Topock Project Executive Abstract

Document Title: Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

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PG&E

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☐ Draft ☒ Report ☐ Letter ☐ Memo
☐ Other / Explain:

Action Required:
☒ Information Only ☐ Review & Comment
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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?
Report is required to be in compliance with DTSC requirements.

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

Brief Summary of attached document:

This annual report documents the monitoring activities and performance evaluation of the Interim Measure (IM) hydraulic containment system under the IM Performance Monitoring Program (PMP) and the groundwater and surface water monitoring program (GMP) at Topock. Hydraulic and chemical monitoring data were collected and used to evaluate IM hydraulic containment system performance based on a set of standards approved by DTSC. Key items included in this report are: (1) Measured groundwater elevation and hydraulic gradient data at compliance well pairs, and the direction of groundwater flow away from the Colorado River and towards the pumping centers on site; (2) Hexavalent chromium [Cr(VI)] data for monitoring wells, and (3) Pumping rates and volumes from the IM extraction system; (4) GMP monitoring activities and results.

Based on the data and evaluation presented in this report, the IM performance standard has been met for the Fourth Quarter 2009 reporting period. During the annual 2009 reporting period the overall average gradient at the site met the IM performance standard for all months. During September 2009, equipment failure caused the IM treatment plant to be down for 7 days and while gradients were still landward, one well pair was below the threshold for the month.

Cr(VI) concentrations observed in the monitoring wells are generally either stable or decreasing during the Fourth Quarter and annual 2009 reporting period. Concentrations continue to decrease in the center of the chromium plume. The average pumping rate for the IM extraction system over the Fourth Quarter 2009 was 128.9 gallons per minute and an estimated 67 kilograms (or 148 pounds) of chromium removed. The average monthly pumping rate over the 2009 reporting period was 121.0 gallons per minute, with an estimated 263 kilograms (or 580 pounds) of chromium removed.

Written by: PG&E

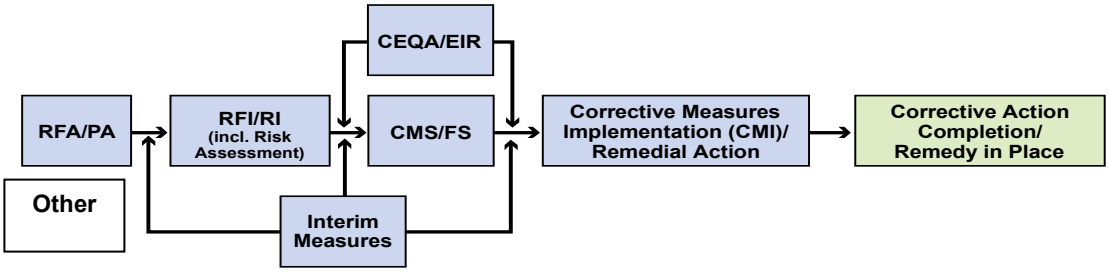
Recommendations:
Performance monitoring and evaluation of the IM hydraulic containment system will continue in accordance with the Performance Monitoring Plan and as directed by the DTSC. This reports presents recommendations for changes in the PMP/GMP for 2010 onward. This report is for information only.

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?

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). **The link to the Documents Library is currently UNDER CONSTRUCTION.**



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

Version 9

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March 15, 2010

Mr. Aaron Yue
Project Manager
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Subject: Fourth Quarter 2009 and Annual Interim Measures Performance and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Dear Mr. Yue:

Enclosed is the *Fourth Quarter 2009 and Annual Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report* for PG&E's Interim Measures (IM) Performance Monitoring Program (PMP) and the Groundwater and Surface Water Monitoring Program (GMP) for the Topock project. This report presents the Fourth Quarter (November 2009 through January 2010) performance monitoring results for the IM hydraulic containment system and provides the annual performance evaluation for the 2009 reporting period, February 2009 through January 2010. This report also presents groundwater and surface water monitoring activities, results, and analysis related to the GMP during the 2009 reporting period. The GMP portion of this report includes data from January 2009 through January 2010 to bring the two reporting schedules into synchronization for this first combined annual PMP/GMP report.

The IM quarterly performance monitoring report is submitted in conformance with the reporting requirements in DTSC's Interim Measure directive dated February 14, 2005 and in updates and modifications approved by DTSC in letters dated October 12, 2007; July 14, 2008; and July 17, 2008. This annual report also presents recommendations for changes to the PMP and GMP going forward into 2010.

Please contact me at (805) 234-2257 if you have any questions on the combined monitoring report. Comments regarding the new report format and contents are welcomed.

Sincerely,

Yvonne Meeks
Topock Project Manager

Enclosure
Fourth Quarter 2009 and Annual Interim Measures Performance and Site-Wide Groundwater and Surface Water Monitoring Report

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Fourth Quarter 2009 and Annual 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

on behalf of

Pacific Gas and Electric Company

March 15, 2010

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Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

Interim Measures Performance Monitoring Program and Groundwater Monitoring Program
PG&E Topock Compressor Station
Needles, California

Prepared for

California Department of Toxic Substances Control

On behalf of

Pacific Gas and Electric Company

March 15, 2010

This report was prepared under the supervision of a California Certified Engineering Geologist

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Contents

Section **Page**

Acronyms and Abbreviations ..... **ix**

1.0 Introduction **1-1**
1.1 Interim Measure Performance Monitoring Program 1-1
1.2 Groundwater and Surface Water Monitoring Program 1-2

2.0 Interim Measures Performance Monitoring **2-1**
2.1 Quarterly Performance Evaluation for November 2009 through January 2010 2-1
2.1.1 Performance Monitoring Network 2-1
2.1.2 Extraction System Operations 2-2
2.1.3 Hexavalent Chromium Distribution and Trends in Floodplain Area 2-2
2.1.4 Other Water Quality Data for Floodplain Wells 2-3
2.1.5 Contingency Plan Cr(VI) Monitoring 2-3
2.1.6 Hydraulic Gradients and River Levels during Quarterly Period 2-3
2.1.7 Projected River Levels during the Next Quarter 2-5
2.1.8 Quarterly Performance Evaluation Summary 2-5
2.2 Extraction System Operations for Annual Reporting Period 2-6
2.2.1 Extraction Facilities and Operations 2-6
2.2.2 Extracted Groundwater Quality and Trends 2-7
2.3 Capture Zone Analysis for Annual Reporting Period 2-7
2.3.1 Monthly Average Gradients 2-7
2.3.2 Annual Average Gradients 2-8
2.3.3 Analysis and Evaluation of Capture Zone 2-8
2.4 Evaluation of Groundwater Quality Data 2-8
2.4.1 Cr(VI) Distribution and Trends 2-9
2.4.2 Groundwater Geochemistry in IM Extraction Area 2-10
2.5 Conclusions and Status of IM Operations 2-11
2.5.1 2009 Performance Evaluation 2-11
2.5.2 Status of Operations and Monitoring 2-13

3.0 Site-Wide Groundwater and Surface Water Monitoring Program **3-1**
3.1 Site-Wide Groundwater Monitoring 3-1
3.1.1 Overview of Groundwater Monitoring Program 3-1
3.1.2 Changes to GMP in 2009 3-2
3.1.3 Fourth Quarter 2009 Monitoring Activities 3-2
3.1.4 Fourth Quarter 2009 Monitoring Results 3-3
3.2 Surface Water Monitoring 3-5
3.2.1 Overview of Surface Water Monitoring Program 3-5
3.2.2 Changes to the Surface Water Monitoring Program in 2009 3-6
3.2.3 Fourth Quarter 2009 Surface Water Monitoring Activities 3-6

3.2.4 Fourth Quarter 2009 Surface Water Monitoring Results....3-6
3.3 Discussion and Conclusions of 2009 GMP Monitoring Results....3-6
3.3.1 Chromium....3-7
3.3.2 Other Monitoring....3-8
3.3.3 Surface Water Monitoring....3-9
3.4 Monitoring and Reporting for 2010....3-9
3.4.1 Monitoring Events....3-9
3.4.2 Reporting....3-10

4.0 Recommendations....4-1
4.1 Recommended Modifications to the GMP....4-1

5.0 References....5-1

Tables

2-1 Pumping Rate and Extracted Volume for IM System, November 2009 through January 2010
2-2 Groundwater Sampling Results, January 2009 through January 2010
2-3 Assessment Monitoring Wells and Trigger Levels for IM Performance Monitoring
2-4 Average Hydraulic Gradients, November 2009 through January 2010
2-5 Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3
2-6 Summary of Pumping Rate and Extracted Volume for 2009 Reporting Period
2-7 Analytical Results from Extraction Wells, February 2009 through January 2010
2-8 Calculated Hydraulic Gradients for Well Pairs by Month for 2009 Reporting Period
3-1 Well Construction and Sampling Summary, January 2010
3-2 Title 22 Metals Results, January 2009 through January 2010
3-3 Manual Water Level Measurements, January 2009 through January 2010
3-4 Field Water Quality Measurements, January 2009 through January 2010
3-5 Surface Water Sampling Results, January 2009 through January 2010
3-6 Unfiltered Hexavalent and Chromium (total) Results, Risk Assessment Data Collection, January 2009 River Monitoring Event

Figures

1-1 Locations of IM-3 Facilities and GMP Monitoring Locations
2-1 Locations of Wells and Cross Sections used for IM Performance Monitoring
2-2 Maximum Cr(VI) Concentrations in Alluvial Aquifer, December 2009
2-3 Cr(VI) Concentrations, Floodplain Cross-section B, December 2009
2-4a Average Groundwater Elevations in Shallow Wells, November 2009 through January 2010
2-4b Average Groundwater Elevations in Mid-depth Wells, November 2009 through January 2010
2-4c Average Groundwater Elevations in Deep Wells, November 2009 through January 2010
2-5 Average Groundwater Elevations for Wells in Floodplain Cross-section A, November 2009 through January 2010
2-6 Measured Hydraulic Gradients, River Elevation, and Pumping Rate, November 2009 through January 2010

2-7 Past and Predicted Future River Levels at Topock Compressor Station
2-8 Monthly Combined Pumping Volumes and Percent Uptime, 2009 Reporting Period
2-9 Cr(VI) and Total Dissolved Solids Concentrations in Extraction Wells TW-3D and PE-1, 2009 Reporting Period
2-10 Measured Hydraulic Gradients, River Elevation, and Pumping Rate, 2009 Reporting Period
2-11a Average Groundwater Elevations in Shallow Wells and River Elevations, 2009 Reporting Period
2-11b Average Groundwater Elevations in Mid-depth Wells, 2009 Reporting Period
2-11c Average Groundwater Elevations in Deep Wells, 2009 Reporting Period
2-12 Average Groundwater Elevations for Wells on Floodplain Cross-Section A, 2009 Reporting Period
2-13 Magnitude and Direction of Hydraulic Gradients in Lower Depth Interval during 2009 Annual Period
2-14 Cr(VI) Concentration Trends in Selected Performance Monitoring Wells, April 2005 through January 2010
2-15 Distribution of Cr(VI) and Geochemical Indicator Parameters in Floodplain Wells, 2009 Reporting Period
2-16 Cr(VI) and Geochemical Indicator Parameters Floodplain Cross-Section A, 2009 Reporting Period
2-17 Average Stable Isotopes of Oxygen and Deuterium, February 2009 through January 2010
2-18 Calculated Percentage of River Water in Select Floodplain Wells from Stable Isotopes
3-1 Monitoring Locations and Sampling Frequency for GMP, January 2010
3-2a Cr(VI) Sampling Results, Shallow Wells in Alluvial Aquifer and Bedrock, Fourth Quarter 2009 Monitoring
3-2b Cr(VI) Sampling Results, Mid-depth Wells in Alluvial Aquifer and Bedrock, Fourth Quarter 2009 Monitoring
3-2c Cr(VI) Sampling Results, Deep Wells in Alluvial Aquifer and Bedrock, Fourth Quarter 2009 Monitoring
3-3 Groundwater Elevation Map, Shallow Zone of the Alluvial Aquifer (Water Table), September 28, 2009
3-4 Surface Water Monitoring Locations, Fourth Quarter 2009

Appendices

A Interim Measure Extraction System Operations Log, November 2009 through January 2010
B Groundwater Monitoring Data for GMP and Interim Measure Monitoring Wells
C Hydraulic Data for Interim Measure Reporting Period
D Summary Information for Interim Measures Performance Monitoring
E Extended Scope Analytical Results for Interim Measures 2009 Reporting Period
F Analytical Data Level 1 Packages, January 2009 through January 2010

Acronyms and Abbreviations

µg/L	micrograms per liter
BOR	United States Bureau of Reclamation
CCR	California Code of Regulations
CMP	Compliance Monitoring Program
Cr(VI)	hexavalent chromium
Cr(T)	total chromium
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ft/ft	feet per foot
GMP	Groundwater and Surface Water Monitoring Program
gpm	gallons per minute
IM	Interim Measure
IMCP	Interim Measure Contingency Plan
IM-3	Interim Measure Number 3
MCL	maximum contaminant level
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
RFI/RI	RCRA facility investigation/remedial investigation
SAFPM	*Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Topock Program*
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The Topock Compressor Station is located in eastern San Bernardino County, 15 miles southeast of the city of Needles, California, as shown in Figure 1-1. In compliance with the requirements for IM monitoring and reporting outlined in the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) IM performance directive of February 2005, and in subsequent directives from the DTSC in 2007 (DTSC, 2005a; DTSC, 2007a-c), this document presents the Fourth Quarter 2009 and Annual Performance Monitoring Program (PMP) evaluation report. The Fourth Quarter reporting period covers IM monitoring activities from November 1, 2009 through January 31, 2010, while the annual reporting period covers activities from February 1, 2009 through January 31, 2010. The data collected as part of the PMP are presented in Section 2.0.

This report also presents the monitoring data from PG&E's site-wide Groundwater and Surface Water Monitoring Program (GMP) collected from November 1, 2009 through January 31, 2010. In addition, this report serves as an annual report and provides a summary of groundwater and surface water monitoring results for samples collected from January 1, 2009 through January 31, 2010 under the Topock GMP. The data collected as part of the GMP are presented in Section 3.0. Further, this report provides recommended changes to the GMP for future monitoring activities (Section 4.0). The annual portion of this report contains data for an additional month to synchronize the GMP and PMP annual reporting schedules. This combined PMP and GMP reporting format was approved by DTSC in May 2009 (DTSC, 2009a). Activities for which data are reported herein have been completed prior to the storm event that occurred during the week of January 18, 2010. Discussion and analysis of impact from the storm event will be presented in the First Quarter 2010 report.

1.1 Interim Measure Performance Monitoring Program

The Topock project IM 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 Interim Measure Number 3 (IM-3). Currently, the IM-3 facilities include a groundwater extraction system (four extraction wells: TW-2D, TW-3D, TW-2S, and PE-1), conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. Figure 1-1 shows the location of the IM-3 extraction, conveyance, treatment, and injection facilities. (All figures are located at the end of the report.)

In a letter dated February 14, 2005, DTSC established the criteria for evaluating the performance of the IM (DTSC, 2005a). 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, 2005a). A draft *Performance Monitoring Plan for Interim Measures in the Floodplain Area* (CH2M HILL, 2005a) was submitted to DTSC on April 15, 2005 (here after referred to as the Performance Monitoring Plan).

The February 2005 DTSC directive also defined the monitoring and reporting requirements for the IM. In October 2007, DTSC modified the reporting requirements for the PMP (DTSC, 2007a) to discontinue submittals of the monthly performance monitoring reports (the quarterly and annual reporting requirements were unchanged). Additional updates and modifications to the PMP were approved by DTSC in letters dated October 12, 2007, July 14, 2008, and July 17, 2008 (DTSC, 2007a, 2008a-b).

1.2 Groundwater and Surface Water Monitoring Program

The Topock GMP was initiated as part of a Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act of 1980 facility investigation/remedial investigation (RFI/RI) groundwater investigation. Since 1996, there have been six phases of investigation at the Topock site to collect data for the RFI/RI; these phases have included well installation, pore water and sediment sampling, and ongoing groundwater and surface water sampling.

Groundwater and surface water monitoring data collected between July 1997 and October 2007 are presented in the approved *Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 2 – Hydrogeological Characterization and Results of Groundwater and Surface Water Investigation*, dated February 11, 2009 (CH2M HILL, 2009a). Select groundwater and surface water monitoring data from November 2007 through September 2008 are presented in the approved *Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2 Addendum – Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation,* dated June 29, 2009 (CH2M HILL, 2009b).

Following completion of the groundwater RFI/RI, the groundwater monitoring continues to support ongoing site monitoring and the two IM compliance and performance monitoring programs: the PMP and the Compliance Monitoring Program (CMP) for the IM onsite groundwater treatment and injection operations (Figure 1-1). The groundwater monitoring data for the CMP are reported separately from the PMP and GMP monitoring reports.

2.0 Interim Measures Performance Monitoring

2.1 Quarterly Performance Evaluation for November 2009 through January 2010

2.1.1 Performance Monitoring Network

Figure 2-1 shows the locations of wells used for IM extraction, performance monitoring, and hydraulic gradient measurements. With approval from DTSC, the list of wells included in the PMP was modified beginning August 1, 2008. The performance monitoring wells that were in service/active as of January 2010 are defined as:

- **Floodplain Wells** (monitoring wells on the Colorado River floodplain): MW-22, MW-27 cluster (three wells), MW-28 cluster (two wells), MW-30-50, MW-32-35, MW-33 cluster (three wells), MW-34 cluster (three wells), MW-36 cluster (six wells), MW-39 cluster (six wells), MW-42 cluster (two wells), MW-43 cluster (two wells), MW-44 cluster (three wells), MW-45-95, MW-46-175, and MW-49-135. Additionally, three pilot test wells installed on the floodplain (PT-2D, PT-5D, and PT-6D) are used to supplement hydraulic monitoring but are not formally part of the PMP.
- **Intermediate Wells** (monitoring wells located immediately north, west, and southwest of the floodplain): MW-20 cluster (three wells), MW-26, MW-31 cluster (two wells), MW-35 cluster (two wells), MW-47 cluster (two wells), MW-50-95, and MW-51.
- **Interior Wells** (monitoring wells located upgradient of IM pumping): MW-25.

Three extraction wells (TW-2D, TW-3D, and TW-2S) are located on the MW-20 bench. In addition, extraction well PE-1 is located on the floodplain approximately 450 feet east of extraction well TW-3D (Figure 2-1). Currently, both extraction wells TW-3D and PE-1 operate full time.

There are additional groundwater monitoring wells installed on the Arizona side of the Colorado River. These include the MW-53 slant well cluster, the MW-54 cluster, and the MW-55 cluster. These wells are not formally part of the PMP, but some of the wells have been used to collect groundwater elevation data for evaluating the hydraulic gradient on the Arizona side of the river.

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, mid-depth, and lower—are based on grouping the monitoring wells screened at common elevations. These divisions do not correspond to any lithostratigraphic layers within the aquifer. The floodplain aquifer is considered to be hydraulically undivided. The subdivision of the aquifer into three depth intervals is an appropriate construct for presenting and evaluating 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.

