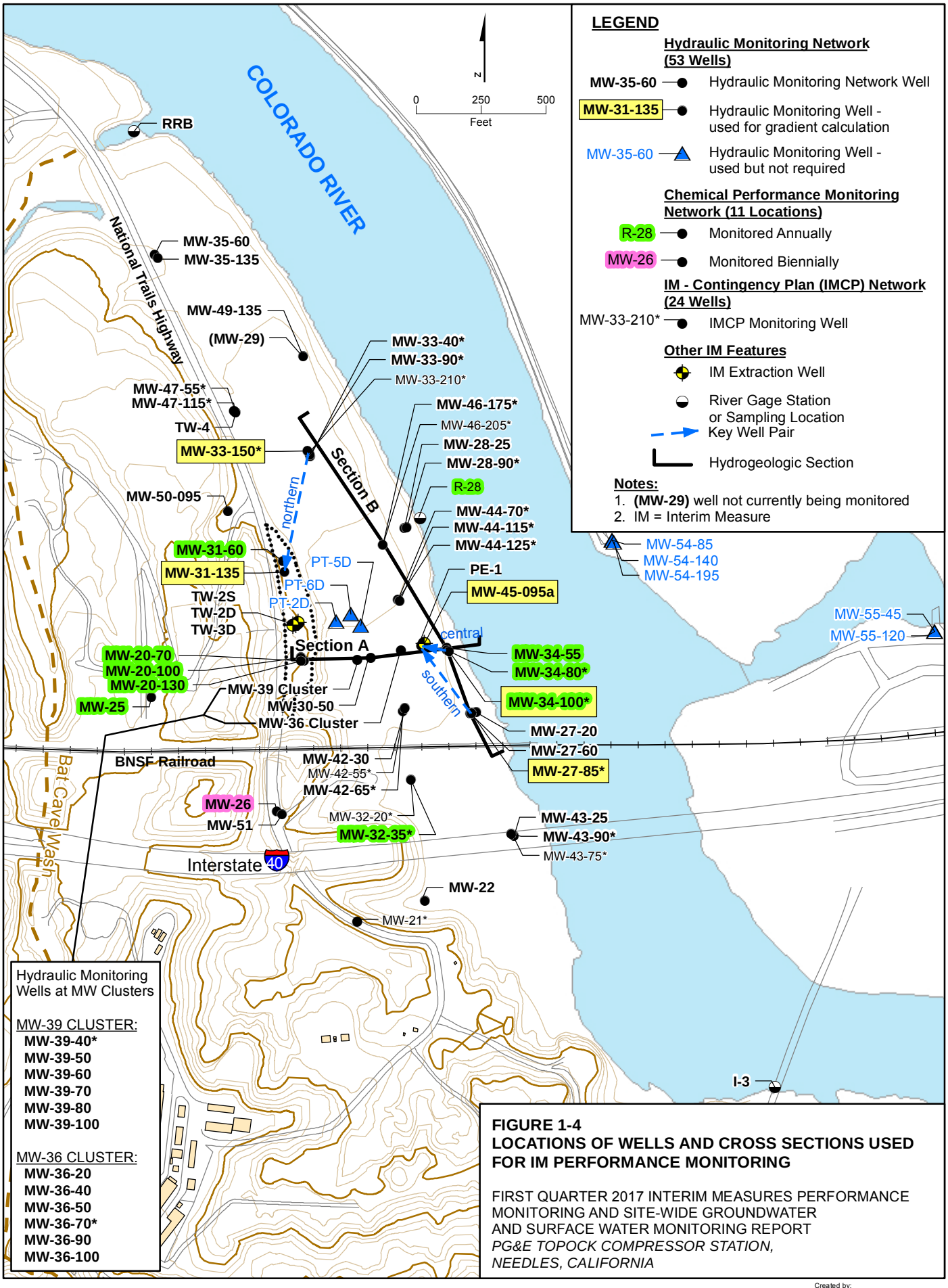
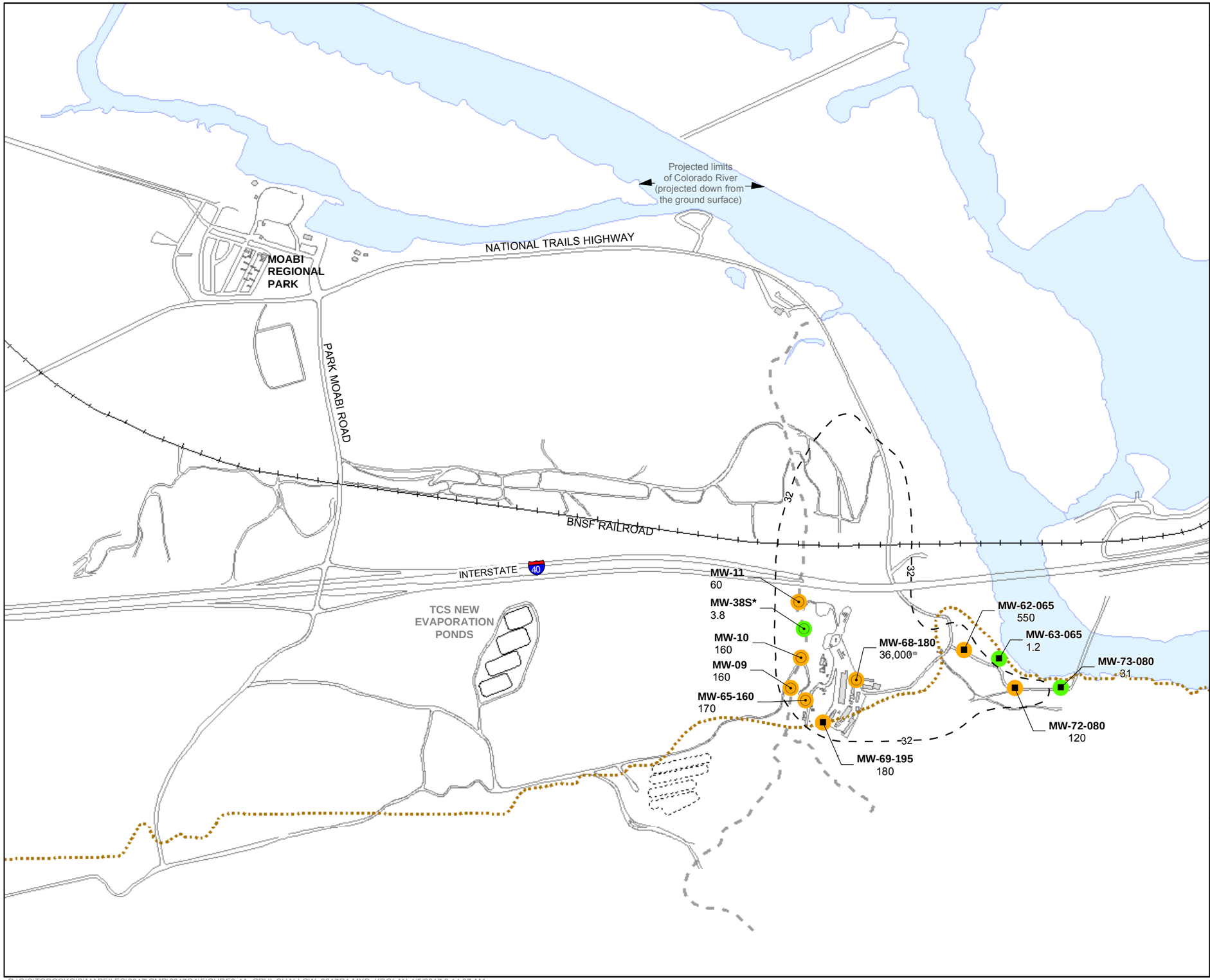


FIGURE 1-4
LOCATIONS OF WELLS AND CROSS SECTIONS USED FOR IM PERFORMANCE MONITORING

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



ARCADIS Design & Consultancy for natural and built assets

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 outline 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
1.2 ——— Groundwater Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = micrograms per liter
4. Cr(VI) = Hexavalent Chromium
5. TCS = Topock Compressor Station
6. * = Wells with sampled values < 32 µg/L shown within footprint of 32 µg/L boundary.
7. Results plotted are maximum concentration from primary and duplicate samples, see Table 3-1 for complete results.
8. The 32 µg/L line for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.

N

0 500 1,000
Feet

FIGURE 3-1a
Cr(VI) SAMPLING RESULTS, SHALLOW WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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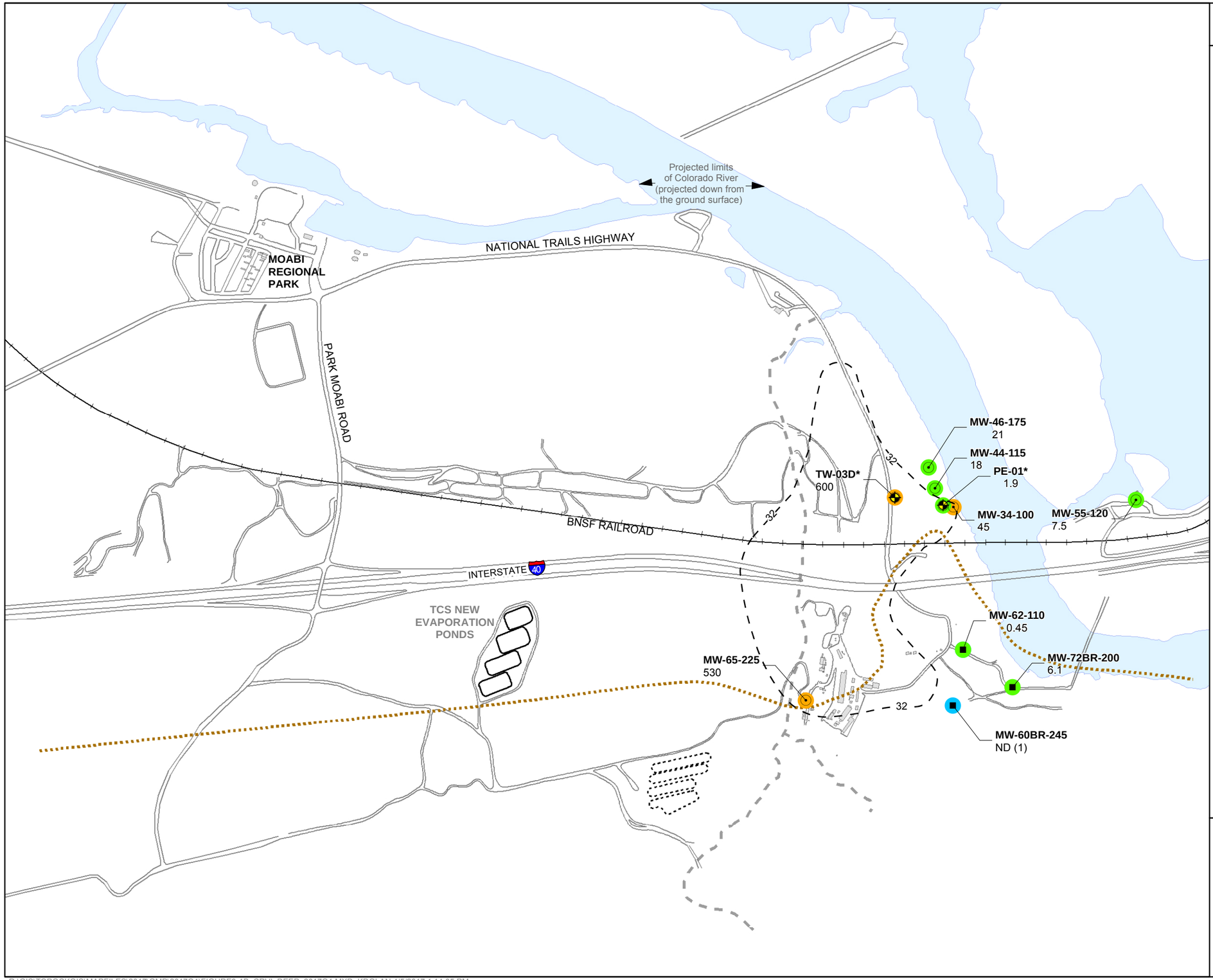
R:\GIS\TOPOCKGIS\MAPFILES\2017\GMP\2017Q1\FIGURE3-1A_CRVI_SHALLOW_2017Q1.MXD KDOLAN 4/5/2017 9:14:37 AM



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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 outline of "deep" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 395 feet above mean sea level.

MW-44-115 Sampling Location
18 Groundwater Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = micrograms per liter
4. Cr(VI) = Hexavalent Chromium
5. * = Wells with sampled values < 32 µg/L shown within footprint of 32 µg/L boundary.
6. Results plotted are maximum concentration from primary and duplicate samples, see Table 3-1 for complete results.
7. The 32 µg/L line for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data. There are no data confirming the existence of Cr(VI) under the Colorado River.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.
9. TCS = Topock Compressor Station

N

0 500 1,000
Feet

FIGURE 3-1b
Cr(VI) SAMPLING RESULTS, DEEP WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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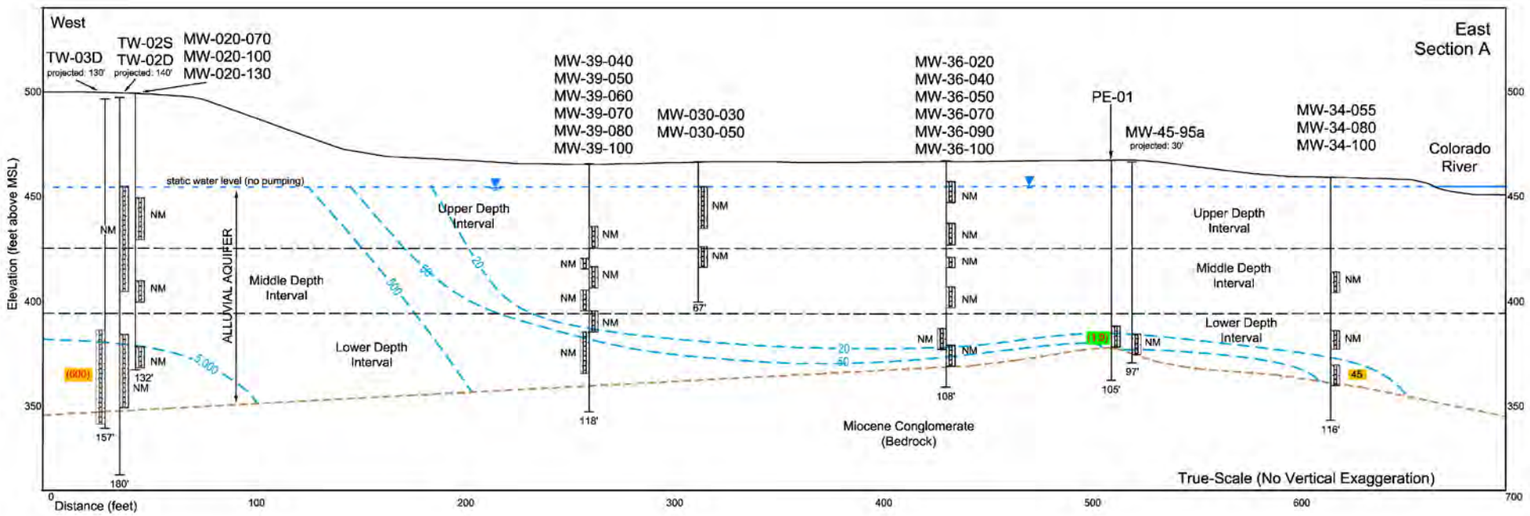
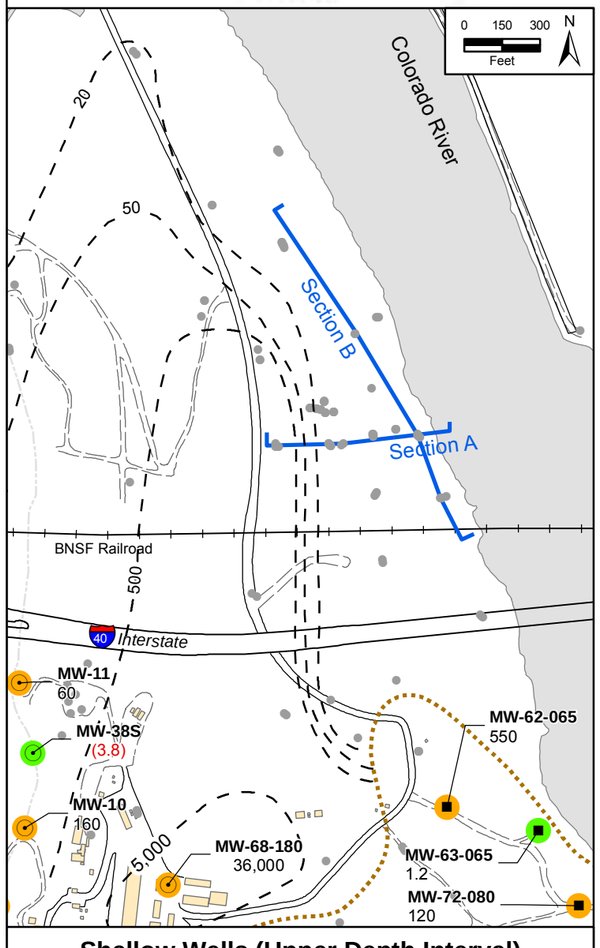
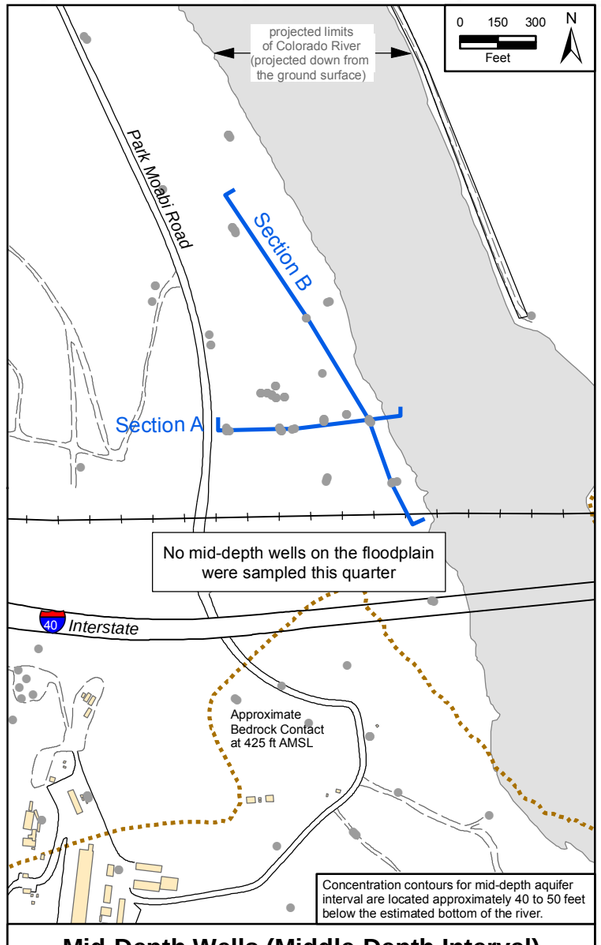
R:\GIS\TOPOCKGIS\MAPFILES\2017\GMP\2017Q1\FIGURE3-1B_CRVI_DEEP_2017Q1.MXD KDOLAN 4/5/2017 1:14:05 PM

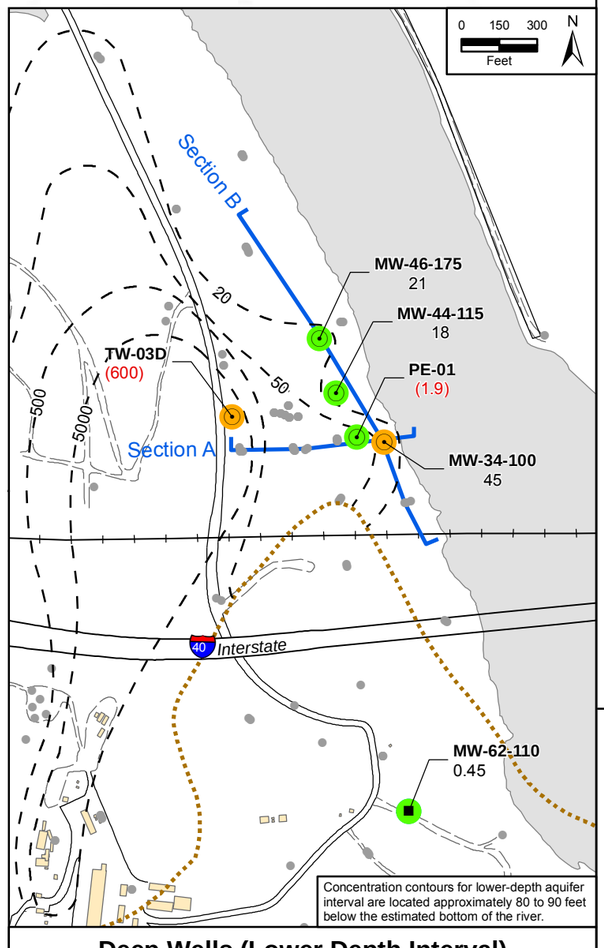




Shallow Wells (Upper Depth Interval)



Mid-Depth Wells (Middle-Depth Interval)



Deep Wells (Lower Depth Interval)

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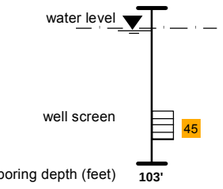
LEGEND

- 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-38S — Sampling Location
3.8 — Groundwater Concentration (µg/L)
(3.8) — Groundwater concentration (µg/L) not used for contouring

Notes:

1. "ND" = Cr(VI) not detected at listed reporting limit.
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. " * " = Deep interval "ND" samples screened vertically above detect sample.
4. µg/L = micrograms per liter
5. Cr(VI) = Hexavalent Chromium
6. The Cr(VI) concentration contours of 20 and 50 µg/L are shown in accordance with DTSC's 2005 IM performance monitoring directive. The IM performance standard was established for containment of Cr(VI) concentrations greater than 20 ug/L in the floodplain portion of the Alluvial Aquifer.
7. The 20 and 50 µg/L lines 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.
8. 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.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.

FIGURE 4-1
CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER AND BEDROCK, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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R:\GIS\TOPOCKGIS\MAPFILES\2017\GMP\2017Q1\FIGURE4-1_GMP_CR6_2017Q1_MAX.MXD 4/7/2017 6:13:15 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

Elevation (feet AMSL)

700
600
500
400
300
200
100
0

water table (average 455' AMSL)

Upper Depth Interval
Middle Depth Interval
Lower Depth Interval

ALLUVIAL AQUIFER
Oldest Alluvium
Fluvial Deposits

NM
18
21
45
20

237'
216'
134'
116'
107'

Approximate geologic contact between alluvial fan and fluvial deposits

Miocene Conglomerate
(Bedrock)

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

1. See Table 3-1 for additional sampling data and prior results for wells on this figure.

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

Legend

water level

well screen

45

boring depth (feet)

103'

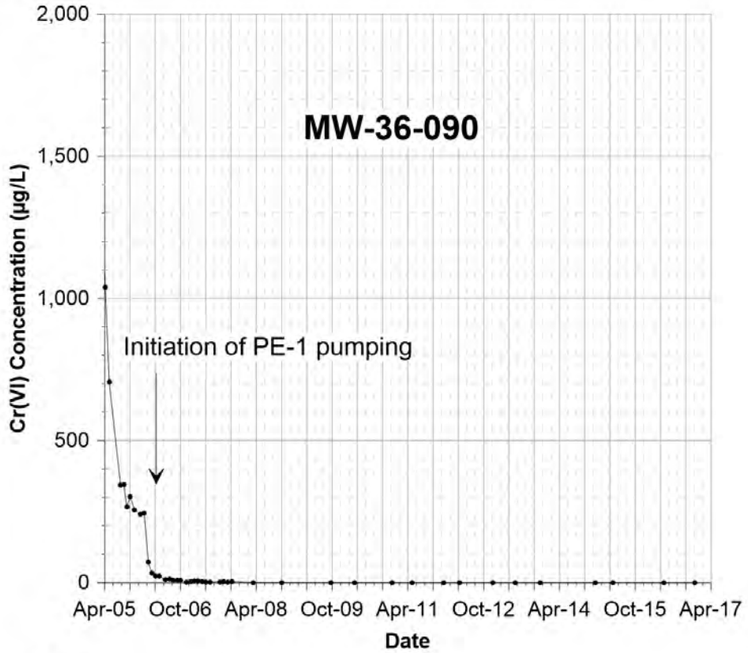
20 Inferred hexavalent chromium contours (µg/L) in Alluvial Aquifer.

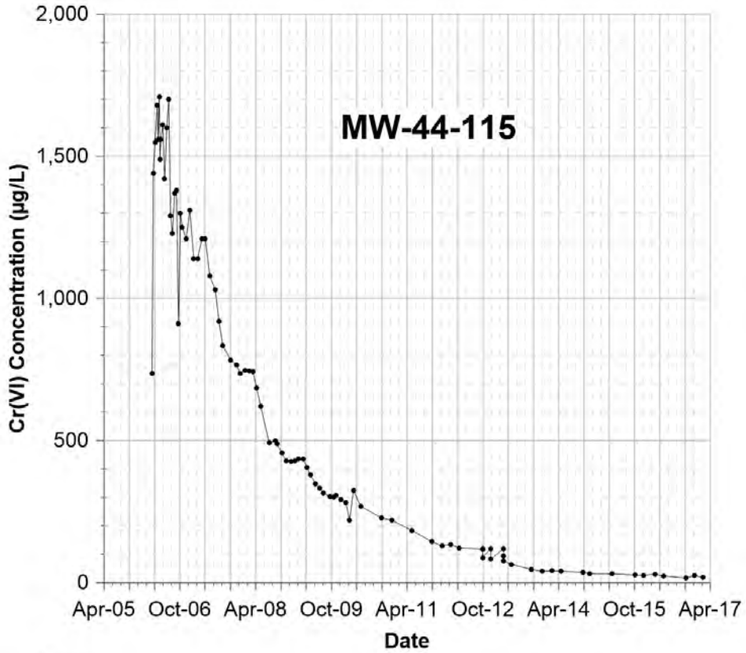
Cr(VI) Concentrations

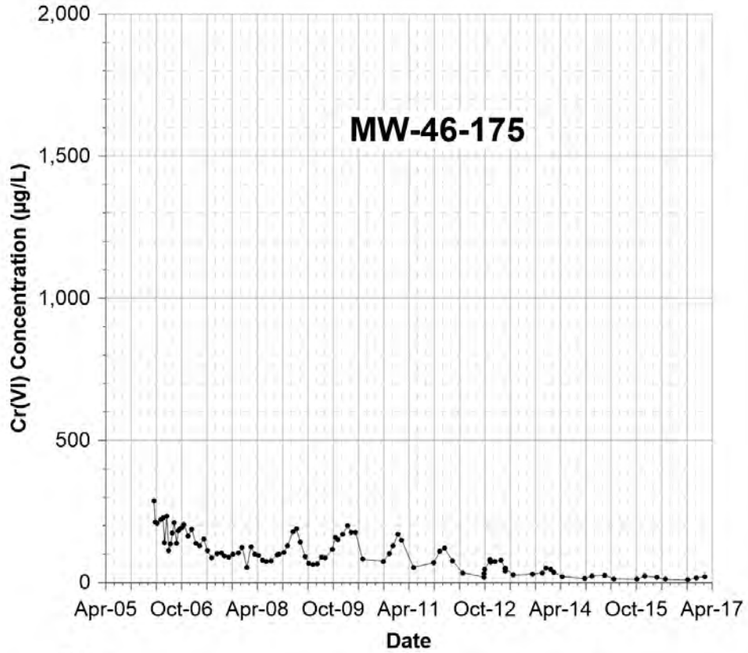
- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L

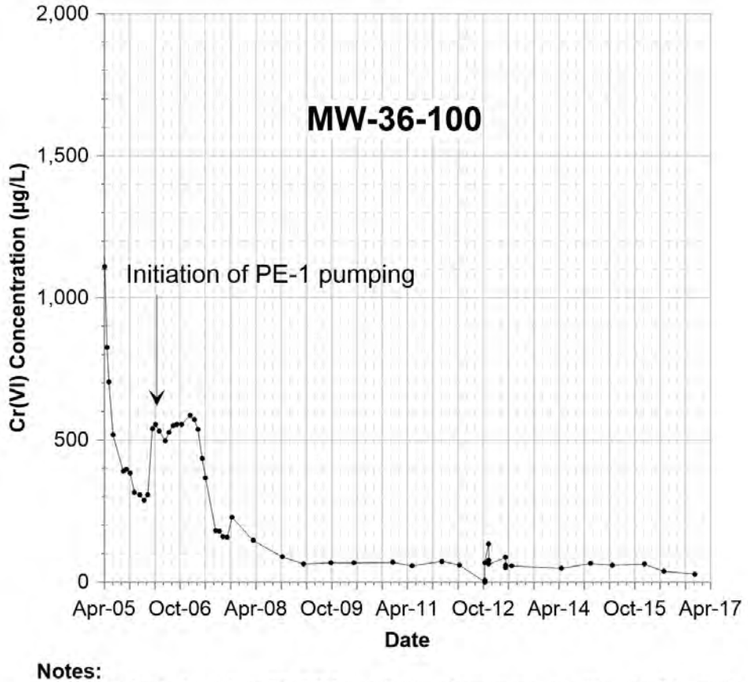
FIGURE 4-2
Cr(VI) CONCENTRATIONS FLOODPLAIN CROSS-SECTION B
FIRST QUARTER 2017
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

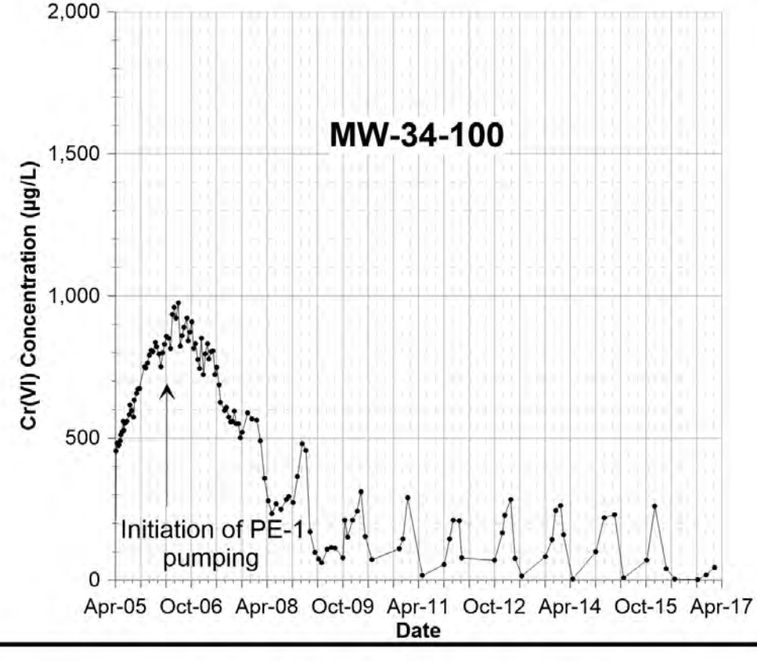
ARCADIS











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-1 pumping on plume west of PE-1. MW-44 wells, MW-46-175, and MW-34-100 selected to monitor concentrations within the plume.

FIGURE 4-3
Cr(VI) CONCENTRATION TRENDS IN SELECTED PERFORMANCE MONITORING WELLS, APRIL 2005 THROUGH APRIL 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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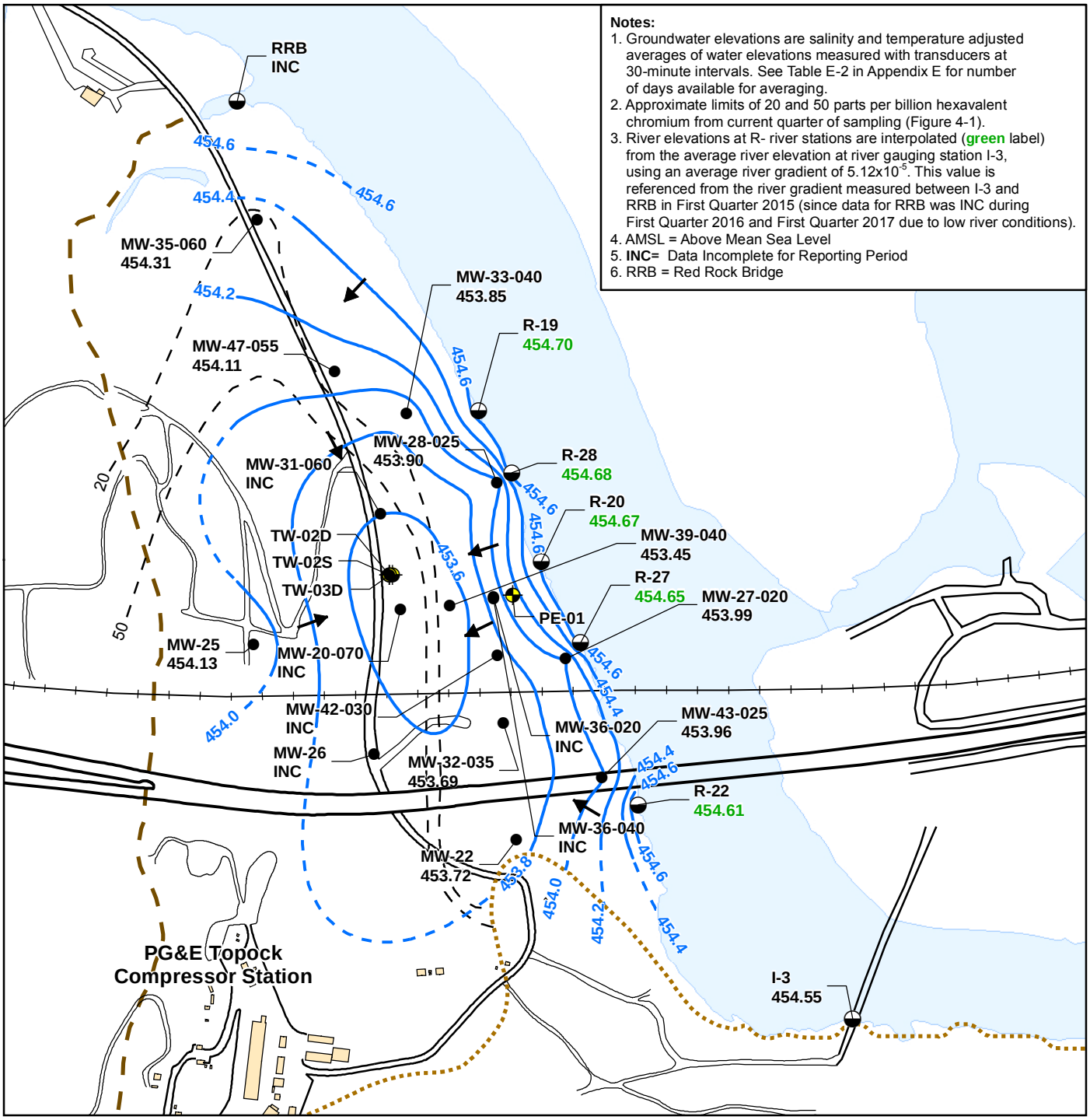


LEGEND

- 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 Contour (see note 2)

0 300 600
Feet

N

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

R-27 — River Station (see note 3)
454.65 — River Elevation (ft AMSL) Interpolated Average

FIGURE 4-4a
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

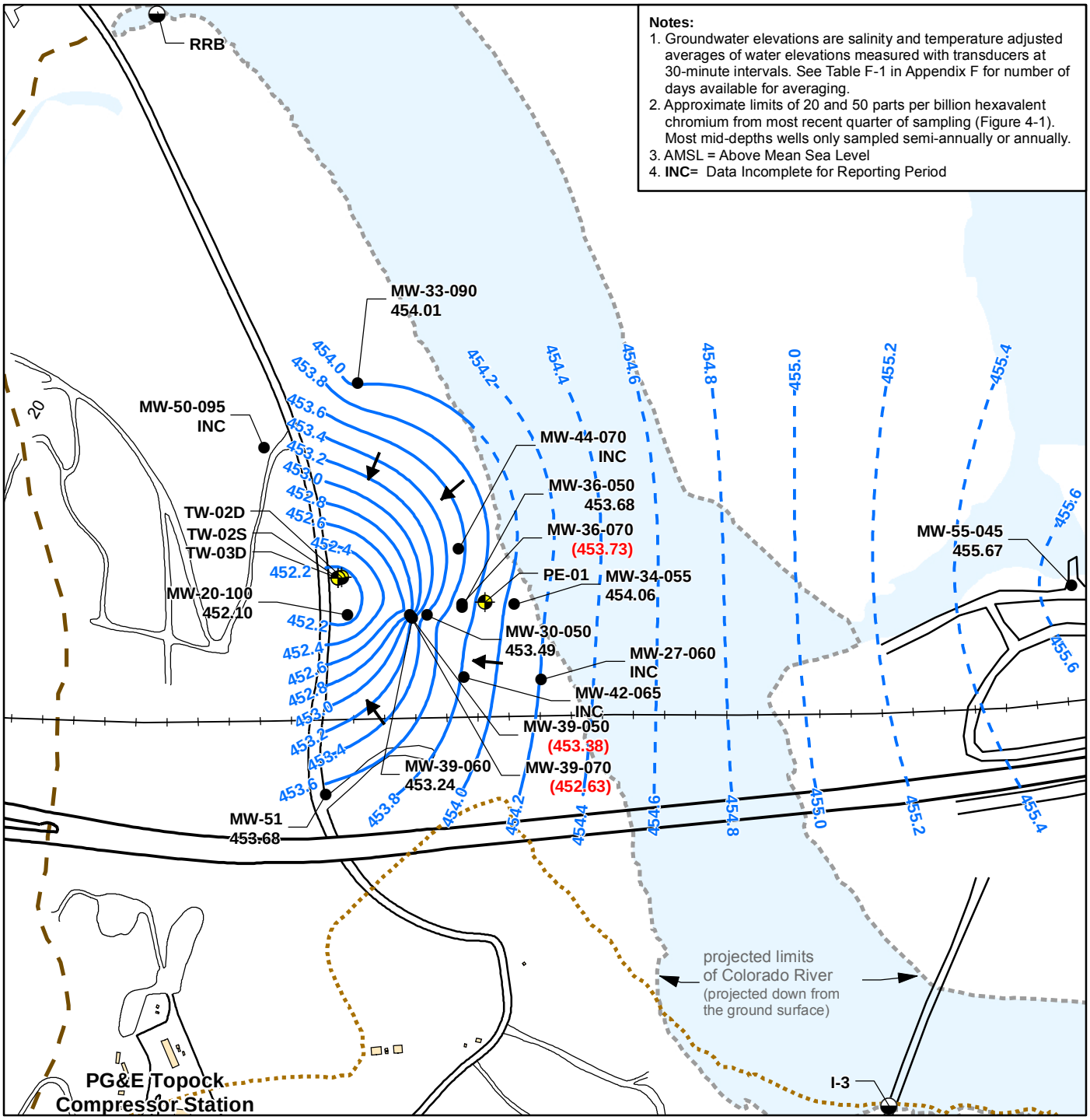
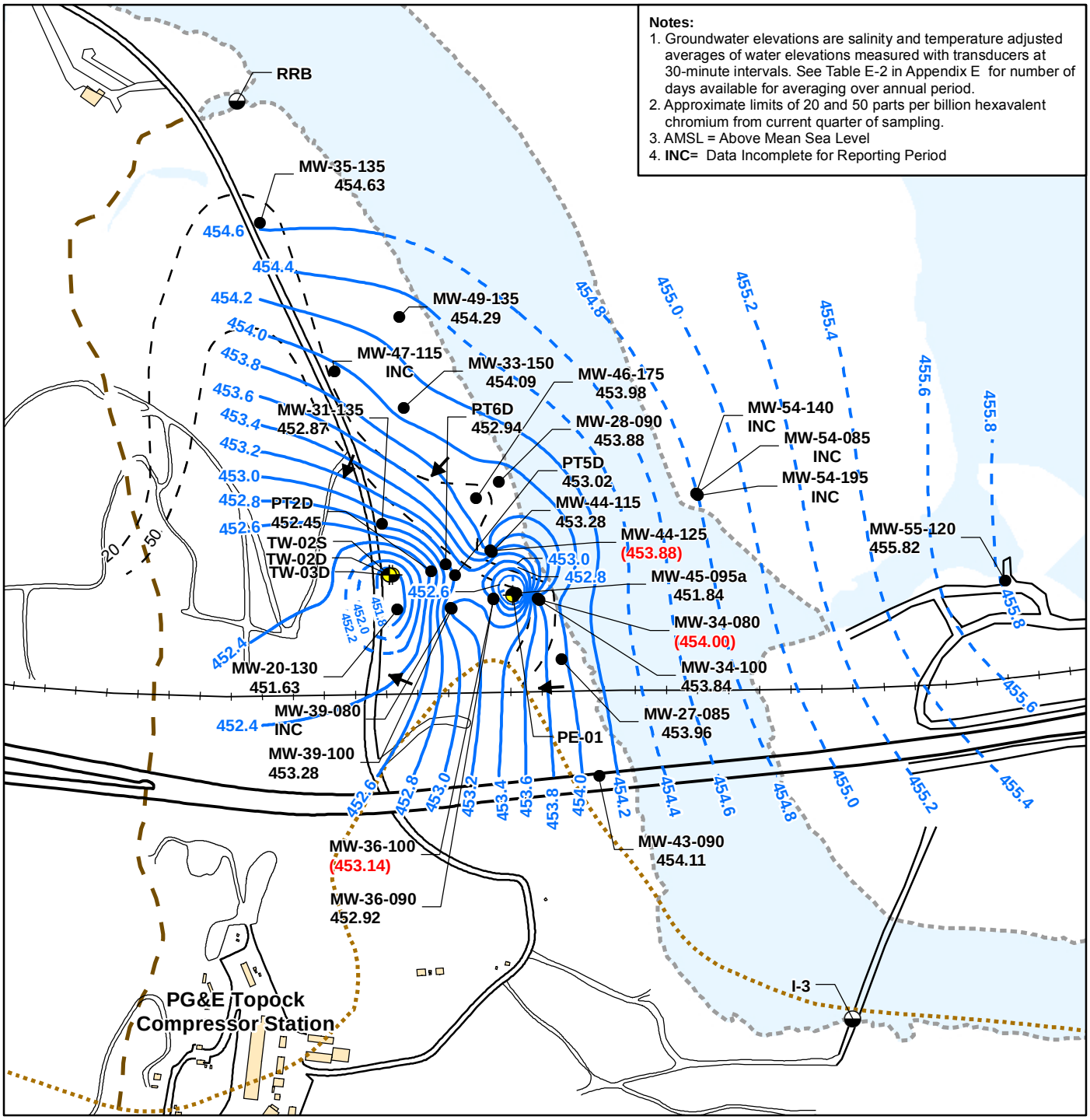


FIGURE 4-4b
AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



LEGEND

- Monitoring Well
- River Station
- Extraction Well
- Bedrock Contact at 396 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour (see note 2)

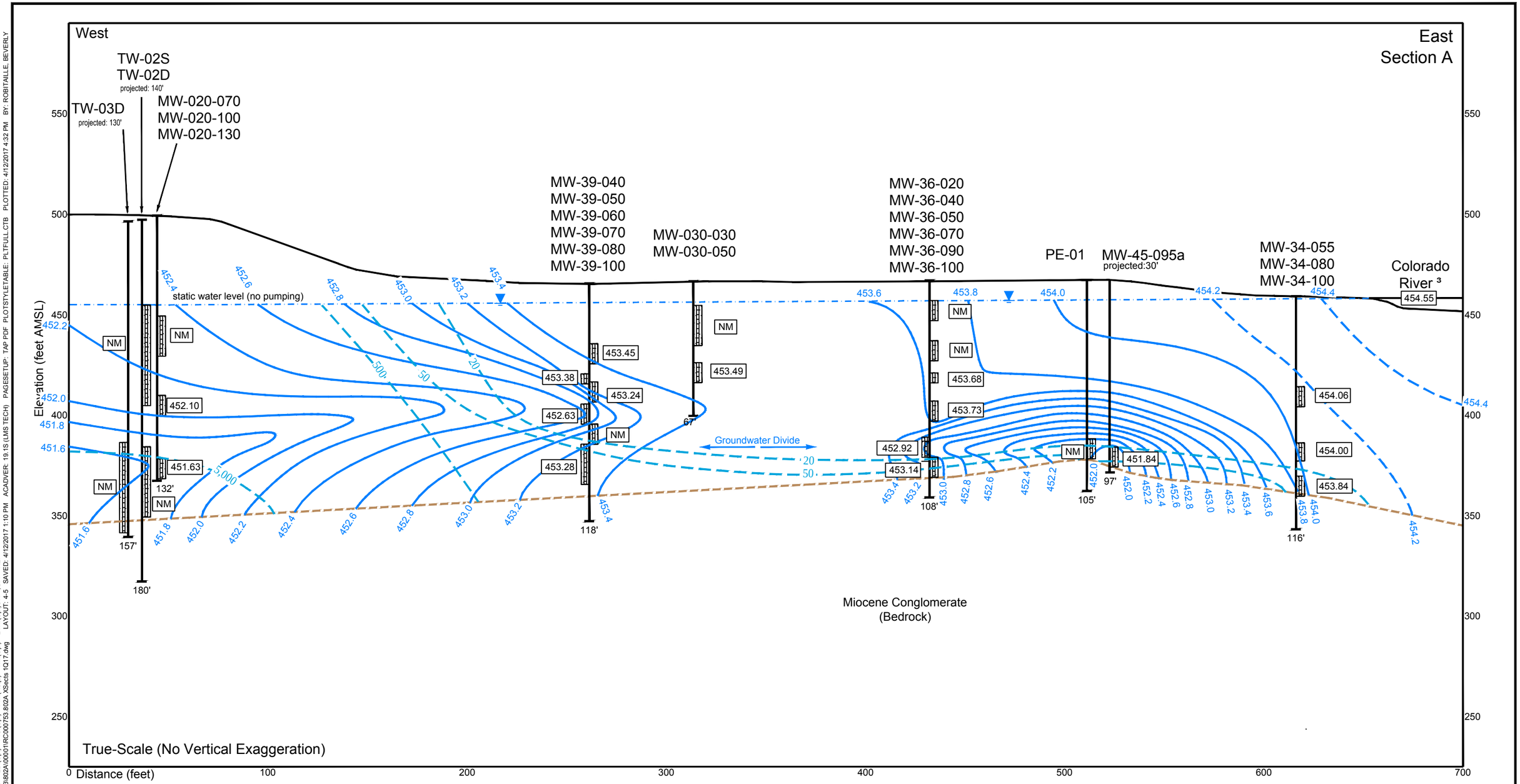
0 300 600
Feet

N

MW-36-090 — Gauging Location
452.92 — Average Groundwater Elevation (ft AMSL)
(453.14) — Elevation in red parentheses not used for contouring

FIGURE 4-4c
AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



Notes:

1. Results show average groundwater elevations for January 2017 through March 2017 measured with transducers at 30-minute intervals.
2. Groundwater elevations adjusted for salinity and temperature.
3. Colorado River elevation shown as interpolated annual average from I-3 gauge.
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

Legend

MW-030-050
Inferred water table
well screen
453.38
boring depth (feet)
67'

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

453.8
Groundwater head contour

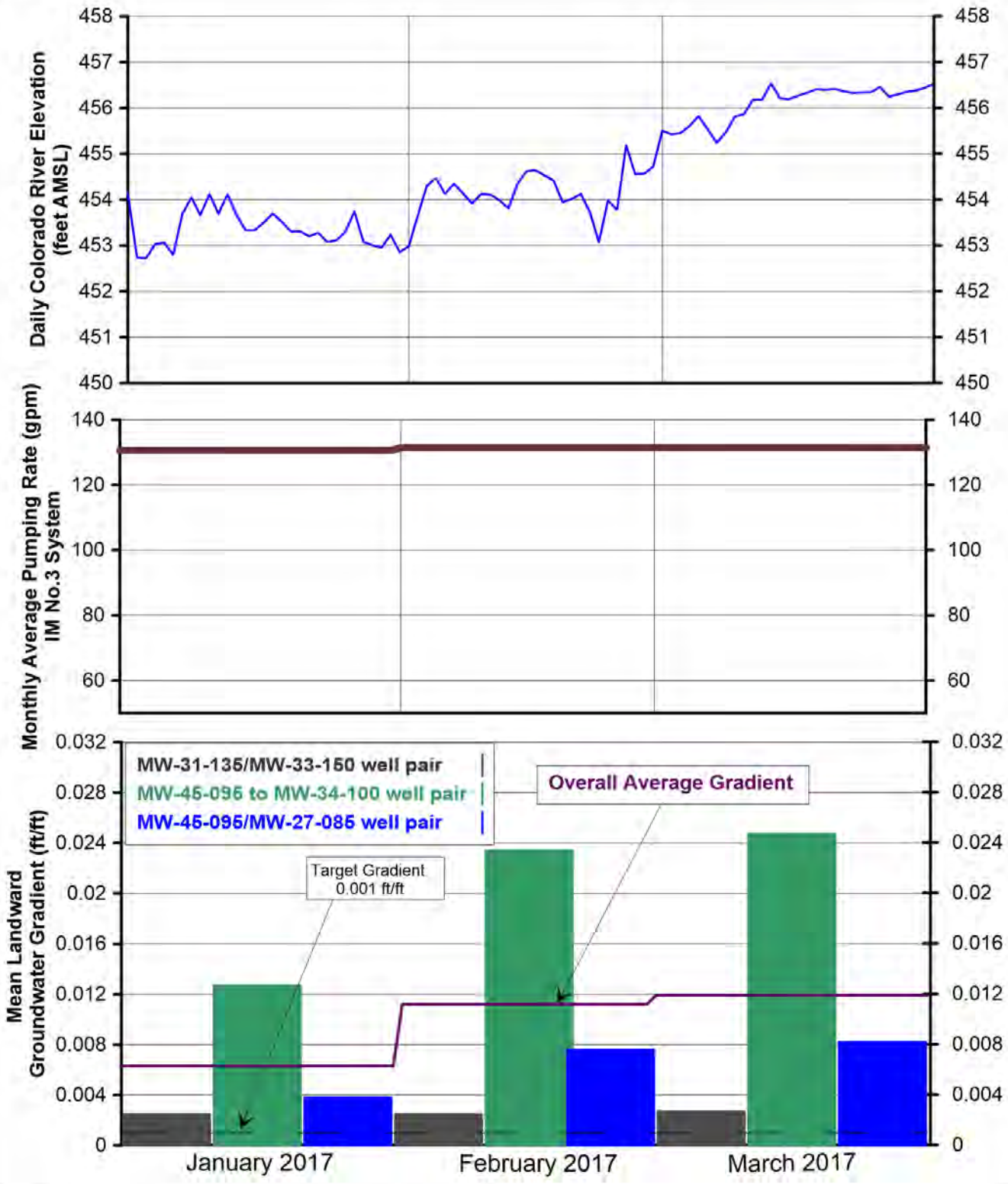
453.8
Inferred groundwater head contour

Interpreted groundwater flow direction

Average groundwater head (ft AMSL)

FIGURE 4-5
AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A, FIRST QUARTER 2017
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

1. For IM pumping, the target landward gradient for well pairs is 0.001 feet/foot.
2. Refer to Table 4-1 and Section 4.4 for discussion of pumping data.
3. Pumping rate plotted is the combined rate of extraction wells TW-3D and PE-1 in operation each month.
4. Refer to Table 4-3 and Section 4.5 for discussion of gradient data.
5. AMSL = above mean sea level.
6. ft/ft = feet per feet
7. gpm = gallons per minute

FIGURE 4-6
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION, AND PUMPING RATE, FIRST QUARTER 2017

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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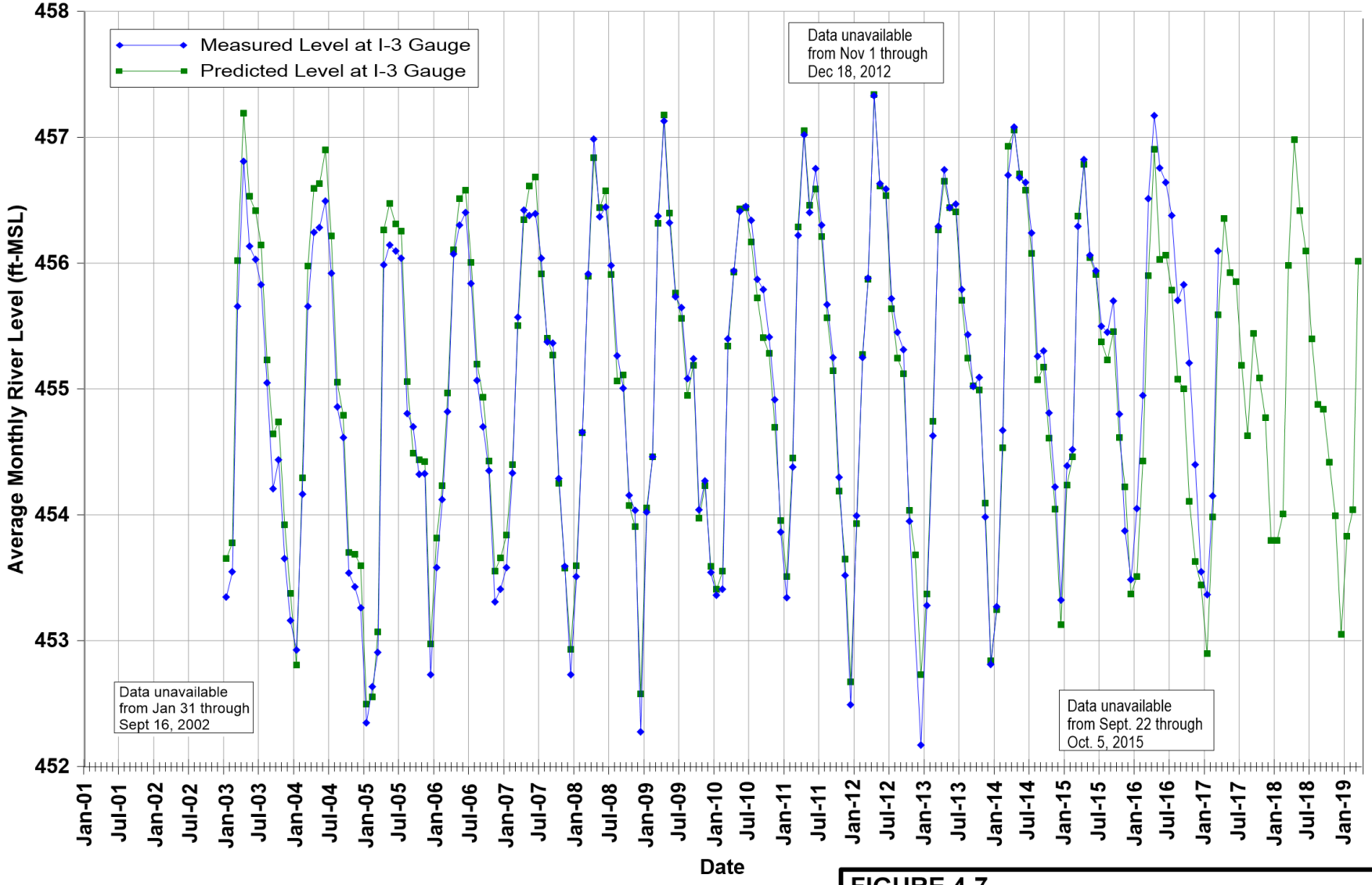

Note:
Projected river level for each month in the past is calculated based on the preceding months USBR projections of Davis Dam release and stage in Lake Havasu. Future projections of river level at I-3 are based upon USBR projections presented in the April 24-Month Study (Report dated April 17, 2017). These data are reported monthly by the US Department of Interior, at http://www.usbr.gov/lc/region/g4000/24mo.pdf

ft-MSL = feet mean sea level

FIGURE 4-7
PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION

FIRST QUARTER 2017 INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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APPENDIX A

Well Inspection and Maintenance Log, First Quarter 2017

Table A-1
Well Inspection Log, First Quarter 2017
First Quarter 2017 and Annual 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 this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
CW-01D	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-01M	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-02D	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-02M	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-03D	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-03M	10/18/2016	No	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-04D	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
CW-04M	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-01D	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-01M	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-01S	10/18/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-02D	10/20/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-02M	10/20/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-02S	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-05D	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-05M	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-05S	10/19/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
C-BNS	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR3-D	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR4-D	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-R22A-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-R27-D	11/29/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-TAZ-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-TAZ-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
MW-09	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-10	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	--	Yes	Yes	--	Yes	Yes				
MW-11	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-12	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-13	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-14	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-15	12/12/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-18	12/08/2016	Yes	No	Yes	--	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-19	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-070	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-100	12/09/2016	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-130	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-21	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-22	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-23-060	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-23-080	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-24A	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-24B	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-24BR	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-25	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-26	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-27-020	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-27-060	12/06/2016	Yes	--	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-27-085	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-28-025	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-28-090	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-29	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-30-030	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-30-050	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-31-060	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-31-135	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-020	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-035	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-035	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-33-040	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				

Table A-2
Well Inspection Log, First Quarter 2017
First Quarter 2017 and Annual 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 this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
MW-33-090	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-33-150	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	No	No	Yes	Yes				
MW-33-210	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-055	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-080	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-100	10/06/2016	Yes	No	Yes	No	Yes	NA	NA	No	Yes	Yes	No	Yes	Yes				
MW-34-100	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-35-060	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-35-135	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-020	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-040	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-050	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-090	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-37D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-37S	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38D	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38S	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-040	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-050	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-060	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-080	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-41D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-41M	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-41S	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-030	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-055	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-065	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-025	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-075	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-090	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-115	10/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	NA	Yes	Yes				
MW-44-115	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-125	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-46-175	10/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-46-175	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-46-205	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-47-055	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-47-115	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-48	12/12/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-135	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-275	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-365	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-50-095	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-50-200	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-51	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-52D	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-52M	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-52S	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-53D	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-53M	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-54-085	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				

Table A-2
Well Inspection Log, First Quarter 2017
First Quarter 2017 and Annual 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 this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
MW-55-120	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-56D	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-56M	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				

MW-56S	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-57-050	12/13/2016	Yes	No	No	Yes	No	Yes	Yes	No	NA	Yes	No	Yes	Yes				
MW-57-070	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	Yes	No	Yes	Yes				
MW-57-185	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	Yes	No	Yes	Yes				
MW-58-065	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-58BR	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-59-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-60-125	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-60BR-245	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-61-110	12/13/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-62-065	12/13/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-62-110	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	NA	No	Yes	Yes				
MW-62-190	12/13/2016	NA	No	No	No	Yes	NA	Yes	No	NA	NA	No	Yes	Yes				
MW-63-065	12/13/2016	Yes	No	NA	No	No	NA	Yes	No	No	Yes	No	Yes	Yes				
MW-64BR	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-65-160	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-65-225	12/06/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66-165	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66-230	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66BR-270	12/05/2016	Yes	Yes	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-67-185	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-67-225	12/05/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-67-260	12/05/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68-180	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68-240	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68BR-280	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-69-195	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	NA	Yes	No	Yes	Yes				
MW-70-105	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-70BR-225	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-71-035	12/12/2016	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	Yes	Yes				
MW-72-080	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-72BR-200	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-73-080	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-74-240	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
OW-03D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-03M	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	--	Yes	No	Yes	Yes				
OW-03S	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
PE-01	10/06/2016	NA	NA	NA	NA	Yes	NA	Yes	NA	Yes	NA	NA	Yes	Yes				
PE-01	11/02/2016	NA	NA	NA	No	Yes	NA	NA	NA	NA	NA	NA	Yes	No				
PE-01	12/06/2016	NA	NA	Yes	No	Yes	NA	Yes	No	NA	NA	NA	Yes	No				
PGE-07BR	12/06/2016	Yes	No	Yes	No	Yes	Yes	--	No	Yes	Yes	No	Yes	Yes				
PGE-08	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
PM-03	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	NA	No	Yes	Yes				
PM-04	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	NA	No	--	Yes				
R-19	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
R-28	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
R63	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
RMP-AB1	11/29/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
RMP-AB2	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
RMP-AB3	11/30/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
RRB	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
SW1	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
SW2	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				

Table A-2
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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 this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
TW-02D	12/13/2016	NA	No	NA	No	Yes	NA	NA	No	NA	NA	No	Yes	Yes				
TW-02S	12/13/2016	NA	No	NA	No	Yes	NA	Yes	No	NA	NA	No	Yes	Yes				
TW-03D	10/06/2016	NA	NA	Yes	NA	Yes	NA	Yes	NA	Yes	NA	NA	Yes	Yes				
TW-03D	11/02/2016	NA	NA	NA	No	Yes	NA	NA	NA	NA	NA	NA	Yes	No				
TW-03D	12/06/2016	NA	NA	NA	No	Yes	NA	NA	No	NA	NA	NA	Yes	No				
C-CON-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-CON-S	11/30/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-I-3-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-I-3-S	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-MAR-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-MAR-S	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR1-D	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR1-S	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR3-S	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-NR4-S	12/02/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-R22A-S	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-R27-S	12/01/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
C-TAZ-S	11/29/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
MW-38S-SMT	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38D-SMT	12/07/2016	Yes	No	--	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-54-140	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-54-195	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-55-045	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				

APPENDIX B

Lab Reports, First Quarter 2017 (Provided on CD Only with Hard Copy Submittal)

APPENDIX C

Other Monitoring Results

Table C-1

Arsenic Results in Monitoring Wells, June 2015 through March 2017

First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-09	SA	10/7/2015		LF	1.6
MW-09	SA	12/1/2015		LF	1.6
MW-09	SA	5/3/2016		LF	1.8
MW-09	SA	12/7/2016		LF	1.8
MW-09	SA	2/9/2017		LF	1.7
MW-10	SA	10/7/2015		LF	3.4
MW-10	SA	12/1/2015		LF	2.9
MW-10	SA	12/7/2016		LF	3
MW-11	SA	10/7/2015		LF	1.4
MW-11	SA	12/2/2015		LF	1.7
MW-11	SA	12/2/2015	FD	LF	1.5
MW-11	SA	5/3/2016		LF	1.5
MW-11	SA	5/3/2016	FD	LF	1.5
MW-11	SA	12/7/2016		LF	1.5
MW-11	SA	12/7/2016	FD	LF	1.4
MW-11	SA	2/9/2017		LF	1.4
MW-12	SA	12/2/2015		LF	36
MW-12	SA	12/7/2016		3V	41
MW-13	SA	12/7/2015		LF	1.9
MW-13	SA	12/8/2016		LF	1.4
MW-14	SA	12/7/2015		LF	0.87
MW-14	SA	4/27/2016		LF	0.86
MW-14	SA	12/8/2016		LF	0.91
MW-19	SA	12/8/2016		LF	0.96
MW-20-130	DA	12/8/2015		LF	4.5
MW-20-130	DA	12/8/2015	FD	LF	4.5
MW-20-130	DA	4/27/2016		LF	4.6
MW-20-130	DA	12/9/2016		LF	5.2
MW-20-130	DA	12/9/2016	FD	LF	5.3
MW-22	SA	12/3/2015		LF	15
MW-22	SA	4/25/2016		LF	13
MW-22	SA	12/6/2016		LF	16
MW-23-060	BR	12/3/2015		3V	4.2
MW-23-060	BR	5/2/2016		3V	4.1
MW-23-060	BR	12/14/2016		LF	5.7
MW-23-080	BR	12/3/2015		3V	4.1
MW-23-080	BR	5/2/2016		3V	4
MW-23-080	BR	12/14/2016		LF	5.1
MW-23-080	BR	12/14/2016	FD	LF	4.9
MW-24A	SA	12/1/2015		LF	0.15

Table C-1

Arsenic Results in Monitoring Wells, June 2015 through March 2017

First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-24A	SA	5/3/2016		LF	ND (0.1)
MW-24A	SA	12/6/2016		LF	0.13
MW-24B	DA	12/1/2015		LF	2.8
MW-24B	DA	5/3/2016		LF	2.8
MW-24B	DA	5/3/2016	FD	LF	3.1
MW-24B	DA	12/6/2016		LF	1.4
MW-24BR	BR	12/2/2015		3V	0.37
MW-24BR	BR	12/7/2016		3V	ND (0.5)
MW-25	SA	12/7/2015		LF	1.2
MW-25	SA	4/27/2016		LF	1.1
MW-25	SA	12/8/2016		LF	1.4
MW-26	SA	12/8/2015		LF	1.9
MW-26	SA	12/8/2015	FD	LF	1.8
MW-26	SA	4/28/2016		LF	2
MW-26	SA	12/8/2016		LF	1.9
MW-26	SA	12/8/2016	FD	LF	1.8
MW-27-020	SA	12/3/2015		LF	1.5
MW-27-020	SA	12/6/2016		LF	1.3
MW-27-060	MA	12/3/2015		LF	12
MW-27-060	MA	12/3/2015	FD	LF	13
MW-27-060	MA	12/6/2016		LF	8.3
MW-27-060	MA	12/6/2016	FD	LF	8
MW-27-085	DA	12/3/2015		LF	1.4
MW-27-085	DA	4/25/2016		LF	1.3
MW-27-085	DA	4/25/2016	FD	LF	1.3
MW-27-085	DA	12/6/2016		LF	1.5
MW-28-025	SA	12/2/2015		LF	0.81
MW-28-025	SA	4/26/2016		LF	1
MW-28-025	SA	12/8/2016		LF	0.84
MW-28-090	DA	12/2/2015		LF	2.1
MW-28-090	DA	4/26/2016		LF	2.2
MW-28-090	DA	12/8/2016		LF	2.5
MW-29	SA	12/1/2015		LF	15
MW-29	SA	4/26/2016		LF	13 J
MW-29	SA	12/8/2016		LF	12
MW-30-030	SA	12/3/2015		LF	2.5
MW-30-030	SA	12/6/2016		LF	2.7
MW-30-050	MA	12/3/2015		LF	2.9
MW-30-050	MA	12/3/2015	FD	LF	3
MW-30-050	MA	12/6/2016		LF	2.9