During 2009, an additional investigation was conducted in an area east of the Topock Compressor Station called the East Ravine. All wells completed during this recent investigation were incorporated into the site-wide GMP and are not part of the PMP monitoring network. With the exception of well MW-59-100, all of these wells are bedrock wells, and all wells are located south of the floodplain where the IM is currently being implemented.

2.1.2 Extraction System Operations

During Fourth Quarter 2009, 17,064,630 gallons of groundwater were extracted and treated by the IM-3 system. This resulted in removal of an estimated 148 pounds (67 kilograms) of chromium from the aquifer during Fourth Quarter 2009. Table 2-1 summarizes the pumping information during the reporting period. (All tables are located at the end of the report.) The average pumping rate for the IM system during Fourth Quarter 2009, including extraction system downtime, was 128.9 gallons per minute (gpm). The average monthly pumping rates were 133.4 gpm (November 2009), 123.8 gpm (December 2009), and 129.4 gpm (January 2010) during the quarterly reporting period.

During Fourth Quarter 2009, extraction wells TW-3D and PE-1 provided primary service, operating at a target combined pumping rate of 135 gpm, excluding periods of planned and unplanned downtime. The operational run-time percentage for the IM extraction system was 96.6 percent during Fourth Quarter 2009. An operations log for the extraction system for Fourth Quarter 2009, including downtime, is included in Appendix A.

The concentrate (i.e., saline water) from the reverse osmosis system was shipped offsite with shipping papers as a RCRA non-hazardous waste and was transported to Liquid Environmental Solutions in Phoenix, Arizona for treatment and disposal. One container of solids from the IM-3 facility was disposed of at the Kettleman Hills Chemical Waste Management facility during Fourth Quarter 2009. Daily inspections of the IM-3 treatment facility included general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained onsite.

Future monitoring of the extraction well(s) water quality will be completed at the frequency required by the Waste Discharge Requirements issued for the IM-3 treatment facility.

2.1.3 Hexavalent Chromium Distribution and Trends in Floodplain Area

During the Fourth Quarter 2009 reporting period, groundwater monitoring wells in the performance monitoring area were monitored for Cr(VI), chromium, and field water quality parameters in November 2009 (monthly event; five PMP wells sampled), December 2009 (quarterly event; 20 PMP wells sampled), and January 2010 (monthly event; five PMP wells sampled).

Figure 2-2 shows, in plan view and cross-section, the December 2009 Cr(VI) sampling results for wells in the upper-, mid-, and lower-depth intervals of the Alluvial Aquifer. The Cr(VI) concentration contours of 20 and 50 µg/L (based on the most recent comprehensive

sampling event conducted September 2009) are also shown, in plan view and cross-section, in Figure 2-2 in accordance with DTSC's performance monitoring directive (DTSC, 2005a). The location of cross-section A is shown on Figure 2-1.

Figure 2-3 presents the December 2009 Cr(VI) results for Cross-section B, oriented parallel to the Colorado River. On Figures 2-2 and 2-3, 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 in Figures 2-2 and 2-3 are shown in accordance with DTSC's 2005 IM directive and are not based on the background Cr(VI) concentration for groundwater.

Table 2-2 presents chromium and field parameter sampling results for all GMP wells sampled for chromium from January 2009 through January 2010. Hexavalent chromium concentration trend graphs for floodplain well clusters with consistent chromium detections are presented in Figures B-1 through B-7 in Appendix B. Section 2.4.1 of this report provides an evaluation of the Cr(VI) trends observed during performance monitoring in the floodplain area.

2.1.4 Other Water Quality Data for Floodplain Wells

Table B-1 in Appendix B presents the results of the general chemistry and stable isotope analyses for 15 PMP monitoring wells and two river stations during sampling events from March 2005 through January 2010. In October 2008, DTSC approved modifications to the PMP IM chemical performance monitoring program (DTSC, 2008b). With those modifications, there are now 10 monitoring wells and one river station sampled for IM chemical performance monitoring. Figure 2-1 shows the locations of the monitoring wells sampled for the performance monitoring parameters. Water samples from the selected performance monitoring locations are analyzed for general chemistry parameters including total dissolved solids (TDS), chloride, sulfate, nitrate, bromide, calcium, potassium, magnesium, sodium, boron, alkalinity, deuterium, and oxygen-18 to monitor the effects of IM pumping on groundwater chemistry. Section 2.4.2 of this report provides an evaluation of the general chemistry groundwater data for the floodplain area.

2.1.5 Contingency Plan Cr(VI) Monitoring

The Topock Interim Measures Contingency Plan (IMCP) was developed to detect and control any possible migration of the Cr(VI) plume toward the Colorado River. Currently, the IMCP consists of 24 wells. Current IMCP wells, trigger levels, and most recent sampling results are listed in Table 2-3. The IMCP well Cr(VI) results in Fourth Quarter 2009 were all below their assigned trigger levels. Appendix B includes Cr(VI) concentration trend graphs for the IMCP wells.

2.1.6 Hydraulic Gradients and River Levels during Quarterly Period

During the reporting period, water levels were recorded at intervals of 30 minutes with pressure transducers in 53 wells and two river monitoring stations (I-3 and RRB). The data are typically continuous, with only short interruptions for sampling or maintenance. The locations of the wells monitored are shown in Figure 2-1 and are listed in Section 2.1.1.

Daily average groundwater and river elevations calculated from the pressure transducer data for Fourth Quarter 2009 reporting period are summarized in Table C-1 in Appendix C. Groundwater elevations (or hydraulic heads) are adjusted for temperature and for salinity differences between wells (i.e., adjusted to a common freshwater equivalent), as described in the Performance Monitoring Plan. Groundwater elevation hydrographs for the PMP wells during the 2009 reporting period are included in Appendix C. The elevation of the Colorado River measured at the I-3 gauge station (Figure 2-1) is also shown on the hydrographs.

Average fourth quarter groundwater elevations for the shallow, mid-depth, and deep wells are presented and contoured in plan view in Figures 2-4a through 2-4c. Average groundwater elevations for wells on floodplain Cross-section A are presented and contoured in Figure 2-5. Note that several monitoring wells are significantly deeper than other wells in the lower depth interval. Due to vertical gradients present at the Topock site, water levels in deeper wells tend to be higher than water levels in shallower wells. Consequently, some of the wells with screen intervals significantly deeper than most of the lower-interval wells exhibit water levels that are not contoured in the plan view in Figure 2-4c.

For the Fourth Quarter 2009 reporting period, a full set of transducer data was recorded in wells located on the Arizona side of the Colorado River. The quarterly average groundwater elevations for wells MW-55-120, MW-54-85, MW-54-140, and MW-54-195 are posted on Figure 2-4c and are used for contouring where appropriate. With the exception of well MW-55-45, all of the wells in the MW-54 and MW-55 clusters are screened in the deep interval of the Alluvial Aquifer. Well MW-55-45 is screened over the boundary between the shallow and middle intervals. Because this is the single data point in these depth intervals on the Arizona side, this area was not shown or included in contouring of the shallow and middle intervals.

Deep zone water levels shown in Figure 2-4c 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 hydraulic gradient on the Arizona side of the river is directed to the west and, as a result, groundwater flow would also be towards the west in that area. This is consistent with the site conceptual model and with the current numerical groundwater flow model.

Hydraulic gradients were measured during the fourth quarter period for well pairs selected for performance monitoring of the two pumping centers (TW-3D and PE-1). The following well pairs were approved by DTSC on October 12, 2007 (DTSC, 2007a) to define the gradients induced while pumping from two locations:

- MW-31-135 and MW-33-150 (northern gradient pair)
- MW-45-95 and MW-34-100 (central gradient pair)
- MW-45-95 and MW-27-85 (southern gradient pair)

Table 2-4 presents the average monthly hydraulic gradients that were measured between the gradient well pairs in November 2009, December 2009, and January 2010. Using the data that are available, the overall average gradients for all well pairs ranged from 0.0050 to 0.0058 ft/ft. This is 5.0 to 5.8 times greater than the required gradient of 0.001 ft/ft. The gradient for the northern well pair ranged from 1.8 to 2.0 times the target gradient of 0.001

ft/ft. For the central well pair, the average landward gradient ranged from 9.6 to 11.3 times the target gradient. The southern well pair gradients averaged 3.6 to 4.1 times the target gradient for the fourth quarter reporting period.

Figure 2-6 presents graphs of the hydraulic gradients, monthly average pumping rates, and river levels for the quarterly period. While river levels were at their lowest stage of the year during the Fourth Quarter 2009 reporting period, strong landward gradients were measured each month.

2.1.7 Projected River Levels during the Next Quarter

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 (BOR). 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 2-7 shows river stage measured at I-3 superimposed on the projected I-3 river levels. Projected river levels for future months are based on the BOR projections of Davis Dam discharge and Lake Havasu levels from the month preceding. For example, the projected river level for December 2009 is based on the November 2009 BOR 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 plotted in Figure 2-7 are summarized in Table 2-5. The future projections shown in Figure 2-7 are based on BOR long-range projections of Davis Dam releases and Lake Havasu levels from February 2010. There is more uncertainty in these projections at longer times in the future since water demand is based on climatic factors.

Current BOR projections (Table 2-5) show that the average Davis Dam release for February 2010 (7,700 cubic feet per second) will be greater than in January 2010 (7,415 cubic feet per second). Based on February 2010 USBR projections, it is anticipated that the Colorado River level at the I-3 gage location in February 2010 will be approximately 0.40 foot lower compared to levels in January 2010. Current projections show that the water levels will increase during the next quarterly reporting period and into the summer months, followed by a decline during the fall, as shown in Figure 2-7.

2.1.8 Quarterly Performance Evaluation Summary

The groundwater elevation and hydraulic gradient data from November and December 2009 and January 2010 performance monitoring indicate that the minimum landward gradient target of 0.001 feet/foot was exceeded each month during the quarterly reporting period. The overall average landward gradients during Fourth Quarter 2009 were 5.0 to 5.8 times the required minimum magnitude. The current gradient well pairs are adequate to define the capture of the plume while pumping from extraction wells TW-3D and PE-1.

A total of 17,064,630 gallons of groundwater was extracted between November 2009 and January 2010 by the IM-3 treatment facility. An estimated 148 pounds (67 kilograms) of chromium were removed and treated during this quarter. The average pumping rate for the IM extraction system during Fourth Quarter 2009, including system downtime, was 128.99 gpm.

A review of the groundwater gradient maps for Fourth Quarter 2009 (Figures 2-4a to 2-4c) shows that floodplain PMP monitoring wells where Cr(VI**)** was detected at greater than 20 µg/L are within the IM capture zone of the pumping well(s) during the reporting period. That is, the inferred groundwater flow lines from floodplain PMP wells with Cr(VI) greater than 20 µg/L are oriented towards the TW-3D and PE-1 extraction wells.

The wells that are monitored in the IM pumping area (e.g., MW-36-100, MW-39-70, MW-39-80, and MW-39-100) continue to show overall declining Cr(VI) concentrations relative to prior monitoring results (see Appendix B, Figures B-1 through B-7). Presentation and evaluation of the Cr(VI) trends observed in the performance monitoring area during the 2009 reporting period are discussed in Section 2.4.1.

Based on the hydraulic and monitoring data and evaluation presented in this report, the IM performance standard has been met for the fourth quarter reporting period.

2.2 Extraction System Operations for Annual Reporting Period

2.2.1 Extraction Facilities and Operations

Pumping data for the IM-3 groundwater extraction system for the 2009 annual reporting period are presented in Table 2-6. A total of 63,414,693 gallons of groundwater was extracted from February 2009 through January 2010. Approximately 580 pounds (263 kilograms) of chromium were removed from the aquifer by pumping over the 2009 annual reporting period. The total mass of chromium removed by the IM-2 and IM-3 extraction systems during IM pumping from March 2004 through January 31, 2010 is approximately 5,974 pounds (2,710 kilograms). The average annual pumping rate during the 2009 reporting period was 121 gpm, while pumping from extraction wells TW-3D and PE-1.

Figure 2-8 summarizes the monthly pumping rates, cumulative volumes extracted, and the percent of time that the extraction system was in operation during the 2009 reporting period. This figure shows that pumping rates were relatively consistent month to month, which is illustrated by the high percentage of uptime for the IM extraction and treatment facilities throughout the year. The decrease in uptime during April 2009 was due to the planned annual treatment plant maintenance event. The decrease in uptime in July 2009 was due to the planned installation of a new reverse osmosis system. The decrease in uptime in September 2009 was due to unplanned downtime. Further discussion of these downtime events can be found in the First Quarter 2009 PMP report, the Second and Third Quarter 2009 combined PMP and GMP reports, and the *Topock Interim Measures No. 3 Extraction System 20 Percent Downtime in September 2009 Report, PG&E Topock Compressor Station, Interim Measures No. 3 Groundwater Treatment System, Needles, California* (CH2M HILL, 2009c-f)

Extraction wells TW-3D and PE-1 operated throughout the annual reporting period at the target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime. During the annual reporting period, extraction wells TW-2D and TW-2S were only operated for short-term support of the extraction system or field operations and for periodic groundwater sampling.

2.2.2 Extracted Groundwater Quality and Trends

Extraction well TW-3D was brought online in late December 2005, and groundwater extraction at well PE-1 on the floodplain began in January 25, 2006; both wells have been operating continuously for the IM. Table 2-7 presents the analytical results for Cr(VI), dissolved chromium, and TDS for extraction wells TW-3D and PE-1 during the 2009 reporting period.

The Cr(VI) and TDS concentration trends for TW-3D and PE-1 are plotted in Figure 2-9. During the 2009 reporting period, Cr(VI) concentrations in TW-3D have remained stable, ranging from a maximum value of 1,610 µg/L in May 2009 to a minimum value of 1,160 µg/L in November 2009. TDS concentrations in TW-3D for this period have remained relatively stable, averaging about 5,500 milligrams per liter (mg/L).

The Cr(VI) concentrations in the extracted groundwater at well PE-1, located on the floodplain, have ranged from 25.5 to 17.5 µg/L during the reporting period, as shown in Table 2-7. TDS concentrations in PE-1 for this period have remained relatively stable, averaging about 3500 mg/L.

2.3 Capture Zone Analysis for Annual Reporting Period

2.3.1 Monthly Average Gradients

Table 2-8 presents the hydraulic gradients measured between the selected gradient control well pairs during the period February 2009 through January 2010. The overall average gradient for well pairs exceeded the threshold for each month in the reporting period. In addition, the IM target landward gradient was met each month at individual gradient control well pairs during the annual reporting period, except for September 2009. For the month of September 2009, the hydraulic gradient of the southern well pair (MW-45-095/MW-27-085) was landward, but below 0.001 feet per feet at 0.0008 ft/ft. For the northern (MW-31-135/MW-33-150) well pair, gradients for August and September 2009 were also not calculated due to greater than 25 percent loss of data caused by transducer malfunction. Gradients measured for the month of September are discussed in more detail in the *Topock Interim Measures No. 3 Extraction System 20 Percent Downtime in September 2009 Report, PG&E Topock Compressor Station, Interim Measures No. 3 Groundwater Treatment System, Needles, California* (CH2M HILL, 2009f). While exceeding the performance standard each month the gradient was calculated, the northern well pair (MW-31-135/MW-33-150) generally had the lowest measured gradients because it is not aligned along the gradient generated by pumping. The gradient measurements are therefore underestimates of the true gradient.

Figure 2-10 summarizes the overall average monthly hydraulic gradient, individual well pair gradients, and the river stage and average pumping rates during the 2009 reporting

period. During the annual reporting period, the average daily river levels ranged from a high of 458.69 feet above mean sea level (April 2009) to a low of 452.42 feet above mean sea level (January 2010). Strong overall average landward gradients were measured each month, even during the lower river stages in November 2009 through January 2010.

2.3.2 Annual Average Gradients

Groundwater contour maps presenting the annual averages of the 2009 measured hydraulic data in the upper, mid-depth, and lower aquifer intervals are shown in Figures 2-11a through 2-11c. The September 2009 Cr(VI) contours are also shown on the annual average gradient maps. In Figure 2-12, the annual average groundwater elevation data are presented in floodplain Cross-section A. Table C-2 in Appendix C presents a listing of the annual average, minimum, and maximum groundwater elevations for the wells used for the 2009 performance monitoring evaluation.

The net annual landward gradients illustrated on the aquifer interval maps show that the gradients are landward and are comparable to the gradient maps prepared for Fourth Quarter 2009 monitoring data.

2.3.3 Analysis and Evaluation of Capture Zone

Two graphical methods were presented in the 2006 annual performance evaluation report to illustrate the capture zone produced by IM pumping (CH2M HILL, 2007). The methodology and results of the capture zone evaluations for 2009 are summarized below.

2.3.3.1 Well Group Gradient Averaging

The temporal variation in magnitude and direction of horizontal hydraulic gradients in the lower-depth aquifer interval was assessed using quarterly average water levels and triangulation with linear interpretation for two well groupings (MW-31-135/MW-33-150/ MW-34-100 and MW-45-95/MW-34-100/MW-27-85) in the IM performance area. Figure 2-13 shows the two well groupings and the calculated average gradients for all four quarterly monitoring periods in 2009.

This analysis shows that strong landward gradients were achieved during the 2009 monitoring period and that there was minimal variation in the direction of the landward gradients during each quarter. These gradients are not the same as those calculated between the gradient control well pairs (Table 2-8) because they are calculated net gradients within the plane formed by each three-well group. Stronger landward gradients were calculated using the three-well method than those measured for the northern well pair MW-31-135/MW-33-150 (Table 2-8) due to a more optimally-aligned flow direction.

2.3.3.2 Particle Track Analysis

For the 2006 performance evaluation, particle tracking was conducted to calculate the direction and distance that groundwater would be likely to flow from selected starting points in the floodplain under the dual-well (TW-3D and PE-1) IM pumping system. During 2006 IM operations, TW-3D and PE-1 were pumping at individual annual average rates of 97.5 and 34.3 gpm, respectively. During 2009 IM operations, the extraction wells were pumped at individual annual average rates of 96.5 and 24.1 gpm, respectively. Because the pumping locations have not changed, conditions were similar and the gradients for the

lower interval were comparable for the two annual periods, completion of a new particle tracking analysis is not warranted. Please see the 2006 annual IM performance evaluation report (CH2M HILL, 2007) for the particle tracking figure and the methods, input parameters, and data used for this analysis.

2.4 Evaluation of Groundwater Quality Data

2.4.1 Cr(VI) Distribution and Trends

Figure 2-2 presents the Cr(VI) concentration results in floodplain wells in the upper, mid-depth, and lower intervals of the Alluvial Aquifer based on groundwater monitoring in September 2009 (Cr[VI] contours) supplemented with December 2009 sampling results. The areas defined by the 50 and 20 µg/L Cr(VI) concentration contours have become smaller overall for the period January 2009 through January 2010 relative to previous years (see prior 2008 and 2009 PMP reports [CH2M HILL, 2009c-e, g-h]).