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-31-060	SA	12/7/2015		LF	1.2
MW-31-060	SA	4/27/2016		LF	1.1
MW-31-060	SA	12/9/2016		LF	1.2
MW-31-060	SA	12/9/2016	FD	LF	1.2
MW-31-135	DA	12/7/2015		LF	3.4
MW-31-135	DA	12/9/2016		LF	3.9
MW-32-020	SA	12/3/2015		LF	3.9
MW-32-020	SA	12/3/2015	FD	LF	4.3
MW-32-020	SA	12/6/2016		LF	4.9
MW-32-035	SA	12/3/2015		LF	17
MW-32-035	SA	4/25/2016		LF	27
MW-32-035	SA	12/6/2016		LF	13
MW-33-040	SA	12/1/2015		LF	10
MW-33-040	SA	4/26/2016		LF	12
MW-33-040	SA	4/26/2016	FD	LF	12
MW-33-040	SA	12/8/2016		LF	11
MW-33-090	MA	12/1/2015		LF	1.1
MW-33-090	MA	4/26/2016		3V	1
MW-33-090	MA	12/8/2016		LF	1.2
MW-33-150	DA	12/1/2015		LF	1.1
MW-33-150	DA	4/26/2016		LF	1.3
MW-33-150	DA	12/8/2016		LF	1.8
MW-33-210	DA	12/1/2015		LF	1
MW-33-210	DA	4/26/2016		LF	1
MW-33-210	DA	12/8/2016		3V	1.2
MW-34-055	MA	12/3/2015		LF	2.4
MW-34-055	MA	12/6/2016		LF	2.4
MW-34-080	DA	12/3/2015		LF	1.3
MW-34-080	DA	4/26/2016		LF	1.3
MW-34-080	DA	12/6/2016		LF	1.3
MW-34-080	DA	12/6/2016	FD	LF	1.3
MW-34-100	DA	10/6/2015		LF	1.4
MW-34-100	DA	12/3/2015		LF	1.4
MW-34-100	DA	12/3/2015	FD	LF	1.5
MW-34-100	DA	2/25/2016		LF	1.9
MW-34-100	DA	4/26/2016		LF	1.1
MW-34-100	DA	12/6/2016		LF	1.2
MW-34-100	DA	2/6/2017		LF	1.2
MW-34-100	DA	2/6/2017	FD	0	1.4
MW-35-060	SA	12/7/2015		LF	1

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-35-060	SA	4/27/2016		LF	0.99
MW-35-060	SA	4/27/2016	FD	LF	1
MW-35-060	SA	12/9/2016		LF	1.1
MW-35-135	DA	12/7/2015		3V	0.87
MW-35-135	DA	4/27/2016		LF	0.81
MW-35-135	DA	12/9/2016		LF	0.95
MW-35-135	DA	12/9/2016	FD	LF	0.91
MW-36-020	SA	12/8/2015		LF	1.8
MW-36-020	SA	12/7/2016		LF	1.9
MW-36-040	SA	12/8/2015		LF	4.6
MW-36-040	SA	12/7/2016		LF	5.6
MW-36-050	MA	12/8/2015		LF	3.8
MW-36-050	MA	12/7/2016		LF	4.4
MW-36-070	MA	12/8/2015		LF	2.9
MW-36-070	MA	12/7/2016		LF	3.2
MW-36-090	DA	12/8/2015		LF	21
MW-36-090	DA	4/26/2016		LF	7.2
MW-36-090	DA	12/7/2016		LF	18
MW-36-100	DA	12/8/2015		LF	8.5
MW-36-100	DA	4/26/2016		LF	6.5
MW-36-100	DA	12/7/2016		LF	6.6
MW-37D	DA	12/8/2016		LF	4.4
MW-37S	MA	12/8/2015		LF	1.7
MW-37S	MA	12/8/2016		LF	1.9
MW-38D	DA	12/1/2015		3V	7.7
MW-38D	DA	12/1/2015		LF	7.3
MW-38D	DA	5/3/2016		3V	7.6
MW-38D	DA	5/3/2016		LF	7.9
MW-38D	DA	12/7/2016		3V	8.2
MW-38D	DA	12/7/2016		LF	8.1
MW-38S	SA	9/28/2015		3V	14
MW-38S	SA	9/28/2015		LF	14
MW-38S	SA	12/1/2015		3V	13
MW-38S	SA	12/1/2015		LF	14
MW-38S	SA	2/24/2016		3V	14
MW-38S	SA	2/24/2016		LF	14
MW-38S	SA	5/3/2016		3V	11
MW-38S	SA	5/3/2016		LF	13
MW-38S	SA	9/29/2016		3V	9.8
MW-38S	SA	9/29/2016		LF	11

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Arsenic Results in Monitoring Wells, June 2015 through March 2017

First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-38S	SA	12/7/2016		3V	9.6
MW-38S	SA	12/7/2016		LF	9.9
MW-38S	SA	12/7/2016	FD	3V	9.9
MW-38S	SA	2/9/2017		3V	8.4
MW-38S	SA	2/9/2017		LF	8.6
MW-39-040	SA	12/4/2015		LF	18
MW-39-040	SA	12/7/2016		LF	19
MW-39-050	MA	12/4/2015		LF	2.4
MW-39-050	MA	12/7/2016		LF	2.3
MW-39-060	MA	12/4/2015		LF	4.4
MW-39-060	MA	12/4/2015	FD	LF	4.2
MW-39-060	MA	12/7/2016		LF	4.7
MW-39-100	DA	12/4/2015		LF	3
MW-39-100	DA	4/26/2016		LF	2.5
MW-39-100	DA	4/26/2016	FD	LF	2.6
MW-39-100	DA	12/7/2016		LF	2.3
MW-40D	DA	12/7/2015		H	4.2
MW-40D	DA	12/7/2015		LF	3.9
MW-40D	DA	12/7/2015	FD	H	3.9
MW-40D	DA	5/4/2016		H	4.4
MW-40D	DA	5/4/2016		LF	4.1
MW-40S	SA	12/7/2015		H	1.7
MW-40S	SA	12/7/2015		LF	1.3
MW-41D	DA	12/7/2015		LF	1.7
MW-41D	DA	4/27/2016		LF	1.9
MW-41D	DA	12/8/2016		LF	2.9
MW-41M	DA	12/7/2015		LF	2
MW-41M	DA	12/7/2015	FD	LF	2.2
MW-41M	DA	12/8/2016		LF	2.2
MW-41S	SA	12/7/2015		LF	1.6
MW-41S	SA	12/8/2016		LF	1.7
MW-42-030	SA	12/3/2015		LF	3.4
MW-42-055	MA	12/3/2015		LF	27
MW-42-055	MA	4/26/2016		LF	28
MW-42-055	MA	12/6/2016		LF	29
MW-42-065	MA	12/3/2015		LF	4
MW-42-065	MA	4/26/2016		LF	5.1
MW-42-065	MA	12/6/2016		LF	5.4
MW-42-065	MA	12/6/2016	FD	LF	5.5
MW-43-025	SA	12/8/2015		LF	17

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-43-025	SA	12/7/2016		LF	25
MW-43-075	DA	12/2/2015		LF	13
MW-43-075	DA	12/9/2016		LF	13
MW-43-090	DA	12/2/2015		LF	1.2
MW-43-090	DA	12/9/2016		LF	2.2
MW-44-070	MA	12/4/2015		LF	6.6
MW-44-070	MA	4/26/2016		LF	4.1
MW-44-070	MA	12/7/2016		LF	5.3
MW-44-115	DA	10/6/2015		LF	5.9
MW-44-115	DA	10/6/2015	FD	LF	5.9
MW-44-115	DA	12/4/2015		LF	5.6
MW-44-115	DA	2/25/2016		LF	6.1
MW-44-115	DA	2/25/2016	FD	LF	5.5
MW-44-115	DA	4/26/2016		LF	6
MW-44-115	DA	12/7/2016		LF	6.6
MW-44-115	DA	2/6/2017		LF	5.2
MW-44-125	DA	12/4/2015		LF	4.3
MW-44-125	DA	12/4/2015	FD	LF	4.1
MW-44-125	DA	4/26/2016		LF	4
MW-44-125	DA	4/26/2016	FD	LF	4
MW-44-125	DA	12/7/2016		LF	5.1
MW-44-125	DA	12/7/2016	FD	LF	5
MW-47-055	SA	12/2/2015		LF	0.74
MW-47-055	SA	4/26/2016		3V	1.1
MW-47-055	SA	12/8/2016		LF	1.3
MW-49-135	DA	12/1/2015		3V	1.9
MW-49-135	DA	12/8/2016		3V	2.2
MW-49-135	DA	12/8/2016	FD	3V	2
MW-49-275	DA	12/8/2016		LF	2.8
MW-49-365	DA	12/1/2015		LF	1.6
MW-49-365	DA	12/8/2016		LF	3.6
MW-50-200	DA	12/7/2015		LF	3.2
MW-51	MA	12/8/2015		LF	3.8
MW-51	MA	4/27/2016		LF	3.4
MW-51	MA	12/9/2016		LF	4
MW-52D	DA	12/2/2015		3V	2.7
MW-52D	DA	4/25/2016		LF	2.3
MW-52D	DA	12/5/2016		LF	2.5
MW-52M	DA	12/2/2015		3V	0.81
MW-52M	DA	4/25/2016		LF	0.92

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-52M	DA	12/5/2016		LF	0.74
MW-52S	MA	12/2/2015		3V	0.37
MW-52S	MA	4/25/2016		LF	0.38
MW-52S	MA	12/5/2016		LF	0.34
MW-52S	MA	12/5/2016	FD	LF	0.23
MW-53D	DA	12/2/2015		3V	2.6
MW-53D	DA	4/27/2016		LF	2.9 J
MW-53D	DA	12/5/2016		LF	0.68
MW-53M	DA	12/2/2015		3V	0.51
MW-53M	DA	4/27/2016		LF	ND (0.5)
MW-53M	DA	12/5/2016		LF	0.47
MW-54-085	DA	12/9/2015		LF	2.5
MW-54-085	DA	12/9/2015	(a)	LF	ND (5)
MW-54-085	DA	12/9/2015	FD	LF	2.4
MW-54-085	DA	4/29/2016	(a)	LF	ND (5)
MW-54-085	DA	12/15/2016	(a)	3V	3.16
MW-54-140	DA	12/9/2015		LF	2.4
MW-54-140	DA	12/9/2015	(a)	LF	ND (5)
MW-54-140	DA	4/29/2016	(a)	LF	ND (5)
MW-54-140	DA	12/15/2016	(a)	3V	2.98
MW-54-195	SA	12/9/2015		Tap	0.94
MW-54-195	BR	12/9/2015	(a)	Tap	ND (5)
MW-54-195	DA	4/29/2016		LF	ND (5)
MW-54-195	DA	12/15/2016		LF	1.17
MW-54-195	DA	12/15/2016		LF	1.35
MW-55-120	DA	2/24/2016		LF	6.4
MW-55-120	DA	2/24/2016		LF	5.8
MW-57-070	BR	12/4/2015		3V	1.4
MW-57-070	BR	4/28/2016		3V	1.4
MW-57-070	BR	12/13/2016		LF	1.5
MW-57-185	BR	12/4/2015		3V	13
MW-57-185	BR	4/28/2016		3V	10
MW-57-185	BR	12/13/2016		3V	17
MW-58BR	BR	9/30/2015		LF	2.9
MW-58BR	BR	12/7/2015		LF	1.5
MW-58BR	BR	2/24/2016		LF	1.5
MW-58BR	BR	4/28/2016		LF	1.4
MW-58BR	BR	4/28/2016		LF	1.3
MW-58BR	---	9/27/2016		LF	1.6
MW-58BR	---	12/13/2016		LF	1.6

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-58BR	BR	2/7/2017	LF	1.4
MW-59-100	SA	12/3/2015	LF	1.9
MW-59-100	SA	12/3/2015	LF	2
MW-59-100	SA	4/29/2016	LF	2.2
MW-59-100	SA	12/7/2016	LF	2.3
MW-59-100	SA	12/7/2016	LF	2.2
MW-60-125	BR	12/4/2015	3V	1.3
MW-60-125	BR	4/28/2016	3V	1.6
MW-60-125	BR	12/14/2016	LF	1.5
MW-60BR-245	BR	9/29/2015	3V	5.9
MW-60BR-245	BR	12/4/2015	3V	7
MW-60BR-245	BR	2/23/2016	3V	6.9
MW-60BR-245	BR	4/29/2016	G	6.8
MW-60BR-245	BR	9/29/2016	3V	7.7
MW-60BR-245	BR	12/14/2016	3V	7.1
MW-60BR-245	BR	2/8/2017	3V	6.4
MW-61-110	BR	12/4/2015	3V	3.3
MW-61-110	BR	4/29/2016	LF	3.3
MW-61-110	BR	12/13/2016	3V	3.4
MW-62-065	BR	10/7/2015	3V	1.3
MW-62-065	BR	12/3/2015	3V	1.3
MW-62-065	BR	2/23/2016	3V	1.2
MW-62-065	BR	5/2/2016	3V	1.5
MW-62-065	BR	9/28/2016	LF	1.8
MW-62-065	BR	12/13/2016	LF	1.4
MW-62-065	BR	2/9/2017	3V	1.3
MW-62-110	BR	10/1/2015	Flute	6.8
MW-62-110	BR	12/4/2015	3V	7.7
MW-62-110	BR	2/24/2016	3V	4.9
MW-62-110	BR	5/3/2016	Tap	6.2
MW-62-110	BR	9/28/2016	Flute	5
MW-62-110	BR	12/14/2016	G	13
MW-62-110	BR	2/8/2017	3V	7.2
MW-62-190	BR	12/4/2015	3V	3.9
MW-62-190	BR	5/3/2016	Tap	4.7
MW-62-190	BR	12/14/2016	G	3.8
MW-63-065	BR	9/28/2015	3V	1.3
MW-63-065	BR	12/4/2015	3V	1.9
MW-63-065	BR	2/23/2016	3V	1.7
MW-63-065	BR	4/28/2016	3V	1.6

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-63-065	BR	4/28/2016	3V	1.5
MW-63-065	BR	9/30/2016	LF	1.5
MW-63-065	BR	9/30/2016	LF	1.4
MW-63-065	BR	12/13/2016	LF	1.6
MW-63-065	BR	2/9/2017	3V	1.4
MW-64BR	BR	10/1/2015	LF	3.2
MW-64BR	BR	12/7/2015	LF	3.3
MW-64BR	BR	2/22/2016	LF	4.1
MW-64BR	BR	5/2/2016	LF	4.2
MW-64BR	BR	9/28/2016	LF	4
MW-64BR	BR	12/13/2016	LF	4.2
MW-64BR	BR	12/13/2016	LF	4.7
MW-64BR	BR	2/7/2017	LF	3.8
MW-65-160	SA	9/30/2015	LF	0.61
MW-65-160	SA	12/2/2015	LF	0.73
MW-65-160	SA	2/24/2016	LF	0.54
MW-65-160	SA	5/3/2016	LF	0.54
MW-65-160	SA	9/29/2016	LF	0.54
MW-65-160	SA	12/6/2016	LF	0.8
MW-65-160	SA	2/8/2017	LF	0.6
MW-65-225	DA	9/30/2015	LF	2.5
MW-65-225	DA	12/2/2015	LF	2.6
MW-65-225	DA	2/24/2016	LF	2.2
MW-65-225	DA	5/3/2016	LF	2.8
MW-65-225	DA	9/29/2016	LF	4.1
MW-65-225	DA	12/6/2016	LF	3
MW-65-225	DA	2/8/2017	LF	2.1
MW-66-165	SA	12/2/2015	LF	0.9
MW-66-165	SA	4/25/2016	LF	1.1
MW-66-165	SA	12/5/2016	LF	0.96
MW-66-230	DA	12/3/2015	LF	4.4
MW-66-230	DA	4/25/2016	LF	4.3
MW-66-230	DA	12/5/2016	LF	4.7
MW-66BR-270	BR	12/9/2015	3V	ND (0.5)
MW-66BR-270	BR	5/4/2016	3V	ND (0.1)
MW-66BR-270	BR	12/15/2016	3V	0.15
MW-67-185	SA	12/2/2015	LF	0.93
MW-67-185	SA	5/3/2016	LF	1.1
MW-67-185	SA	12/5/2016	LF	0.96
MW-67-225	MA	12/2/2015	LF	3.5

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-67-225	MA	5/3/2016	LF	3.6
MW-67-225	MA	5/3/2016	LF	3.7
MW-67-225	MA	12/5/2016	LF	3.6
MW-67-260	DA	12/2/2015	LF	8.9
MW-67-260	DA	5/3/2016	LF	9.3
MW-67-260	DA	12/5/2016	LF	9 J
MW-67-260	DA	12/5/2016	LF	20 J
MW-68-180	SA	9/30/2015	LF	2.5
MW-68-180	SA	9/30/2015	LF	2.4
MW-68-180	SA	12/2/2015	LF	2.7
MW-68-180	SA	2/24/2016	LF	2.7
MW-68-180	SA	5/4/2016	LF	2.8
MW-68-180	SA	9/29/2016	LF	3.1
MW-68-180	SA	12/6/2016	LF	3
MW-68-180	SA	2/8/2017	LF	2.6
MW-68-180	SA	2/8/2017	0	2.4
MW-68-240	DA	12/2/2015	LF	1.5
MW-68-240	DA	5/4/2016	LF	1.5
MW-68-240	DA	12/6/2016	LF	1.8
MW-68BR-280	BR	12/3/2015	LF	1.3
MW-68BR-280	BR	5/4/2016	LF	0.82
MW-68BR-280	BR	12/6/2016	3V	1.2
MW-69-195	BR	10/1/2015	3V	2.3
MW-69-195	BR	12/4/2015	3V	2.3
MW-69-195	BR	2/24/2016	3V	2.4
MW-69-195	BR	2/24/2016	3V	2.3
MW-69-195	BR	4/25/2016	3V	2.3
MW-69-195	BR	9/29/2016	LF	2.5
MW-69-195	BR	12/6/2016	LF	2.7
MW-69-195	BR	2/9/2017	LF	2.2
MW-70-105	BR	12/7/2015	3V	4.2
MW-70-105	BR	4/28/2016	LF	4.8
MW-70-105	BR	12/14/2016	LF	4.1
MW-70BR-225	BR	12/7/2015	3V	1.8
MW-70BR-225	BR	4/28/2016	3V	2
MW-70BR-225	BR	12/14/2016	3V	2
MW-70BR-225	BR	12/14/2016	3V	2.1
MW-71-035	SA	12/4/2015	LF	9.5
MW-71-035	SA	5/3/2016	LF	5.3
MW-71-035	SA	5/3/2016	LF	5.7

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First Quarter 2017 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	Dissolved Arsenic (µg/L)
MW-71-035	SA	12/14/2016	G	4.2
MW-72-080	BR	9/29/2015	3V	12
MW-72-080	BR	12/7/2015	3V	10
MW-72-080	BR	2/23/2016	3V	12
MW-72-080	BR	4/29/2016	3V	10
MW-72-080	BR	9/28/2016	LF	11
MW-72-080	BR	12/12/2016	LF	12
MW-72-080	BR	2/7/2017	3V	11
MW-72BR-200	BR	9/29/2015	3V	16
MW-72BR-200	BR	12/8/2015	3V	15
MW-72BR-200	BR	2/23/2016	3V	16
MW-72BR-200	BR	4/28/2016	3V	16
MW-72BR-200	BR	9/28/2016	3V	16
MW-72BR-200	BR	12/12/2016	3V	17
MW-72BR-200	BR	2/8/2017	3V	15
MW-73-080	BR	9/29/2015	3V	1.3
MW-73-080	BR	12/8/2015	3V	1.7
MW-73-080	BR	2/23/2016	3V	1.5
MW-73-080	BR	4/29/2016	3V	2.1
MW-73-080	BR	9/28/2016	G	2.3
MW-73-080	BR	12/12/2016	LF	1.6
MW-73-080	BR	12/12/2016	LF	1.7
MW-73-080	BR	2/8/2017	3V	1.6
MW-74-240	BR	12/7/2015	3V	14
MW-74-240	BR	4/27/2016	LF	11
MW-74-240	BR	12/8/2016	LF	9.6
PM-03	---	4/5/2016	Tap	1.2
PM-04	---	4/5/2016	Tap	0.43
TW-02D	DA	12/9/2015	Tap	2.4

Notes:

(a) = data were analyzed by an Arizona certified laboratory.
--- = data were either not collected, not available or were rejected
FD = field duplicate sample.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
ND = not detected at listed RL.
UF = unfiltered.
µg/LL = micrograms per liter.

Sample Methods:

Table C-1

Arsenic Results in Monitoring Wells, June 2015 through March 2017

First Quarter 2017 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	Dissolved Arsenic (µg/L)

3V = three volume.
Flute = flexible liner underground technologies sampling system.
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump.
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.
MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

The California primary drinking water standard maximum contaminant level (MCL) for Arsenic is 10 µg/L.
The Background Study Upper Tolerance Limit for Arsenic at the site is 24.3 ug/L.

Table C-2

Additional Analytes from Wells in Bat Cave Wash, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

							Dissolved Metals (µg/L)				
Location ID	**Sample Date**	**Chloride (mg/L)**	**Bromide (mg/L)**	**Sulfate (mg/L)**	**Total Alkalinity (mg/L)**	**Total Dissolved Solids (mg/L)**	**Calcium**	**Magnesium**	**Iron**	**Sodium**	**Boron**
MW-09	2/9/2017	720	0.6	250	140	1,700	110,000	28,000	ND (20)	440,000	760
MW-10	2/9/2017	610	0.86	260	130	1,600	120,000	18,000	ND (20)	390,000	870
MW-11	2/9/2017	530	0.63	190	98	1,300	120,000	19,000	ND (20)	290,000	500

Notes:

--- = data were either not collected, not available or were rejected

FD = field duplicate sample.

J = concentration or reporting limit (RL) estimated by laboratory or data validation.

APPENDIX D

Groundwater Monitoring Data for GMP and Interim Measures Monitoring Wells

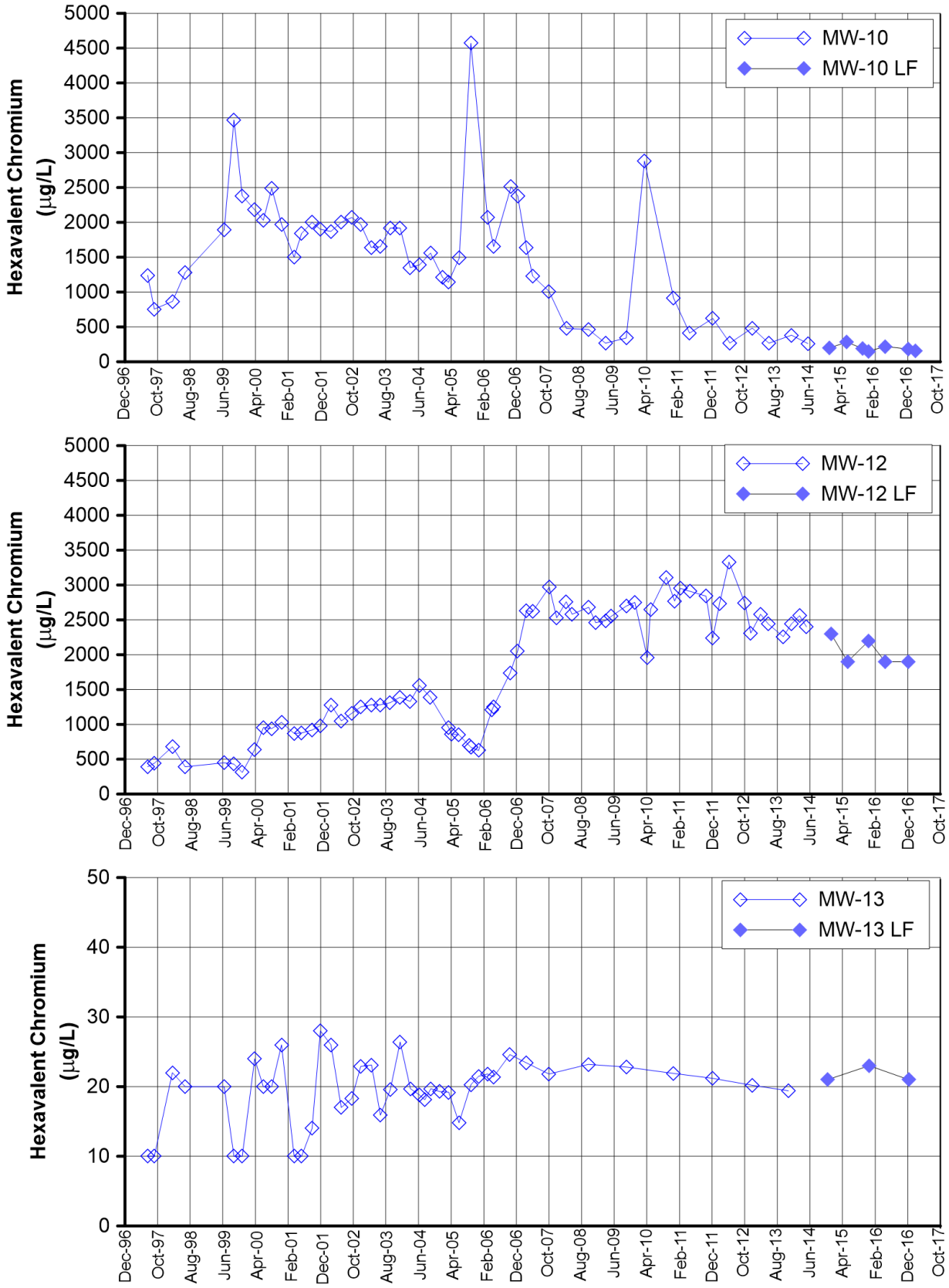
Table D-1
Chromium Concentrations of Wells within Approximately 800 feet of TW-3D Compared to the Maximum Detected Chromium Concentrations from 2014
First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Hexavalent Chromium		Total Dissolved Chromium		
Location ID	Maximum 2014 Hexavalent Chromium Concentration and New Trigger Levels (µg/L)	2017 First Quarter Hexavalent Chromium Result (µg/L)	Maximum 2014 Total Dissolved Chromium Concentration and New Trigger Levels (µg/L)	2017 First Quarter Total Dissolved Chromium Result (µg/L)	Trigger Level Exceeded (Yes if triggered - blank if not)
Shallow Zone Wells					
MW-20-070	2,200	---	2,400	---	
MW-26	2,400	---	2,300	---	
MW-27-020	ND (0.20)	---	ND (1.0)	---	
MW-28-025	ND (0.20)	---	ND (1.0)	---	
MW-30-030	0.21	---	ND (1.0)	---	
MW-31-060	600	---	660	---	
MW-32-020	ND (1.0)	---	ND (5.0)	---	
MW-32-035	ND (1.0)	---	ND (1.0)	---	
MW-33-040	0.28	---	ND (1.0)	---	
MW-36-020	ND (0.20)	---	ND (1.0)	---	
MW-36-040	0.34	---	ND (1.0)	---	
MW-39-040	ND (0.20)	---	ND (1.0)	---	
MW-42-030	0.54	---	ND (1.0)	---	
MW-47-055	16	---	16	---	
Middle Zone Wells					
MW-20-100	2,900	---	2,900	---	
MW-27-060	ND (0.20)	---	ND (1.0)	---	
MW-30-050	ND (0.20)	---	ND (1.0)	---	
MW-33-090	13.3	---	15.5	---	
MW-34-055	ND (0.20)	---	ND (1.0)	---	
MW-36-050	ND (0.20)	---	ND (1.0)	---	
MW-36-070	ND (0.20)	---	ND (1.0)	---	
MW-39-050	ND (0.20)	---	ND (1.0)	---	
MW-39-060	ND (0.20)	---	ND (1.0)	---	
MW-39-070	ND (0.20)	---	ND (1.0)	---	
MW-42-055	0.35	---	2.8	---	
MW-42-065	ND (0.20)	---	ND (1.0)	---	
MW-44-070	ND (0.20)	---	ND (1.0)	---	
MW-51	4,800	---	4,800	---	
Deep Zone Wells					
MW-20-130	9,100	---	9,000	---	
MW-27-085	ND (1.0)	---	ND (1.0)	---	
MW-28-090	ND (0.20)	---	ND (1.0)	---	
MW-31-135	12	---	12	---	
MW-33-150	12 J	---	10.8	---	
MW-33-210	13	---	13.5	---	
MW-34-080	ND (0.20)	---	ND (1.0)	---	
MW-34-100	263	45	270	43	
MW-36-090	ND (0.20)	---	ND (1.0)	---	
MW-36-100	65	---	62	---	

Table D-1
Chromium Concentrations of Wells within Approximately 800 feet of TW-3D Compared to the Maximum Detected Chromium Concentrations from 2014
First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Hexavalent Chromium		Total Dissolved Chromium		
Location ID	**Maximum 2014 Hexavalent Chromium Concentration and New Trigger Levels (µg/L)**	**2017 First Quarter Hexavalent Chromium Result (µg/L)**	**Maximum 2014 Total Dissolved Chromium Concentration and New Trigger Levels (µg/L)**	**2017 First Quarter Total Dissolved Chromium Result (µg/L)**	**Trigger Level Exceeded (Yes if triggered - blank if not)**
MW-39-080	ND (0.20)	---	ND (1.0)	---	
MW-39-100	57	---	49	---	
MW-44-115	41.6	18	42.9	16	
MW-44-125	4.0 J	---	5.9	---	
MW-45-095a	13.7 (a)	---	14.2 (a)	---	
MW-46-175	46.3	21	46.1	18	
MW-46-205	5.5	---	4.8	---	
MW-47-115	24	---	20	---	
PE-01	5.6	1.9	6	2.1	
TW-04	7.4	---	6.5	---	

Notes:
--- = data were either not collected, not available or were rejected
J = concentration or reporting limit estimated by laboratory or data validation.
ug/L = micrograms per liter.
(a) = Result is the maximum from 2013



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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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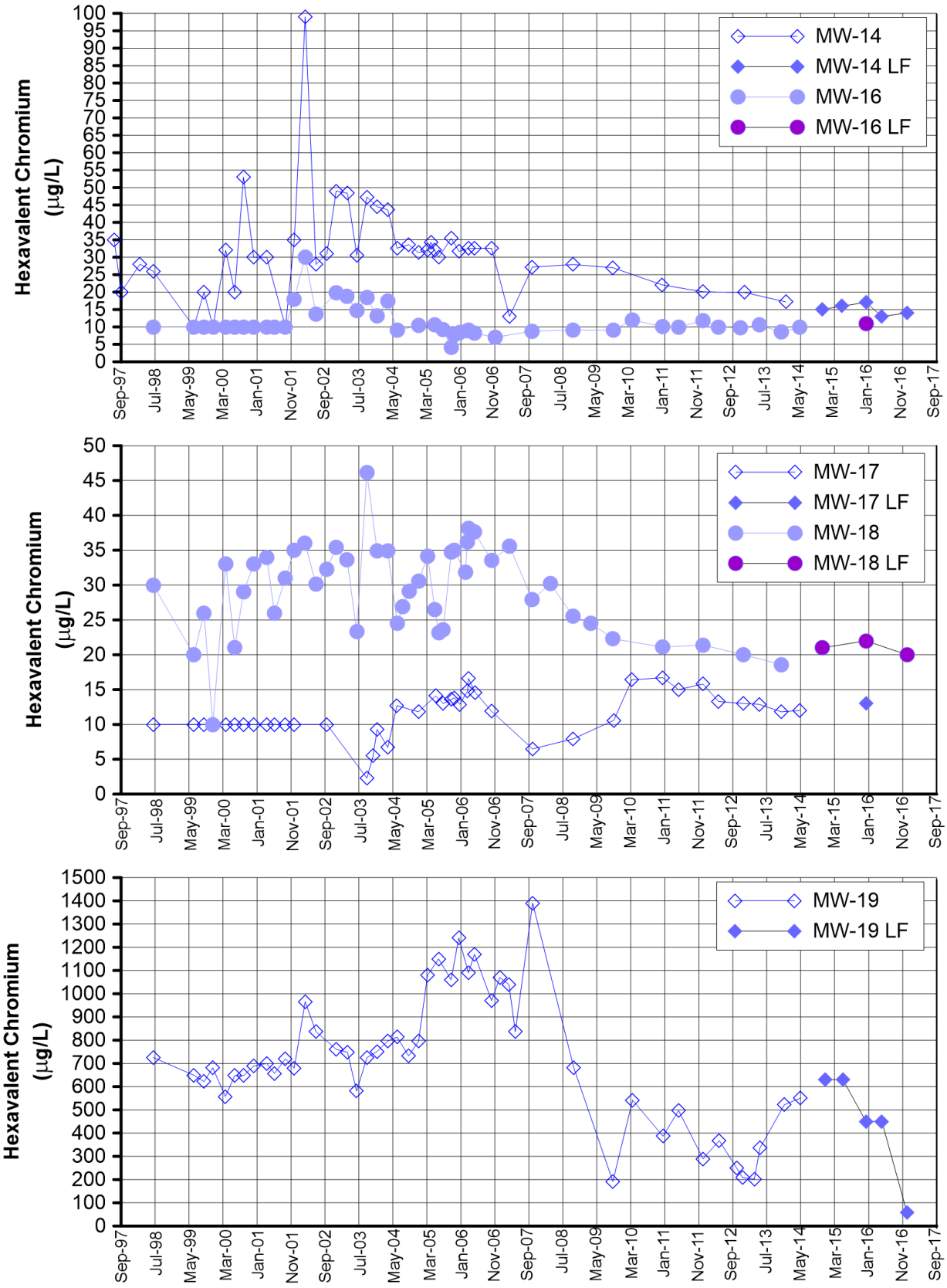

Notes:

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-2
HEXAVALENT CHROMIUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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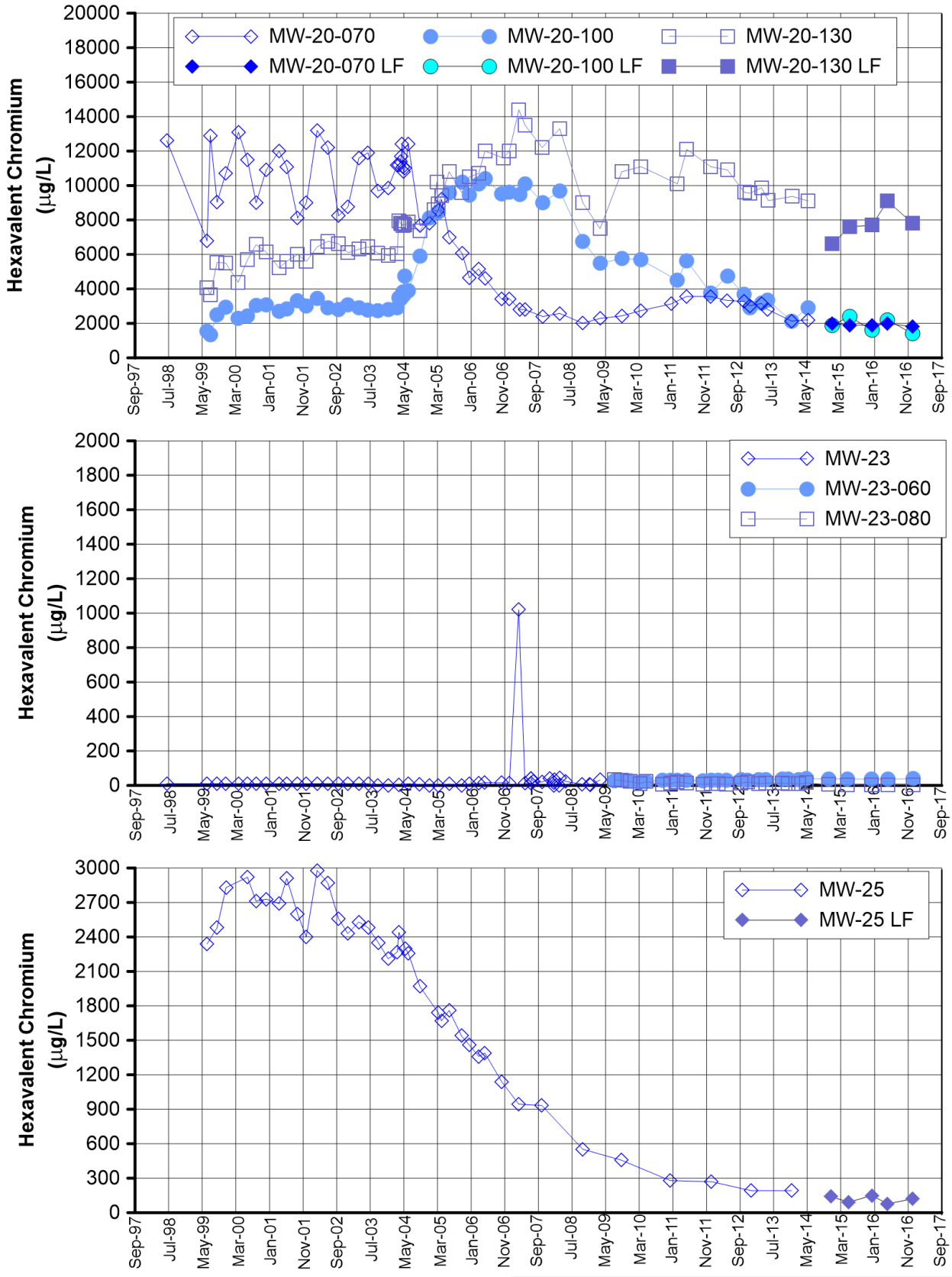

Notes:

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-3
HEXAVALENT CHROMIUM
IN MW-20 AND MW-23 CLUSTERS AND MW-25
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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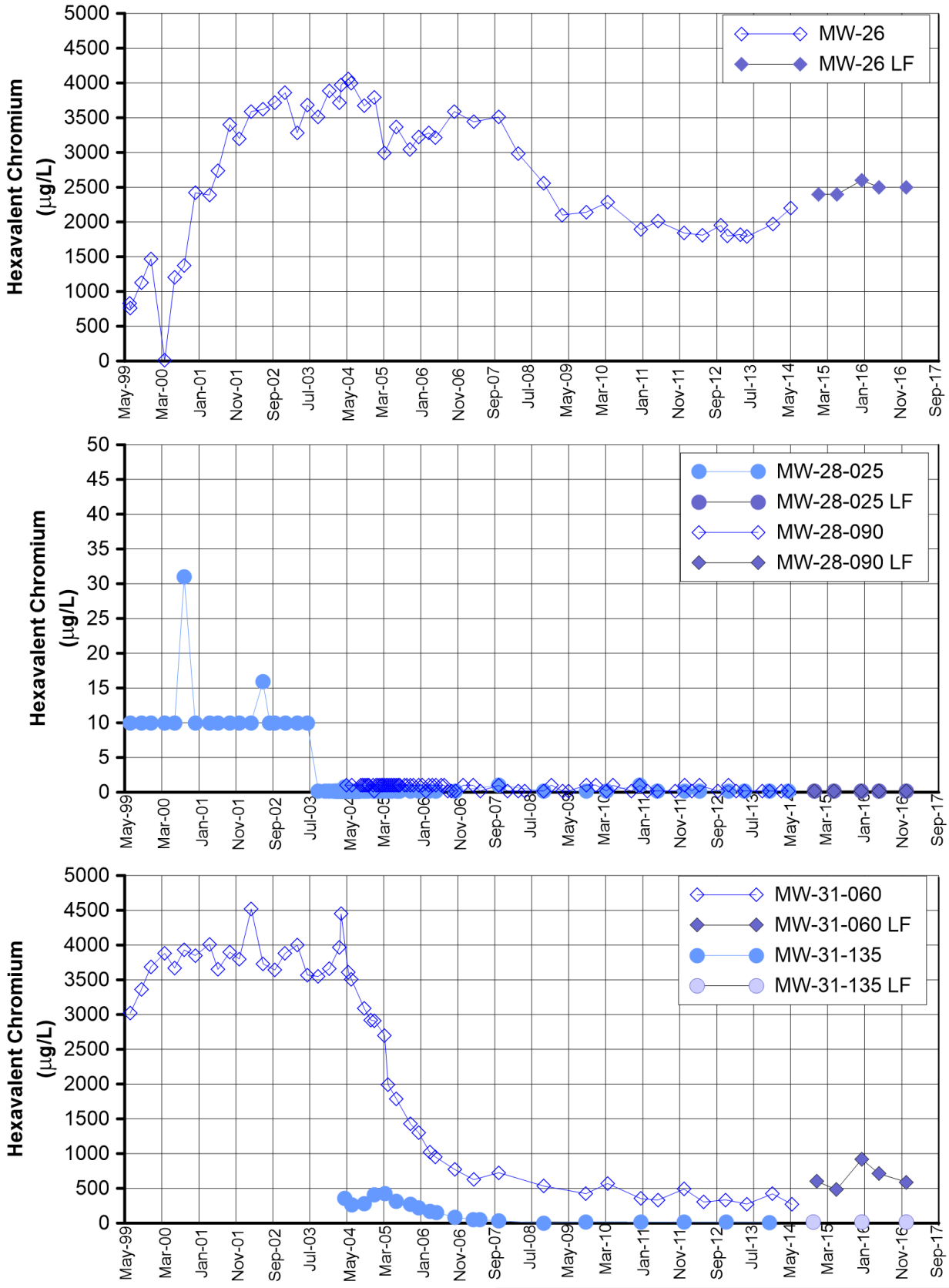

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-28-090 is 20 µg/L.

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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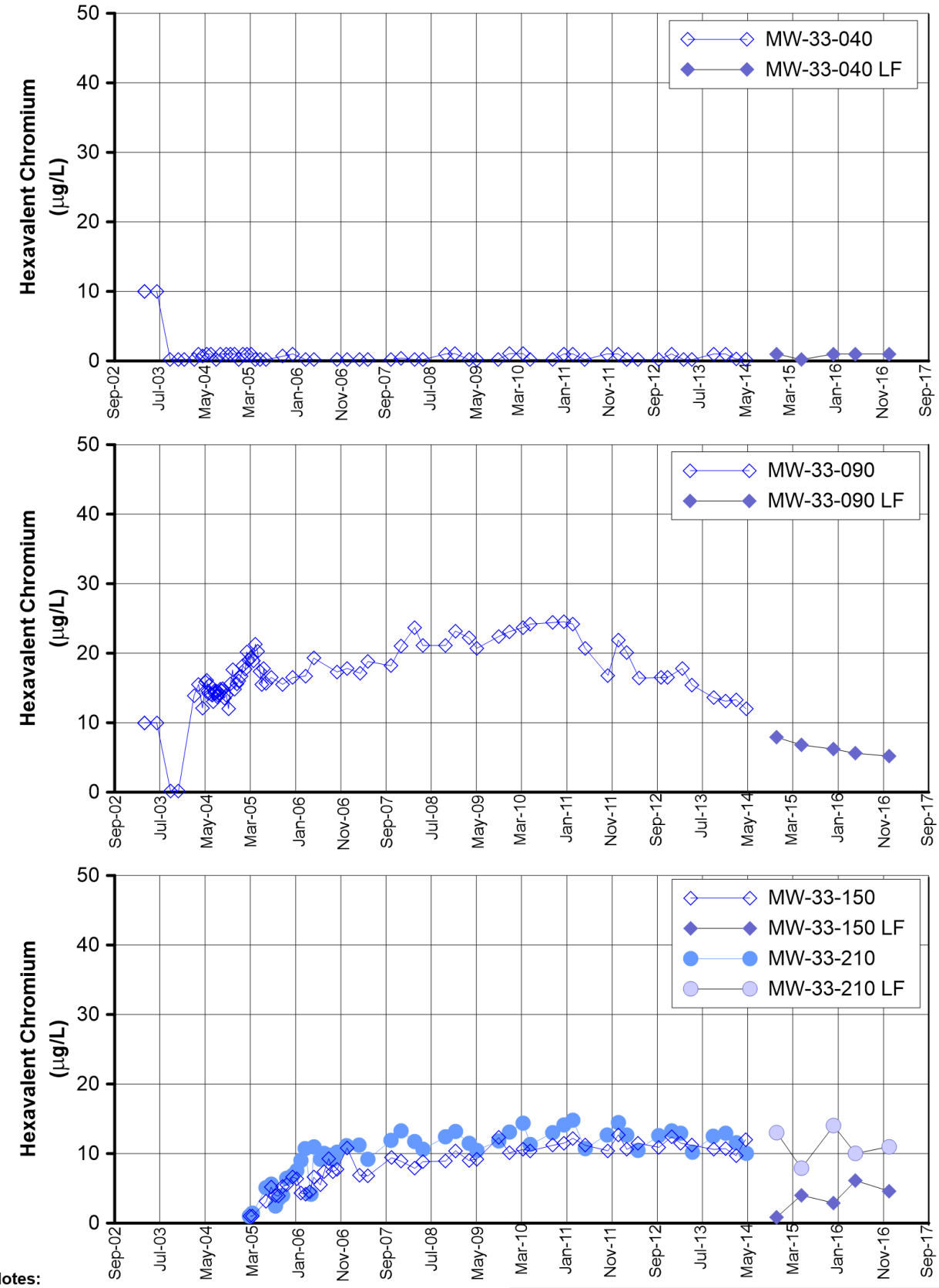

Notes:

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-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

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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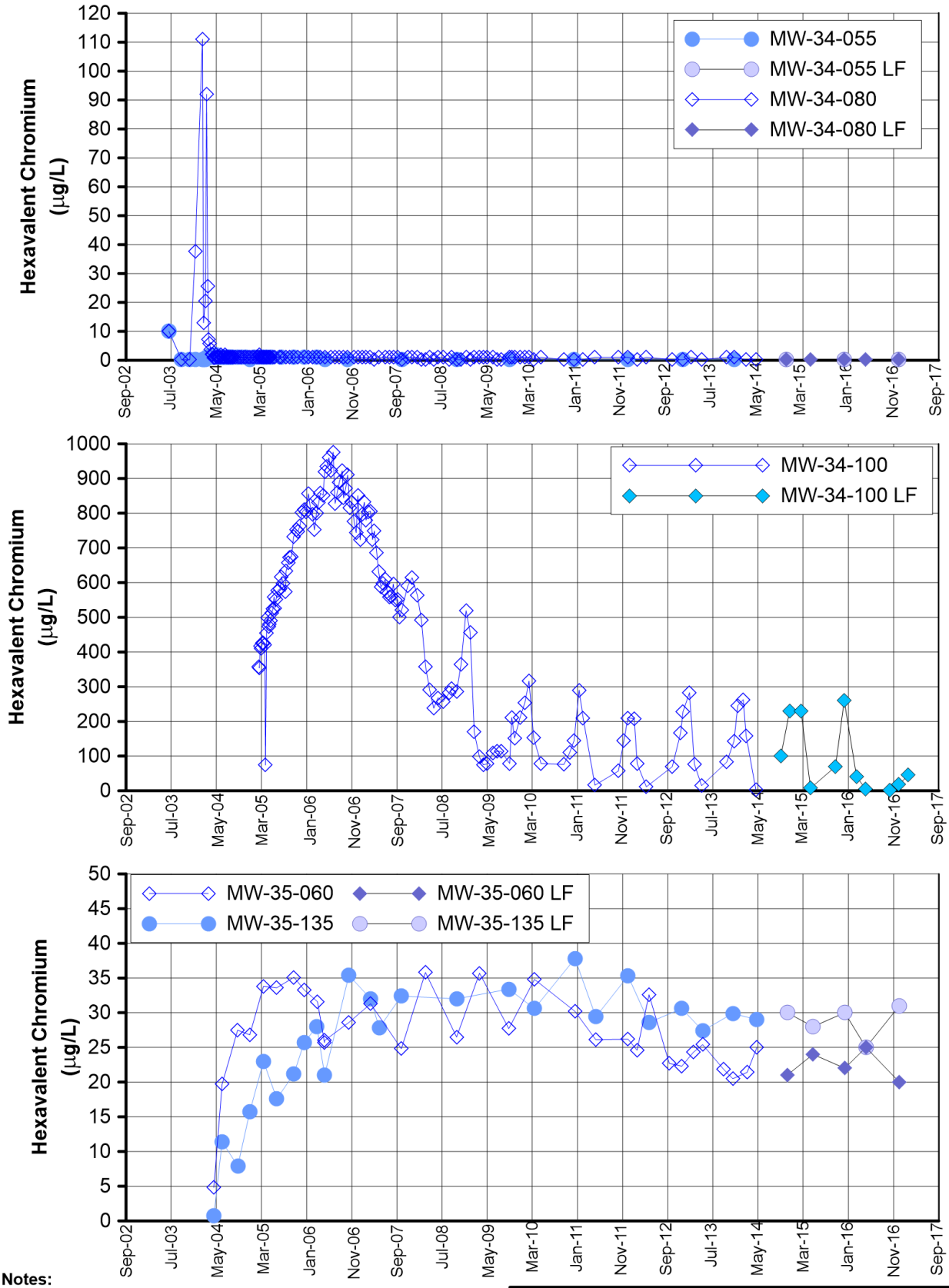

Notes:

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-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

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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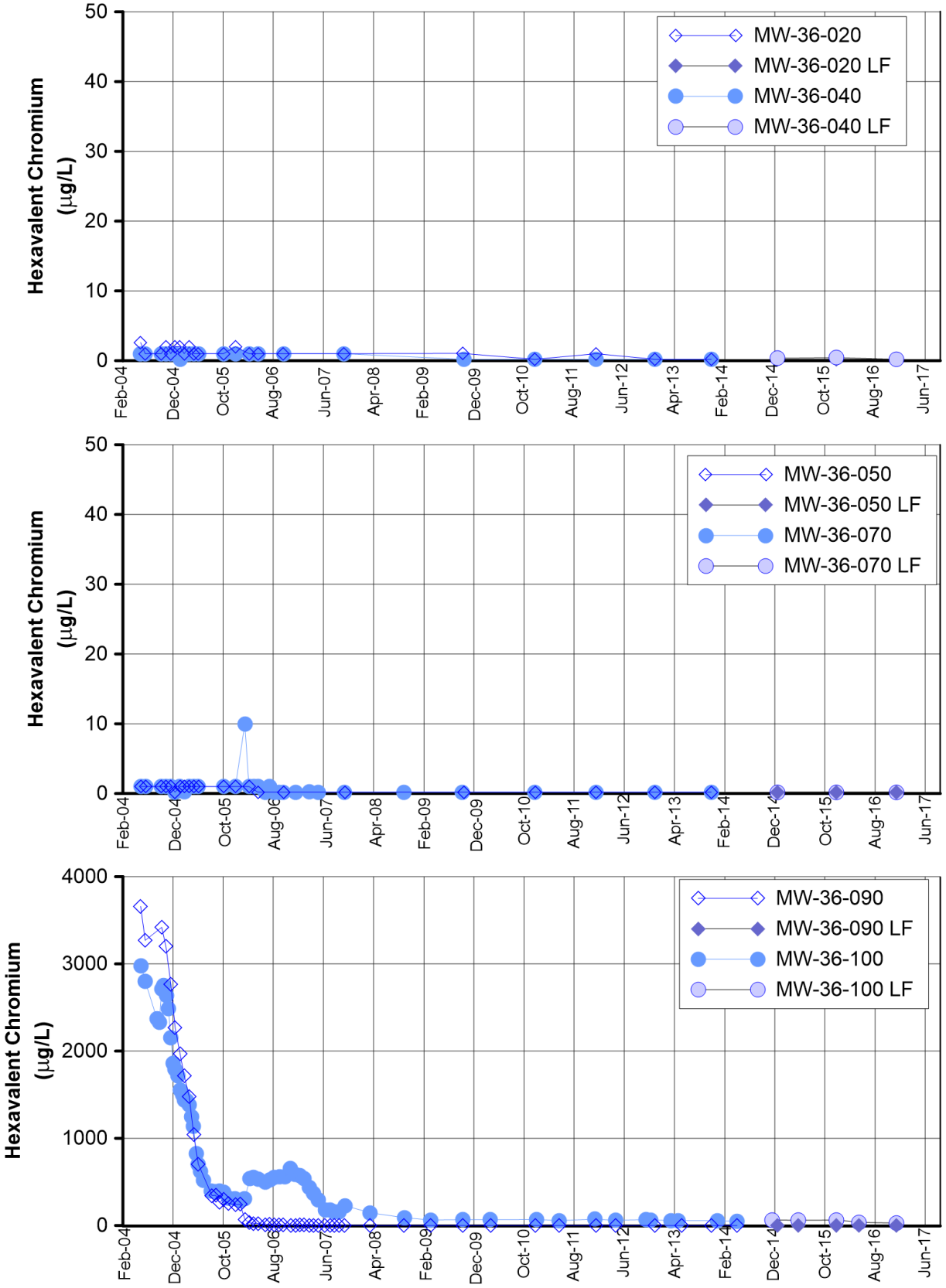

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-36-070 is 20 µg/L.

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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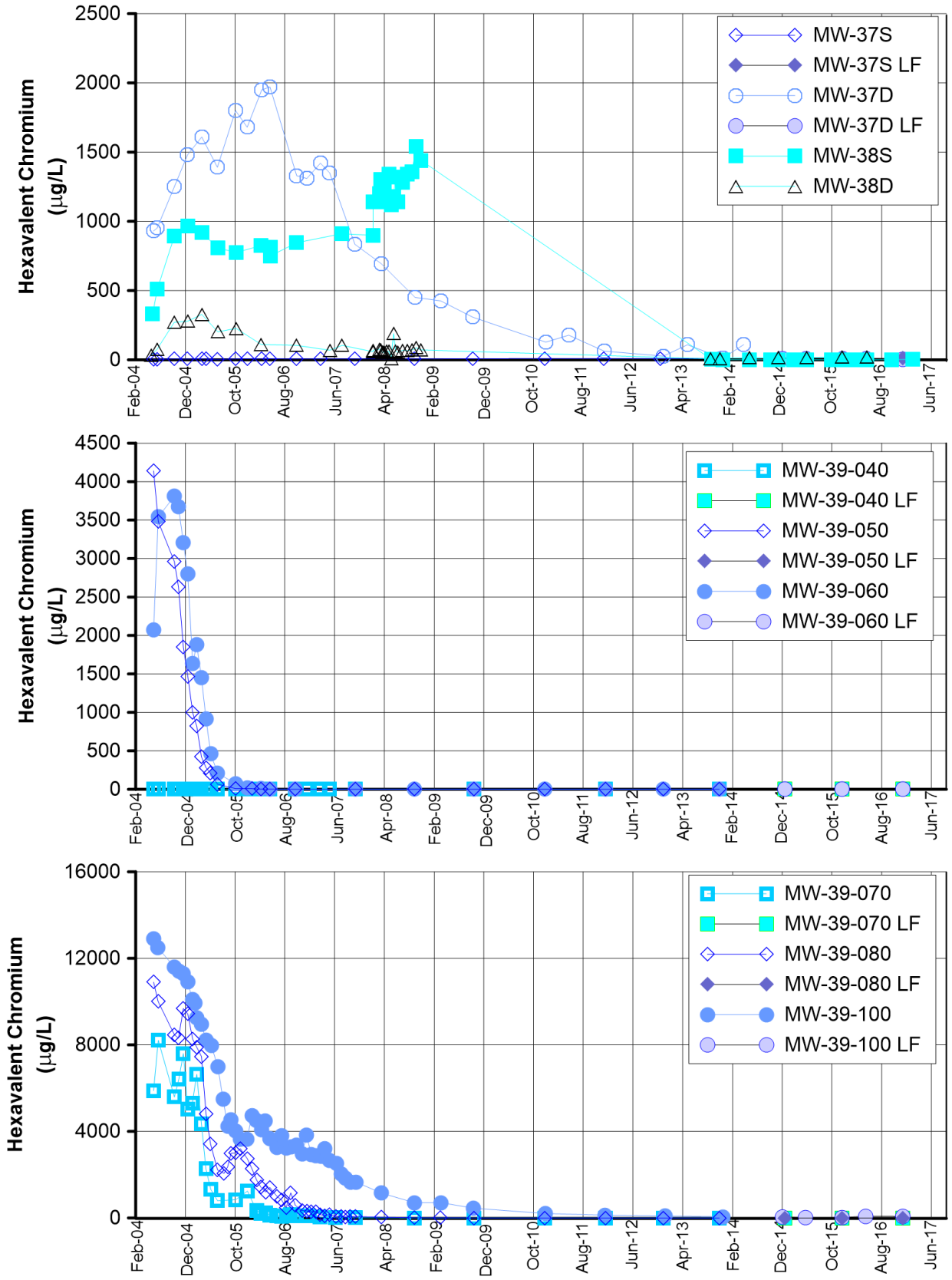

Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-39-040 is 20 µg/L.

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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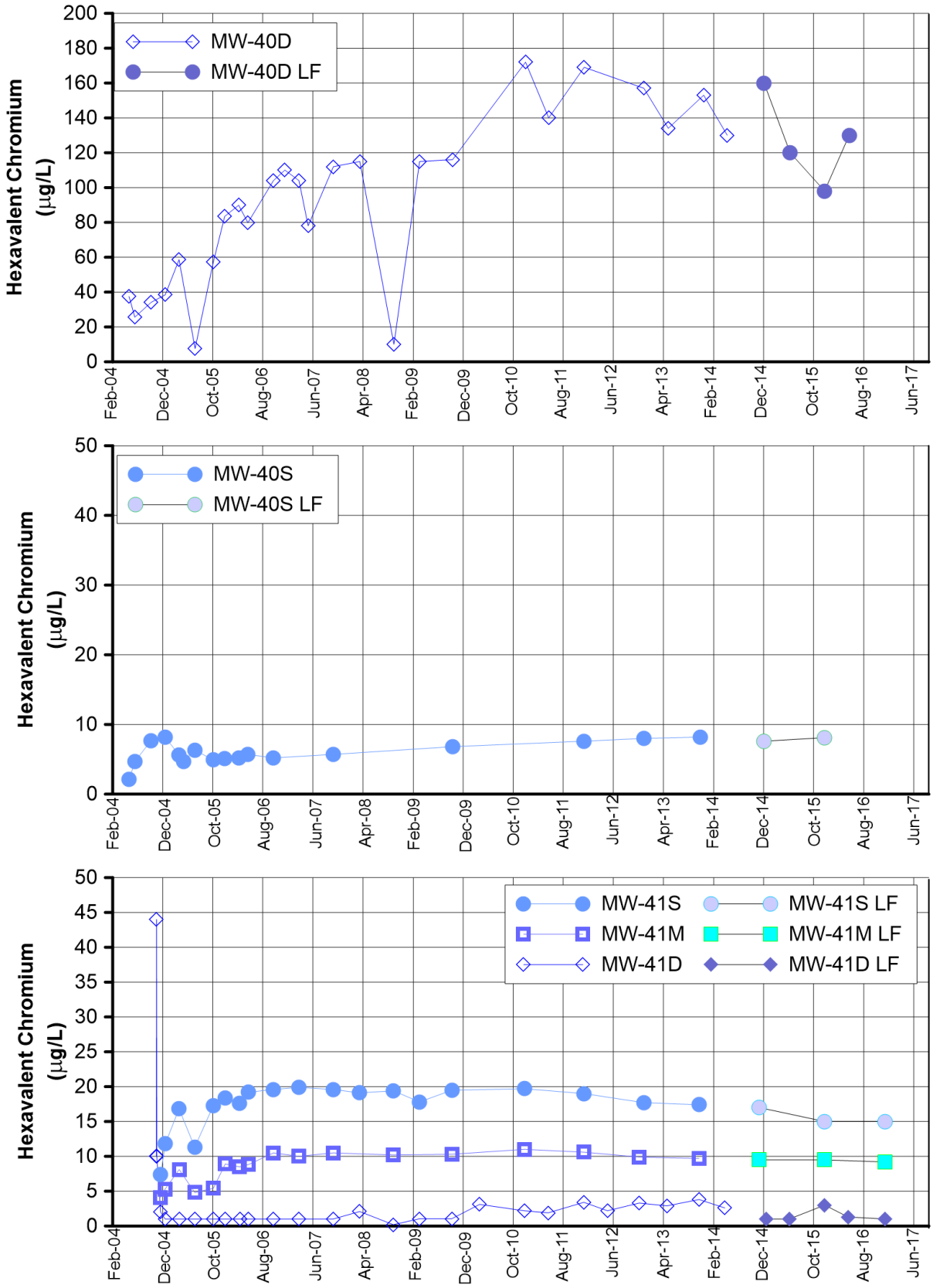

Notes:

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
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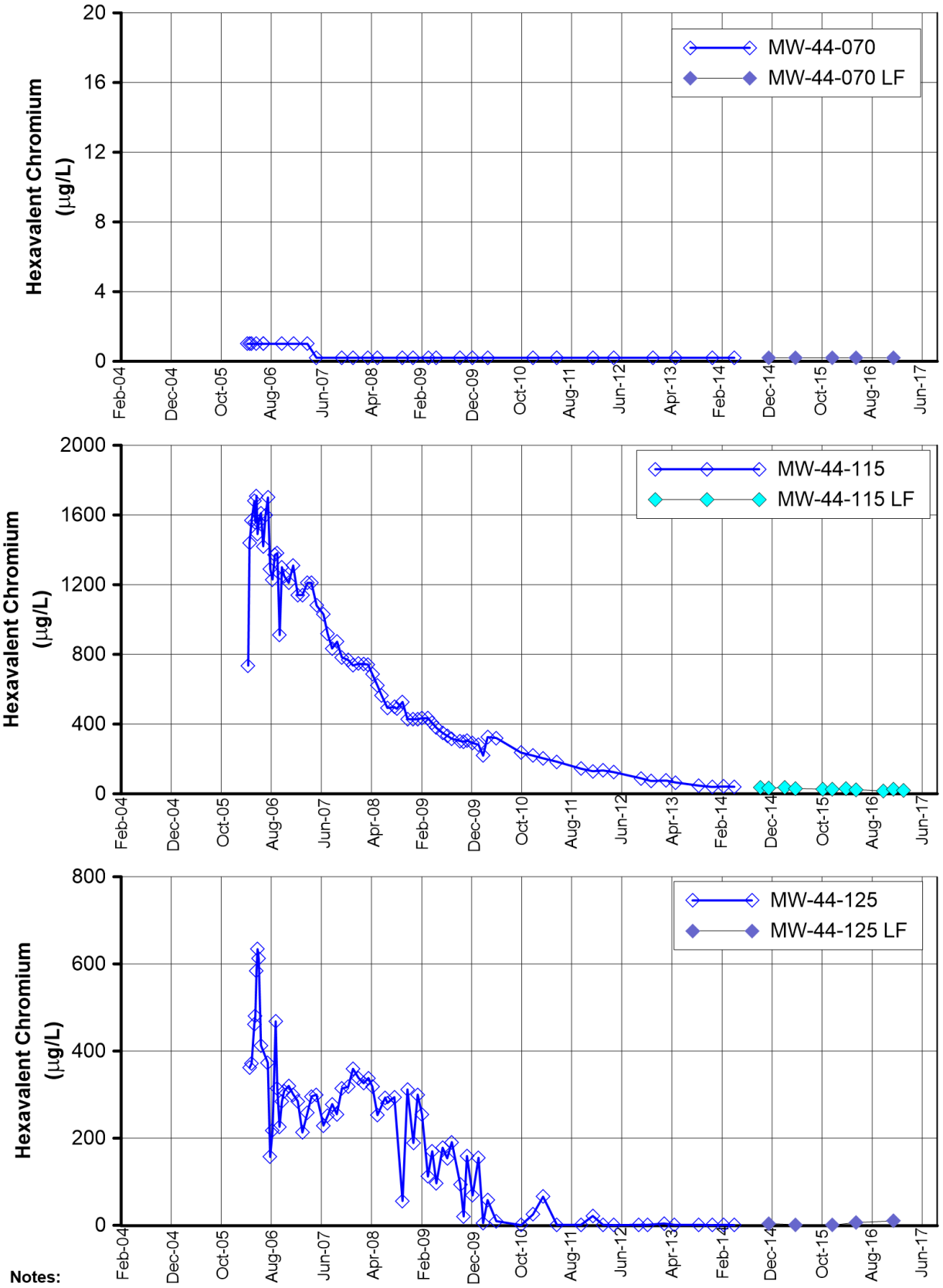

Notes:

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

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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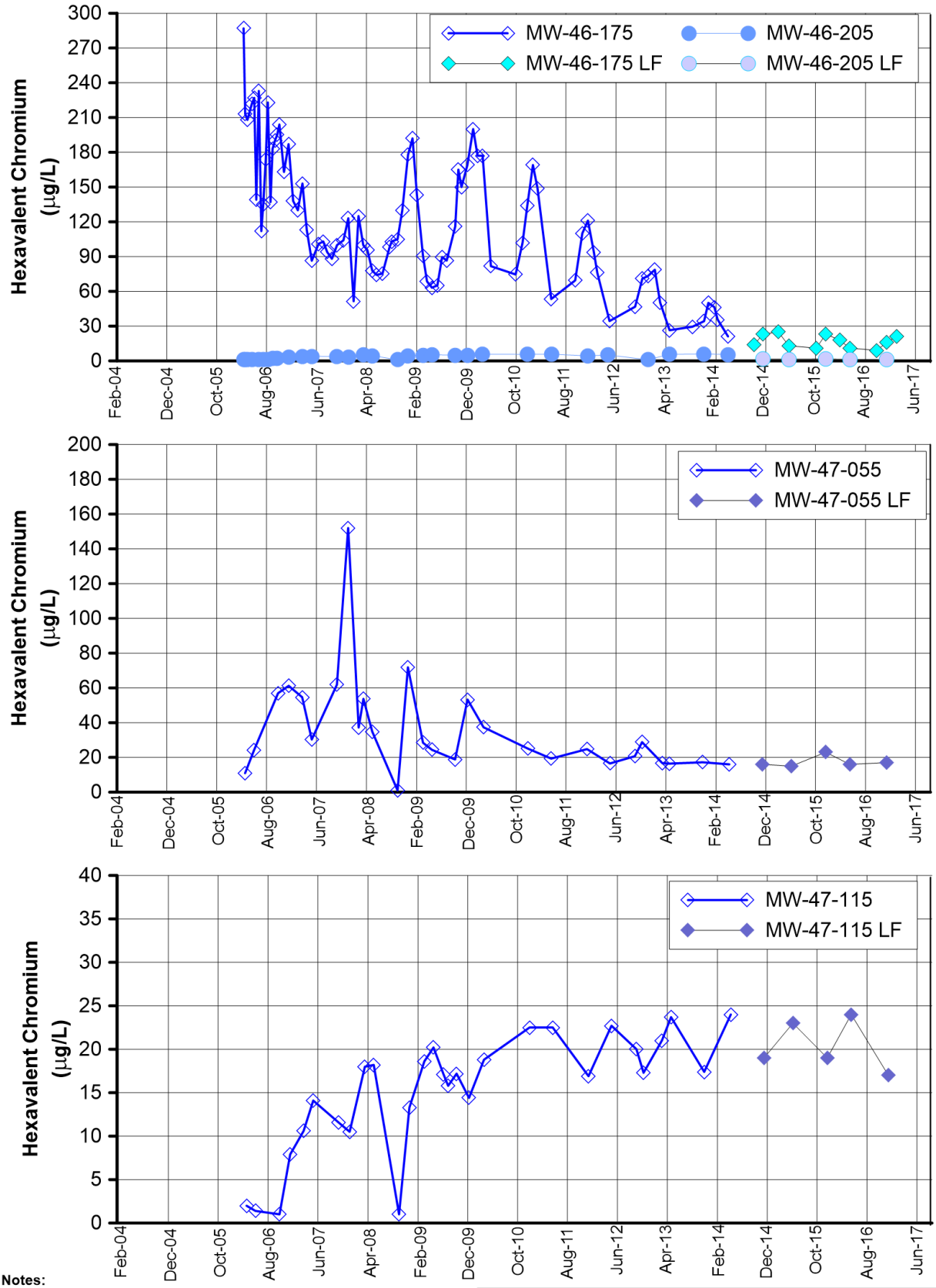

Notes:

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

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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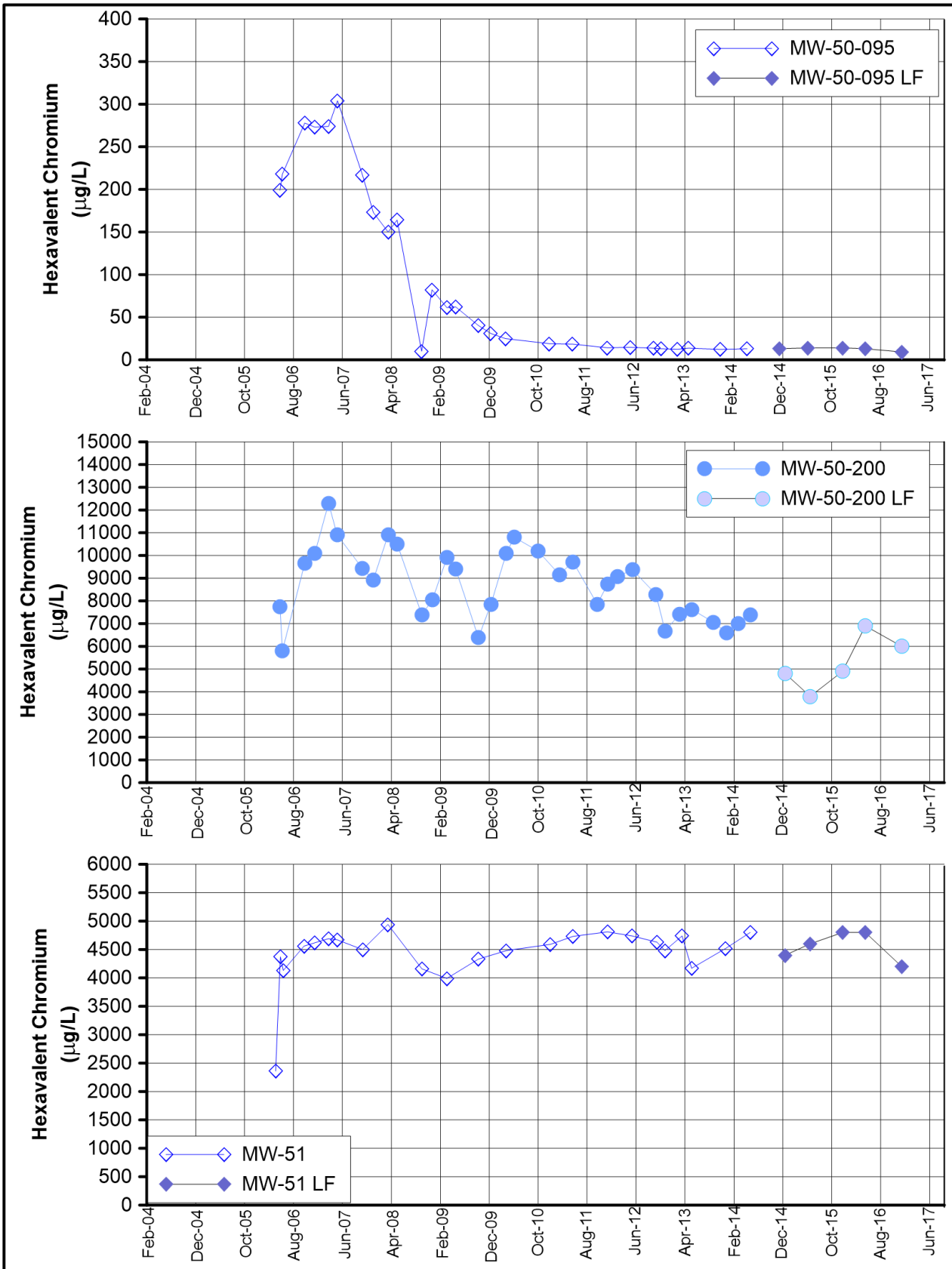

Notes:

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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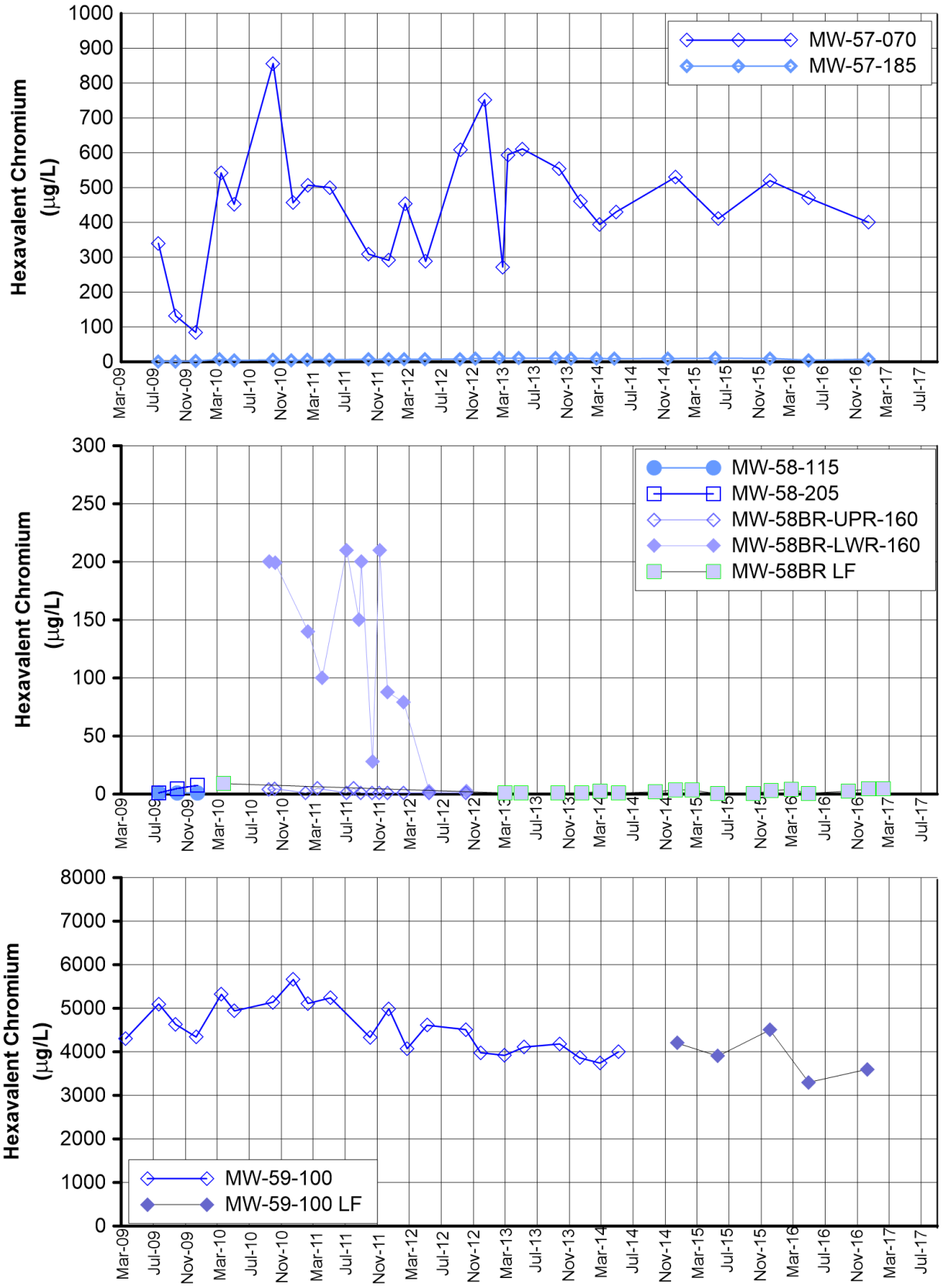

Note:

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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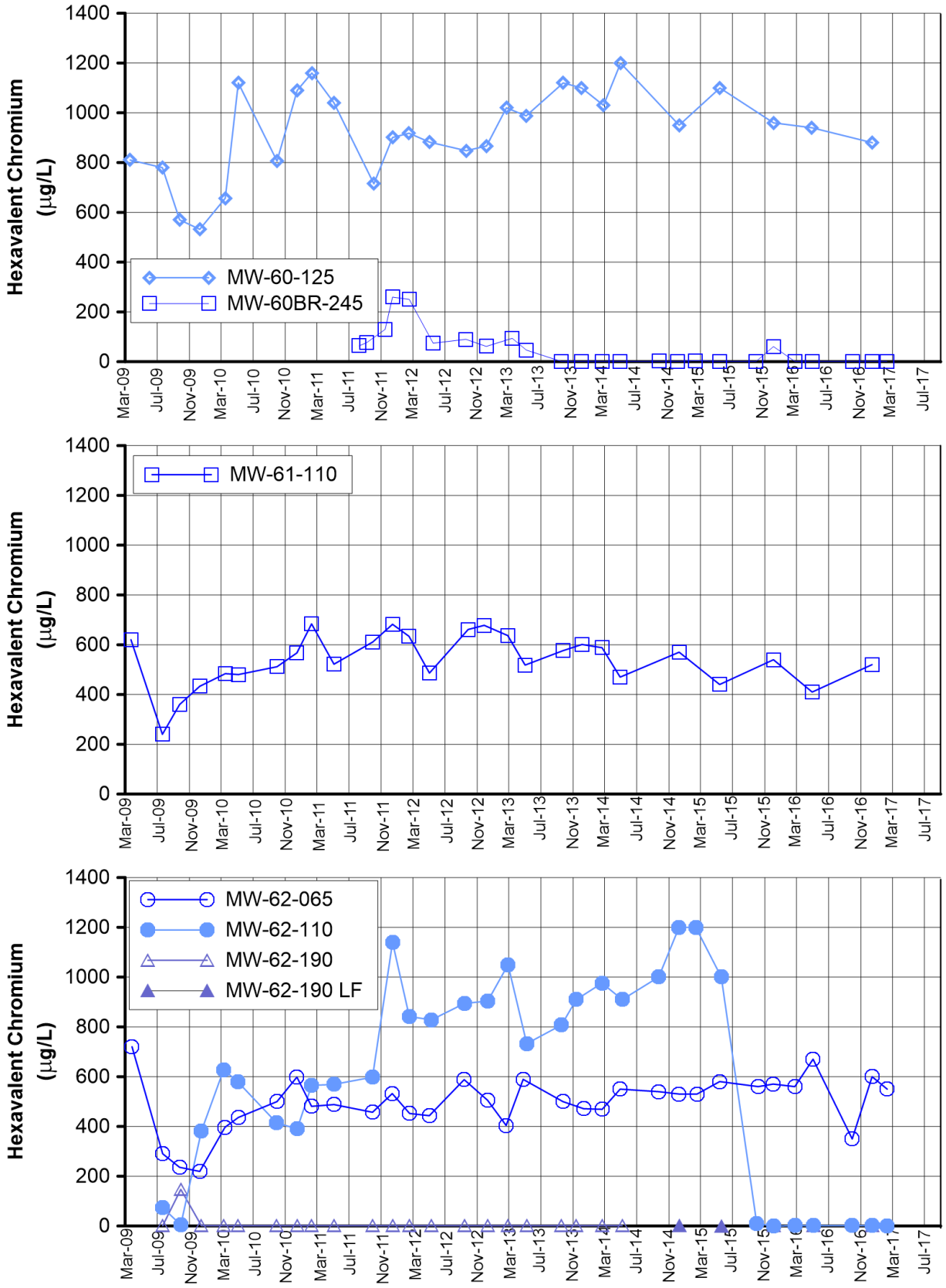

Notes:

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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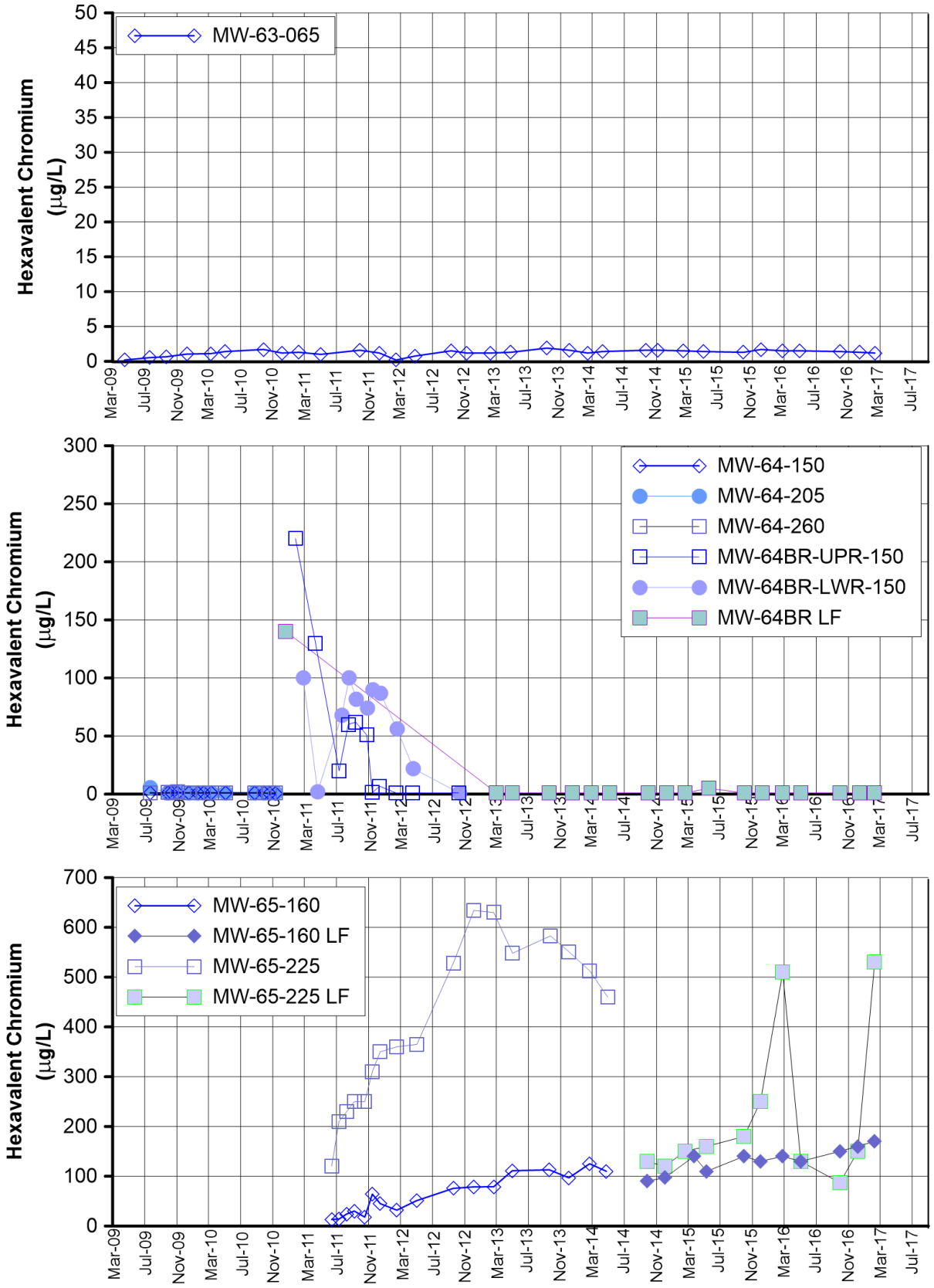

Notes:

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-15
HEXAVALENT CHROMIUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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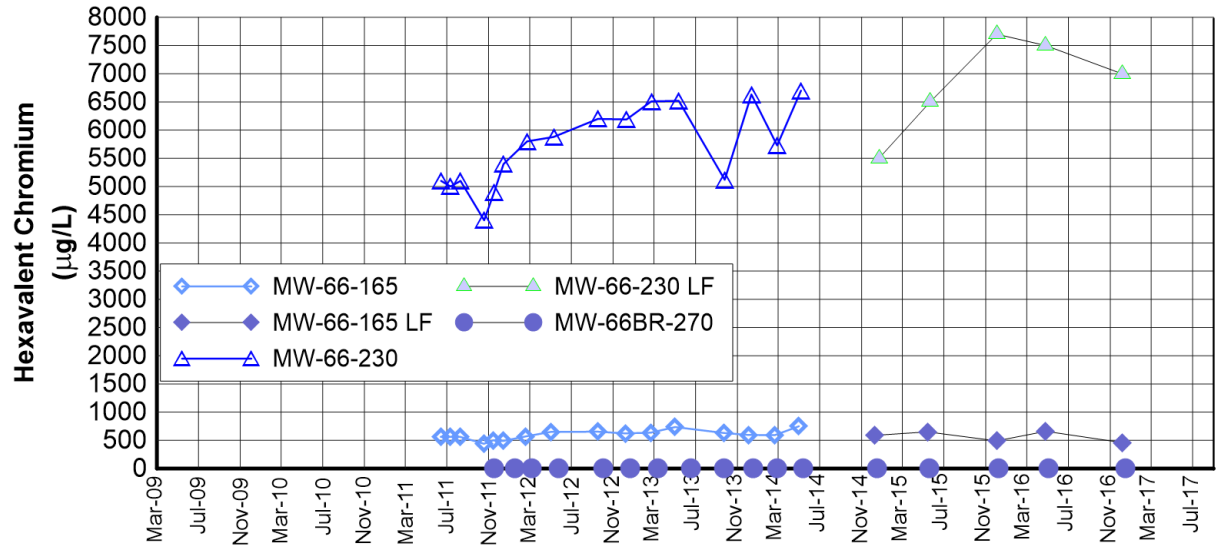

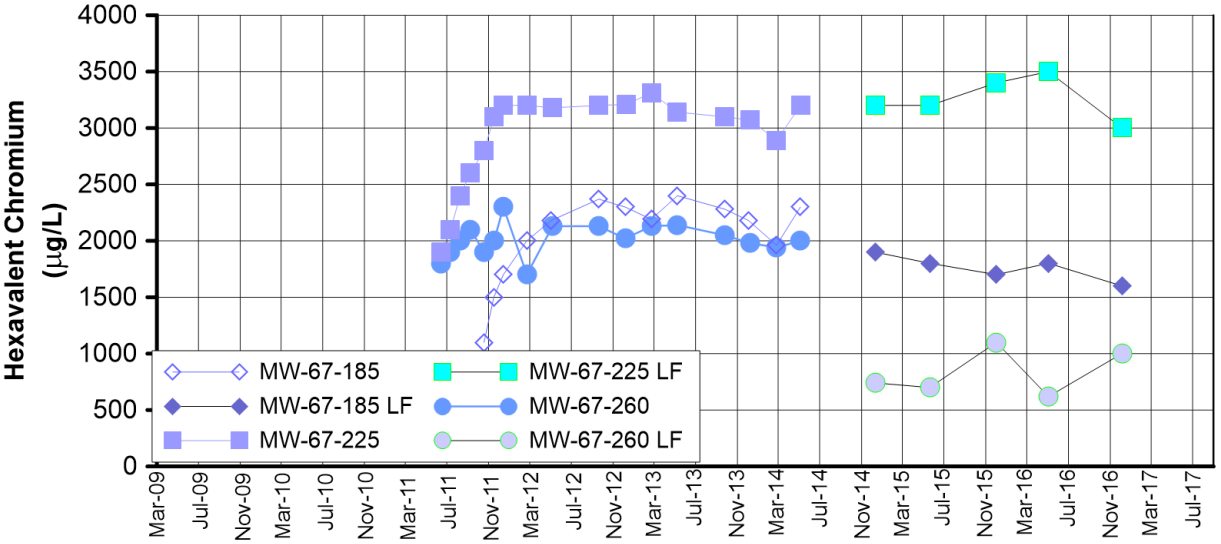

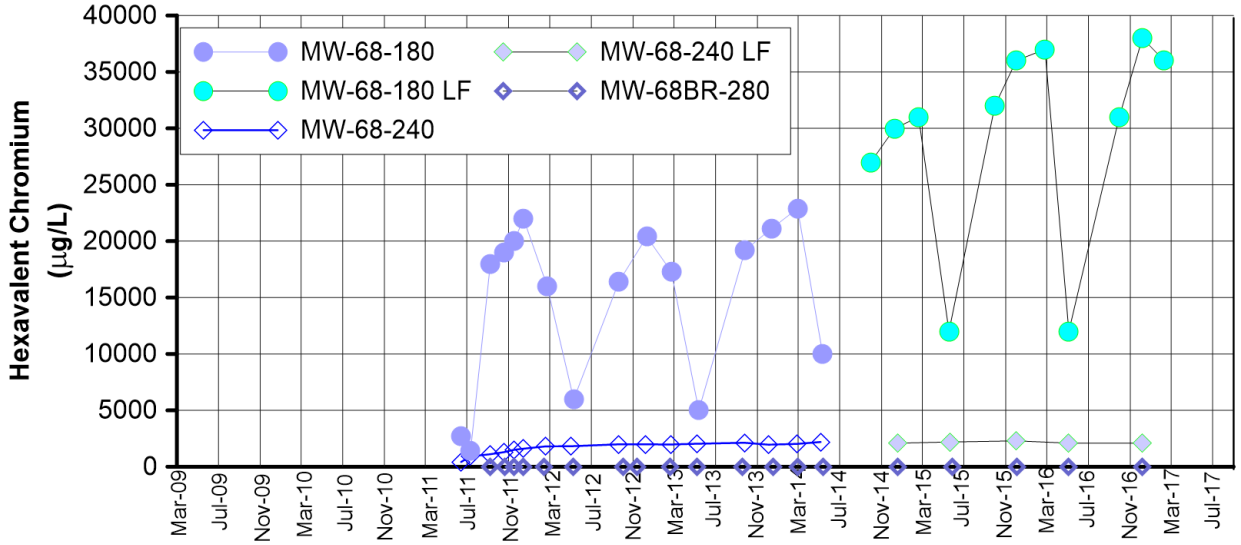

Notes:

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-16
HEXAVALENT CHROMIUM
IN MW-66, MW-67, AND MW-68 CLUSTERS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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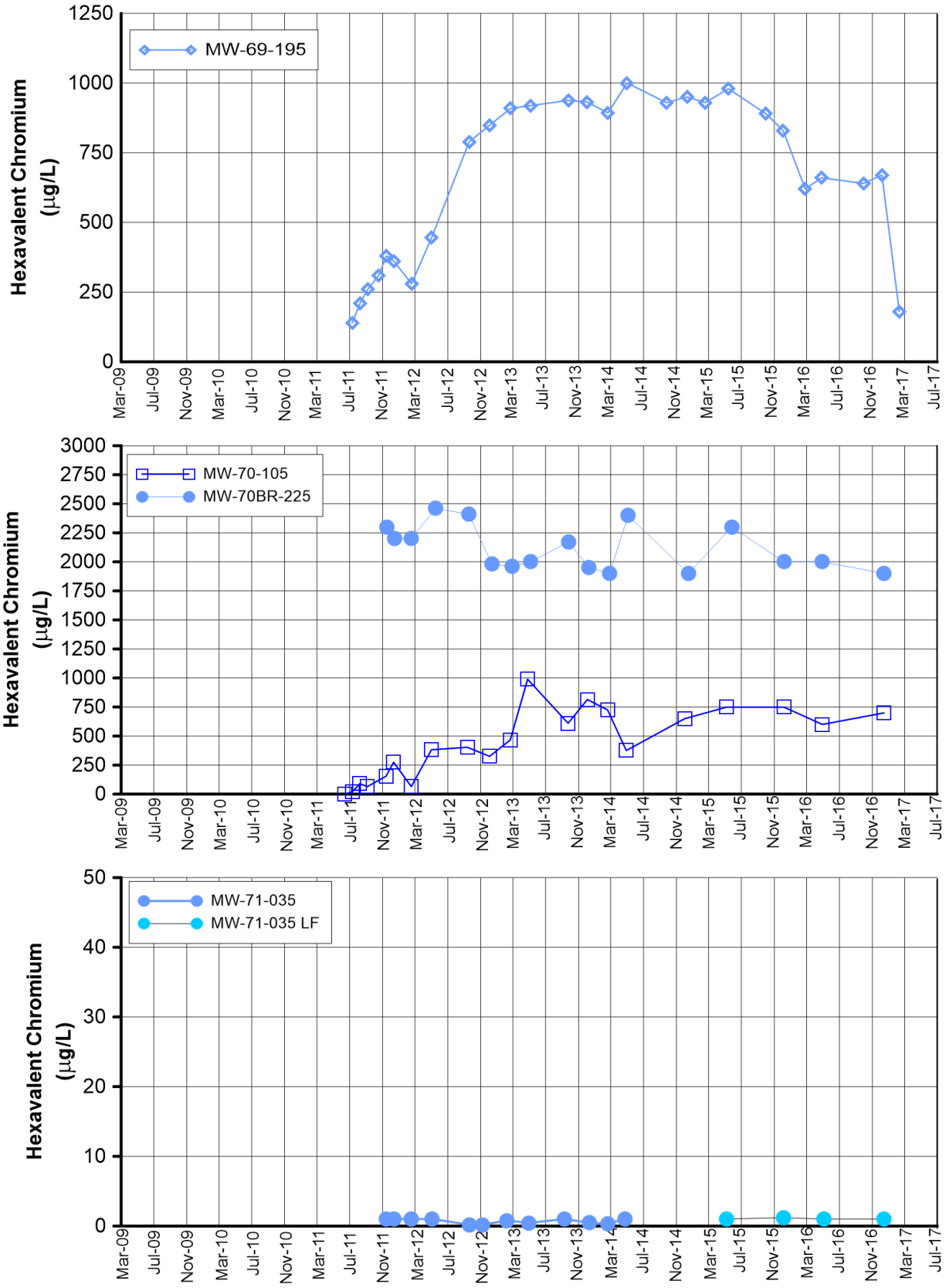

Notes:

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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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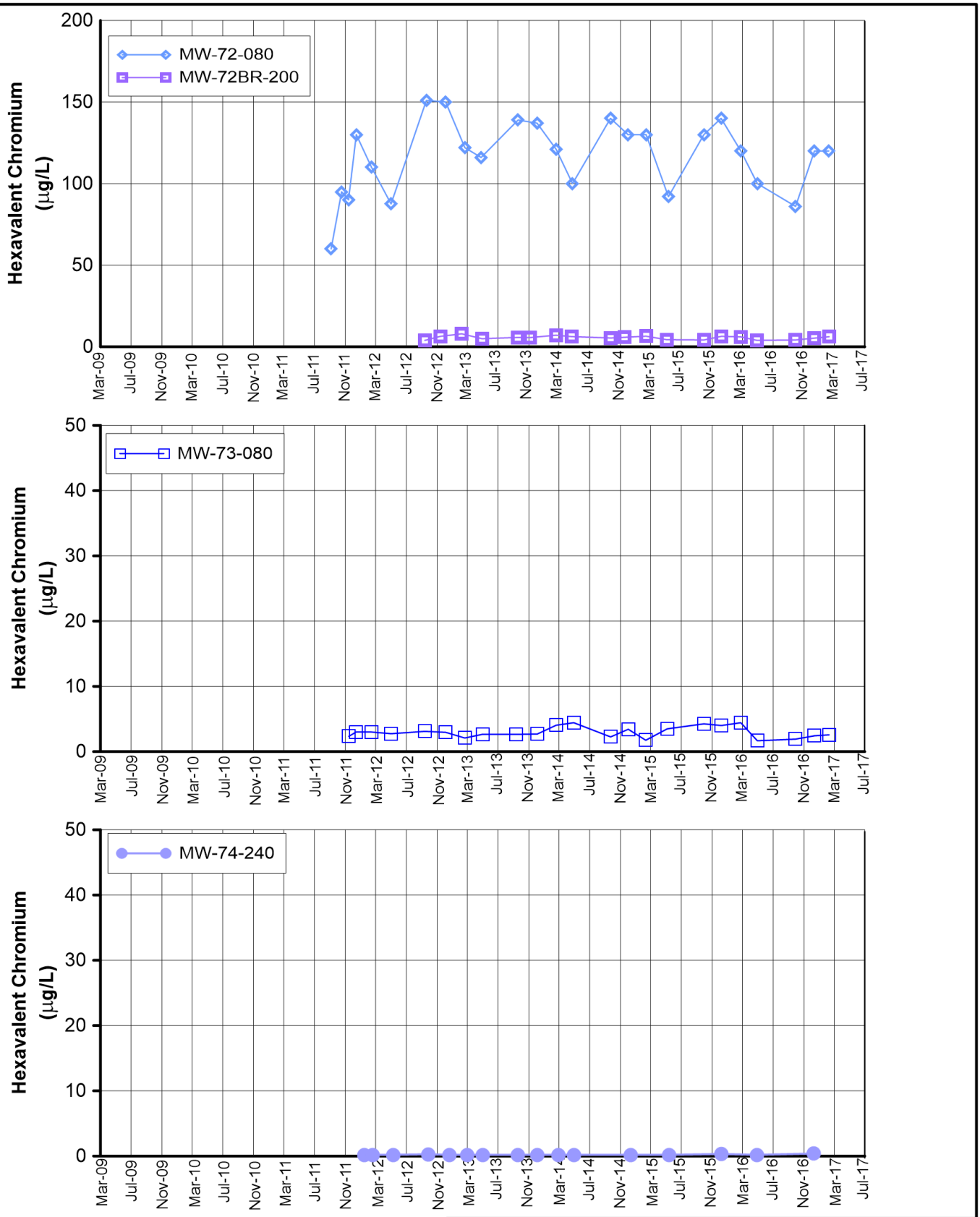

FIGURE D-18
HEXAVALENT CHROMIUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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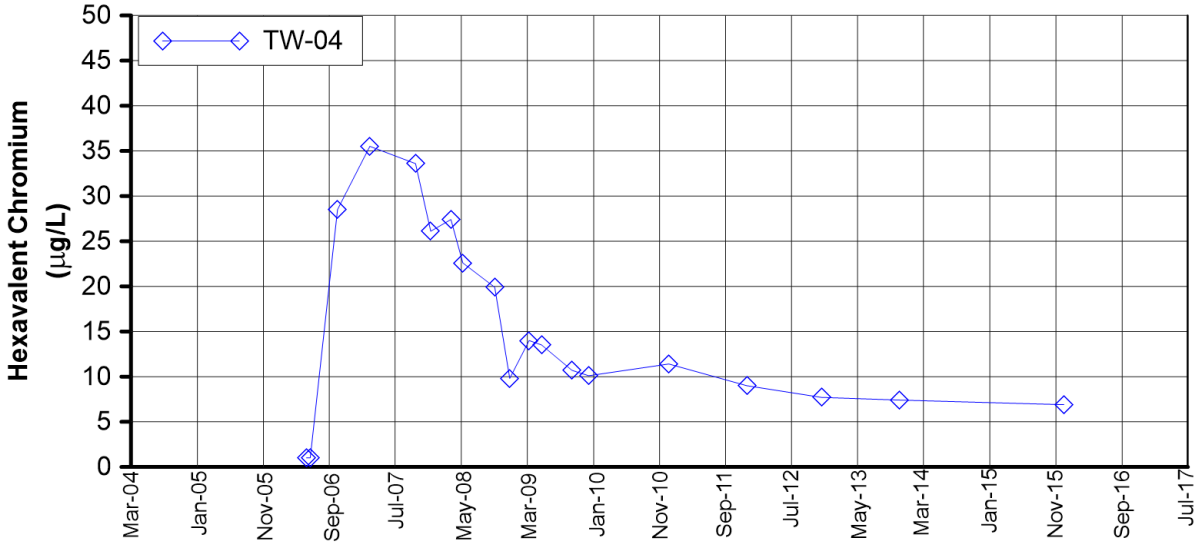

FIGURE D-19
HEXAVALENT CHROMIUM
IN TW-04

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE
MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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APPENDIX E

Interim Measures Extraction System Operations Log, First Quarter 2017

APPENDIX E

Interim Measures Extraction System Operations Log, First Quarter 2017, PG&E Topock Performance Monitoring Program

During First Quarter 2017 (January through March), extraction wells PE-1, TW-2D, and TW-3D operated at a target pump rate of at 135 gallons per minute, excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during First Quarter 2017. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 97.45 percent during First Quarter 2017.