Figure 2-14 presents Cr(VI) trend plots for selected deep wells within the IM pumping area since April 2005. Concentration trend graphs for additional floodplain wells beginning in March 2004 are presented in Figures B-1 through B-7 in Appendix B. Table 2-2 presents the 2009 reporting period groundwater chromium sample results. Wells showing marked decreases in concentration are generally in the floodplain area where IM pumping is removing chromium in groundwater. Wells with historic detections, near or at reporting limits, remained at these levels during the 2009 reporting period. A review of Figure 2-14 and Appendix B indicates that Cr(VI) concentrations have remained steady or decreased in many wells since IM and PE-1 pumping began in 2004 and 2005, respectively. Key trends include:

- MW-33 cluster Cr(VI) concentrations have remained relatively steady since 2006 (Figure B-1).
- MW-36 cluster Cr(VI) concentrations in the shallow and mid-depth wells have generally remained at reporting limits since 2004 (Figure B-3).
- Deep well MW-36-90 Cr(VI) concentrations decreased after the start of IM pumping, diminishing further to reporting limits upon the initiation of PE-01 pumping in 2006 (Figure 2-14).
- Deep well MW-36-100 Cr(VI) concentrations initially increased upon the startup of PE-01 pumping but decreased from 2007 through 2009 to less than 100 µg/L (Figure B-3 and Figure 2-14).
- Shallow well MW-39-40 Cr(VI) concentrations have remained at reporting limits since 2004 (Figure B-3), while mid-depth wells in the MW-39 cluster (MW-39-50, MW-39-60, MW-39-70) decreased to reporting limits in 2008 and 2009 (Figure B-4).
- In the deep well MW-39-080, Cr(VI) concentrations rapidly decreased after the start of IM pumping and declined further to reporting limits in 2009. Deep well MW-39-100 concentrations also steadily declined since the start of IM pumping, with the lowest concentration observed to date in 2009 (Figure B-4).

- Deep well MW-44-115 has shown an overall downward trend since July 2006 (Figures 2-15 and B-5). Well MW-44-125 has also shown an overall downward trend since November 2008 (Figure 2-14).
- Concentrations in deep well MW-46-175 have been generally stable since 2006 (Figures 2-15 and B-6).
- MW-47 cluster Cr(VI) concentration trends have generally been stable since these wells were installed in 2006 (Figure B-7). Well TW-04, a deeper well in this cluster, has shown an overall declining trend since March 2007.

As shown in Figure 2-14, well MW-34-100 has shown both short-term declines and increases in Cr(VI) concentrations since PE-1 pumping commenced. Since June 2006, concentrations at this well have shown a general downward trend. However, concentrations increased during Fourth Quarter 2009 sampling, consistent with previous seasonal increases (Figure 2-14). Landward gradients have been present at this location since IM pumping began; therefore, the periodic increases in concentration observed at MW-34-100 do not indicate any movement of the plume toward the river.

2.4.2 Groundwater Geochemistry in IM Extraction Area

2.4.2.1 Oxidation-Reduction Potential Evaluation

Figure 2-15 shows the mean concentrations and distributions of Cr(VI), oxidation-reduction potential (ORP), nitrate, and TDS from February 2009 through January 2010. Wells with the strongest reducing conditions (ORP values less than -90 millivolts) are shaded dark blue. In wells where ORP is less than -90 millivolts, both Cr(VI) and nitrate are generally non-detect because they are not geochemically stable under reducing conditions. Shaded contour lines that represent the approximate margin of the zone of strongest reducing conditions are shown for each depth interval in Figure 2-15. On the landward side of these lines, reducing conditions are not generally strong enough to preclude the presence of Cr(VI).

Reducing conditions are prevalent throughout the shallow and mid-depth floodplain wells. Most of these wells are screened in fluvial sediments. Wells screened in alluvial deposits generally show non-reducing conditions in most areas of the site. The exception is in a few deep alluvial wells (MW-49 cluster, MW-41D, and OW-3D) that show reducing conditions. Alluvial materials in this aquifer generally contain low amounts of organic carbon and are considerably older than the fluvial deposits. Fluvial deposits typically contain more organic carbon at the time of deposition than alluvial deposits, and the shallow fluvial wells in the floodplain have measurable dissolved organic carbon.

Figure 2-16 shows the average Cr(VI) concentrations and geochemical indicator parameters, including TDS, along the west-to-east floodplain Cross-section A. As illustrated in Figure 2-15, the sampling locations with ORP less than -90 millivolts are generally nondetect for Cr(VI) and nitrate.

Figure B-8 in Appendix B presents time-series plots of Cr(VI) and ORP in wells along floodplain Cross-section A. These figures illustrate further the influence of IM pumping on Cr(VI) concentrations in nearby floodplain wells, with values decreasing in several wells since the start of extraction.

2.4.2.2 General Chemistry Evaluation

Fifteen floodplain wells were sampled for chemical performance monitoring parameters over the period of March 2005 through January 2010. The majority of the parameters in groundwater samples from these wells remained stable through the reporting period (Table 2-2). Shallow-depth wells exhibit both increases and decreases in some of these same parameters over the reporting period, but in these cases, it is interpreted as natural variation because some values were similar to those measured in previous years. Little change was evident in the river sample R-28 in 2009 compared to prior years.

2.4.2.3 Stable Isotope Evaluation

Analysis of stable isotope data provides some insight to the source water for certain site wells but does not appear to provide a reliable method for distinguishing wells that may be affected by the discharge of cooling water from some other wells that are clearly not so affected.

Figure 2-17 shows the results of stable isotopes of oxygen and deuterium in floodplain wells using data collected during the annual reporting period. This same plot is provided with posted well names within each category identified in Figure B-9 in Appendix B. The points that plot to the upper right in this plot are considered heavier in isotopic signature (i.e., enriched in heavy isotopes), while the points that plot to the lower left are considered lighter in isotopic signature. In this plot, it is apparent that the lighter signatures are dominated by river samples (with some wells showing similar signature), whereas the heaviest signatures are found in selected floodplain wells, which likely contain higher percentages of water that has flowed from the upland areas.

The effects of IM pumping on the isotopic signature of floodplain wells have been plotted in Figure 2-18 by using a simple two-end member system of river water (represented by R-28 samples) and industrial signature water (represented by the MW-20 wells). It is evident that isotopic signature in most industrial signature wells has become more similar to river water since IM pumping began. This is a result of the continuous landward gradient created by IM pumping and the resultant mixing of industrial water with river-influenced groundwater. These changes are likely due to lateral and downward movement of shallow floodplain water, which has an isotopic signature similar to river water.

2.5 Conclusions and Status of IM Operations

2.5.1 2009 Performance Evaluation

As of March 2010, the IM has operated full time for 6 years (approximately 28 months for IM-2 and 56 months for IM-3) and has been successful in meeting the IM objectives and performance criteria. This section summarizes the conclusions of IM operations and performance monitoring for the 2009 reporting period.

2.5.1.1 Attainment of Performance Standard

Throughout 2009, the IM extraction system (combined wells TW-3D and PE-1) operated at the target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime. The operational run-time percentage for the extraction system was 90 percent

during the 2009 reporting period. The average pumping rate for the IM extraction system, including downtime, during the annual period was 121 gpm. The results and conclusions of the 2009 performance evaluation include:

- A total of 63,414,693 gallons of groundwater was extracted and treated at the IM-3 system during the annual reporting period. The IM system removed approximately 580 pounds (263 kilograms) of chromium from the aquifer during the reporting period.
- The IM pumping rate was sufficient to maintain the minimum overall average landward gradient throughout the 2009 annual reporting period. The landward gradient calculated for the southern well pair during the month of September was less than 0.001 ft/ft due to previously reported downtime, but the overall average gradient for all three well pairs exceeded that threshold for the month. The strong landward gradients were maintained even during the period of lower river stages in November 2009 through January 2010.
- The current gradient well pairs are adequate to define the capture of the plume while pumping from extraction wells TW-3D and PE-1, although the northern pair particularly underestimates the gradient as it is not well aligned along the gradient.
- The hydraulic gradient monitoring showed that all floodplain monitoring wells where Cr(VI) was detected at greater than 20 µg/L were within the capture zone of the IM extraction system.

2.5.1.2 Cr(VI) Distribution and Trends

The key conclusions on Cr(VI) distribution and trends observed in the IM performance monitoring area during 2009 include:

- Overall, the groundwater Cr(VI) concentrations in the floodplain are stable or decreasing. The ongoing monitoring has shown marked decreases in Cr(VI) concentration in the floodplain areas where IM pumping exerts a strong influence on hydraulic gradients (e.g., well clusters MW-36, MW-39, and MW-44).
- Based on comprehensive groundwater sampling events (conducted October 2006 through September 2009), the areas defined by the 50 µg/L and 20 µg/L Cr(VI) concentration contours have become smaller overall in the performance monitoring area. In addition, the Cr(VI) concentrations have decreased in many wells within the groundwater plume over this monitoring period.
- The concentration trend for MW-34-100 has shown both short-term declines and increases in concentrations since PE-1 pumping commenced in January 2006. Since June 2006, concentrations at this well have shown an overall downward trend; however, the concentrations slightly increased in Fourth Quarter 2009, which is consistent with the seasonal rebound seen in previous years. Landward gradients have been present at this location since IM pumping began; therefore, the periodic increases in concentration observed at MW-34-100 do not indicate any movement of the plume toward the river.
- The distribution of Cr(VI) in the performance monitoring area is significantly affected by the redox conditions in the aquifer. Reducing conditions where Cr(VI) and nitrate are

generally non-detect are prevalent throughout the shallow and mid-depth floodplain wells.

- The groundwater ORP and stable isotopes monitoring data confirm that continued IM extraction is drawing more oxidizing river-influenced groundwater into the performance monitoring area.

2.5.2 Status of Operations and Monitoring

2.5.2.1 Extraction System Operations

Per DTSC direction, PG&E will continue to operate both TW-3D and PE-1 at a target combined pumping rate of 135 gpm, except for periods of planned and unplanned downtime. Treated groundwater will be discharged into the IM-3 injection wells in accordance with Waste Discharge Requirements Order No. R7-2006-0060. Saline water generated as a byproduct of the reverse osmosis process will continue to be transported offsite for treatment and disposal.

PG&E will balance the pumping rates between TW-3D and PE-1 to maintain the target pumping rate and maintain appropriate hydraulic gradients across the Alluvial Aquifer. If, at any time, hydraulic data indicate that PE-1 pumping has the potential to draw higher concentrations of chromium away from the capture zone of TW-3D, PG&E will request authorization from DTSC to increase the pumping rate at TW-3D and decrease the rate at PE-1. TW-2D will serve as a backup extraction well to TW-3D and PE-1.

Current BOR projections show that the river levels will increase during the next quarterly reporting period (February through April 2010) and into the summer months, followed by a decline during the fall. The lowest river levels during the upcoming IM operations year are expected to occur in December 2010-January 2011. By April-May 2010, the average monthly river elevations are projected to reach their maximum level of the year, as shown in Figure 2-7.

2.5.2.2 Performance Monitoring Program

Appendix D contains updated listings of the extraction and monitoring wells in the PMP area that are currently used for IM hydraulic monitoring, as well as groundwater sampling information for the wells used for chromium, geochemical, and general chemistry performance monitoring.

The PMP monitoring, evaluation, and reporting activities for the 2010 operations period will continue as directed by the DTSC. In accordance with DTSC approval (DTSC, 2007a), the next IM Performance Monitoring Report will present IM operations and performance monitoring data from February 1, 2010 through April 30, 2010 (first quarter 2010 reporting period). The next quarterly performance monitoring report will be submitted on May 28, 2010.

3.0 Site-Wide Groundwater and Surface Water Monitoring Program

3.1 Site-Wide Groundwater Monitoring

3.1.1 Overview of Groundwater Monitoring Program

Figure 3-1 shows the locations and sampling frequencies of the monitoring well locations in the GMP. Table 3-1 summarizes the well construction and sampling methods for all wells in the GMP and other monitoring wells at the site. As of January 2010, monitoring wells in the GMP are sampled according to the following schedule:

- One hundred twenty-seven of the site monitoring wells are sampled during biennial sampling events (once every 2 years).
- One hundred fifteen of the monitoring wells are sampled during annual sampling events.
- Seventy-eight of the monitoring wells are sampled during semiannual sampling events (twice a year).
- Fifty-eight monitoring wells are sampled during quarterly sampling events.
- Five monitoring wells (MW-34-80, MW-34-100, MW-44-115, MW-44-125, and MW-46-175) on the floodplain and two active extraction wells (PE-1 and TW-3D) are sampled monthly.

Groundwater samples collected for GMP monitoring are analyzed for Cr(VI), chromium, and specific conductance. The analyses are performed by Truesdail Laboratories, Inc., a California-certified analytical laboratory in Tustin, California. Analyses for the groundwater samples collected from monitoring wells in Arizona are performed by Emax Laboratories Inc., an Arizona-certified analytical laboratory in Torrance, California. The sampling procedures, field documentation of sampling, water level measurements, and field water quality monitoring are performed in accordance with the *Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Topock Program* (SAFPM), dated March 31, 2005 (CH2M HILL, 2005b). In accordance with the SAFPM and subsequent agreements with the DTSC, Cr(VI) and chromium are analyzed using the following analytical methods:

- Method SM 3500 is used for samples collected from monitoring wells where prior monitoring has detected Cr(VI) concentrations above 20 µg/L. The minimum reporting limit for Method SM 3500 for undiluted samples is 10 µg/L. This analytical method allows for a 28-day hold time.
- United States Environmental Protection Agency (USEPA) Method 218.6 is used for all surface water samples and all groundwater samples collected from monitoring wells where prior monitoring did not detect Cr(VI) concentrations above 20 µg/L. However,

monthly samples from wells MW-34-80, MW-34-100, MW-44-115, MW-44-125, and MW-46-175 are analyzed using USEPA Method 218.6, even though prior detections exceeded 100 µg/L. The minimum reporting limit for Cr(VI) using USEPA Method 218.6 is 0.2 µg/L for undiluted samples. This analytical method allows for a 28-day hold time.

- Dissolved chromium is analyzed using USEPA Method SW 6010B or Method SW 6020A. Both methods have a reporting limit of 1 µg/L for undiluted samples.

Groundwater data from the 2009 GMP monitoring events have been reported in prior quarterly monitoring reports (CH2M HILL, 2009c-e, g-h). The results of the Fourth Quarter 2009 GMP monitoring and discussion of the GMP data for the 2009 annual reporting period are presented in Sections 3.1.4 and 3.3.1.

3.1.2 Changes to GMP in 2009

During 2009, the following changes and modifications to the GMP were approved and implemented:

- In an email dated May 26, 2009, DTSC approved PG&E's request to combine the quarterly and annual GMP reports with the quarterly and annual PMP reports (DTSC, 2009a). In accordance with this email, the GMP and PMP reports were combined beginning with the Second Quarter 2009 report.
- In an email dated July 27, 2009, DTSC approved a deviation from the initial East Ravine Groundwater Investigation Work Plan (DTSC, 2009b). The deviation request stated that, following the first contemporaneous groundwater sampling of the 16 East Ravine wells, the wells will be incorporated into the site-wide GMP for subsequent data collection. These wells were first sampled under the GMP program in September 2009, and results were first reported in the *Third Quarter 2009 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2009e).

3.1.3 Fourth Quarter 2009 Monitoring Activities

The Fourth Quarter 2009 GMP monitoring event was conducted from December 8 through 12, 2010 and included sampling of 55 monitoring wells and two active extraction wells for analysis of Cr(VI), chromium, and specific conductance. Quarterly groundwater sampling of the Arizona monitoring wells (MW-54, MW-55, and MW-56 clusters) and the 16 East Ravine wells were also included in this event.

Monthly groundwater sampling events were conducted on November 2-3, 2009 and January 11-12, 2010. These events included sampling of five monitoring wells for Cr(VI) and chromium and two extraction wells for Cr(VI), chromium, and specific conductance.

Additional sampling activities performed during Fourth Quarter 2009 that fall outside the general GMP activities include:

- Two GMP wells (MW-12 and MW-22) were sampled for California Code of Regulations (CCR) Title 22 Metals during the December 2009 quarterly sampling event. Title 22 metals results are presented in Table 3-2.

- Fifteen wells screened in fluvial sediments were sampled for arsenic during the September biennial sampling event as directed by DTSC in their Corrective Measures Study/Feasibility Study review comment No. 186 (DTSC, 2009c). These results are presented in Appendix E, Table E-1.
- Seven East Ravine bedrock wells (MW-58, MW-62 and MW-64 clusters) were sampled in December 2009. Three wells comprising the MW-64 cluster were sampled monthly beginning September 2009 for Cr(VI) and chromium. This well cluster will be sampled monthly through March 2010, as directed by DTSC in an email dated October 5, 2009 (DTSC, 2009d). Results from this sampling are located in Table 2-2.

3.1.4 Fourth Quarter 2009 Monitoring Results

This section presents the results of the GMP groundwater monitoring conducted during Fourth Quarter 2009. Figure 3-1 shows the locations of the GMP monitoring wells as of January 2010. The monitoring results and data presented include Cr(VI), chromium, specific conductance, CCR Title 22 metals, and field parameters. Laboratory data quality review, water level measurements, and water quality field parameter data are also presented in this section. Level 1 data packages, including field data sheets and chain-of-custody records, are included as Appendix F.

3.1.4.1 Groundwater Results for Chromium

Table 2-2 presents the results for Cr(VI), chromium, ORP, specific conductance, and field pH in groundwater samples collected from January 2009 through January 2010. In Fourth Quarter 2009, the maximum detected Cr(VI) concentration was 7,860 µg/L at well MW-50-200. Overall, Fourth Quarter 2009 chromium results are generally consistent with prior Third Quarter 2009 results.

Figures 3-2a through 3-2c present the Cr(VI) results for wells monitoring the shallow, mid-depth, and deep intervals of the Alluvial Aquifer, respectively, from the December 2009 quarterly sampling event. Figures 3-2a through 3-2c also show the approximate outline of the areas where Cr(VI) was detected in samples at concentrations greater than 32 µg/L during the December 2009 monitoring event. The value of 32 µg/L is based on the calculated natural background upper tolerance limit for Cr(VI) in groundwater from the background study (CH2M HILL, 2009a). Discussion of the GMP data for the 2009 annual reporting period is presented in Section 3.3.1.

The approximate outlines of monitoring wells with Cr(VI) concentrations greater than 32 µg/L in the shallow, mid-depth, and deep intervals of the Alluvial Aquifer and East Ravine bedrock wells are generally similar to the previous quarterly monitoring events (CH2M HILL, 2009d-e, h). Relative to prior 2009 monitoring, increasing Cr(VI) concentrations were detected in the December 2009 samples at MW-12 (2,750 µg/L) and MW-47-55 (53.3 µg/L).

During the fourth quarter event, Cr(VI) and chromium were not detected in groundwater samples from the Arizona monitoring wells, with the exception of MW-55-120, which had a concentration of 4.69 µg/L.

Generally declining or stable chromium concentration trends were observed in most other wells sampled in December 2009 (Table 2-2).

3.1.4.2 Other Monitoring Results

Groundwater Title 22 Metals Results. Table 3-2 presents the CCR Title 22 metals results for the GMP monitoring wells sampled from January 2009 through January 2010. In December 2009, samples from monitoring wells MW-12 and MW-22 were analyzed for Title 22 metals. In addition to chromium, the trace metals detected during the December 2009 groundwater sampling event were arsenic, barium, molybdenum, nickel, vanadium, and zinc. The dissolved concentrations of the trace metals detected during the December 2009 event—other than chromium (in well MW-12) and arsenic (in well MW-12)—are below the respective federal and California drinking water standards.

Arsenic Sampling in Fluvial and Bedrock Wells. Fifteen fluvial were sampled for arsenic in December 2009. These results are presented in Appendix E, Table E-1. Ten of the fluvial well samples were greater than the California arsenic maximum contaminant level (MCL) of 10 µg/L. The maximum reported concentrations in the fluvial wells were detected at the two fluvial wells of the MW-32 cluster where strongly reducing conditions are present.

Seven bedrock wells constructed with FLUTe liners were sampled for arsenic in December 2009. The results from all seven wells were greater than the California MCL of 10 µg/L. Arsenic is known to leach from newly installed FLUTe liners. Therefore, arsenic concentrations in the FLUTe wells may be elevated until the liners become passivated and cease leaching arsenic. Groundwater samples will continue to be analyzed for arsenic in these bedrock wells to better define concentrations in this area.

Monthly MW-64 Sampling. Three East Ravine wells (MW-64-150, MW-64-205, and MW-64-260) were sampled monthly beginning in September 2009 for Cr(VI) and chromium, and results are presented in Table 2-2. Cr(VI) results for MW-64-150 were non-detect from July 2009 through January 2010, while Cr(VI) results from MW-64-205 and MW-64-260 were either non-detect or below 2 µg/L, since September 2009. Monthly sampling has been conducted in addition to quarterly sampling at MW-64 for the purpose of determining the necessity of step-out wells at this location. Monthly sampling will continue through March 2010.

3.1.4.3 Data Validation and Completeness

Laboratory analytical data from Fourth Quarter 2009 GMP sampling events were reviewed by project chemists to assess data quality and to identify deviations from analytical requirements. The completeness objectives were met for all method and analyte combinations. No significant analytical deficiencies were identified in Fourth Quarter 2009 GMP data.

3.1.4.4 Water Level Monitoring

Table 3-3 presents the water level measurements from January 2009 through January 2010 from wells. Table 3-3 also lists salinity data for the wells where water levels were measured. Groundwater salinity during Fourth Quarter 2009 ranged from 0.08 percent (MW-18 and MW-34-055) to 3.0 percent (well MW-32-020)—a range that is consistent with results of prior

monitoring. Due to the variation in groundwater salinity at the site, the groundwater elevations measured in the monitoring wells have been adjusted (normalized) to an equivalent freshwater head (Fetter, 1994).

Beginning in June 2005, at DTSC's direction (DTSC, 2005b), a site-wide water level data set has been collected quarterly as part of the GMP to construct a groundwater elevation contour map for the shallow, upper-depth interval of the Alluvial Aquifer. That requirement was changed to annually in the September 28, 2007 letter from DTSC (DTSC, 2007d).

Figure 3-3 presents the groundwater elevation contours for the shallow-depth interval of the Alluvial Aquifer. A site-wide water level survey was conducted on September 28, 2009 that involved the manual collection of groundwater level data at 32 shallow wells within a 4-hour period. Because groundwater levels at the site fluctuate continuously in response to changes in the river stage, these groundwater elevation contours reflect transient conditions at the time of measurement and may not be representative of the average groundwater flow directions.

3.1.4.5 Field Parameter Data

A field water quality meter and flow-through cell were used to measure parameters during well purging and groundwater sampling (CH2M HILL, 2005b). Water quality field measurements were also recorded during surface water sampling. Table 3-4 summarizes the field water quality data collected (specific conductance, temperature, pH, ORP, and dissolved oxygen) from January 2009 through January 2010.

3.2 Surface Water Monitoring

3.2.1 Overview of Surface Water Monitoring Program

Figure 3-4 shows the locations of the shoreline, in-channel and other surface water monitoring stations as of January 2010. Four shoreline surface water stations (R-19, R-28, R-63, and RRB), 10 in-channel surface water stations (C-BNS, C-CON, C-I-3, C-MAR, C-NR1, C-NR3, C-NR4, C-R22A, C-R27, and C-TAZ) and two other surface water stations (SW-1 and SW-2) are sampled quarterly during the year and twice during low-river stages. In April 2009, shoreline sampling location R-63 and surface water sampling location SW-2 were added in response to new data collected in the East Ravine.

Samples collected from surface water stations during Fourth Quarter 2009 were analyzed for Cr(VI), chromium, specific conductance, and pH. The analyses were performed by Truesdail Laboratories, Inc., a California-certified analytical laboratory in Tustin, California. The sampling procedures, field documentation of sampling, water level measurements, and field water quality monitoring were performed in accordance with the SAFPM (CH2M HILL, 2005b). In accordance with the SAFPM and subsequent agreements with the DTSC, Cr(VI) and chromium were analyzed using the following analytical methods:

- USEPA Method 218.6 was used for all surface water samples analyzed for Cr(VI). The minimum reporting limit for Cr(VI) using USEPA Method 218.6 is 0.2 µg/L for undiluted samples. This analytical method allows for a 28-day hold time.

- Dissolved chromium was analyzed using USEPA Method SW 6010B or Method SW 6020A. Both methods have a reporting limit of 1 µg/L for undiluted samples.

Surface water data from the 2009 GMP reporting period have been reported in prior quarterly monitoring reports (CH2M HILL, 2009c-e, g-h). The results of the Fourth Quarter 2009 surface water monitoring and discussion of the other surface water data for the 2009 annual reporting period are presented in Sections 3.2.4 and 3.3.3.

3.2.2 Changes to the Surface Water Monitoring Program in 2009

During 2009, the following changes and modifications to the surface water monitoring program were approved and implemented:

- In a letter dated March 20, 2009, DTSC concurred with PG&E to discontinue unfiltered sampling for Cr(VI) and chromium in shallow in-channel and shoreline river locations (DTSC, 2009e). Sampling at Topock Marsh locations TM-1 and TM-2 were discontinued.
- During an April 7, 2009 site walk by PG&E and DTSC personnel, two new surface water sampling locations were identified. These two locations were designated SW-2 and R-63 and were sampled for the first time on April 9 and 10, 2009. In addition to the new surface water sampling locations, former location R-23 was re-designated SW-1. Figure 3-4 shows new sampling locations SW-2 and R-63.

3.2.3 Fourth Quarter 2009 Surface Water Monitoring Activities

Quarterly surface water sampling was conducted on December 14-15, 2009 at four shoreline, 10 in-channel sampling locations, and two other surface water locations. A low river stage event was conducted on January 19-20, 2010. Samples were analyzed for Cr(VI), chromium, specific conductance, and pH.

3.2.4 Fourth Quarter 2009 Surface Water Monitoring Results

Table 3-5 presents the sampling results of chromium and other analytes from the December 2009 and January 2010 surface water monitoring events. Cr(VI) and chromium were not detected above the reporting limit at any in-channel, shoreline or other surface water monitoring locations during fourth quarter events.

3.3 Discussion and Conclusions of 2009 GMP Monitoring Results

This section summarizes the results of the monitoring events completed for the Topock GMP in 2009 and presents key observations and data trends for the monitoring period and previous years.

During 2009, the quarterly events occurred in March, May, September, and December. Quarterly events in May and September were timed to occur before and after Southwestern Willow Flycatcher nesting season to minimize biological impacts to potential nesting habitat from the field activities during these larger-scale sampling events.

3.3.1 Chromium

Table 2-2 presents the results for Cr(VI), chromium, specific conductance, and field pH in groundwater samples collected from January 2009 to January 2010. Hexavalent chromium concentration trend graphs for GMP monitoring wells with consistent chromium detections are presented in Figures B-11 through B-16 in Appendix B. The December 2009 results are shown in Figures 3-2a through 3-2c. The majority of the wells with decreasing Cr(VI) concentration trends are located in the floodplain, and the decreasing trend is likely a result of the groundwater extraction for the IM. These results were presented in Section 2.4.1; this section presents the results for wells that were not evaluated for the PMP.

A review of the GMP Cr(VI) concentration trend plots (Figures B-11 through B-16 and Table 2-2) reveals the following Cr(VI) trends since 2004:

- Concentrations have generally been declining at MW-10, increasing at MW-12 (but stable since 2008), and remained stable at MW-13 (Figure B-11).
- Concentrations have generally been stable at MW-14 and MW-18 and declining at MW-19 (Figure B-12). The September 2009 result for MW-19 was the lowest concentration reported to date.
- Concentrations at the MW-20 cluster (located near the TW-3D pumping well) indicate declining concentrations at the shallow well MW-20-070 and generally stable trends at MW-20-100 and MW-20-130, where Cr(VI) concentrations initially increased upon the initiation of IM pumping in 2004 (Figure B-13).
- Concentrations at the shallow alluvial well MW-25 have steadily decreased, with the lowest concentration to date reported in September 2009 (Figure B-13).
- Concentrations at MW-26 and the MW-31 cluster have decreased. The lowest concentrations reported to date for MW-26 and MW-31-060 were observed during 2009 (Figure B-14).
- Concentrations at MW-37S and MW-40S have remained stable, while concentrations have decreased in MW-37D and have increased in MW-40D (Figure B-15).
- Concentrations in the well MW-50-095 have generally declined since installation, and the lowest concentration reported to date was observed in September 2009. Concentrations at MW-50-200 have generally remained stable (Table B-16).

Samples from the Arizona monitoring wells did not have detections of Cr(VI) or chromium in 2009, with the exception of samples from MW-55-120, which had detections of less than 7 µg/L.

The Park Moabi drinking water production wells, Park Moabi-3 and Park Moabi-4, had maximum detections of 9.86 and 21.0 µg/L for Cr(VI) and 9.50 and 18.0 µg/L for chromium, respectively, in October 2009. The Cr(VI) and chromium detections were below the California drinking water standard of 50 µg/L for chromium (Title 22, CCR, Division 4, Chapter 15).

Beginning in Third Quarter 2009, sample results for recently completed alluvial (MW-59-100) and bedrock wells from the East Ravine Groundwater Investigation (CH2M HILL, 2009i) were incorporated into the GMP. Sample results for the East Ravine bedrock wells

indicated that Cr(VI) is present within bedrock and exceeds the groundwater background value of 32 µg/L in the shallow- and mid-depth intervals (using the same elevations designated for the alluvial wells). As a result, the Cr(VI) contours in Figures 3-2a and 3-2b were increased to the southeast to incorporate these new data.

During Third Quarter 2009 sampling, Cr(VI) was detected at 147 µg/L in the deep bedrock well MW-62-190. This result was inconsistent to previous and other deep well East Ravine results, where Cr(VI) is generally limited to the shallow- and mid-depth intervals. Sample results for MW-62-190 in December 2009 returned to non-detect (Table 2-2). Sample results for Cr(VI) in MW-62-110 have been variable over the reporting period. Sample results for other East Ravine bedrock wells were generally consistent with previous results or have declined since these wells were completed and initially sampled during Spring/Summer 2009. Generally decreasing Cr(VI) concentrations have been observed at wells MW-60-125, MW-61-110, and MW-62-065 since installation (Table 2-2).

3.3.2 Other Monitoring

3.3.2.1 CCR Title 22 Metals

Besides chromium, the trace Title 22 metals detected in groundwater samples from the GMP monitoring wells in 2009 were arsenic, barium, copper, molybdenum, nickel, vanadium, and zinc (Table 3-2). With the exception of chromium and arsenic, all of the trace metal detections in 2009 were below the respective California drinking water standards (Title 22, CCR, Division 4, Chapter 15). The concentrations of Title 22 metals that were consistently detected in monitoring wells remained fairly stable overall during the 2009 monitoring period.

3.3.2.2 Dioxins and Furans

Three GMP wells (MW-9, MW-10, and MW-12) were sampled in May 2009 for dioxins and furans, and the results are presented in Appendix E, Table E-2. All results were below reporting limits.

3.3.2.3 Organics and Trace Metals

Three GMP wells (MW-9, MW-10 and MW-12) were sampled in June 2009 for organics, and MW-9 was sampled for trace metals. The results are presented in Table 3-2 and Appendix E, Table E-3. The organic results are all below reporting limits. Arsenic, barium, boron, chromium, molybdenum, potassium, selenium, and vanadium were detected above their reporting limits during the June 2009 sampling.

3.3.2.4 Arsenic Sampling in Fluvial and Bedrock Wells

Thirty-three fluvial wells were sampled in September 2009 for arsenic. Twenty-two of the 33 arsenic results were greater than the California MCL of 10 µg/L. Fifteen fluvial wells were sampled in December for arsenic. Ten of the fluvial well sample results were greater than the California arsenic MCL of 10 µg/L. The maximum reported concentrations were detected at the two fluvial wells of the MW-32 cluster where strongly reducing conditions are present. All arsenic results are presented in Appendix E, Table E-1.

Seven bedrock wells constructed with FLUTe liners were sampled for arsenic in December 2009. The results from all seven wells were greater than the California MCL of 10 µg/L. Arsenic is known to leach from newly installed FLUTe liners. Therefore, arsenic concentrations in the FLUTe wells may be elevated until the liners become passivated and cease leaching arsenic. Groundwater samples will continue to be analyzed for arsenic in these bedrock wells to better define concentrations in this area.

3.3.2.5 Additional Water Quality Analytes

To supplement the water quality site characterization, groundwater samples analyzed for additional parameters during the September 2009 monitoring event. The samples were analyzed by ATL Laboratories for additional parameters that are not part of the routine GMP. These include TDS (USEPA Method 160.1); chloride, sulfate, nitrate, and bromide (anions; USEPA Method 300.0); calcium, magnesium potassium, sodium, and boron (cations; USEPA Method SW 6010B or SW 6020A); alkalinity (USEPA Method 310.1); stable isotopes oxygen-18 and deuterium (CF-IRMS methods). The results of these additional analyte results are presented in Table B-1 (Appendix B).

3.3.2.6 Monthly MW-64 Sampling

Three GMP wells (MW-64-150, MW-64-205, and MW-64-260) were sampled monthly beginning in September 2009 for Cr(VI) and chromium, and results are presented in Table 2-2. Cr(VI) results were below 6 µg/L for each sampling event in the annual reporting period.

3.3.3 Surface Water Monitoring

Cr(VI) and chromium were not detected in any of the surface water samples collected at any of the surface water stations during the 2009 reporting period (Table 3-5).

In January 2009 unfiltered Cr(VI) and chromium were analyzed in surface water samples for a subset of 11 in-channel (C-CON, C-I-3, C-MAR, C-NR1, C-NR3, C-NR4, C-R22A, C-R27, C-TAZ, C-TM-1, and C-TM-2) and four shoreline (R-19, R-23, R-28, and RRB) locations for potential use in the risk assessment. Unfiltered Cr(VI) and chromium were not detected in surface water samples from the in-channel or shoreline locations in 2009, as shown in Table 3-6.

3.4 Monitoring and Reporting for 2010

This section summarizes upcoming 2010 monitoring and reporting activities for the Topock GMP. The schedule presented below is an estimate and is subject to change.

3.4.1 Monitoring Events

In an email dated March 3, 2010, DTSC concurred with PG&E in regard to a new sampling frequency plan for the GMP (DTSC, 2010). This change will be discussed further in the First Quarter 2010 monitoring report. Following the changes outlined in the email, the monitoring schedule for the 2010 GMP is as follows:

- The first quarter monitoring event is planned for March 2010. This quarterly event will also serve as a semiannual event and will include 76 monitoring wells.

- The second quarter monitoring event is planned for May 2010. This quarterly sampling event will include 47 monitoring wells.
- The third quarter monitoring event is planned for September 2010. This event will serve as the annual event and will include 115 monitoring wells.
- The fourth quarter sampling event is planned for December 2010. This quarterly sampling event will include 47 monitoring wells.
- Quarterly surface water sampling, including four shoreline, 10 in-channel and two other surface water locations, are scheduled to coincide with quarterly GMP events. One additional surface water sampling event will be conducted during low-river stage between November 2010 and January 2011.
- Monthly sampling events of the two active extraction wells will occur during the first two weeks of April, June, July, August, October, and November 2010, and January 2011. Monthly sampling of MW-34-100 and MW-46-175 will occur in November 2010 and January 2011. The first monthly event of 2010 occurred on February 8-9, 2010 and included MW-34-080, MW-34-100, MW-44-115, MW-44-125, and MW-46-175.

3.4.2 Reporting

The reporting schedule for the 2010 GMP is as follows:

- Quarterly reports will be submitted to DTSC 30 days after the end of the reporting quarter. The fourth quarter report will also serve as an annual summary and will be submitted March 15, 2011.
- Approximately 4 to 5 weeks after each monthly sampling event, groundwater analytical result plots for wells MW-34-100, MW-44-115, MW-44-125, and MW-46-175 will be e-mailed to DTSC.

4.0 Recommendations

4.1 Recommended Modifications to the GMP

The eight Arizona monitoring wells (locations MW-54 through MW-56) installed in 2008 are presently being sampled on a quarterly basis. A request was submitted to ADEQ in January 2010 (PG&E, 2010) for modification of the sampling frequencies. The requested frequencies and rational are as follows:

MW-54 location (HNWR property):
- Current sampling frequency – Quarterly
- Proposed sampling frequency – Biennial
- Basis for modification – stable trends indicate chromium below detection limits (except one ppb-level detection in 2008 at deeper well) and water levels indicate a westward gradient.

MW-55 location (Topock Marina property):
- Current sampling frequency – Quarterly
- Proposed sampling frequency – Biennial
- Basis for modification – stable trends indicate chromium below detection limits, or low level background chromium at deeper well, and water levels indicate a westward gradient.

MW-56 location (slant wells under Colorado River, on EPNG property):
- Current sampling frequency – Quarterly
- Proposed sampling frequency – Semi-annual
- Basis for modification – Chromium has been below detection limits in every sample.
- This proposed frequency is consistent with the monitoring frequency proposed to DTSC for the companion California slant wells MW-52 and MW-53.

5.0 References

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Tables

TABLE 2-1

Pumping Rate and Extracted Volume for IM System, November 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance
Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Extraction Well ID	November 2009		December 2009		January 2010		Fourth Quarter 2009		Project to Date [a]
	Average Pumping Rate [b] (gpm)	Volume Pumped (gal)	Average Pumping Rate [b] (gpm)	Volume Pumped (gal)	Average Pumping Rate [b] (gpm)	Volume Pumped (gal)	Average Pumping Rate [b] (gpm)	Volume Pumped (gal)	Cumulative Volume Pumped (gal)
TW-02S	0.00	0	0.00	0	0.00	0	0.00	0	1,000,780
TW-02D	0.00	0	0.00	0	0.00	0	0.00	0	53,104,680
TW-03D	106.43	4,597,642	98.60	4,401,486	103.12	4,603,255	102.72	13,602,383	211,762,764
PE-01	26.98	1,165,366	25.20	1,124,979	26.25	1,171,901	26.14	3,462,247	62,422,098
TOTAL	**133.4**	**5,763,008**	**123.8**	**5,526,465**	**129.4**	**5,775,157**	**128.9**	**17,064,630**	328,290,321
							Volume Pumped from the MW-20 Well Cluster		1,527,724
							Total Volume Pumped (gal)		329,818,045
							Total Volume Pumped (ac-ft)		1,012.2

NOTES:

gpm gallons per minute
gal gallons
ac-ft acre-feet

[a] Interim measure groundwater extraction at the Topock site was initiated in March 2004.