The Interim Measure Number 3 (IM-3) facility treated approximately 19,991,019 gallons of extracted groundwater during First Quarter 2017. The IM-3 facility treated 800 gallons of purge water from groundwater sampling activities, and 28,500 gallons of water from injection well backwashing/re-development. Four containers of solids from the IM-3 facility were transported offsite during the reporting period.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 2.55 percent of downtime during First Quarter 2017) 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 January 2017

- **January 1, 2017 (unplanned):** The extraction well system was offline from 4:58 a.m. to 6:34 a.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 1 hour 36 minutes.
- **January 2, 2017 (unplanned):** The extraction well system was offline from 2:00 p.m. to 3:40 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 1 hour 40 minutes.
- **January 3, 2017 (unplanned):** The extraction well system was offline from 10:16 p.m. to 11:50 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 1 hour 34 minutes.
- **January 4, 2017 (planned):** The extraction well system was offline from 11:40 a.m. to 11:46 a.m. for extraction well sample collection by Blaine Tech at extraction well PE-1. Extraction system downtime was 6 minutes.
- **January 5, 2017 (unplanned):** The extraction well system was offline from 11:46 a.m. to 11:52 a.m., from 11:58 a.m. to 12:00 p.m., from 12:04 p.m. to 12:06 p.m., from 12:18 p.m. to 12:24 p.m., and from 12:34 p.m. to 12:36 p.m. to perform a check of the extraction well vault leak detection systems. Extraction system downtime was 20 minutes.
- **January 8, 2017 (unplanned):** The extraction well system was offline from 10:16 p.m. to 10:40 p.m. to change pre-filters on the primary reverse osmosis system. Extraction system downtime was 24 minutes.
- **January 11, 2017 (unplanned):** The extraction well system was offline from 9:12 a.m. to 1:54 p.m. due to a blockage requiring maintenance in the iron oxidation tanks (T-301A, B and C). Extraction system downtime was 4 hours 42 minutes.
- **January 12, 2017 (unplanned):** The extraction well system was offline from 8:46 a.m. to 2:08 p.m. to replace the microfilter modules and repair the primary reverse osmosis unit. Extraction system downtime was 5 hours 22 minutes.

- **January 18, 2017 (unplanned):** The extraction well system was offline from 9:34 a.m. to 10:04 a.m. due to maintenance for leaking valves and fittings on reverse osmosis unit and the anti-scalant pump. Extraction system downtime was 30 minutes.
- **January 19, 2017 (unplanned):** The extraction well system was offline from 2:24 a.m. to 7:20 a.m. due to plant maintenance on the blower for the iron oxidation tanks (T-301A, B, and C). Extraction system downtime was 4 hours 56 minutes.
- **January 30, 2017 (planned):** The extraction well system was offline from 10:16 p.m. to 10:40 p.m. to replace the microfilter modules. Extraction system downtime was 1 hour 12 minutes.

E.2 February 2017

- **February 1, 2017 (unplanned):** The extraction well system was offline from 7:32 a.m. to 7:38 a.m., from 7:40 a.m. to 7:56 a.m., from 7:58 a.m. to 8:04 a.m., and from 8:10 a.m. to 8:12 a.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 30 minutes.
- **February 14, 2017 (unplanned):** The extraction well system was offline 11:30 a.m. to 2:22 p.m. to replace the microfilter modules. Extraction system downtime was 2 hours 52 minutes.
- **February 16, 2017 (unplanned):** The extraction well system was offline from 2:26 a.m. to 8:00 a.m. for pneumatic valve repair for the Microfilter Feed Tank (T-501). Extraction system downtime was 5 hours 34 minutes.
- **February 16, 2017 (planned):** The extraction well system was offline from 8:44 a.m. to 9:34 a.m. due to maintenance on the human-machine interface (HMI) system. Extraction system downtime was 50 minutes.
- **February 22, 2017 (unplanned):** The extraction well system was offline from 8:12 a.m. to 12:48 p.m. and again from 1:00 p.m. to 2:48 p.m. to replace the microfilter modules. Extraction system downtime was 6 hours 4 minutes.

E.3 March 2017

- **March 8, 2017 (planned):** The extraction well system was offline from 12:44 p.m. to 12:46 p.m. and again from 1:48 p.m. to 2:00 p.m. for managing water levels in the Raw Water Storage tank (T-100) and for Blaine Tech sampling at extraction well TW-2D. Extraction system downtime was 14 minutes.
- **March 13, 2017 (unplanned):** The extraction well system was offline 12:54 pm. to 3:12 p.m. and again from 5:20 p.m. to 5:56 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 2 hours 54 minutes.
- **March 14, 2017 (unplanned):** The extraction well system was offline from 9:34 a.m. to 4:06 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 6 hours 32 minutes.
- **March 16, 2017 (unplanned):** The extraction well system was offline from 11:00 a.m. to 11:54 a.m. for microfilter module replacement. Extraction system downtime was 54 minutes.
- **March 21, 2017 (unplanned):** The extraction well system was offline from 2:06 p.m. to 2:08 p.m. due to power failure from the City of Needles. Extraction system downtime was 2 minutes.
- **March 22, 2017 (unplanned):** The extraction well system was offline from 9:58 a.m. to 10:00 a.m. due to power failure from the City of Needles. Extraction system downtime was 2 minutes.

- **March 23, 2017 (unplanned):** The extraction well system was offline from 12:40 p.m. to 1:12 p.m. and again from 1:18 p.m. to 1:46 p.m. for repairs to the acid pump. Extraction system downtime was 1 hour.
- **March 25, 2017 (unplanned):** The extraction well system was offline from 9:42 a.m. to 12:42 p.m., from 12:46 p.m. to 1:00 p.m., from 1:10 p.m. to 1:20 p.m., and from 2:02 p.m. to 2:18 p.m. to replace the pump and motor in P-500. Extraction system downtime was 3 hours 40 minutes.
- **March 25, 2017 (unplanned):** The extraction well system was offline from 2:32 p.m. to 3:30 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 58 minutes.
- **March 30, 2017 (unplanned):** The extraction well system was offline from 4:40 p.m. to 5:18 p.m. and again from 5:50 p.m. to 5:54 p.m. due to power failure from the City if Needles. Extraction system downtime 42 minutes.

APPENDIX F

Hydraulic Data for Interim Measures Reporting Period

Table F-1

Average Monthly and Quarterly Groundwater Elevations, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	January 2017	February 2017	March 2017	Quarter Average	Days in Quarter Average
I-3	River Station	453.37	454.15	456.10	454.55	90
MW-20-070	Shallow Zone	INC	INC	INC	INC	7
MW-20-100	Middle Zone	451.39	451.87	453.01	452.10	90
MW-20-130	Deep Zone	450.85	451.37	452.63	451.63	90
MW-22	Shallow Zone	453.35	453.40	454.38	453.72	90
MW-25	Shallow Zone	453.84	453.93	454.60	454.13	90
MW-26	Shallow Zone	INC	INC	INC	INC	--
MW-27-020	Shallow Zone	452.93	453.58	455.43	453.99	90
MW-27-060	Middle Zone	INC	INC	INC	INC	--
MW-27-085	Deep Zone	452.91	453.57	455.35	453.96	90
MW-28-025	Shallow Zone	452.84	453.51	455.33	453.90	90
MW-28-090	Deep Zone	452.86	453.52	455.22	453.88	90
MW-30-050	Middle Zone	452.55	453.13	454.75	453.49	90
MW-31-060	Shallow Zone	INC	INC	INC	INC	--
MW-31-135	Deep Zone	452.14	452.60	453.85	452.87	90
MW-32-035	Shallow Zone	452.80	453.33	454.91	453.69	90
MW-33-040	Shallow Zone	453.06	453.53	454.95	453.85	90
MW-33-090	Middle Zone	453.19	453.68	455.12	454.01	90
MW-33-150	Deep Zone	453.31	453.78	455.14	454.09	90
MW-34-055	Middle Zone	453.09	453.64	455.41	454.06	90
MW-34-080	Deep Zone	452.96	453.59	455.40	454.00	90
MW-34-100	Deep Zone	452.94	453.43	455.10	453.84	90
MW-35-060	Shallow Zone	453.42	453.93	455.54	454.31	90
MW-35-135	Deep Zone	453.98	454.33	455.57	454.63	90
MW-36-020	Shallow Zone	INC	INC	INC	INC	--
MW-36-040	Shallow Zone	INC	INC	INC	INC	--
MW-36-050	Middle Zone	452.70	453.30	454.99	453.68	90
MW-36-070	Middle Zone	452.79	453.34	455.03	453.73	90
MW-36-090	Deep Zone	452.15	452.52	454.06	452.92	90
MW-36-100	Deep Zone	452.36	452.74	454.27	453.14	90
MW-39-040	Shallow Zone	452.57	453.07	454.68	453.45	90
MW-39-050	Middle Zone	452.48	453.03	454.61	453.38	90
MW-39-060	Middle Zone	452.34	452.90	454.44	453.24	90
MW-39-070	Middle Zone	451.80	452.32	453.75	452.63	90
MW-39-080	Deep Zone	INC	INC	INC	INC	--
MW-39-100	Deep Zone	452.47	452.97	454.38	453.28	90
MW-42-030	Shallow Zone	INC	INC	INC	INC	--
MW-42-065	Middle Zone	INC	INC	INC	INC	--
MW-43-025	Shallow Zone	452.86	453.57	455.41	453.96	90
MW-43-090	Deep Zone	453.01	453.70	455.58	454.11	90

Table F-1

Average Monthly and Quarterly Groundwater Elevations, First Quarter 2017

First Quarter 2017 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

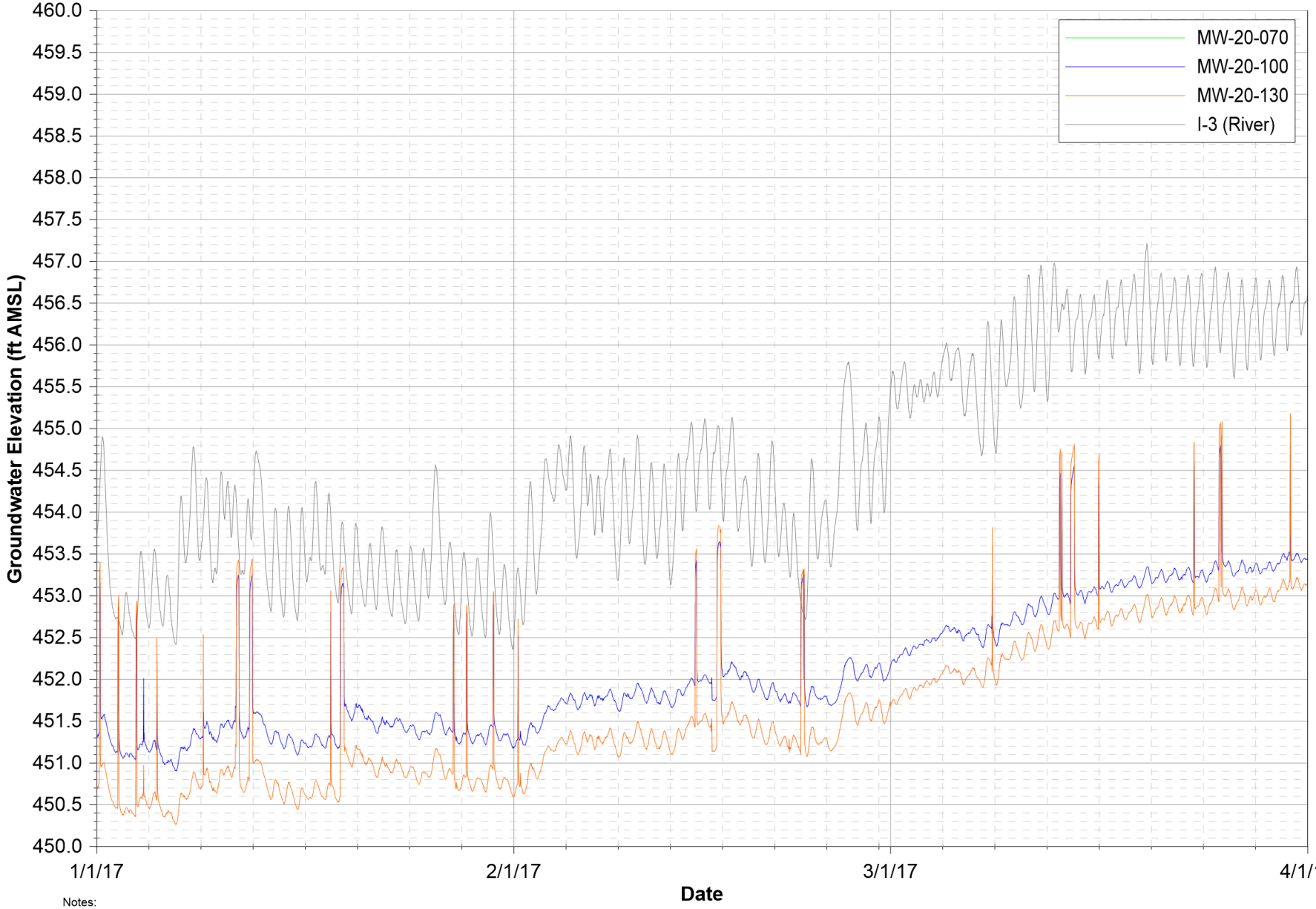
Well ID	Aquifer Zone	January 2017	February 2017	March 2017	Quarter Average	Days in Quarter Average
MW-44-070	Middle Zone	INC	INC	INC	INC	--
MW-44-115	Deep Zone	452.41	452.91	454.47	453.28	90
MW-44-125	Deep Zone	453.00	453.51	455.08	453.88	90
MW-45-095a	Deep Zone	451.68	451.11	452.67	451.84	90
MW-46-175	Deep Zone	453.17	453.67	455.08	453.98	90
MW-47-055	Shallow Zone	453.36	453.78	455.15	454.11	90
MW-47-115	Deep Zone	INC	INC	INC	INC	--
MW-49-135	Deep Zone	453.44	453.96	455.43	454.29	90
MW-50-095	Middle Zone	INC	INC	INC	INC	--
MW-51	Middle Zone	453.38	453.48	454.15	453.68	90
MW-54-085	Deep Zone	INC	INC	INC	INC	--
MW-54-140	Deep Zone	INC	INC	INC	INC	--
MW-54-195	Deep Zone	INC	INC	INC	INC	--
MW-55-045	Middle Zone	455.32	455.42	456.25	455.67	90
MW-55-120	Deep Zone	455.44	455.49	456.50	455.82	90
PT2D	Deep Zone	451.60	452.14	453.57	452.45	90
PT5D	Deep Zone	452.18	452.69	454.18	453.02	90
PT6D	Deep Zone	452.10	452.62	454.08	452.94	90
RRB	River Station	INC	INC	INC	INC	--

Notes:

Average reported in ft amsl (feet above mean sea level).

Quarter Average = average of daily averages over reporting period.

INC = Data incomplete, less than 75% of data available over reporting period due to rejection or field equipment malfunction.



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-20-070 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1A
MW-20 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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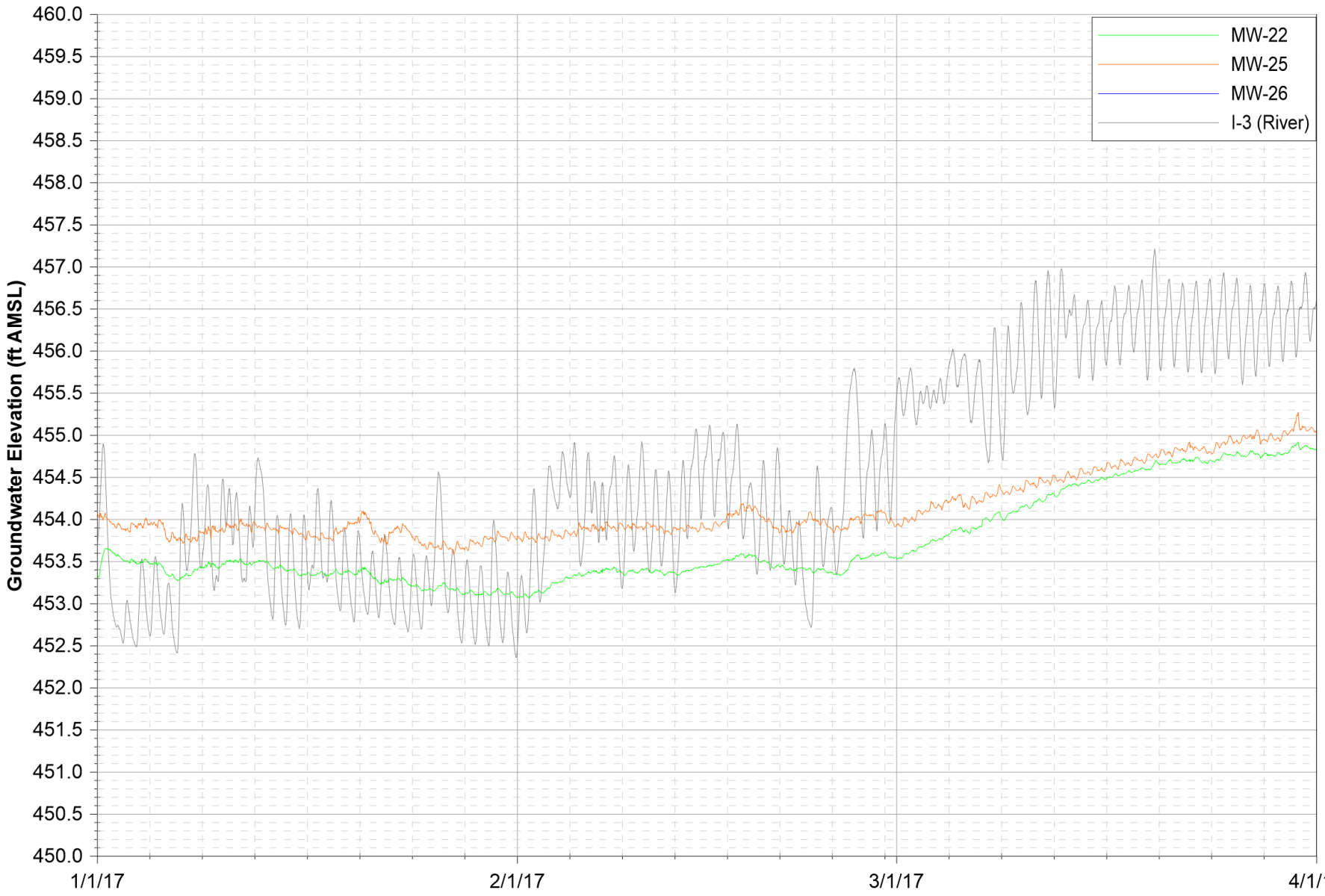

Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-26 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1B

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

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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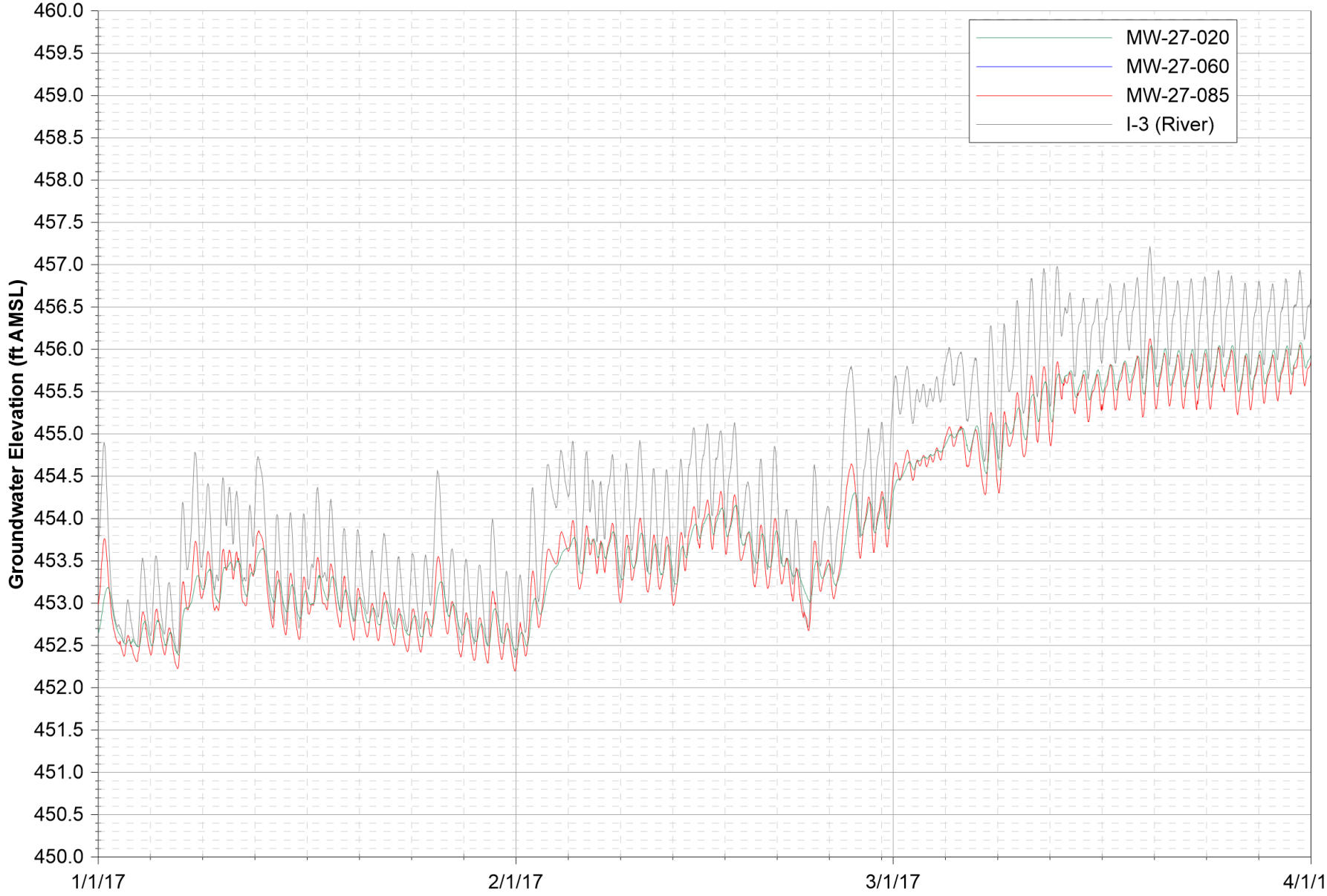


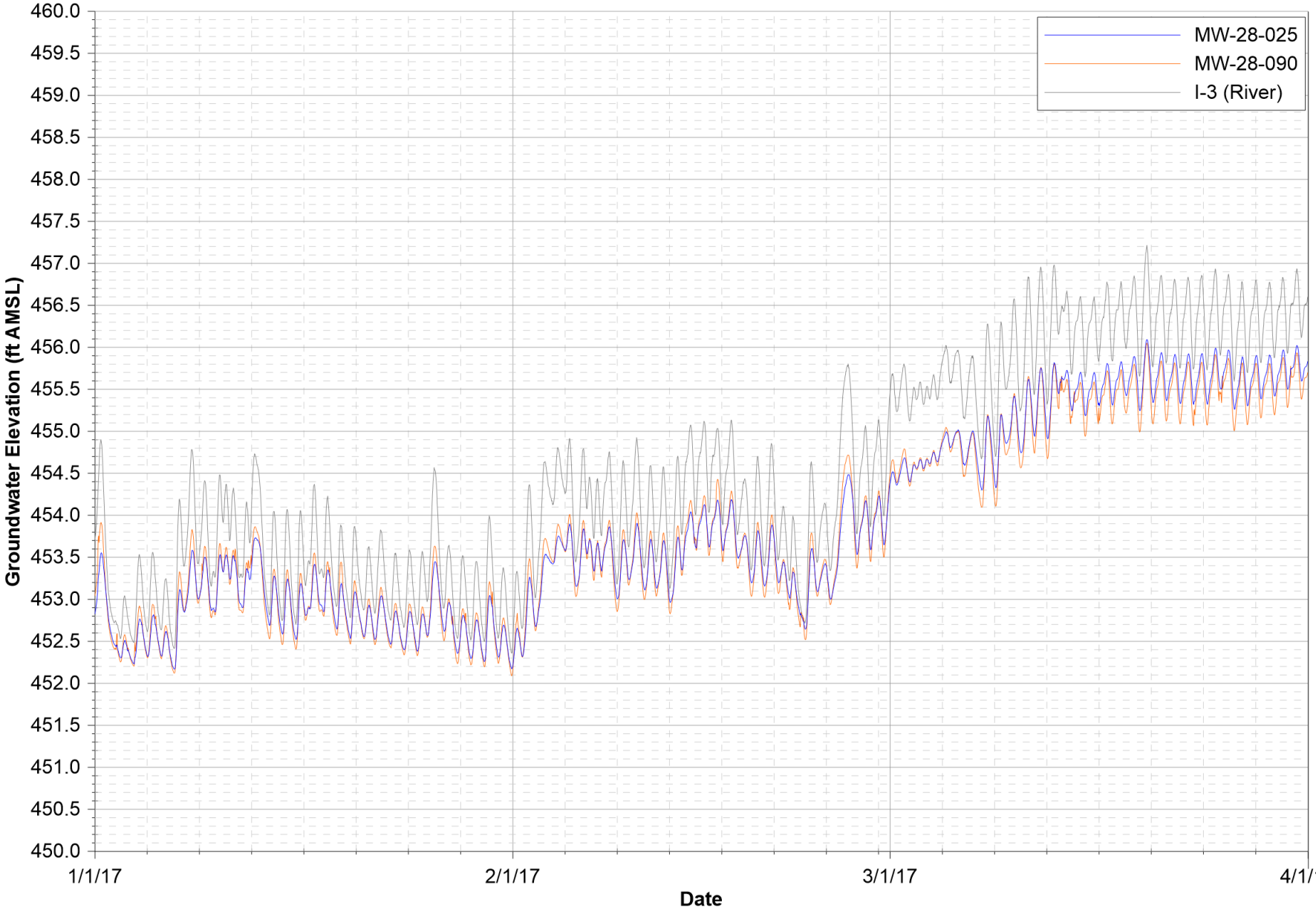
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level
3. MW-27-060 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1C

MW-27 CLUSTER HYDROGRAPHS

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

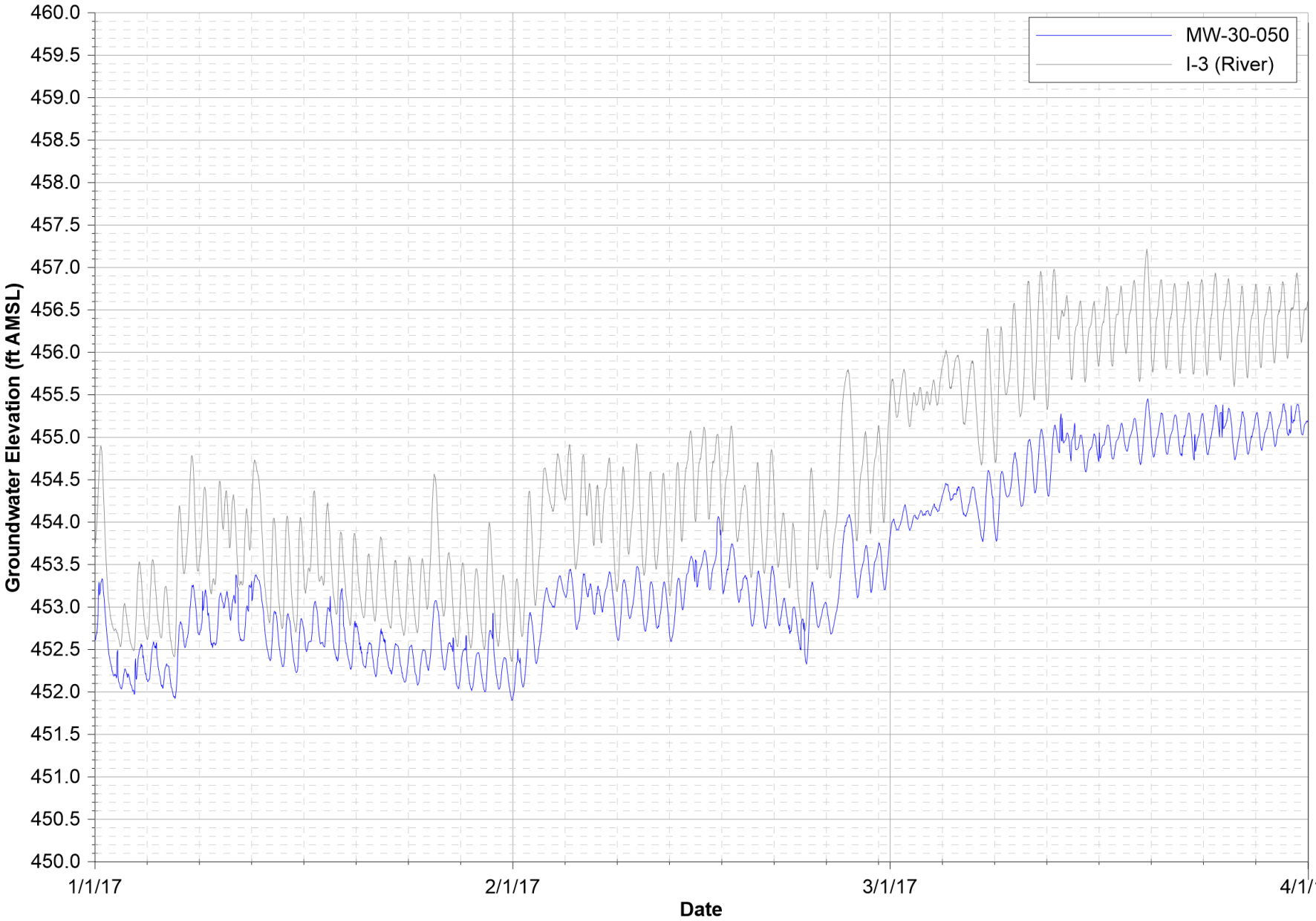
ARCADIS



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

FIGURE F-1D
MW-28 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 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
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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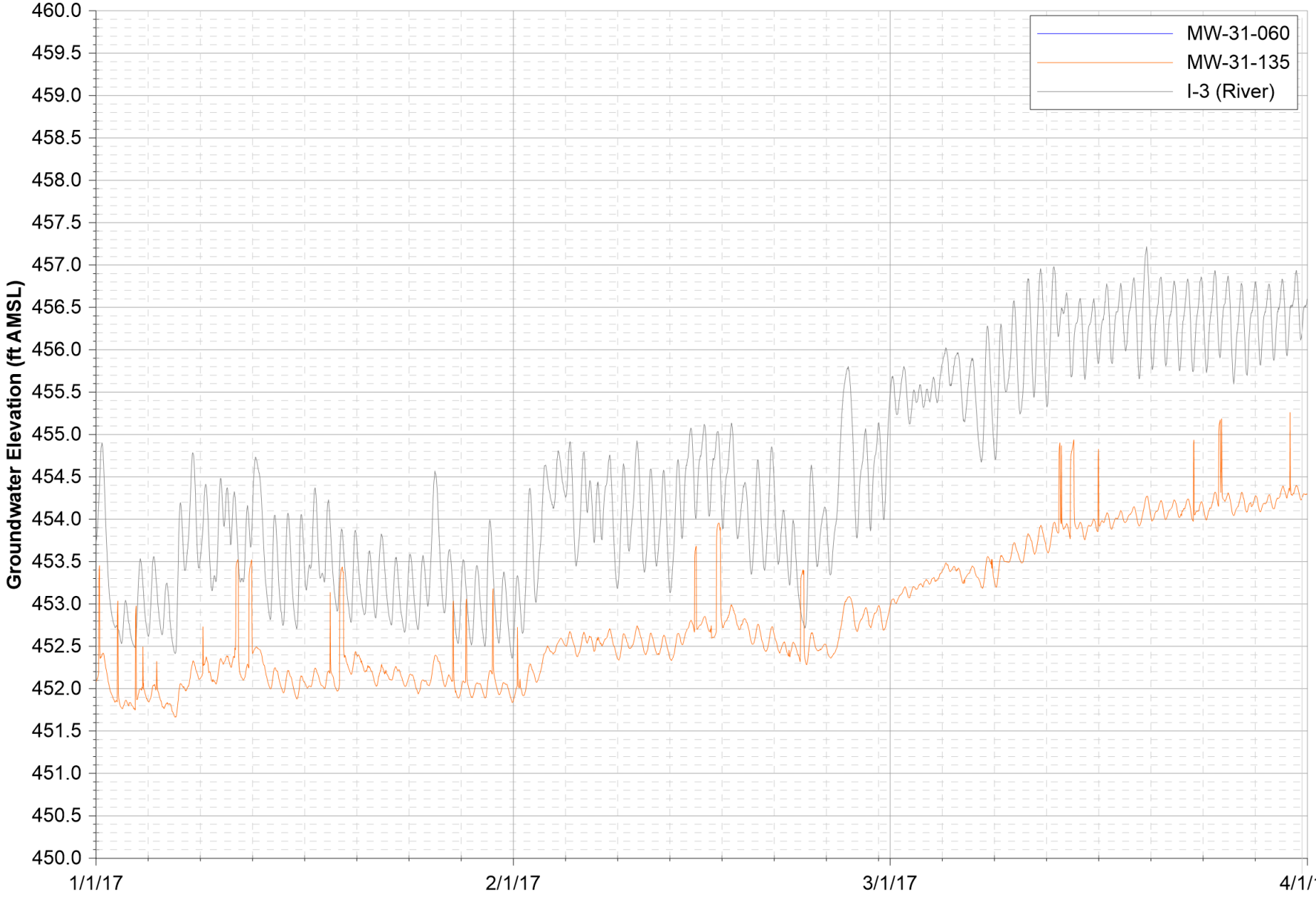

Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-31-060 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1F
MW-31 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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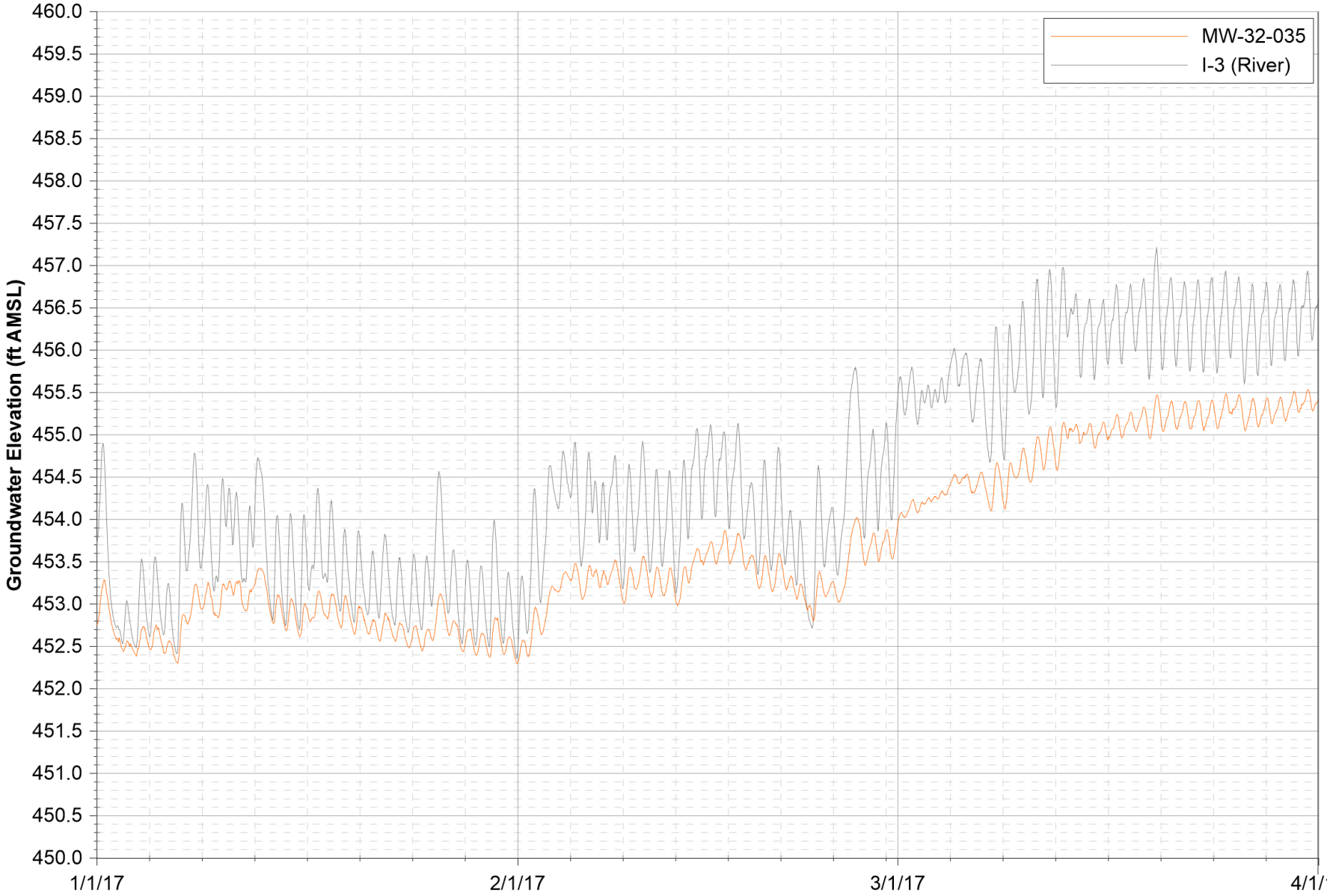
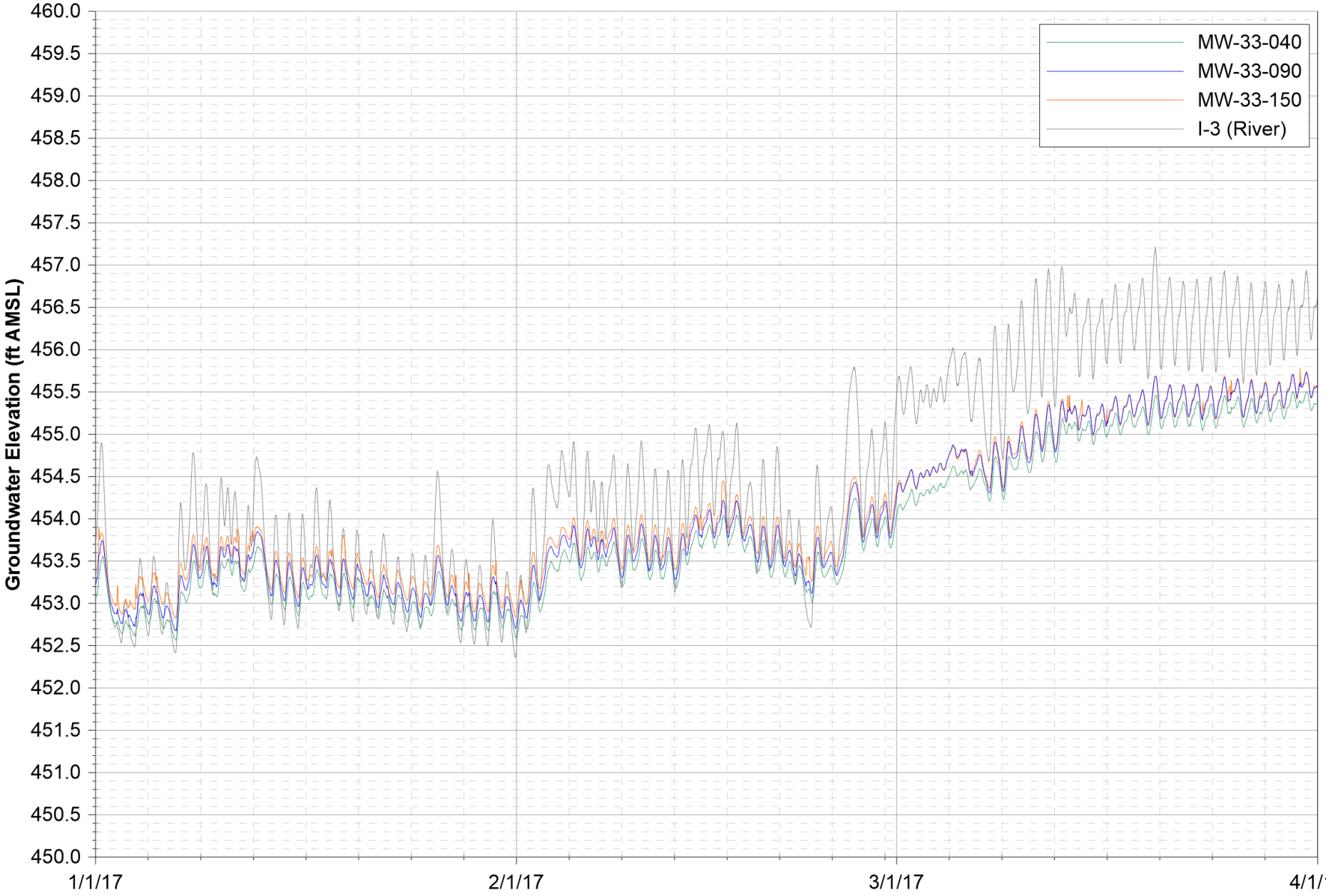


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1G
MW-32 HYDROGRAPH
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



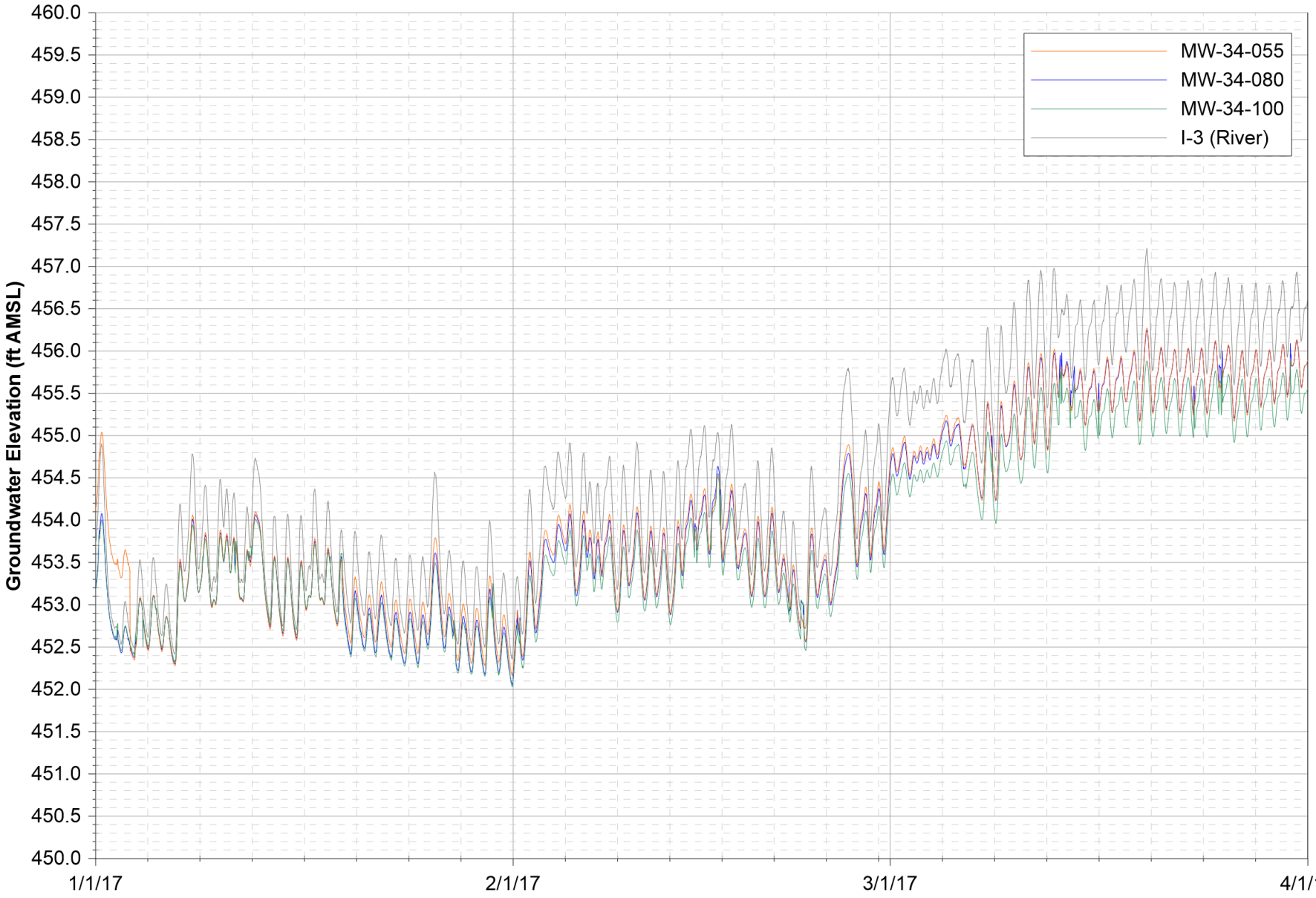
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1H

MW-33 CLUSTER HYDROGRAPHS

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

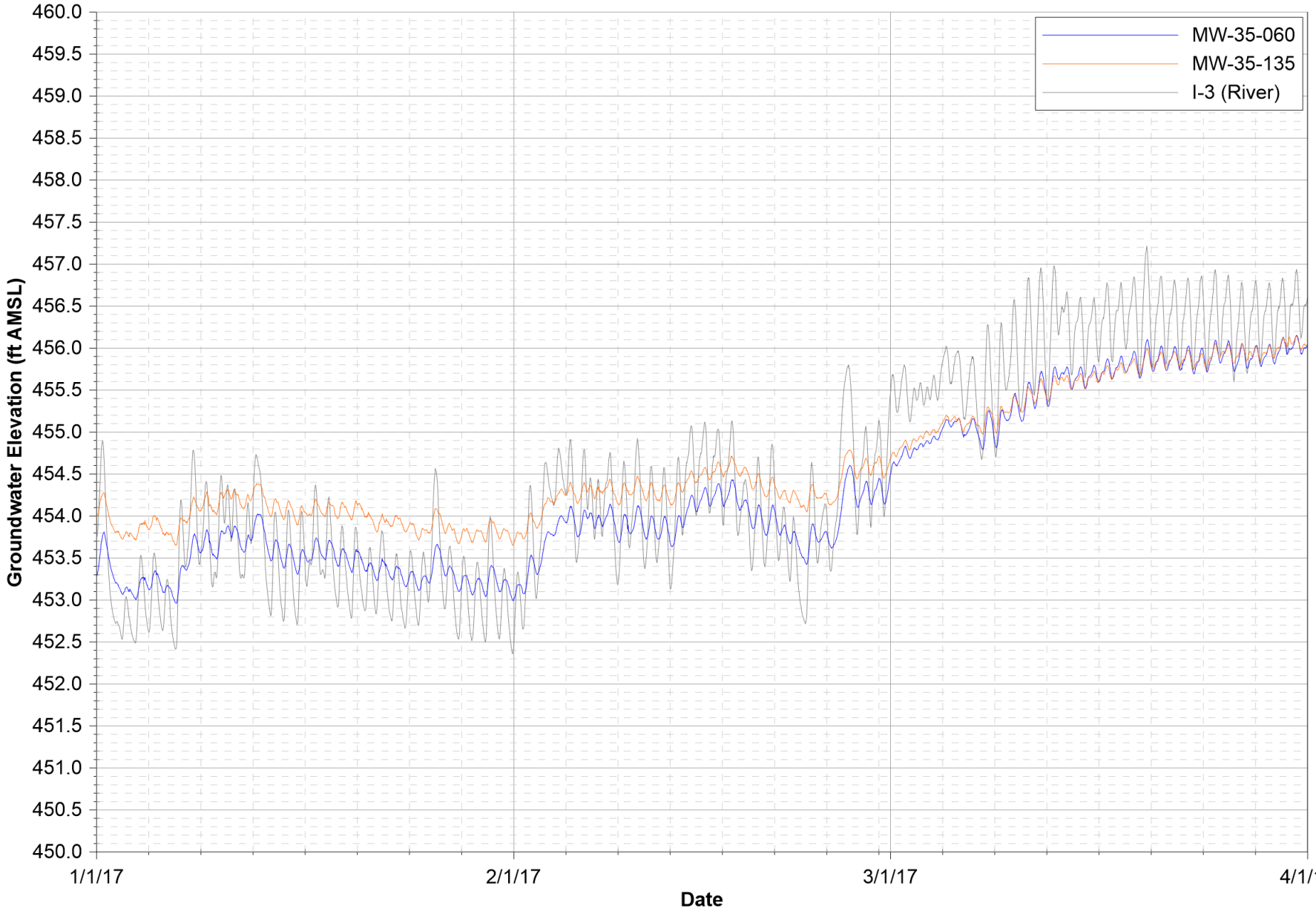
ARCADIS



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

FIGURE F-1I
MW-34 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

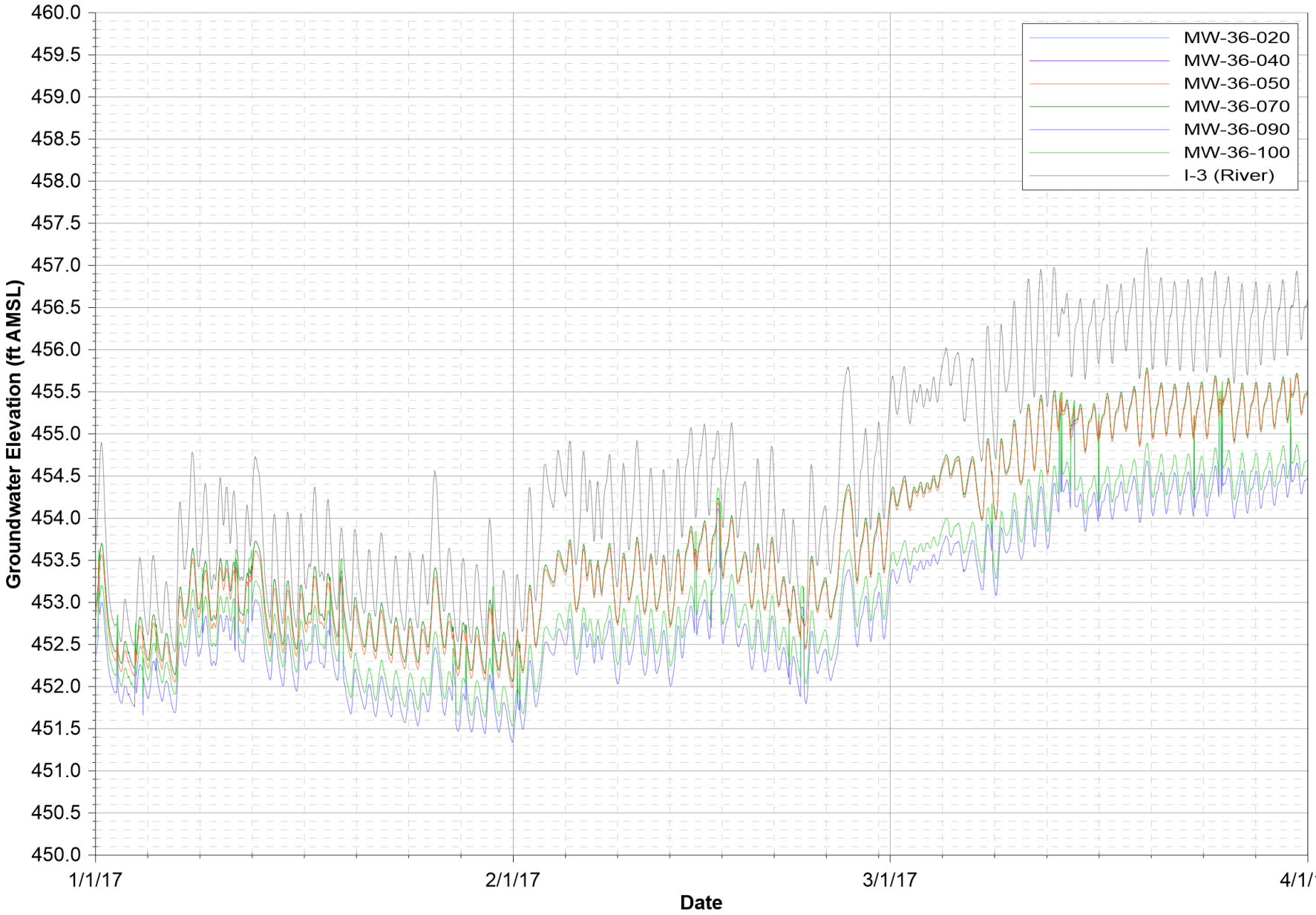
ARCADIS



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

FIGURE F-1J
MW-35 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 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 January 1, 2017 through March 31, 2017 due to transducer malfunction.
4. MW-36-040 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1K
MW-36 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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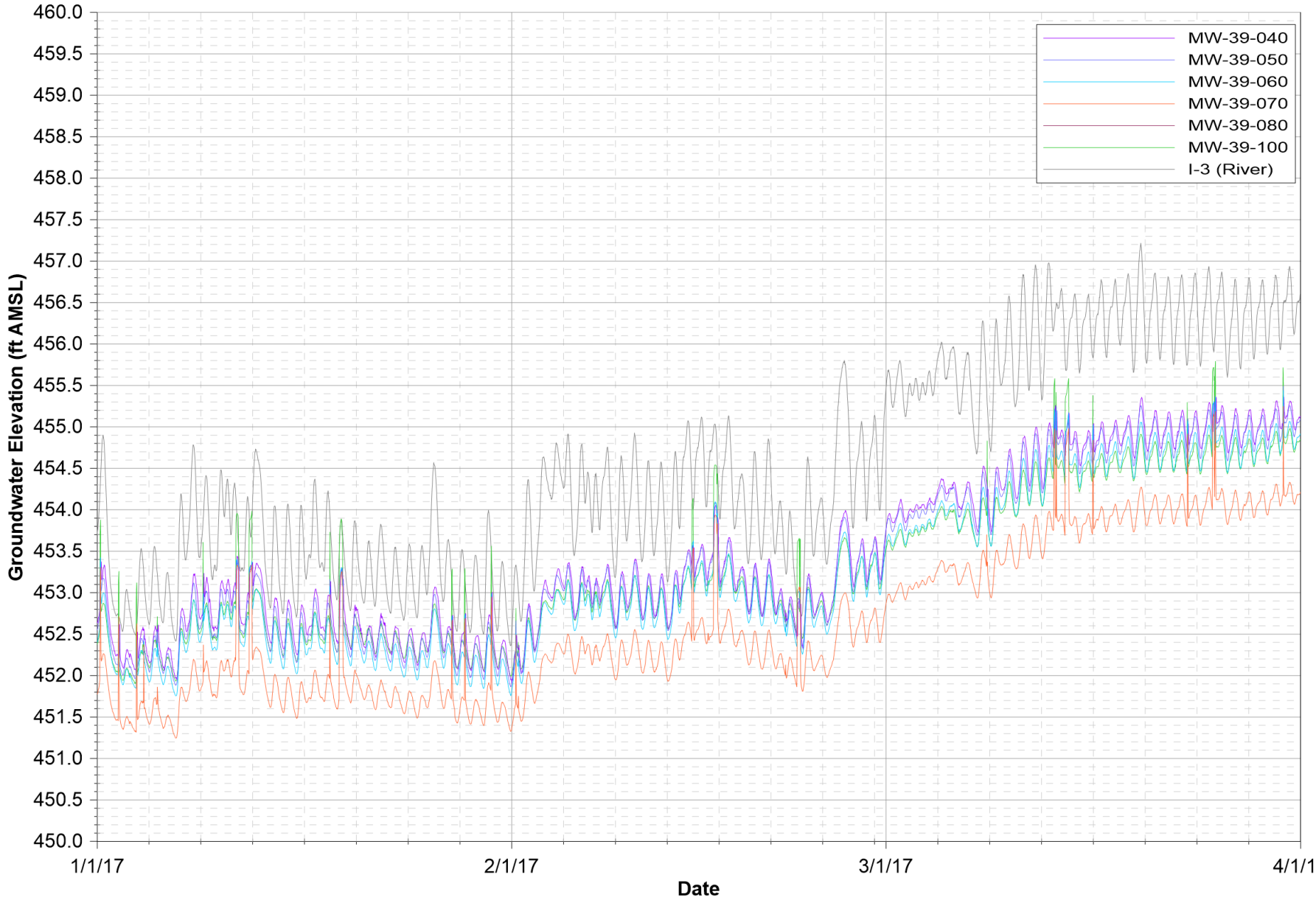

Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-39-080 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction

FIGURE F-1L
MW-39 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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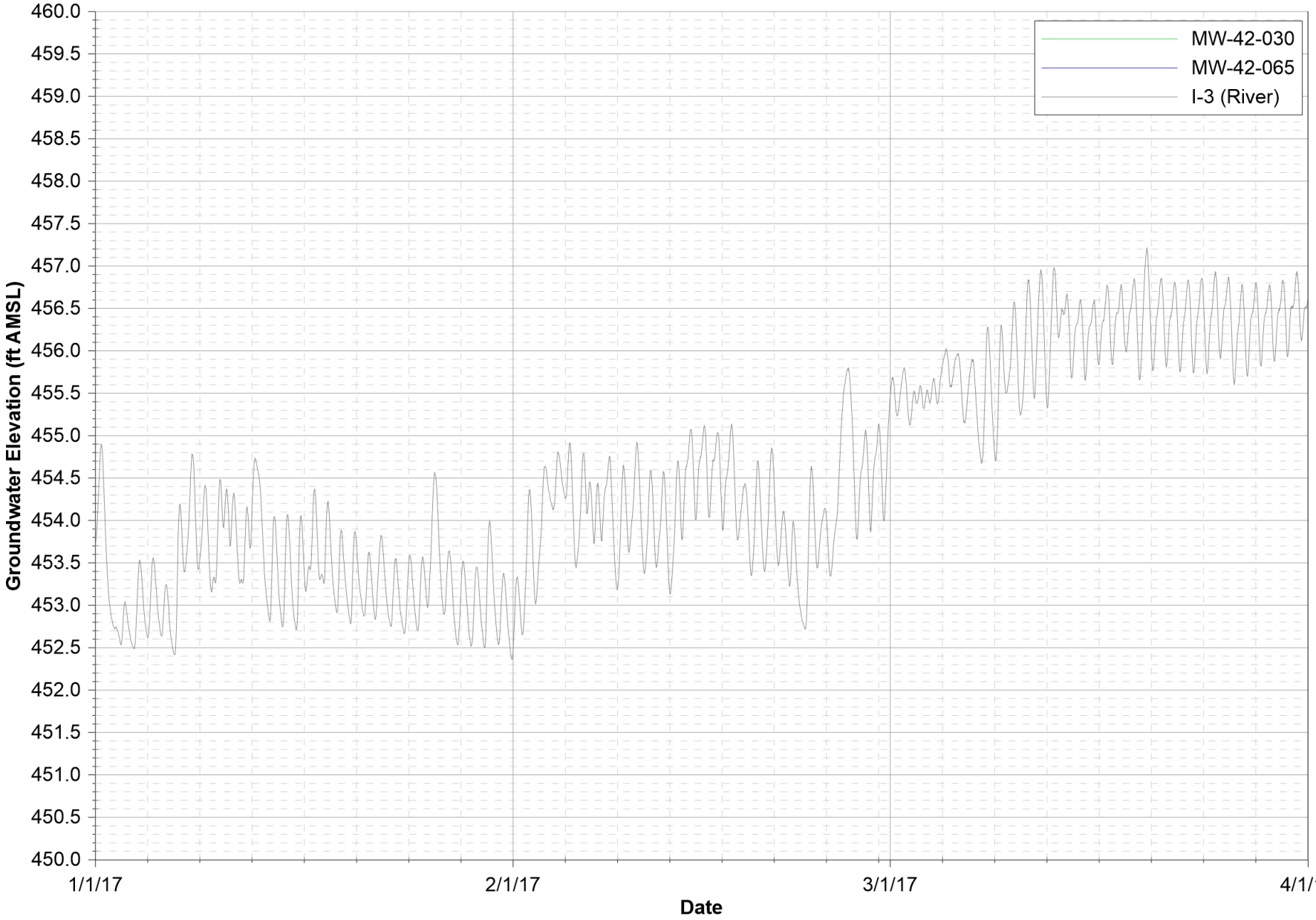
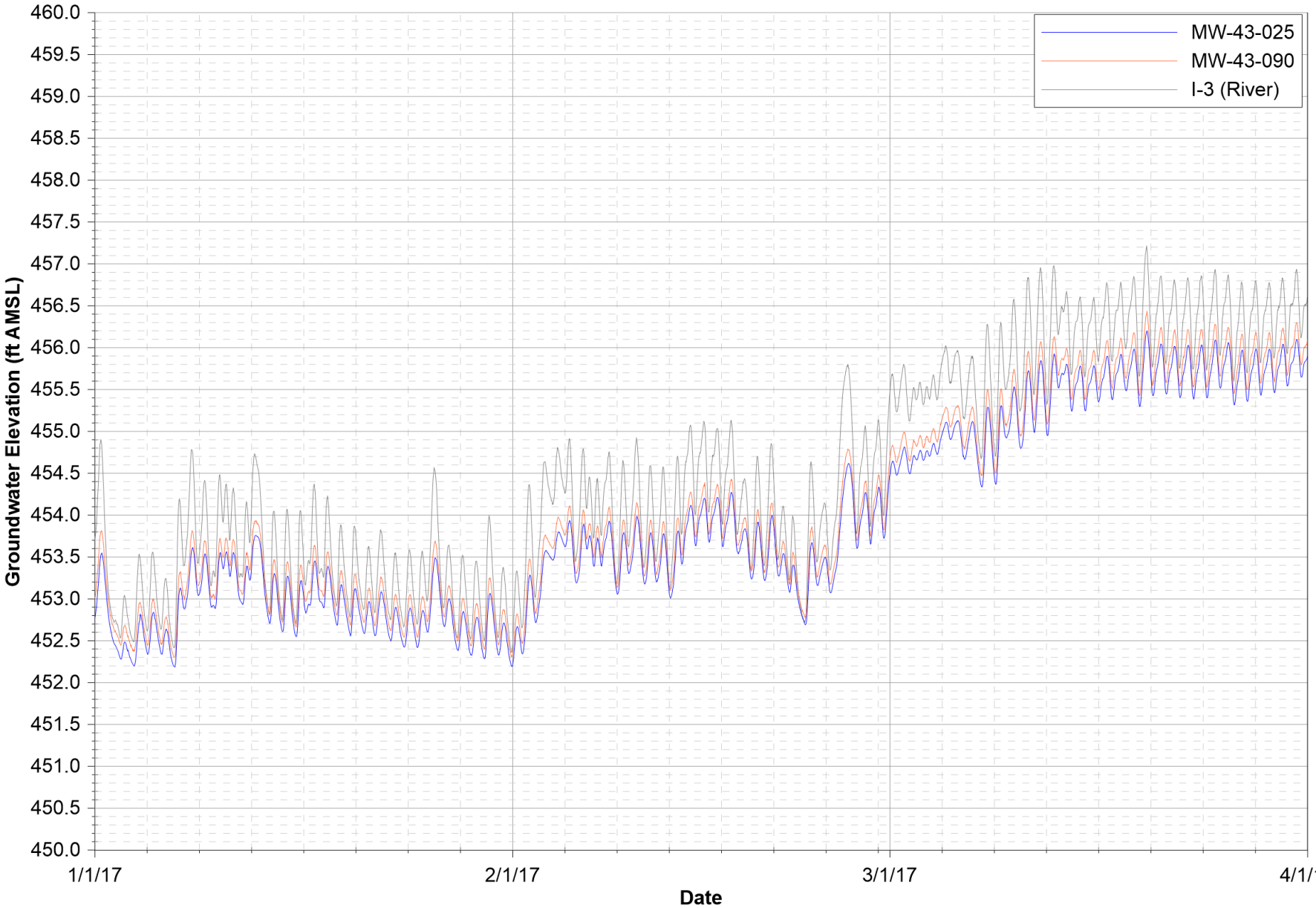