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

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-9	SA	09-Jun-09	---	340	32.0	3,210	7.16
		09-Jun-09 FD	---	340	FD	FD	FD
		24-Sep-09	311	260	60.4	3,180	7.55
MW-10	SA	12-Mar-09	265	250	145	3,580	7.58
		09-Jun-09	---	---	33.0	3,070	7.34
		22-Sep-09	341	348	16.3	3,200	7.73
MW-12	SA	12-Mar-09	2,490	2,660	67.0	6,880	8.27
		05-May-09	2,550	2,670	1.30	6,270	8.12
		10-Jun-09	---	---	35.0	6,540	8.03
		24-Sep-09	2,490	2,780	18.8	6,650	8.26
		24-Sep-09 FD	2,700	2,910	FD	FD	FD
		11-Dec-09	2,750	2,660	146	6,840	8.30
MW-13	SA	21-Sep-09	22.8	22.5	49.9	1,980	7.53
MW-14	SA	21-Sep-09	27.0	26.6	37.7	1,510	7.71
MW-15	SA	30-Sep-09	12.3	10.4	45.5	1,750	7.81
MW-16	SA	06-May-09	---	8.02	5.80	1,140	7.99
		28-Sep-09	9.12	8.56	56.5	1,110	7.90
MW-17	SA	06-May-09	---	10.2	-35.7	1,780	7.79
		30-Sep-09	10.6	10.1	27.4	1,760	7.91
MW-18	SA	11-Mar-09	24.5	22.7	49.2	1,380	7.53
		11-Mar-09 FD	23.2	19.6	FD	FD	FD
		22-Sep-09	22.3	20.2	48.2	1,410	7.71
MW-19	SA	22-Sep-09	192	193	51.2	2,370	7.45
MW-20-70	SA	12-Mar-09	2,290	2,710	64.0	3,440	7.68
		25-Sep-09	2,430	2,650	106	3,140	7.58
MW-20-100	MA	13-Mar-09	5,490	5,470	186	3,970	7.35
		25-Sep-09	5,760	6,790	93.7	3,500	7.41
MW-20-130	DA	13-Mar-09	7,500	7,720	134	14,300	7.42
		25-Sep-09	10,800	11,000	81.7	12,600	7.52
MW-21	SA	11-Mar-09	1.90	2.32	41.8	12,200	6.88
		06-May-09	1.64	1.39	-27	11,300	6.81
		04-Aug-09	---	---	76.0	9,060	7.53
		23-Sep-09	ND (1.0)	2.70	48.8	12,800	7.17
		09-Dec-09	ND (1.0)	ND (1.0)	-66.9 R	11,000	6.78
MW-22	SA	12-Mar-09	ND (2.1)	2.72	-98.2	25,500	6.72
		29-Apr-09	---	1.22	-99.8	29,700	6.87
		29-Sep-09	ND (1.0)	ND (1.0)	-61	20,800	6.90
		10-Dec-09	---	ND (1.0)	-52.2	34,200	6.78
MW-23	BR	12-Mar-09	32.6	32.6	43.0	18,400	7.10

Refer to table footnotes for data qualifier explanation.

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-23-060	BR-SA	21-Jul-09	26.0	30.0	146	16,400	8.43
		24-Sep-09	30.5	25.6	24.1	17,000	9.37
		10-Dec-09	25.8	25.6	-1.9 R	16,200	11.3
MW-23-080	BR-SA	21-Jul-09	34.0	44.0	87.9	16,900	11.0
		23-Sep-09	29.7	28.1	-5.4 R	17,700	11.3
		10-Dec-09	21.8	22.4	-41.3 R	17,700	11.1
MW-24BR	BR	11-Mar-09	ND (0.2)	ND (1.0)	-202	15,500	8.07
		07-May-09	ND (0.2)	ND (1.0)	-165	15,000	7.85
		28-Sep-09	ND (2.1)	ND (1.0)	-65.1	15,100	8.06
		08-Dec-09	ND (1.0)	ND (1.0)	-179	14,900	7.75
MW-25	SA	21-Sep-09	455	495	85.6	1,270	7.29
		21-Sep-09 FD	457	482	FD	FD	FD
MW-26	SA	10-Mar-09	1,990	2,220	63.7	4,330	7.59
		10-Mar-09 FD	2,100	2,720	FD	FD	FD
		22-Sep-09	2,140	2,180	43.8	3,940	7.45
MW-27-20	SA	01-Oct-09	ND (0.2)	ND (1.0)	-158	1,040	7.60
MW-27-60	MA	01-Oct-09	ND (0.2)	ND (1.0)	-103	1,820 R	7.80
		08-Dec-09	ND (0.2)	ND (1.0)	-64	1,810	8.24
MW-27-85	DA	11-Mar-09	ND (1.0)	ND (1.0)	-105	17,200	7.24
		30-Apr-09	ND (1.0)	ND (1.0)	-103	16,200	6.69
		01-Oct-09	ND (1.0)	ND (1.0)	-31.5	15,200	7.12
		08-Dec-09	ND (1.0)	ND (1.0)	-35.5	15,100	6.99
MW-28-25	SA	24-Sep-09	ND (0.2)	ND (1.0)	-115	1,140	7.42
MW-28-90	DA	11-Mar-09	ND (0.2)	ND (1.0)	-160	8,110	7.60
		30-Apr-09	ND (0.2)	ND (1.0)	-181	7,600	7.42
		24-Sep-09	ND (1.0)	ND (1.0)	-163	7,560	7.47
		09-Dec-09	ND (1.0)	ND (1.0)	-112	7,650	7.32
MW-29	SA	12-Mar-09	ND (0.2)	ND (1.0)	-162	3,270	7.20
		24-Sep-09	ND (1.0)	ND (1.0)	-175	2,620	7.53
MW-30-30	SA	04-Aug-09	---	---	-236	11,900	7.62
		24-Sep-09	ND (1.0)	ND (1.0)	-131	19,500	7.27
MW-30-50	MA	24-Sep-09	ND (0.21)	ND (1.0)	-89.8	1,590	7.96
MW-31-60	SA	21-Sep-09	424	417	54.9	3,320	7.58
MW-31-135	DA	21-Sep-09	19.6	20.4	65.4	11,300	7.85
MW-32-20	SA	10-Mar-09	ND (2.1)	4.56	-170	44,700	6.72
		22-Sep-09	ND (5.2)	ND (1.0)	-150	53,300	6.77
MW-32-35	SA	22-Sep-09	ND (1.0)	ND (1.0)	-189	21,900	7.03
MW-33-40	SA	12-Mar-09	ND (0.2)	ND (1.0)	-35.5	6,390	8.05
		05-May-09	ND (0.2)	ND (1.0)	-72.4	5,270	8.29

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TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-33-40	SA	24-Sep-09	ND (0.21)	ND (1.0)	-125	6,600	8.07
		09-Dec-09	ND (1.0)	2.16	12.3	11,400	7.81
MW-33-90	MA	13-Mar-09	22.2	20.1	58.7	11,100	7.46
		05-May-09	20.7	19.9	-86.7	10,700	7.44
		29-Sep-09	22.4	21.1	62.4	10,500	7.55
		09-Dec-09	23.1	24.4	37.9	10,600	7.53
MW-33-150	DA	12-Mar-09	9.00	10.9	-38.9	17,700	7.49
		05-May-09	9.17	8.82	-91.3	17,100	7.55
		29-Sep-09	9.28 J	8.88	140	16,900	7.58
		29-Sep-09 FD	12.3 J	9.26	FD	FD	FD
		09-Dec-09	10.1	10.5	8.20 R	17,600	7.58
MW-33-210	DA	12-Mar-09	11.5	11.8	-17.8	20,500	7.31
		05-May-09	10.5	12.4	-87.7	20,000	7.31
		29-Sep-09	11.8	11.4	59.3	19,600	7.40
		09-Dec-09	13.1	13.3	26.3	19,900	7.42
MW-34-55	MA	30-Sep-09	ND (0.2)	ND (1.0)	-122	1,060	7.85
		17-Nov-09	---	---	-117	1,080	7.53
MW-34-80	DA	07-Jan-09	ND (0.2)	ND (1.0)	13.8	7,610	7.18
		03-Feb-09	ND (1.0)	ND (1.0)	-30.6	7,670	7.60
		10-Mar-09	ND (1.0)	1.69	-72	8,820	7.31
		06-Apr-09	ND (1.0)	ND (1.0)	10.7	8,590	7.32
		30-Apr-09	ND (1.0)	ND (1.0)	-178	8,640	7.37
		09-Jun-09	ND (1.0)	ND (1.0)	5.30	8,170	7.16
		07-Jul-09	ND (0.2)	ND (1.0)	-38.6	7,600	7.33
		04-Aug-09	ND (0.2)	ND (1.0)	-295	6,850	7.90
		30-Sep-09	ND (1.0)	ND (1.0)	-46.6	8,230	7.43
		13-Oct-09	ND (1.0)	ND (1.0)	-4.1	8,200	7.48
		02-Nov-09	ND (1.0)	ND (1.0)	-288	8,090	8.08
		09-Dec-09	ND (1.0)	ND (1.0)	-56.9	8,050	7.38
		11-Jan-10	ND (1.0)	1.61	-58	8,020	7.22
MW-34-100	DA	07-Jan-09	456	442	17.9	17,700	7.14
		03-Feb-09	170	152	27.4	13,500	7.64
		10-Mar-09	97.9	123	-0.9	19,300	7.40
		06-Apr-09	74.7	83.8	24.9	18,600	7.36
		30-Apr-09	61.3 J	65.5	-134	18,500	7.51
		30-Apr-09 FD	77.6 J	65.8	FD	FD	FD
		09-Jun-09	108	112	37.0	18,000	7.17
		07-Jul-09	114	115	-11.2	16,800	7.45
		04-Aug-09	113	112	-250	11,700	7.87
		30-Sep-09	78.4	70.8	-6.0	18,400	7.50
		30-Sep-09 FD	78.9	72.6	FD	FD	FD
		14-Oct-09	211	208	-71.3	18,600	7.76
		02-Nov-09	152	146	-285	18,500	8.13

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TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-34-100	DA	02-Nov-09 FD	152	144	FD	FD	FD
		17-Nov-09	---	---	115 R	18,600	7.41
		09-Dec-09	211	203	22.5	18,400	7.58
		09-Dec-09 FD	211	211	FD	FD	FD
		11-Jan-10	243	231	66.6	20,000	7.98
		11-Jan-10 FD	254	235	FD	FD	FD
MW-35-60	SA	11-Mar-09	35.7	33.0	12.1	6,970	7.37
		24-Sep-09	27.7	23.2	77.9	7,410	7.56
		24-Sep-09 FD	25.3	23.6	FD	FD	FD
MW-35-135	DA	24-Sep-09	33.4	30.8	100	9,920	7.95
MW-36-20	SA	23-Sep-09	ND (1.0)	ND (1.0)	-188	3,920	8.07
MW-36-40	SA	30-Sep-09	ND (0.2)	ND (1.0)	-179	3,730	7.94
MW-36-50	MA	30-Sep-09	ND (0.2)	ND (1.0)	-133	1,230	7.93
MW-36-70	MA	22-Sep-09	ND (0.2)	ND (1.0)	36.8	12,800	3.28
MW-36-90	DA	12-Mar-09	ND (0.2)	ND (1.0)	-85.4	1,480	7.98
		12-Mar-09 FD	ND (0.2)	ND (1.0)	FD	FD	FD
		23-Sep-09	ND (0.2)	ND (1.0)	-56.9	1,490	8.18
MW-36-100	DA	12-Mar-09	63.5	90.6	-99.7	12,900	6.96
		23-Sep-09	67.6	64.5	-165	11,500	7.12
MW-37S	MA	23-Sep-09	7.93	8.23	38.0	5,150	7.91
		23-Sep-09 FD	8.50	7.91	FD	FD	FD
MW-37D	DA	12-Mar-09	425	682	79.0	17,300	7.70
		23-Sep-09	308	336	48.8	15,700	7.92
MW-39-40	SA	01-Oct-09	ND (1.0)	ND (1.0)	-125	8,490	7.40
MW-39-50	MA	01-Oct-09	ND (0.2)	ND (1.0)	5.30 R	1,990	8.07
MW-39-60	MA	01-Oct-09	ND (0.2)	ND (1.0)	38.2	2,720	7.88
MW-39-70	MA	01-Oct-09	ND (0.2)	ND (1.0)	48.9	4,090	7.59
MW-39-80	DA	11-Mar-09	4.67	5.66	-89.9	12,300	6.93
		01-Oct-09	ND (1.0)	1.44	33.8	10,800	7.07
MW-39-100	DA	13-Mar-09	708	920	19.4	22,500	6.71
		29-Sep-09	451	451	61.0	20,900	6.76
MW-40S	SA	28-Sep-09	6.85	6.87	77.5	2,250	7.69
MW-40D	DA	11-Mar-09	115	135	-44.8	17,000	7.49
		28-Sep-09	116	114	53.4	16,300	7.53
MW-41S	SA	11-Mar-09	17.8	21.2	-27.5	5,280	7.80
		23-Sep-09	18.7	18.9	32.0	5,220	8.04
		23-Sep-09 FD	19.5	17.8	FD	FD	FD

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TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-41M	DA	23-Sep-09	10.3	10.8	29.4	15,500	7.69
MW-41D	DA	11-Mar-09	ND (1.0)	2.80	-150	22,800	7.67
		23-Sep-09	ND (1.0)	2.19	62.8	22,400	7.90
MW-42-30	SA	23-Sep-09	---	---	-176	6,150	7.69
MW-42-55	MA	09-Mar-09	ND (1.0)	ND (1.0)	-167	13,300	7.18
		30-Apr-09	ND (1.0)	ND (1.0)	-174	12,200	7.40
		23-Sep-09	ND (1.0)	ND (1.0)	-187	10,600	7.42
		08-Dec-09	ND (1.0)	ND (1.0)	-118	10,800	7.20
MW-42-65	MA	09-Mar-09	ND (1.0)	ND (1.0)	-130	15,600	6.96
		30-Apr-09	ND (1.0)	ND (1.0)	-172	13,700	7.22
		23-Sep-09	ND (1.0)	ND (1.0)	-111	12,800	7.10
		08-Dec-09	ND (1.0)	ND (1.0)	-24.9	13,200	6.97
MW-43-25	SA	01-Oct-09	ND (0.2)	ND (1.0)	-171	1,300	7.46
MW-43-75	DA	01-Oct-09	ND (1.0)	ND (1.0)	-140	11,900	7.57
MW-43-90	DA	01-Oct-09	ND (1.0)	ND (1.0)	-94.5	18,900	6.86
MW-44-70	MA	12-Mar-09	ND (0.2)	ND (1.0)	-170	3,470	7.45
		01-May-09	ND (0.2)	ND (1.0)	-137	3,470	7.35
		21-Sep-09	ND (0.2)	ND (1.0)	-191	3,030	7.72
		07-Dec-09	ND (0.2)	ND (1.0)	-96.6	3,000	7.49
MW-44-115	DA	07-Jan-09	428	425	13.9	12,800	7.15
		02-Feb-09	434	433	-61.4	10,700	7.77
		02-Feb-09 FD	434	425	FD	FD	FD
		10-Mar-09	434	472	-142	13,300	7.24
		06-Apr-09	406	425	4.50	12,700	7.77
		06-Apr-09 FD	406	428	FD	FD	FD
		01-May-09	379	365	-211	12,900	7.90
		08-Jun-09	348	322	-20	12,700	7.65
		08-Jun-09 FD	349	351	FD	FD	FD
		06-Jul-09	333	308	-148	12,000	7.86
		03-Aug-09	316	300	-358	10,400	8.18
		21-Sep-09	302	304	-249	12,000	8.10
		21-Sep-09 FD	303	296	FD	FD	FD
		14-Oct-09	300	295	-110	12,300	8.03
		03-Nov-09	306	293	-25.3	12,300	7.90
		07-Dec-09	291	284	-93.5	12,300	7.94
		12-Jan-10	282	279	-174	12,600	7.86
MW-44-125	DA	07-Jan-09	300	290	-31.9	14,400	7.35
		02-Feb-09	255	250	-77.5	11,000	8.00
		10-Mar-09	112	126	-194	12,500	7.93
		06-Apr-09	170	166	-5.1	12,800	7.71
		01-May-09	96.3	117	-192	13,400	7.87

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TABLE 2-2
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Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-44-125	DA	08-Jun-09	178	175	-35.2	13,000	7.73
		06-Jul-09	154	169	-149	12,600	7.93
		03-Aug-09	191	184	-375	11,000	8.35
		23-Sep-09	93.7	90.3	-198	12,700	7.95
		14-Oct-09	20.3	176	-117	13,400	8.12
		03-Nov-09	159	160	-245	13,100	8.08
		07-Dec-09	68.8	78.3	-96.7	13,400	8.18
		12-Jan-10	155	127	-193	13,800	8.03
MW-45-095a	DA	29-Sep-09	---	---	-0.9	9,700	7.61
MW-46-175	DA	07-Jan-09	190	196	-4.9	16,900	9.01
		07-Jan-09 FD	192	205	FD	FD	FD
		03-Feb-09	143	136	7.00	12,600	8.39
		12-Mar-09	90.5	89.2	-213	18,200	8.28
		06-Apr-09	68.5	77.0	-8.0	17,700	8.20
		05-May-09	63.2	55.0	-164	17,800	8.33
		08-Jun-09	65.1	65.6	-26	18,200	8.15
		07-Jul-09	89.6	82.8	-133	15,900	8.37
		04-Aug-09	86.6	86.6	-304	11,300	8.59
		25-Sep-09	116	105	-122	17,600	8.38
		14-Oct-09	160	159	-98.7	17,700	8.56
		14-Oct-09 FD	165	155	FD	FD	FD
		02-Nov-09	150	142	-328	17,200	8.64
		08-Dec-09	169	163	-96.6	17,800	8.26
		12-Jan-10	200	194	-158	18,300	8.37
MW-46-205	DA	12-Mar-09	4.98	5.95	-74.6	22,300	8.29
		05-May-09	4.94	5.78	-100	21,600	8.27
		05-May-09 FD	5.44	5.34	FD	FD	FD
		25-Sep-09	4.86	5.64	-91.4	21,500	8.37
		08-Dec-09	4.64	4.72	-49.1	21,900	8.20
		08-Dec-09 FD	4.92	4.90	FD	FD	FD
MW-47-55	SA	12-Mar-09	28.4	27.0	110	4,510	7.55
		12-Mar-09 FD	27.6	30.2	FD	FD	FD
		06-May-09	24.3	22.1	-17	4,440	7.53
		24-Sep-09	18.8	17.4	50.8	4,910	7.65
		09-Dec-09	53.3	46.4	-12.9	4,150	7.44
MW-47-115	DA	11-Mar-09	18.6	20.8	-73	13,900	7.58
		06-May-09	20.2	18.7	42.0	13,300	7.53
		07-Jul-09	17.0	17.8	76.1	12,100	7.55
		07-Jul-09 FD	17.1	14.8	FD	FD	FD
		04-Aug-09	15.8	15.0	-204	9,310	7.76
		04-Aug-09 FD	15.8	13.5	FD	FD	FD
		24-Sep-09	17.2	16.3	46.2	13,200	7.69
		09-Dec-09	14.4	14.4	-55.2	14,300	7.46

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Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-48	BR	11-Mar-09	ND (0.2)	ND (1.0)	41.3	20,100	7.22
		06-May-09	ND (1.0)	---	-10	17,600	7.37
		23-Sep-09	ND (1.0)	ND (1.0)	122	18,300	7.33
		09-Dec-09	ND (1.0)	ND (1.0)	16.9	18,400	7.23
MW-49-135	DA	11-Mar-09	ND (1.0)	ND (1.0)	-97.2	15,100	7.80
		22-Sep-09	ND (1.0)	ND (1.0)	84.6 R	13,500	7.85
MW-49-275	DA	11-Mar-09	ND (1.0)	ND (1.0)	-237	27,500	8.88
		22-Sep-09	ND (2.1)	1.76	-154	24,400	8.16
MW-49-365	DA	11-Mar-09	ND (5.2)	ND (1.0)	-240	42,100	8.15
		22-Sep-09	ND (2.1)	ND (1.0)	-230	37,900	8.03
MW-50-095	MA	12-Mar-09	60.1	72.6	100	5,420	7.83
		12-Mar-09 FD	61.2	71.1	FD	FD	FD
		06-May-09	62.2	72.2	-42.3	5,260	7.79
		24-Sep-09	40.3	39.6	55.6	5,120	8.08
		10-Dec-09	30.9	29.5	5.00	5,220	8.17
MW-50-200	DA	13-Mar-09	9,910	12,400	156	24,200	7.70
		06-May-09	9,010	10,900	-19.7	22,100	7.84
		06-May-09 FD	9,400	10,800	FD	FD	FD
		25-Sep-09	6,380	7,450	76.6	20,900	8.02
		11-Dec-09	7,860	8,140	91.9	22,300	7.79
		11-Dec-09 FD	7,510	8,370	FD	FD	FD
MW-51	MA	12-Mar-09	3,990	5,000	73.0	12,500	7.44
		24-Sep-09	4,330	4,760	42.2	11,300	7.47
MW-52S	MA	12-Mar-09	ND (1.0)	ND (1.0)	-100	11,500	6.56
		29-Apr-09	ND (1.0)	ND (1.0)	-145	10,700	7.20
		29-Sep-09	ND (1.0)	ND (1.0)	-130	11,300	7.37
		10-Dec-09	ND (1.0)	1.57	-163	11,000	7.62
MW-52M	DA	12-Mar-09	ND (1.0)	ND (1.0)	-174	14,500	7.67
		29-Apr-09	ND (1.0)	ND (1.0)	-156	17,200	7.91
		29-Sep-09	ND (1.0)	ND (1.0)	-146	17,400	7.72
		10-Dec-09	ND (2.1)	1.77	-204	17,200	7.78
MW-52D	DA	12-Mar-09	ND (1.0)	6.63	-111	21,900	7.34
		29-Apr-09	ND (2.1)	ND (1.0)	-117	21,800	7.66
		29-Sep-09	ND (1.0)	ND (1.0)	-150	22,600	8.04
		10-Dec-09	ND (5.2)	1.64	-196	22,100	8.31
MW-53M	DA	12-Mar-09	ND (1.0)	ND (2.0)	-173	17,200	8.16
		29-Apr-09	ND (1.0)	ND (1.0)	-182	20,000	8.10
		29-Sep-09	ND (1.0)	ND (1.0)	-159	20,700	8.39
		10-Dec-09	ND (2.1)	1.94	-209	20,600	8.29
MW-53D	DA	12-Mar-09	ND (2.1)	ND (2.0)	-19.3	26,800	8.46
		29-Apr-09	ND (2.1)	ND (1.0)	-203	27,000	8.59

Refer to table footnotes for data qualifier explanation.

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-53D	DA	29-Sep-09	ND (2.1)	ND (1.0)	-195	27,300	8.60
		10-Dec-09	ND (5.2)	ND (1.0)	-217	26,900	8.74
MW-54-85	DA	09-Mar-09	ND (0.2)	ND (1.0)	-251	11,400	7.73
		05-May-09	ND (1.0) J	ND (1.0)	-174	10,100	7.30
		22-Sep-09	ND (0.2)	ND (1.0)	-200	10,800	7.59
		08-Dec-09	ND (0.2)	ND (1.0)	-158	10,800	7.29
MW-54-140	DA	09-Mar-09	ND (1.0)	ND (1.0)	-235	14,000	8.09
		05-May-09	ND (1.0) J	ND (1.0)	-151	12,500	7.69
		22-Sep-09	ND (0.2)	ND (1.0)	-53	13,400	7.94
		08-Dec-09	ND (1.0)	ND (1.0)	-104	13,300	7.72
MW-54-195	DA	09-Mar-09	ND (2.0)	ND (1.0)	-260	21,200	8.42
		05-May-09	ND (2.0) J	ND (1.0)	-236	18,900	8.01
		22-Sep-09	ND (1.0)	ND (1.0)	-216	20,000	8.16
		08-Dec-09	ND (0.2)	ND (1.0)	-216	19,700	7.97
MW-55-45	MA	09-Mar-09	ND (0.2)	ND (1.0)	-271	1,550	7.65
		04-May-09	ND (0.2)	ND (1.0)	-171	1,550	7.63
		22-Sep-09	ND (0.2)	ND (1.0)	-157	1,550	7.82
		07-Dec-09	ND (0.2)	ND (1.0)	-108	1,520	7.77
MW-55-120	DA	09-Mar-09	3.23	4.12	-142	9,740	7.85
		09-Mar-09 FD	3.09	4.04	FD	FD	FD
		04-May-09	2.93	3.69	-87.2	9,110	7.87
		04-May-09 FD	2.92	3.72	FD	FD	FD
		22-Sep-09	3.97	5.08	-89.4	9,400	8.02
		22-Sep-09 FD	3.98	5.10	FD	FD	FD
		07-Dec-09	4.69	6.09	-42.4	9,430	7.94
		07-Dec-09 FD	4.61	5.85	FD	FD	FD
MW-56S	SA	13-Mar-09	ND (0.2)	ND (1.0)	-71	6,480	7.25
		04-May-09	ND (0.2) J	ND (1.0)	-143	6,490	7.29
		30-Sep-09	ND (0.2)	ND (1.0)	-119	6,510	7.41
		10-Dec-09	ND (0.2)	ND (1.0)	-173	5,970	7.59
MW-56M	DA	13-Mar-09	ND (1.0)	ND (1.0)	-58.2	15,100	7.14
		04-May-09	ND (1.0) J	ND (1.0)	-133	14,700	7.27
		30-Sep-09	ND (0.2)	ND (1.0)	-107	15,000	7.38
		10-Dec-09	ND (1.0)	ND (1.0)	-156	14,900	7.35
MW-56D	DA	13-Mar-09	ND (2.0)	ND (1.0)	-38	21,300	7.71
		04-May-09	ND (5.0)	ND (1.0)	-234	21,500	8.53
		30-Sep-09	ND (1.0)	ND (1.0)	-119	21,700	7.87
		10-Dec-09	ND (2.0)	ND (1.0)	-145	21,500	8.01
MW-57-070	BR	11-Feb-09	660	720	-93.6	2,910	7.30
		10-Jun-09	---	---	48.0	3,060	6.97
		21-Jul-09	340	350	287	3,140	6.60
		24-Sep-09	132	139	34.2	3,160	7.22

Refer to table footnotes for data qualifier explanation.

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-57-070	BR	10-Dec-09	84.4	103	-31.5	3,270	7.30
MW-57-185	BR-DA	20-Jul-09	1.40	ND (4.9)	194	18,300	8.19
		23-Sep-09	1.13	2.38	-42.2 R	19,000	8.90
		09-Dec-09	2.09	2.62	-191	18,900	8.51
MW-58-115	BR-MA	22-Jul-09	ND (1.0)	3.00	-319	6,590	6.78
		29-Sep-09	ND (1.0)	ND (1.0)	-156	12,300	7.30
		16-Dec-09	ND (1.0)	1.38	-178	8,810	7.44
MW-58-205	BR-DA	22-Jul-09	ND (1.0)	6.30	-337	16,300	7.38
		29-Sep-09	4.69	9.70	-250	4,550	7.41
		16-Dec-09	7.56	26.6	-283	5,330	7.82
MW-59-100	SA	18-Mar-09	4,300	4,800	46.0	25,600	7.16
		10-Jun-09	---	---	53.0	11,100	6.87
		22-Jul-09	5,100	4,900	90.1	10,800	6.92
		22-Jul-09 FD	5,100	4,800	FD	FD	FD
		24-Sep-09	4,630	5,300	62.5	11,900	6.99
		11-Dec-09	4,340	4,420	199	11,200	7.06
MW-60-125	BR-SA	20-Mar-09	810	840	99.0	15,500	7.44
		21-Jul-09	780	810	70.6	8,200	7.24
		05-Aug-09	---	---	-138	6,220	7.58
		24-Sep-09	570	619	-13.6	8,240	7.54
		10-Dec-09	532	592	-71	8,320	7.51
MW-61-110	BR-SA	23-Mar-09	620	670	-119	20,000	7.52
		21-Jul-09	240	260	-9.6	15,100	7.27
		24-Sep-09	360	363	-20	15,900	7.73
		10-Dec-09	433	450	-75.9	16,400	7.66
MW-62-065	BR-SA	27-Mar-09	720	740	148	7,410	7.40
		22-Jul-09	290	300	51.8	5,810	7.31
		24-Sep-09	236	251	29.0	5,780	7.60
		10-Dec-09	219	247	-17	5,760	7.50
MW-62-110	BR-MA	22-Jul-09	74.0	71.0	-94	8,950	8.09
		29-Sep-09	4.43	31.3	-134	8,580	7.78
		16-Dec-09	381	460	-119	8,840	7.73
MW-62-190	BR-DA	22-Jul-09	ND (1.0)	2.00	-305	28,800	7.71
		29-Sep-09	147	50.3	-226	18,600	7.58
		16-Dec-09	ND (1.0)	1.61	-190	18,300	7.70
MW-63-065	BR-SA	15-Apr-09	ND (0.2)	2.30	12.0	10,900	7.08
		20-Jul-09	0.54	ND (2.9)	308	6,650	6.49
		20-Jul-09 FD	0.54	ND (3.0)	FD	FD	FD
		22-Sep-09	0.65	1.24	66.1	6,930	7.26
		22-Sep-09 FD	0.54	1.93	FD	FD	FD
		09-Dec-09	0.63	1.15	40.4	6,840	7.09

Refer to table footnotes for data qualifier explanation.

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
MW-63-065	BR-SA	09-Dec-09 FD	ND (1.0)	ND (1.0)	FD	FD	FD
MW-64-150	BR-SA	22-Jul-09	ND (1.0)	5.20	-30 R	8,860	7.37
		29-Sep-09	ND (1.0)	1.55	-202	9,760	6.77
		12-Oct-09	ND (1.0)	ND (1.0)	-316	9,760	7.05
		04-Nov-09	ND (1.0)	ND (1.0)	-304	9,820	7.11
		16-Dec-09	ND (1.0)	1.84	-290	10,900	7.14
		19-Jan-10	ND (1.0)	ND (1.0)	-95	11,900	7.04
MW-64-205	BR-DA	22-Jul-09	5.70	17.0	26.0 R	14,800	7.34
		29-Sep-09	ND (1.0)	2.47	-239	14,200	6.74
		12-Oct-09	1.58	6.01	-302	13,800	7.07
		04-Nov-09	1.38	5.56	-311	14,100	7.14
		16-Dec-09	ND (1.0)	5.57	-180	15,200	7.00
		19-Jan-10	ND (1.0)	3.19	-192	15,400	7.05
MW-64-260	BR-DA	22-Jul-09	ND (1.0)	4.80	29.0 R	10,900	7.33
		29-Sep-09	1.45	1.42	-282	14,200	6.82
		12-Oct-09	ND (1.0)	1.28	-308	13,300	7.18
		04-Nov-09	1.88	1.21	-292	11,600	7.10
		16-Dec-09	ND (1.0)	2.25	-206	15,100	6.99
		19-Jan-10	ND (1.0)	ND (1.0)	-207	15,700	6.97
PE-1	DA	09-Jan-09	33.4	27.6	---	---	---
		04-Feb-09	26.3	25.5	---	---	---
		04-Mar-09	23.5	22.4 LF	---	---	---
		01-Apr-09	21.4	20.8	---	---	---
		06-May-09	18.6	18.1	---	---	---
		03-Jun-09	18.7	19.8	---	---	---
		01-Jul-09	20.4	19.2	---	---	---
		05-Aug-09	19.2	17.5	---	---	---
		02-Sep-09	19.6	17.9	---	---	---
		01-Oct-09	---	---	216	5,630	7.49
		07-Oct-09	20.7	18.6 LF	---	---	---
		04-Nov-09	19.9	19.6 LF	---	---	---
		02-Dec-09	19.7	19.4	---	---	---
		06-Jan-10	20.0	19.6 LF	---	---	---
Park Moabi-3	MA	01-Oct-09	9.86	9.50	345	1,430	7.72
Park Moabi-4	MA	01-Oct-09	21.0	18.0	726	1,870	7.91
TW-1	MA	22-Sep-09	3,740	4,130	87.5	7,180	7.39
TW-2S	MA	01-Oct-09	831	880	230	2,530	7.70
TW-2D	DA	01-Oct-09	356	352	253	8,690	7.22
TW-3D	DA	09-Jan-09	1,570	1,300	---	---	---
		04-Feb-09	1,330	1,620	---	---	---
		04-Mar-09	1,280	1,280 LF	---	---	---

Refer to table footnotes for data qualifier explanation.

TABLE 2-2
Groundwater Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 Annual 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	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Selected Field Parameters		
					ORP (mV)	Specific Conductance (µS/cm)	Field pH
TW-3D	DA	01-Apr-09	1,270	1,320	---	---	---
		06-May-09	1,610	1,450	---	---	---
		03-Jun-09	1,470	1,500	---	---	---
		01-Jul-09	1,500	1,360	---	---	---
		05-Aug-09	1,190	1,270	---	---	---
		02-Sep-09	1,220	1,360	---	---	---
		07-Oct-09	1,330	1,340 LF	---	---	---
		04-Nov-09	1,160	1,310 LF	---	---	---
		02-Dec-09	1,410	1,340	---	---	---
		06-Jan-10	1,300	1,350 LF	---	---	---
TW-4	DA	10-Mar-09	14.0	13.0	31.3	23,400	7.51
		06-May-09	13.5	14.4	-68	20,700	7.65
		23-Sep-09	10.7	11.1	40.5	21,800	7.71
		23-Sep-09 FD	10.1	10.5	FD	FD	FD
		09-Dec-09	10.1	10.4	-62.6	21,800	7.49
TW-5	DA	23-Sep-09	10.4	9.61	-29.6	13,800	7.97

NOTES:
ND = not detected at listed reporting limit (RL)
FD = field duplicate sample
UF = unfiltered
LF = lab filtered
R = result exceeded analytical criteria for precision and accuracy; should not be used for project decision-making.
J = concentration or RL estimated by laboratory or data validation
(---) = data not collected, available, rejected, or field instrument malfunction
µg/L= micrograms per liter
mV = millivolts
ORP = oxidation-reduction potential
µS/cm = microSiemens per centimeter

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 SW7199 analyses have been elevated above the standard RL of 0.2 µg/L due to required sample dilution to accommodate matrix interferences.

Sampling results from East Ravine wells prior to August 1, 2009 can be found in the ERGI Report.

Wells are assigned to seperate Aquifer zones for results reporting:
SA: shallow interval of Alluvial Aquifer
MA: mid-depth interval of Alluvial Aquifer
DA: deep interval of Alluvial Aquifer
BR: well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock)

TABLE 2-3

Assessment Monitoring Wells and Trigger Levels for IM Performance Monitoring
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Assessment Monitoring Well	July 2008 Cr(VI) Trigger Level [(a)] (µg/L)	Most Recent Cr(VI) Concentration		Cr(VI) Concentration Trend 2009 [(c)]
		(µg/L)	Date	
Shallow Zone Wells				
MW-21	20	ND (1.0)	9-Dec-09	NA
MW-32-20	20	ND (5.2)	22-Sep-09	NA
MW-32-35	20	ND (1.0)	22-Sep-09	NA
MW-33-40	20	ND (1.0)	9-Dec-09	NA
MW-39-40	20	ND (1.0)	1-Oct-09	NA
MW-47-55	150	53.3	9-Dec-09	fluctuating, overall stable
Mid-Depth Zone Wells				
MW-33-90	25	23.1	9-Dec-09	stable
MW-36-70	20	ND (0.2)	22-Sep-09	NA
MW-42-55	20	ND (1.0)	8-Dec-09	NA
MW-42-65	20	ND (1.0)	8-Dec-09	NA
MW-44-70	20	ND (0.2)	7-Dec-09	NA
Deep Zone Wells				
MW-27-85	20	ND (1.0)	8-Dec-09	NA
MW-28-90	20	ND (1.0)	9-Dec-09	NA
MW-33-150	20	10.1	9-Dec-09	stable
MW-33-210	20	13.1	9-Dec-09	stable
MW-34-80	20	ND (1.0)	11-Jan-10	NA
MW-34-100	750	254	11-Jan-10	overall decreasing
MW-43-75	20	ND (1.0)	1-Oct-09	NA
MW-43-90	20	ND (1.0)	1-Oct-09	NA
MW-44-115	1,200	282	12-Jan-10	decreasing
MW-44-125	475	155	12-Jan-10	overall decreasing
MW-46-175	225	200	12-Jan-10	fluctuating, increase in 4th quarter
MW-46-205	20	4.92	8-Dec-09	stable
MW-47-115	31 [(b)]	14.4	9-Dec-09	stable

Notes:

(a) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC 2008d). Concentrations in micrograms per liter (µg/L)

(b) An updated trigger level for MW-47-115, based on Shewart statistical control limit calculated from data through May 2009, was approved by DTSC by email June 24, 2009.

(c) Chromium concentration plots for selected wells are included in Appendix B.