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-42-030 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.
4. MW-42-065 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1M
MW-42 CLUSTER HYDROGRAPHS

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

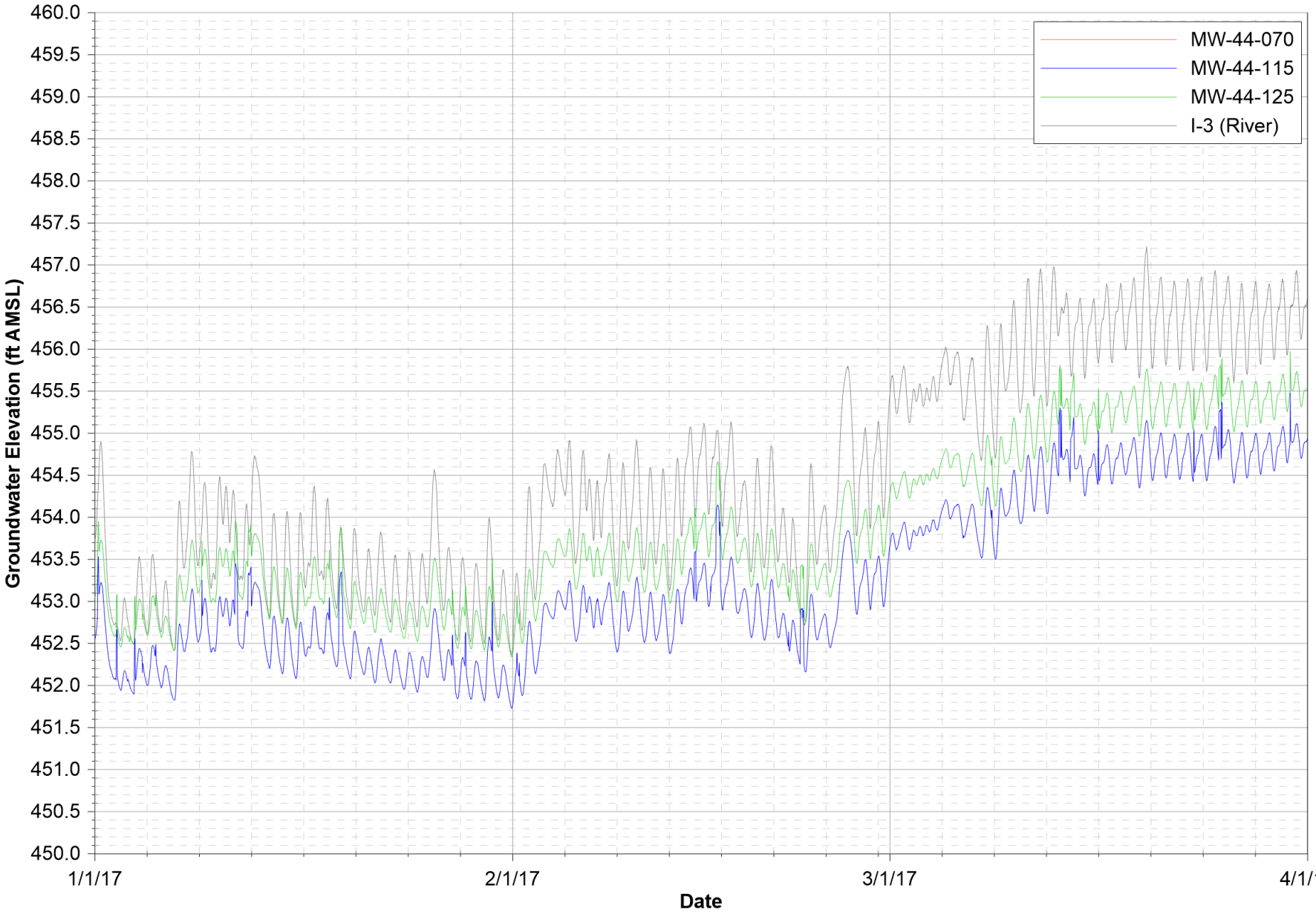
ARCADIS



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

FIGURE F-1N
MW-43 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

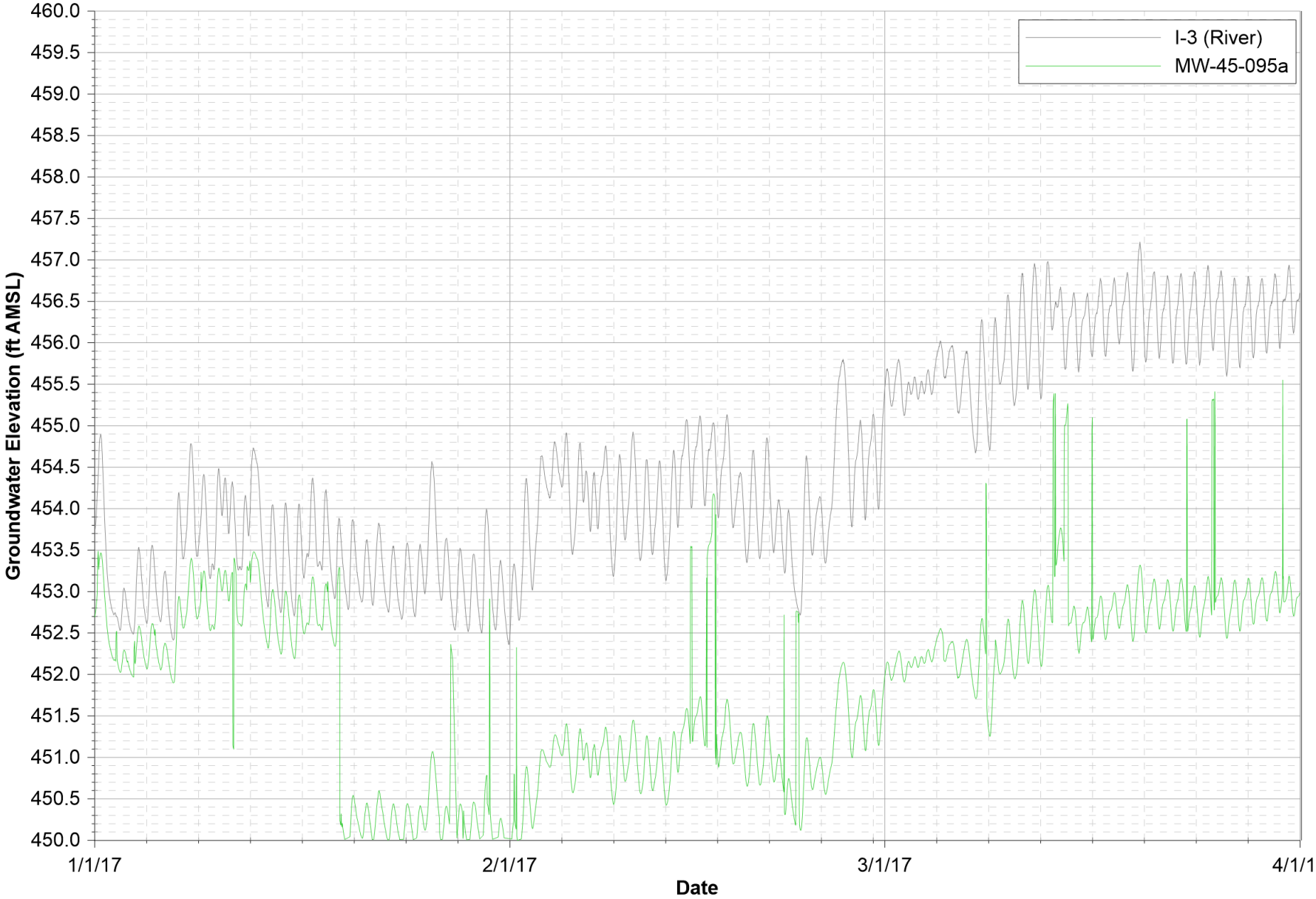
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-44-070 data unavailable from January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1O
MW-44 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

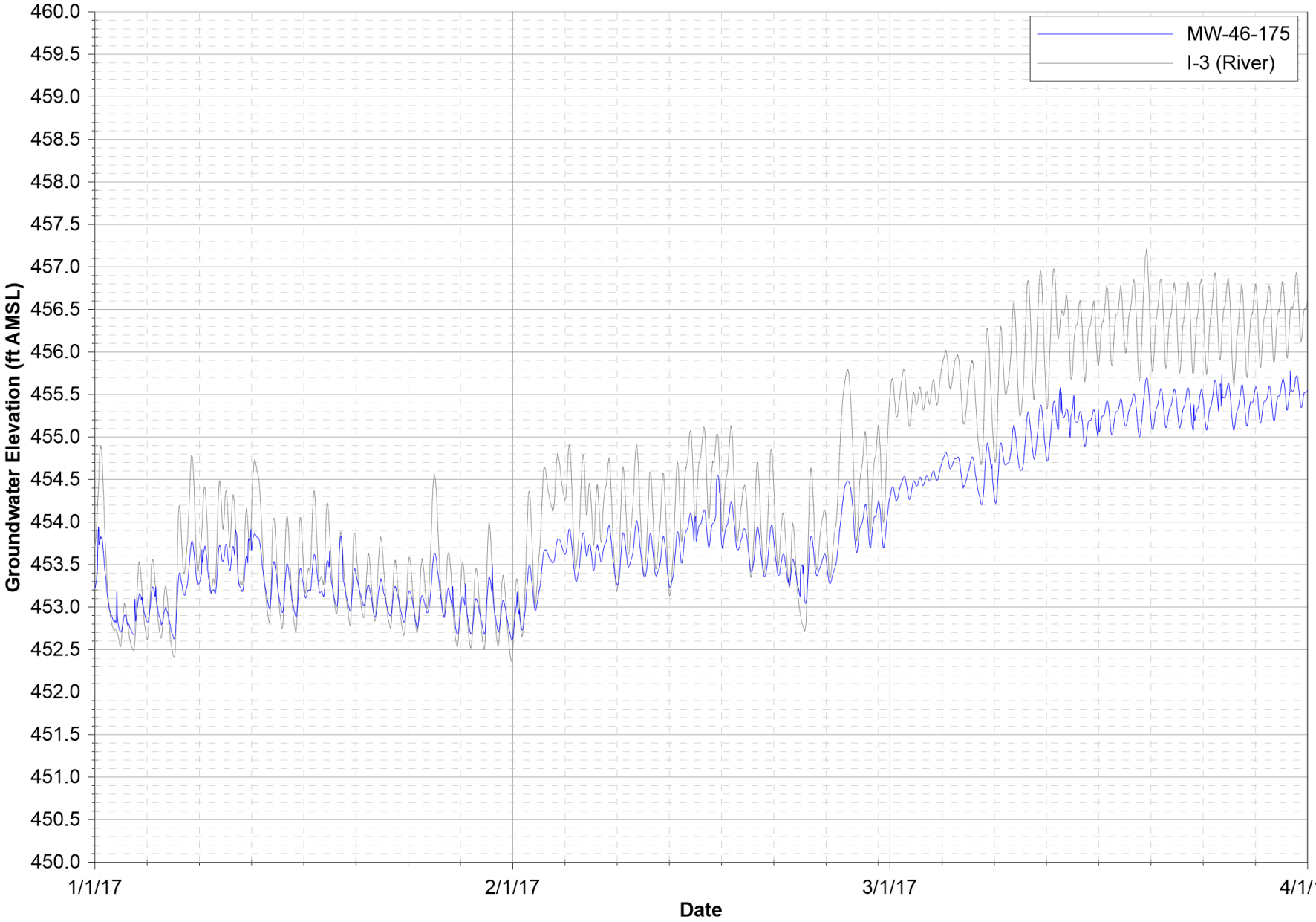
ARCADIS



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

FIGURE F-1P
MW-45-095a HYDROGRAPH
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

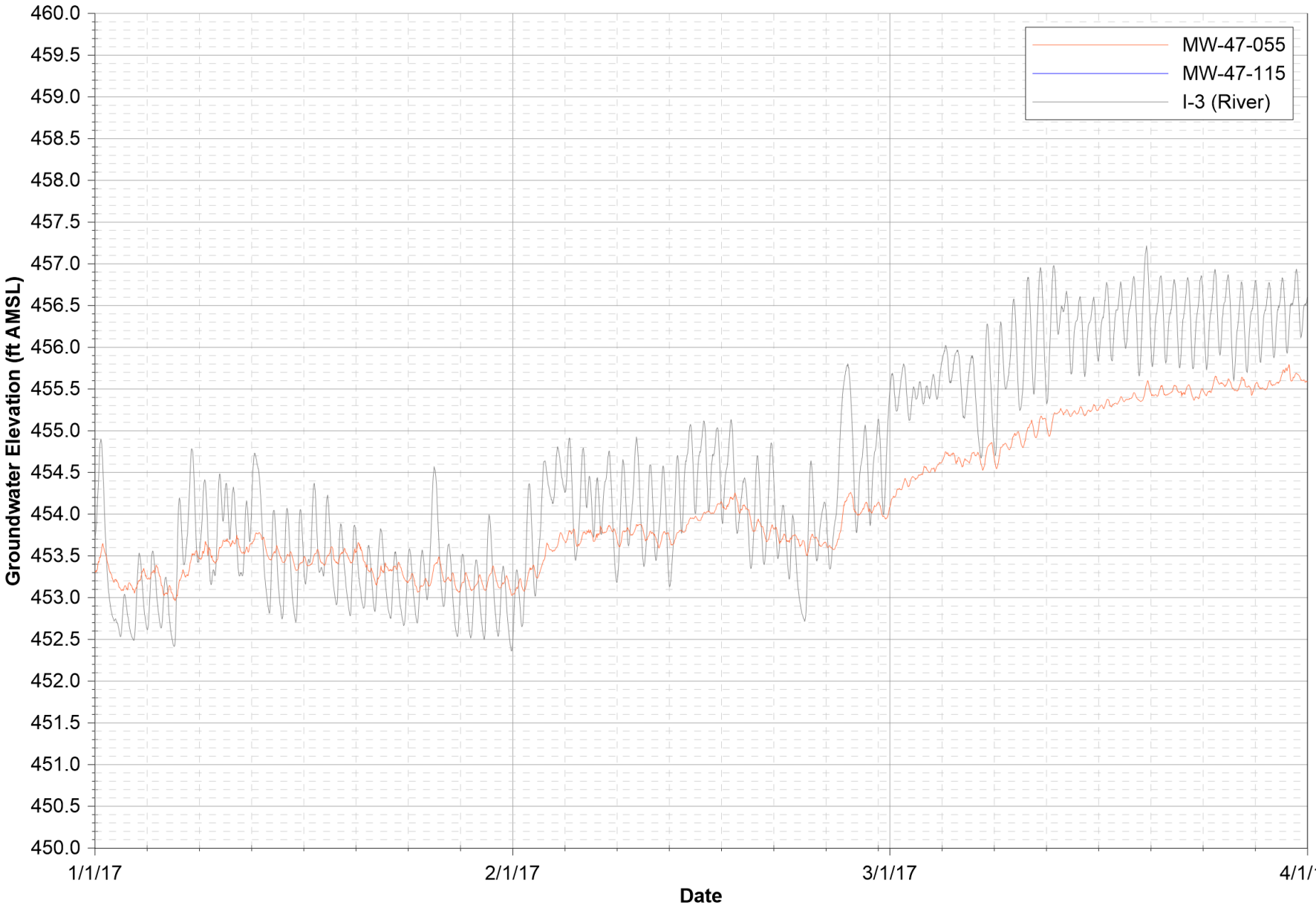
ARCADIS



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

FIGURE F-1Q
MW-46 HYDROGRAPH
FIRST QUARTER 2017 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-47-115 data unavailable from January 1, 2017 to March 31, 2017 due to transducer malfunction.

FIGURE F-1R
MW-47 CLUSTER HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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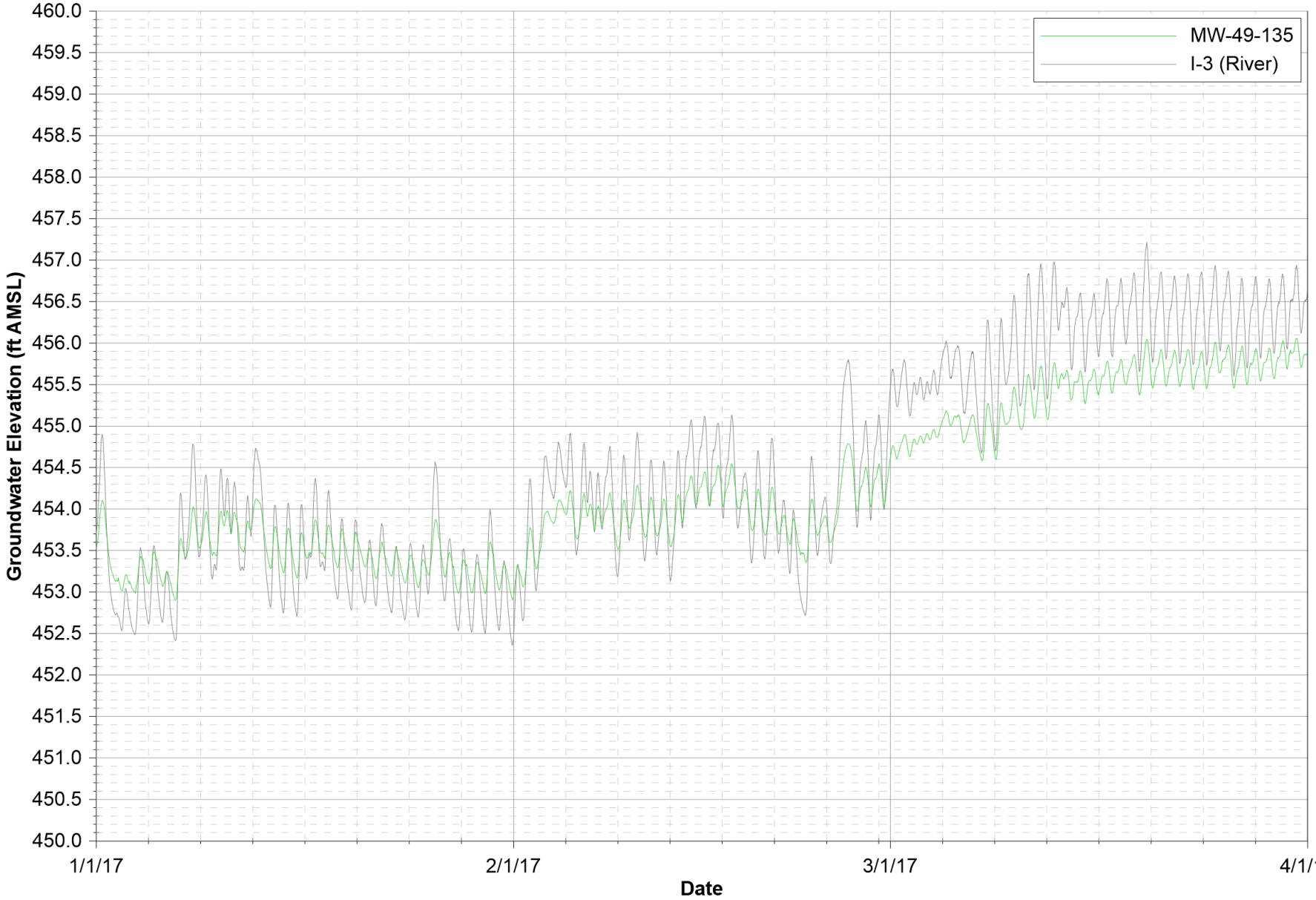
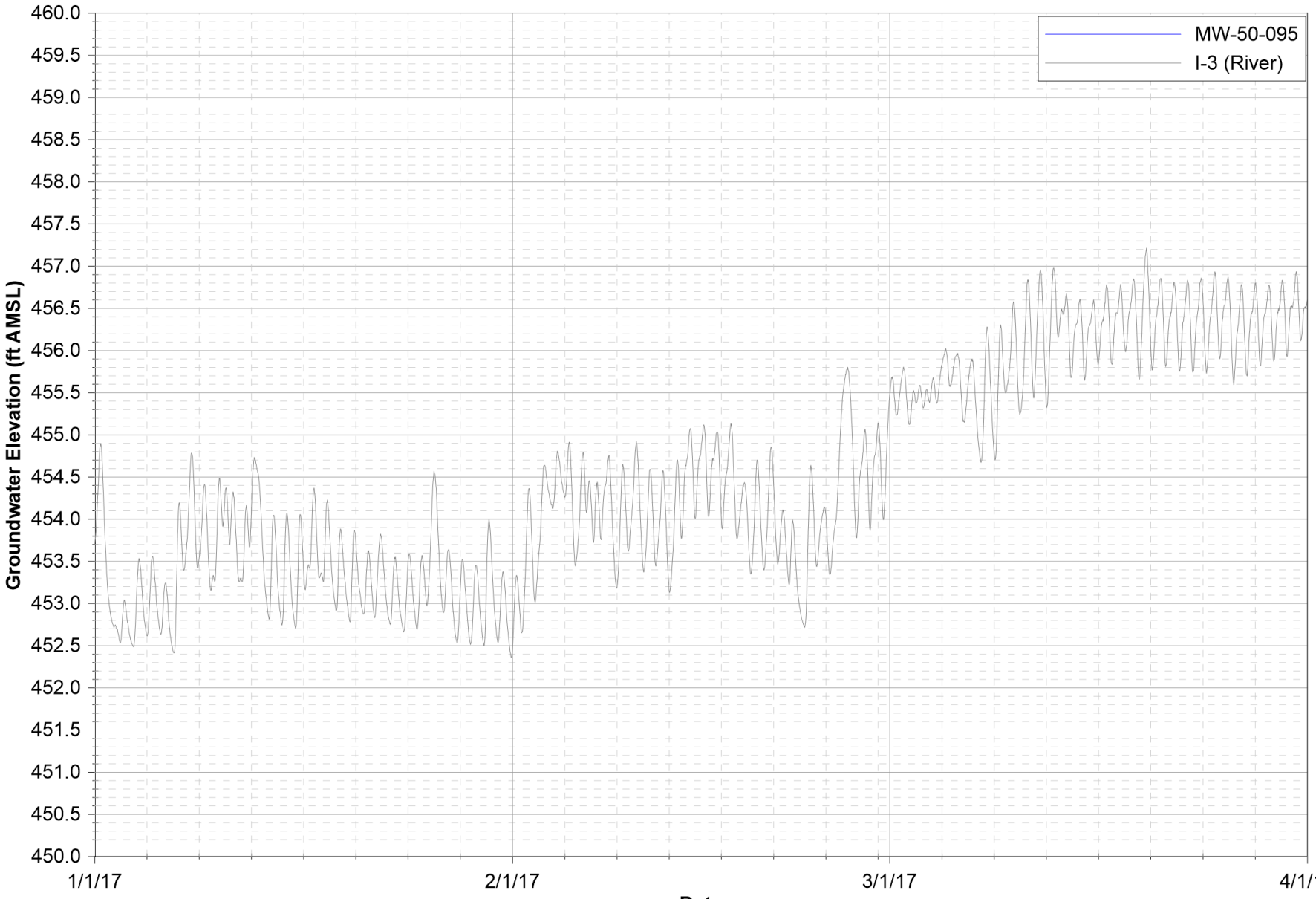


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1S
MW-49 HYDROGRAPH
FIRST QUARTER 2017 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 January 1, 2017 through March 31, 2017 due to transducer malfunction.

FIGURE F-1T

MW-50 HYDROGRAPH

FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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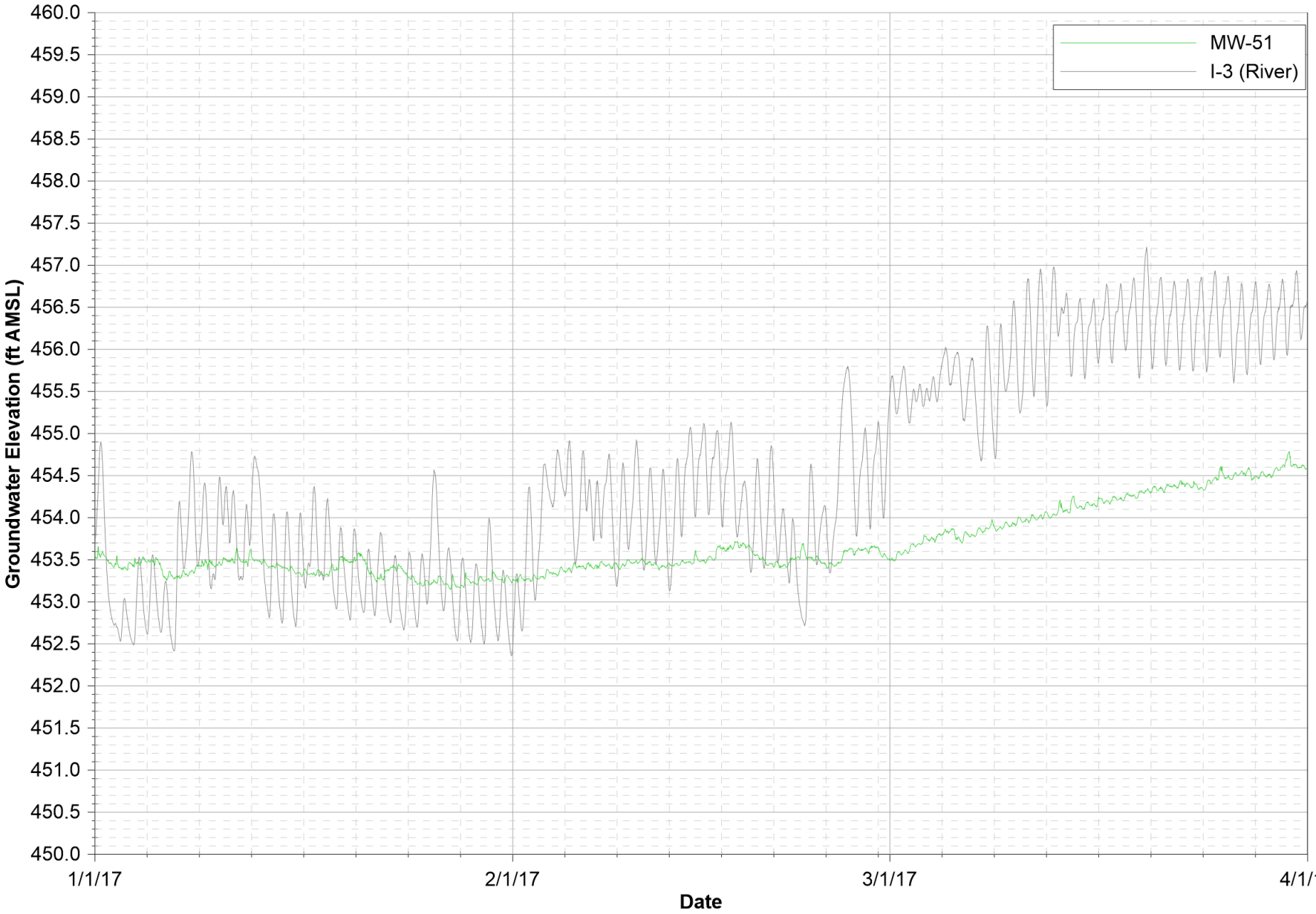
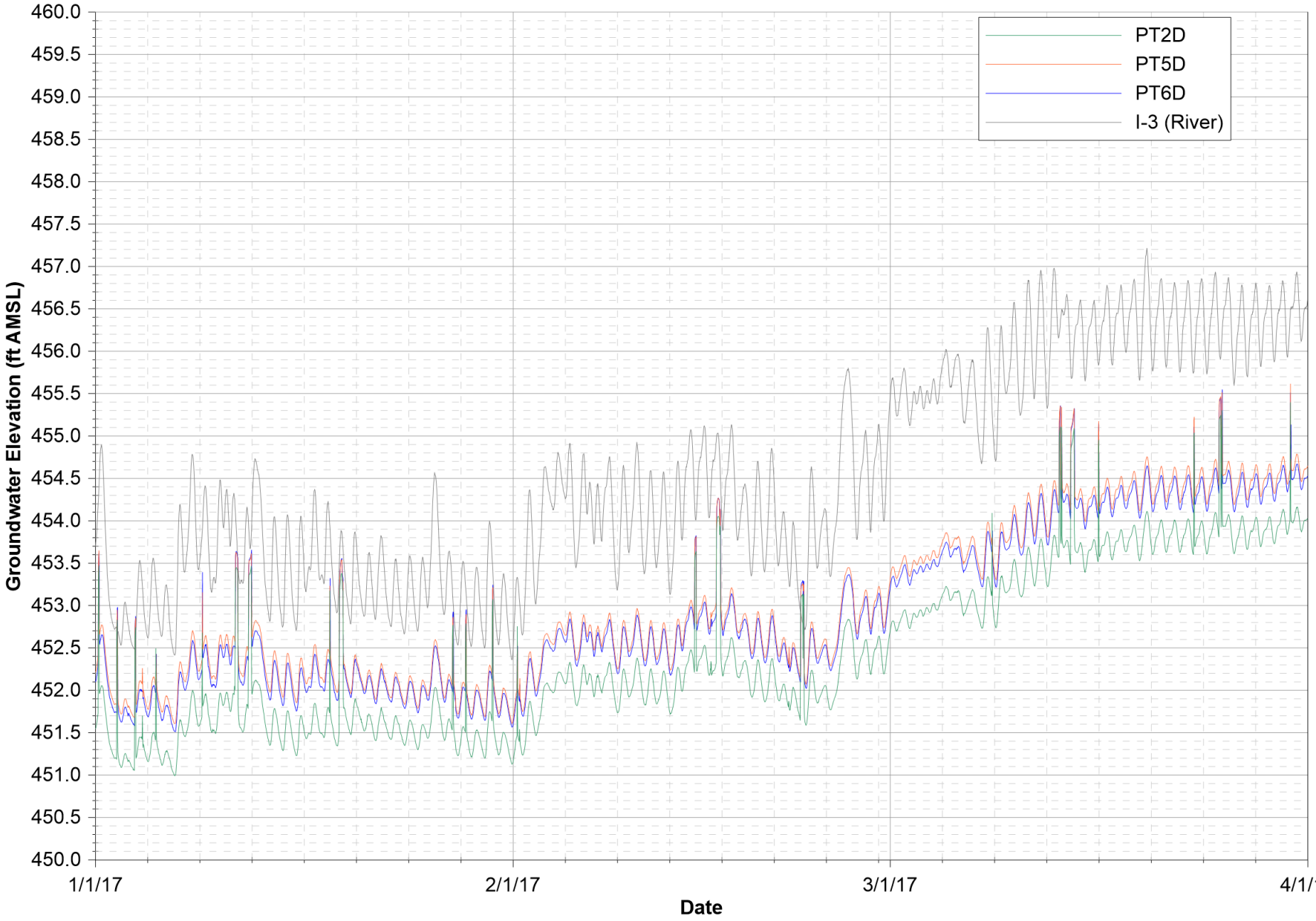


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1U
MW-51 HYDROGRAPHS
FIRST QUARTER 2017 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.

FIGURE F-1V
INSITU PILOT STUDY WELL HYDROGRAPHS
FIRST QUARTER 2017 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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