ND = not detected at listed reporting limit

NA = not applicable

TABLE 2-4

Average Hydraulic Gradients, November 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance
Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location[a]	Reporting Period	Mean Landward Hydraulic Gradient[b] (feet/foot)	Days in Monthly Average[c]
Overall Average	November	0.0058	NA
	December	0.0050	NA
	January	0.0052	NA
Northern Gradient Pair	November	0.0020	30/30
MW-31-135 / MW-33-150	December	0.0018	31/31
	January	0.0019	31/31
Central Gradient Pair	November	0.0113	30/30
MW-45-95 / MW-34-100	December	0.0096	31/31
	January	0.0099	31/31
Southern Gradient Pair	November	0.0041	30/30
MW-45-95 / MW-27-85	December	0.0036	31/31
	January	0.0038	31/31

NOTES:

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

[a] Refer to Figure 2-1 for location of well pairs.

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

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

TABLE 2-5
Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3
Fourth Quarter 2009 and Annual Interim Measures Performance
Monitoring and Site-Wide 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 2007	8,600	8,796	-196	453.2	453.6	0.4
February 2007	9,800	11,680	-1,880	453.6	454.3	0.7
March 2007	14,300	14,554	-254	455.1	455.6	0.5
April 2007	17,300	16,818	482	456.4	456.4	0.0
May 2007	16,800	16,199	601	456.5	456.4	-0.1
June 2007	16,000	16,212	-212	456.4	456.4	0.0
July 2007	14,900	14,897	3	455.8	456.0	0.2
August 2007	12,100	12,776	-676	454.7	455.4	0.7
September 2007	12,700	13,050	-350	454.8	455.4	0.5
October 2007	10,600	10,324	276	454.0	454.3	0.3
November 2007	9,100	8,387	713	453.6	453.6	0.0
December 2007	5,700	6,445	-745	452.3	452.7	0.4
January 2008	9,300	8,900	400	453.5	453.6	0.1
February 2008	10,100	12,463	-2,363	454.5	454.7	0.1
March 2008	15,200	15,837	-637	455.6	455.9	0.3
April 2008	17,600	18,554	-954	456.6	457.0	0.4
May 2008	17,200	16,155	1,045	456.6	456.4	-0.3
June 2008	15,400	15,655	-255	456.2	456.5	0.3
July 2008	14,500	14,574	-74	455.8	456.0	0.2
August 2008	13,100	12,976	124	455.2	455.2	0.0
September 2008	12,300	11,731	569	454.9	455.0	0.1
October 2008	10,500	10,272	228	454.1	454.2	0.1
November 2008	10,400	10,130	270	454.1	454.03	-0.1
December 2008	5,800	5,506	294	452.3	452.45	0.2
January 2009	9,300	10,644	-1,344	452.6	454.02	1.4
February 2009	10,800	11,319	-519	454.2	454.34	0.2
March 2009	16,200	16,826	-626	456.1	456.37	0.3
April 2009	18,800	18,432	368	457.2	457.13	-0.1
May 2009	15,800	14,889	911	456.4	456.26	-0.1
June 2009	14,100	13,246	854	455.8	455.73	0.0
July 2009	13,500	13,579	-79	455.5	455.65	0.1
August 2009	11,900	12,296	-396	454.8	455.08	0.3
September 2009	12,700	12,203	497	454.9	455.24	0.4
October 2009	9,500	10,128	-628	453.8	454.04	0.3
November 2009	10,200	9,909	291	454.1	454.3	0.2
December 2009	9,000	8,650	350	453.6	453.5	-0.1
January 2010	9,900	7,415	2,485	453.9	453.4	-0.5
February 2010	7,700			453.0		

NOTES:
cfs = cubic feet per second; ft amsl = feet above mean sea level.

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 February 2010 USBR projections. These data are reported monthly by the US Department of Interior, at http://www.usbr.gov/lc/region/g4000/24mo.pdf

The difference in I-3 elevation is the difference between the I-3 elevation predicted and the actual elevation measured at I-3. The source of this difference is differences between BOR projections and actual dam releases/Havasu reservoir levels, rather than the multiple regression error.

TABLE 2-6

Summary of Pumping Rate and Extracted Volume for 2009 Reporting Period

Fourth Quarter 2009 and Annual Interim Measures Performance

Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Reporting Period	Target Pump Rate[a] (gpm)	Actual Monthly Pump Rate (gpm)	Individual Extraction Well Operations				Total Volume (gallons)
			TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	
Feb-09	135	133.4	0	829	4,324,820	1,055,287	5,380,936
Mar-09	135	127.8	0	0	4,576,794	1,127,062	5,703,856
Apr-09	135	102.3	0	0	3,539,665	878,175	4,417,840
May-09	135	129.5	0	0	4,435,577	1,095,753	5,531,330
Jun-09	135	132.4	0	0	4,541,652	1,122,582	5,664,234
Jul-09	135	130.1	0	0	3,063,892	776,256	3,840,148
Aug-09	135	132.6	0	0	4,685,456	1,179,304	5,864,760
Sep-09	135	124.8	0	0	3,380,954	787,608	4,168,562
Oct-09	135	130.7	0	13,168	4,713,335	1,225,509	5,952,012
Nov-09	135	131.7	0	0	4,597,642	1,165,366	5,763,008
Dec-09	135	125.3	0	0	4,263,625	1,089,226	5,352,851
Jan-10	135	128.9	0	0	4,603,255	1,171,901	5,775,156
Totals for 2009 Annual Period		**121.0**	**0**	**13,997**	**50,726,667**	**12,674,029**	**63,414,693**

Notes:

gpm: gallons per minute

[a]The target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime, was maintained by pumping from extraction wells TW-3D and PE-1 during the 2009 reporting period.
Extraction wells TW-2S and TW-2D were only used for interim service or to support field operations.

TABLE 2-7
Analytical Results from Extraction Wells, February 2009 through January 2010
Fourth Quarter 2009 Annual interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Sample Date	Dissolved Chromium (total) µg/L	Hexavalent Chromium µg/L	Total Dissolved Solids mg/L
TW-3D	04-Feb-09	1620	1330	5970
TW-3D	04-Mar-09	1280	1280	5630
TW-3D	01-Apr-09	1320	1270	5700
TW-3D	06-May-09	1450	1610	5020
TW-3D	03-Jun-09	1500	1470	5340
TW-3D	01-Jul-09	1360	1500	5300
TW-3D	05-Aug-09	1270	1190	5270
TW-3D	02-Sep-09	1360	1220	5140
TW-3D	07-Oct-09	1340	1330	5530
TW-3D	04-Nov-09	1310	1160	5810
TW-3D	02-Dec-09	1340	1410	5370
TW-3D	06-Jan-10	1350	1300	5350
PE-1	04-Feb-09	25.5	26.3	3500
PE-1	04-Mar-09	22.4	23.5	3490
PE-1	01-Apr-09	20.8	21.4	3690
PE-1	06-May-09	18.1	18.6	3460
PE-1	03-Jun-09	19.8	18.7	3490
PE-1	01-Jul-09	19.2	20.4	3460
PE-1	05-Aug-09	17.5	19.2	3560
PE-1	02-Sep-09	17.9	19.6	3420
PE-1	07-Oct-09	18.6	20.7	3360
PE-1	04-Nov-09	19.6	19.9	3620
PE-1	02-Dec-09	19.4	19.7	3430
PE-1	06-Jan-10	19.6	20.0	3110

NOTES:
µg/L = concentration in micrograms per liter
mg/L = concentration in milligrams per liter

Analytical results from inactive extraction wells are presented in Table B-2.

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

TABLE 2-8

Calculated Hydraulic Gradients for Well Pairs by Month for 2009 Reporting Period
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

	Mean Landward Hydraulic Gradient (ft/ft)[a]			
Reporting Period 2009	**Overall Average[b]**	**Northern Gradient Pair[c] MW-31-135 / MW-33-150**	**Central Gradient Pair MW-45-95 / MW-34-100**	**Southern Gradient Pair MW-45-95 / MW-27-85**
February	0.0054	0.0023	0.0101	0.0038
March	0.0052	0.0024	0.0095	0.0037
April	0.0028	0.0019	0.0048	0.0018
May	0.0048	0.0018	0.0095	0.0031
June	0.0048	0.0021	0.0089	0.0033
July	0.0048	0.0013	0.0099	0.0032
August	0.0065	INC	0.0098	0.0033
September	0.0013	INC	0.0019	0.0008
October	0.0063	0.0017	0.0123	0.0041
November	0.0058	0.0020	0.0114	0.0041
December	0.0050	0.0018	0.0096	0.0036
January	0.0052	0.0019	0.0099	0.0038

Notes:

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

b. Overall average gradients are calculated using all available data.

c. Refer to Figure 2-1 for location of well pairs.

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

TABLE 3-1

Well Construction and Sampling Summary, January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft MSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Remarks
GMP Monitoring Wells										
MW-9	Bat Cave Wash	536.56	77 - 87	4 in PVC	89.4	80.2	Temp. pump	2	11	
MW-10	Bat Cave Wash	530.65	74 - 94	4 in PVC	96.9	74.6	CD pump	5	40	
MW-11	Bat Cave Wash	522.61	62.5 - 82.5	4 in PVC	86.1	66.3	CD pump	5	30	
MW-12	East of Station	484.01	27.5 - 47.5	4 in PVC	50.4	29.2	Temp. pump	3	40	
MW-13	Bat Cave Wash	488.64	28.5 - 48.5	4 in PVC	52.0	32.5	CD pump	4	30	
MW-14	East Mesa	570.99	111 - 131	4 in PVC	133.8	114.5	CD pump	4	30	
MW-15	East of New Ponds	641.52	180.5 - 200.5	4 in PVC	203.0	184.6	CD pump	5	30	
MW-16	Near New Ponds	657.31	198 - 218	4 in PVC	218.1	199.9	Temp. pump	2	35	
MW-17	West of Mesa Area	589.96	130 - 150	4 in PVC	153.6	132.8	CD pump	7	32	
MW-18	West Mesa	545.32	85 - 105	4 in PVC	106.7	88.4	Temp. pump	2	30	
MW-19	Route 66	499.92	46 - 66	4 in PVC	65.8	44.6	CD pump	7	41	
MW-20-70	MW-20 bench	500.15	50 - 70	4 in PVC	69.6	45.9	Temp. pump	4	53	
MW-20-100	MW-20 bench	500.58	89.5 - 99.5	4 in PVC	101.4	46.8	Temp. pump	5	110	
MW-20-130	MW-20 bench	500.66	121 - 131	4 in PVC	132.3	46.4	Temp. pump	5	180	
MW-21	Route 66	505.55	39 - 59	4 in PVC	58.5	50.8	Temp. pump	2	10	low recharge well; typically purges dry at 1 casing volume
MW-22	Floodplain	460.72	5.5 - 10.5	2 in PVC	12.4	6.8	Peristaltic	0.2	4	
MW-23-060	East Ravine	504.08	50 - 60	2 in Sch 40 PVC	60.2	49.6	Temp. pump	NA	NA	
MW-23-080	East Ravine	504.13	75 - 80	2 in Sch 40 PVC	80.8	49.7	Temp. pump	NA	NA	
MW-24A	MW-24 Bench	567.16	104 - 124	4 in PVC	127.5	110.9	CD pump	3	30	
MW-24B	MW-24 Bench	564.76	193 - 213	4 in PVC	214.8	109.5	CD pump	7	210	
MW-24BR	MW-24 Bench	563.95	378 - 437	4 in PVC	441.0	108.0	Temp. pump	5	185	low recharge well; typically purges dry at 1 casing volume
MW-25	Near Bat Cave Wash	542.90	84.5 - 104.5	4 in PVC	106.5	87.2	CD pump	7	32	
MW-26	Route 66	502.22	51.5 - 71.5	2 in PVC	70.1	46.9	CD pump	7	50	
MW-27-20	Floodplain	460.56	7 - 17	2 in PVC	14.4	5.4	Temp. pump	1	7	
MW-27-60	Floodplain	461.38	47.3 - 57.3	2 in PVC	59.0	8.1	Temp. pump	2	25	
MW-27-85	Floodplain	460.99	77.5 - 87.5	2 in PVC	80.0	8.1	Temp. pump	2	36	
MW-28-25	Floodplain	466.77	13 - 23	2 in PVC	21.1	11.9	Ded. RF	1	5	
MW-28-90	Floodplain	467.53	70 - 90	2 in PVC	98.4	14.3	Temp. pump	2	50	
MW-29	Floodplain	485.21	29.5 - 39.5	2 in PVC	41.5	29.7	Temp. pump	0.5	6	
MW-30-30	Floodplain	468.12	12 - 32	2 in PVC	26.9	13.2	Ded. RF	1	10	
MW-30-50	Floodplain	468.81	40 - 50	4 in PVC	52.6	13.4	Ded. RF	2	75	
MW-31-60	MW-20 Bench	496.81	41.5 - 61.5	4 in PVC	64.0	41.9	CD pump	10	40	

TABLE 3-1

Well Construction and Sampling Summary, January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft MSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Remarks
GMP Monitoring Wells										
MW-31-135	MW-20 Bench	498.11	113 - 133	2 in PVC	135.4	44.1	Temp. pump	3	60	
MW-32-20	Floodplain	461.51	10 - 20	2 in PVC	19.6	5.4	Ded. RF	1.5	6	
MW-32-35	Floodplain	461.63	27.5 - 35	4 in PVC	37.2	7.0	Ded. RF	2	60	
MW-33-40	Floodplain	487.38	29 - 39	4 in PVC	41.8	33.8	Temp. pump	0.5	4	
MW-33-90	Floodplain	487.55	69 - 89	4 in PVC	88.3	34.1	Temp. pump	2	110	
MW-33-150	Floodplain	487.77	132 - 152	2 in PVC	155.4	34.5	Temp. pump	3	60	
MW-33-210	Floodplain	487.25	190 - 210	2 in PVC	223.0	34.0	Temp. pump	3	90	
MW-34-55	Floodplain	460.95	45 - 55	4 in PVC	56.6	7.2	Ded. RF	2	100	
MW-34-80	Floodplain	461.20	73 - 83	4 in PVC	84.3	8.4	Temp. pump	3	150	
MW-34-100	Floodplain	460.97	89.5 - 99.5	2 in PVC	117.0	8.9	Ded. RF	2	55	
MW-35-60	Route 66	484.33	41 - 61	2 in PVC	56.8	28.3	Temp. pump	2	18	
MW-35-135	Route 66	484.24	116 - 136	2 in PVC	158.7	28.2	Temp. pump	3	66	
MW-36-20	Floodplain	469.33	10 - 20	1 in PVC	22.7	14.0	Peristaltic	0.5	4	
MW-36-40	Floodplain	469.59	30 - 40	1 in PVC	42.8	15.2	Peristaltic	0.5	4	
MW-36-50	Floodplain	469.62	46 - 51	1 in PVC	53.3	15.4	Peristaltic	0.75	5	
MW-36-70	Floodplain	469.27	60 - 70	1 in PVC	72.5	14.9	Peristaltic	0.5	7	
MW-36-90	Floodplain	469.64	80 - 90	1 in PVC	92.5	14.6	Peristaltic	0.4	10	
MW-36-100	Floodplain	469.65	88 - 98	2 in PVC	110.2	14.4	Ded. RF	2	45	
MW-37D	Bat Cave Wash	486.19	180 - 200	2 in PVC	226.7	31.0	Temp. pump	3	100	
MW-37S	Bat Cave Wash	485.97	64 - 84	2 in PVC	87.0	30.6	Temp. pump	2	30	
MW-38D	Bat Cave Wash	525.31	163 - 183	2 in PVC	190.9	70.0	Temp. pump	3	60	
MW-38S	Bat Cave Wash	525.51	75 - 95	2 in PVC	98.1	70.0	Temp. pump	1	13	
MW-39-40	Floodplain	468.02	30 - 40	1 in PVC	42.1	13.8	Peristaltic	0.5	3.5	
MW-39-50	Floodplain	467.93	47 - 52	1 in PVC	54.6	13.9	Peristaltic	0.5	5	
MW-39-60	Floodplain	468.00	49 - 59	1 in PVC	66.3	13.7	Peristaltic	0.5	6	
MW-39-70	Floodplain	468.02	60 - 70	1 in PVC	71.7	14.2	Peristaltic	0.5	7	
MW-39-80	Floodplain	467.92	70 - 80	1 in PVC	82.6	14.4	Peristaltic	0.5	9	
MW-39-100	Floodplain	468.12	80 - 100	2 in PVC	117.7	14.4	Ded. RF	2	45	
MW-40D	I-40 Median	566.08	240 - 260	2 in PVC	266.0	110.6	Temp. pump	3	75	
MW-40S	I-40 Median	566.04	115 - 135	2 in PVC	134.0	109.9	Temp. pump	2	13	
MW-41D	Bat Cave Wash	479.42	271 - 291	2 in PVC	313.0	23.9	Temp. pump	5	145	
MW-41M	Bat Cave Wash	479.84	170 - 190	2 in PVC	192.4	24.0	Temp. pump	3	85	

TABLE 3-1

Well Construction and Sampling Summary, January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft MSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Remarks
GMP Monitoring Wells										
MW-41S	Bat Cave Wash	480.07	40 - 60	2 in PVC	61.6	24.0	Temp. pump	2	42	
MW-42-30	Floodplain	463.74	9.8 - 29.8	2 in PVC	32.0	9.1	Temp. pump	2	28	
MW-42-55	Floodplain	463.85	42.5 - 52.5	2 in PVC	56.0	10.8	Temp. pump	3	21	
MW-42-65	Floodplain	463.37	56.2 - 66.2	2 in PVC	80.0	10.5	Temp. pump	3	36	
MW-43-25	Floodplain	462.54	15 - 25	2 in PVC	27.0	8.1	Temp. pump	1	9	
MW-43-75	Floodplain	462.71	65 - 75	2 in PVC	77.0	8.6	Ded. RF	2	28	
MW-43-90	Floodplain	462.76	80 - 90	2 in PVC	102.0	8.9	Temp. pump	2	47	
MW-44-70	Floodplain	471.90	61 - 71	2 in PVC	70.0	17.7	Temp. pump	1.5	38	
MW-44-115	Floodplain	472.01	103 - 113	2 in PVC	113.5	19.3	Ded. RF	3	60	
MW-44-125	Floodplain	472.04	116 - 125	2 in PVC	128.8	19.3	Ded. RF	0.35	57	
MW-46-175	Floodplain	482.16	165 - 175	2 in PVC	181.8	29.7	Ded. RF	1.5	100	
MW-46-205	Floodplain	482.23	196.5 - 206.5	2 in PVC	224.7	29.7	Temp. pump	2	90	
MW-47-55	Floodplain	484.04	45 - 55	2 in PVC	55.0	29.9	Temp. pump	2	30	
MW-47-115	Floodplain	484.17	105 - 115	2 in PVC	115.0	30.2	Temp. pump	1.5	55	
MW-48	East of Station	486.22	124 - 134	2 in PVC	138.0	31.5	Temp. pump	0.5	22	low recharge well; typically purges dry at 1 casing volume
MW-49-135	Floodplain	484.02	125 - 135	1.5 in PVC	136.6	28.5	Temp. pump	0.6	30	
MW-49-275	Floodplain	483.95	255 - 275	2 in PVC	274.7	29.7	Temp. pump	3	126	
MW-49-365	Floodplain	484.01	345 - 365	2 in PVC	367.4	31.5	Temp. pump	2	180	
MW-50-095	Route 66	496.49	85 - 95	2 in PVC	96.4	42.4	Temp. pump	2	36	
MW-50-200	Route 66	496.35	190 - 200	2 in PVC	204.5	42.9	Temp. pump	5	85	
MW-51	Route 66	501.56	97 - 112	4 in PVC	113.3	46.3	Temp. pump	4	180	
MW-52D	Floodplain	462.16	85 - 87	0.75 in MLABS	89.5	14.9	Peristaltic	0.2	4.5	
MW-52M	Floodplain	462.16	66 - 68	0.75 in MLABS	70.5	11.3	Peristaltic	0.2	4.5	
MW-52S	Floodplain	462.16	47 - 49	0.75 in MLABS	51.5	9.8	Peristaltic	0.2	4.5	
MW-53D	Floodplain	461.32	123.5 - 125	0.75 in MLABS	---	14.3	Peristaltic	0.2	5.1	
MW-53M	Floodplain	461.32	98.5 - 100	0.75 in MLABS	---	13.7	Peristaltic	0.06	5.4	
MW-54-85	Arizona	466.10	77 - 87	2 in PVC	93.2	12.5	---	NA	NA	
MW-54-140	Arizona	465.98	128 - 138	2 in PVC	137.8	12.5	---	NA	NA	
MW-54-195	Arizona	466.32	185 - 195	2 in PVC	195.0	12.9	---	NA	NA	
MW-55-45	Arizona	463.41	37 - 47	2 in PVC	51.8	7.6	---	NA	NA	
MW-55-120	Arizona	463.21	108 - 118	2 in PVC	117.6	7.4	---	NA	NA	
MW-56D	Arizona	461.36	103.5 - 105.5	0.75 in MLABS	---	16.3	---	NA	NA	

TABLE 3-1

Well Construction and Sampling Summary, January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft MSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Remarks
GMP Monitoring Wells										
MW-56M	Arizona	461.36	73.5 - 75.5	0.75 in MLABS	---	15.2	---	NA	NA	
MW-56S	Arizona	461.36	33.5 - 35.5	0.75 in MLABS	---	14.1	---	NA	NA	
MW-57-050	East Ravine	508.76	40 - 50	2 in Sch 40 PVC	50.0	---	Temp. pump	NA	NA	Dry
MW-57-070	East Ravine	509.37	55 - 70	2 in Sch 40 PVC	70.0	53.6	Temp. pump	0.3	10	
MW-57-185	East Ravine	508.97	70 - 184	3 in Sch 40 PVC	184.7	53.2	Temp. pump	3	270	
MW-58-065	East Ravine	523.26	54 - 64	2 in Sch 40 PVC	66.0	66.2	Temp. pump	NA	NA	Damaged
MW-58-115	East Ravine	524.44	95 - 115	---	115.0	68.3	Flute	NA	NA	Damaged
MW-58-205	East Ravine	524.42	160 - 206	---	206.0	67.7	Flute	NA	NA	Damaged
MW-59-100	East Ravine	541.61	86 - 101	2 in Sch 40 PVC	101.0	86.0	Temp. pump	0.5	8	
MW-60-125	East Ravine	555.47	103 - 123	2 in Sch 40 PVC	122.5	99.8	Temp. pump	0.3	13	
MW-61-110	East Ravine	544.03	92 - 112	2 in Sch 40 PVC	112.5	88.5	Temp. pump	0.4	14	
MW-62-065	East Ravine	503.56	44.5 - 64.5	2 in Sch 40 PVC	67.4	48.9	Temp. pump	0.3	9	
MW-62-110	East Ravine	504.05	85 - 110	---	110.0	49.3	Flute	NA	2	
MW-62-190	East Ravine	504.05	155 - 192	---	190.0	49.6	Flute	NA	2	
MW-63-065	East Ravine	504.47	46 - 66	2 in Sch 40 PVC	65.6	50.8	Temp. pump	0.5	10	
MW-64-150	East Ravine	575.90	120 - 150	---	150.0	121.1	Flute	NA	1	
MW-64-205	East Ravine	575.92	175 - 205	---	205.0	121.1	Flute	NA	1	
MW-64-260	East Ravine	575.90	230 - 260	---	260.0	118.5	Flute	NA	1	
OW-3D	West Mesa	558.63	242 - 262	2 in PVC	274.0	103.2	Temp. pump	3	90	
OW-3M	West Mesa	558.90	180 - 200	2 in PVC	202.0	103.1	Temp. pump	3	54	
OW-3S	West Mesa	558.58	86 - 116	2 in PVC	118.0	101.6	Temp. pump	2	30	
Other Site Wells not in GMP										
MW-1	New Ponds	661.76	201 - 211	4 in PVC	217.0	205.2	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-3	New Ponds	650.51	193 - 203	4 in PVC	205.0	194.6	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-4	New Ponds	625.73	164.5 - 174.5	4 in PVC	176.3	169.1	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-5	New Ponds	635.69	175.9 - 184.9	4 in PVC	186.2	178.8	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-6	New Ponds	642.84	184.5 - 193.5	4 in PVC	194.9	185.7	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-7	New Ponds	631.91	172.7 - 182.7	4 in PVC	185.0	175.5	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-8	New Ponds	627.54	169 - 178	4 in PVC	179.9	170.4	Ded. RF	NA	NA	active PG&E pond monitoring well
MW-45-095a	Floodplain	470.03	83 - 93	2 in PVC	97.0	16.6	Temp. pump	1	40	pressure transducer location
MW-45-095b	Floodplain	469.51	83 - 93	1 in PVC	97.0	17.9	Temp. pump	NA	9	groundwater sampling location
MWP-8	Old Ponds	677.48	181 - 211	3 in PVC	213.0	189.5	---	NA	NA	inactive monitoring well

TABLE 3-1

Well Construction and Sampling Summary, January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft MSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Remarks
Other Site Wells not in GMP										
MWP-10	Old Ponds	675.81	194 - 234	3 in PVC	237.0	208.6	---	NA	NA	inactive monitoring well
MWP-12	Old Ponds	663.49	96 - 136	3 in PVC	143.0	107.8	---	NA	NA	inactive monitoring well
P-2	New Ponds	537.60	238.5 - 248.5	4 in PVC	251.0	169.6	---	NA	NA	inactive monitoring well
PGE-9N	East of River	462.21	25 - 95	12 in Steel	---	---	---	NA	NA	
PGE-9S	East of River	461.99	30 - 100	12 in Steel	---	---	---	NA	NA	
Test and Extraction Wells										
IW-2	East Mesa	550.11	170 - 330	6 in Steel	343.0	95.8	---	NA	NA	IM3 injection well
IW-3	East Mesa	554.44	160 - 320	6 in Steel	333.0	100.1	---	NA	NA	IM3 injection well
PE-1	Floodplain	457.52	79 - 89	6 in Steel	97.0	16.4	CD pump	3	400	active IM extraction well
TW-1	Plan B Test	620.55	169 - 269	5 in PVC	240.2	164.4	CD pump	20	200	inactive pilot test well
TW-2D	MW-20 bench	493.29	113 - 148	6 in PVC	150.0	69.3	CD pump	70.1	160	inactive IM extraction well
TW-2S	MW-20 bench	499.05	42.5 - 92.5	6 in PVC	102.1	34.0	CD pump	6	75	inactive IM extraction well
TW-3D	MW-20 bench	498.09	111 - 156	8 in PVC	157.0	46.5	CD pump	NA	NA	active IM extraction well
TW-4	Floodplain	484.11	210 - 250	4 in PVC	255.0	30.5	Temp. pump	NA	NA	
TW-5	Route 66	496.30	110 - 150	4 in PVC	152.5	40.9	Temp. pump	3	150	
Water Supply Wells										
PGE-7BR	MW-24 Bench	---	249 - 300	7 in	300.0	109.7	---	NA	NA	
PGE-8	Station	596.01	405 - 554	6.75 in Steel	564.0	139.0	CD pump	20	1900	inactive injection
Park Moabi-3	Park Moabi	518.55	80 - 200	8 in Steel	252.0	61.3	active supply well	NA	NA	call Park Ranger to schedule sampling
Park Moabi-4	Park Moabi	---	93 - 140	Steel	---	---	---	NA	NA	

Notes:

bgs	below ground surface
MSL	mean sea level
btoc	below top of casing
NA	not known or available
CD pump	dedicated constant-discharge electric submersible pump
Redi-Flo AR	adjustable-rate electric submersible pump
Temp. pump	temporary pump
PVC	polyvinyl chloride
Ded. RF	dedicated Redi - Flo submersible pump
GMP	Groundwater Monitoring Program
Flute	Flexible Liner Underground Technologies

Depth to water shown is the most recently measured depth to water.

All GMP wells except low recharge wells, active IM extraction wells, and Park Moabi wells are purged and sampled using well-volume method.

TABLE 3-2
Title 22 Metals Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

		California MCL:	6	10	1,000	4	5	NE	50	1,000*	15	2	NE	100	50	100*	2	NE	5,000*
Well ID		**Sample Date**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Cobalt**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Molybdenum**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Vanadium**	**Zinc**
MW-9		06/09/2009	ND (10)	---	55.0	ND (3.0)	ND (3.0)	ND (3.0)	---	---	ND (10)	ND (0.2)	6.70	ND (5.0)	---	ND (3.0)	---	11.0	ND (41)
	FD	06/09/2009	ND (10)	---	55.0	ND (3.0)	ND (3.0)	ND (3.0)	---	---	ND (10)	ND (0.2)	7.10	ND (5.0)	---	ND (3.0)	---	11.0	ND (14)
MW-10		09/22/2009	ND (10)	---	42.0	ND (1.0)	ND (3.0)	ND (3.0)	**348**	5.20	ND (10)	ND (0.2)	59.0	ND (5.0)	---	ND (3.0)	---	26.0	17.0
MW-12		09/24/2009	ND (10)	---	63.0	ND (1.0)	ND (3.0)	ND (3.0)	**2,780**	ND (5.0)	ND (10)	ND (0.2)	17.0	ND (5.0)	---	ND (3.0)	---	11.0	ND (10)
	FD	09/24/2009	ND (10)	---	63.0	ND (1.0)	ND (3.0)	ND (3.0)	**2,910**	ND (5.0)	ND (10)	ND (0.2)	15.0	ND (5.0)	---	ND (3.0)	---	12.0	ND (10)
		12/11/2009	ND (10)	**26.0**	59.0	ND (1.0)	ND (3.0)	ND (3.0)	**2,660**	ND (5.0)	ND (10)	ND (0.2)	15.0	ND (5.0)	ND (10)	ND (3.0)	ND (15)	12.0	ND (10)
MW-22		09/29/2009	ND (10)	---	67.0	ND (1.0)	ND (3.0)	ND (3.0)	ND (1.0)	ND (5.0)	ND (10)	ND (0.2)	33.0	5.40	---	ND (3.0)	---	ND (3.0)	17.0
		12/10/2009	ND (10)	---	77.0	ND (1.0)	ND (3.0)	ND (3.0)	ND (1.0)	ND (5.0)	ND (10)	ND (0.2)	8.50	6.30	ND (10)	ND (3.0)	ND (15) J	ND (3.0)	20.0
TW-1		09/22/2009	ND (10)	---	29.0	ND (1.0)	ND (3.0)	ND (3.0)	**4,130**	25.0	ND (10)	ND (0.2)	15.0	ND (5.0)	---	ND (3.0)	---	ND (3.0)	56.0

Notes:

ND not detected at listed reporting limit
FD field duplicate sample
NE not established
* Secondary USEPA MCL

Title 22 metals are the metals listed in California Code of Regulations, Title 22, Section 66261.24(a)(2)(A).

The maximum contaminant levels (MCLs) listed, in micrograms per liter (µg/L), are the California primary drinking water standards, except where noted.

All results are dissolved metals concentrations in µg/L from field-filtered samples.

Metals analyzed by Methods SW6010B or SW6020A or SW7470A.

Analytes detected above MCL are in bold.

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells						
MW-9	89	536.56	06/09/09 12:53 PM	79.29	0.20	457.24
			09/24/09 11:22 AM	80.04	0.20	456.49
			09/28/09 08:52 AM	80.15	0.20	456.38
MW-10	97	530.65	03/12/09 07:34 AM	75.01	0.20	455.58
			06/09/09 04:35 PM	73.54	0.20	457.05
			09/22/09 02:34 PM	74.28	0.20	456.31
			09/28/09 08:46 AM	74.58	0.20	456.01
MW-11	86	522.61	09/28/09 08:29 AM	66.35	0.16	456.20
MW-12	50	484.01	03/12/09 12:11 PM	28.07	0.35	455.91
			05/05/09 02:44 PM	27.55	0.40	456.44
			06/10/09 10:28 AM	27.75	0.40	456.24
			09/24/09 01:07 PM	28.34	0.40	455.65
			09/28/09 09:13 AM	28.42	0.40	455.58
			12/11/09 08:07 AM	29.23	0.40	454.76
MW-13	52	488.64	09/21/09 02:36 PM	32.62	0.12	455.96
			09/28/09 08:29 AM	32.50	0.12	456.08
MW-14	134	570.99	09/21/09 03:12 PM	114.50	0.10	456.43
			09/28/09 08:43 AM	114.50	0.10	456.43
MW-15	203	641.52	09/28/09 08:57 AM	184.60	0.10	456.86
			09/30/09 01:35 PM	184.64	0.10	456.82
MW-16	218	657.31	05/06/09 11:25 AM	199.96	0.10	457.29
			09/28/09 09:03 AM	199.88	0.10	457.36
			09/28/09 01:00 PM	199.78	0.10	457.46
MW-17	154	589.96	05/06/09 09:00 AM	132.33	0.11	457.55
			09/28/09 09:07 AM	132.62	0.11	457.26
			09/30/09 12:24 PM	132.79	0.11	457.09
MW-18	107	545.32	03/11/09 04:17 PM	88.72	0.08	456.54
			09/22/09 04:35 PM	88.32	0.08	456.94
			09/28/09 08:51 AM	88.37	0.08	456.89
MW-19	66	499.92	09/22/09 09:48 AM	44.49	0.15	455.37
			09/28/09 09:03 AM	44.60	0.15	455.26
MW-20-70	70	500.15	03/12/09 02:19 PM	46.06	0.20	454.03
			09/25/09 08:03 AM	45.93	0.21	454.16
MW-20-100	101	500.58	03/13/09 06:56 AM	46.65	0.24	453.81
			09/25/09 08:32 AM	46.78	0.24	453.67
MW-20-130	132	500.66	03/13/09 09:13 AM	47.34	0.85	453.51
			09/25/09 09:22 AM	46.37	0.85	454.45
MW-21	58	505.55	03/10/09 08:20 AM	31.50	0.90	474.12
			05/05/09 03:56 PM	49.25	0.90	456.32
			08/03/09 11:14 AM	49.61	0.90	455.96

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time		Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells							
MW-21	58	505.55	08/04/09	07:55 AM	53.45	0.90	452.11
			09/22/09	04:06 PM	50.10	0.90	455.47
			12/08/09	01:17 PM	50.81	0.90	454.76
MW-22	12	460.72	03/12/09	02:00 PM	5.64	2.25	455.18
			04/29/09	02:49 PM	4.24	2.00	456.58
			09/29/09	03:13 PM	5.78	2.00	455.01
			12/10/09	08:45 AM	6.78	2.00	454.00
MW-23	81	507.33	03/11/09	02:27 PM	52.25	1.22	455.22
MW-24A	127	567.16	09/28/09	08:22 AM	110.90	0.68	456.27
MW-24BR	441	563.95	03/10/09	01:51 PM	108.15	1.03	456.62
			05/06/09	08:35 AM	106.78	1.03	457.99
			09/28/09	03:39 PM	107.45	1.03	457.30
			12/08/09	02:06 PM	108.02	1.03	456.73
MW-25	107	542.90	09/21/09	01:27 PM	87.18	0.09	455.65
MW-26	70	502.22	03/10/09	09:15 AM	47.42	0.23	454.75
			09/22/09	12:30 PM	46.88	0.26	455.28
MW-27-20	14	460.56	10/01/09	08:37 AM	5.44	0.07	455.11
MW-27-60	59	461.38	10/01/09	11:12 AM	6.63	0.28	454.77
			12/08/09	08:56 AM	8.15	0.28	453.21
			12/08/09	08:36 AM	8.15	0.28	453.21
MW-27-85	80	460.99	03/11/09	04:09 PM	6.47	0.97	454.94
			04/30/09	08:56 AM	4.51	1.10	456.97
			10/01/09	09:35 AM	6.44	1.10	455.00
			12/08/09	10:03 AM	8.13	1.10	453.31
MW-28-25	21	466.77	09/24/09	03:00 PM	11.92	0.08	454.83
MW-28-90	98	467.53	03/11/09	02:30 PM	12.97	0.48	454.70
			04/30/09	03:27 PM	11.72	0.50	455.97
			09/24/09	03:38 PM	13.12	0.50	454.55
			12/09/09	08:29 AM	14.34	0.50	453.30
MW-29	42	485.21	03/12/09	09:29 AM	29.51	0.18	455.68
			09/24/09	01:29 PM	29.68	0.18	455.51
MW-30-30	27	468.12	08/04/09	04:00 PM	13.45	2.50	454.86
			08/04/09	03:00 PM	13.45	2.50	454.86
			09/24/09	08:41 AM	13.19	2.50	455.13
MW-30-50	53	468.81	09/24/09	07:27 AM	13.43	0.50	455.41
MW-31-60	64	496.81	09/21/09	03:07 PM	41.90	0.20	454.85
MW-31-135	135	498.11	09/21/09	01:56 PM	44.08	0.72	454.16
MW-32-20	20	461.51	03/10/09	07:27 AM	6.41	3.00	455.34
			09/22/09	03:35 PM	5.36	3.00	456.41
MW-32-35	37	461.63	09/22/09	02:38 PM	6.99	1.40	454.83

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells						
MW-33-40	42	487.38	03/12/09 01:23 PM	32.06	0.50	455.32
			05/05/09 12:01 PM	30.85	0.49	456.53
			09/24/09 10:05 AM	31.94	0.49	455.44
			12/09/09 12:42 PM	33.82	0.49	453.56
MW-33-90	88	487.55	03/13/09 07:03 AM	31.89	0.62	455.73
			05/05/09 03:44 PM	30.98	0.70	456.64
			09/29/09 10:49 AM	32.33	0.70	455.30
			12/09/09 03:26 PM	34.12	0.70	453.50
MW-33-150	155	487.77	03/12/09 02:15 PM	33.12	1.15	455.24
			05/05/09 01:30 PM	31.40	1.15	456.97
			09/29/09 08:22 AM	32.62	1.15	455.69
			12/09/09 01:40 PM	34.53	1.15	453.83
MW-33-210	223	487.25	03/12/09 03:05 PM	33.30	1.20	454.84
			05/05/09 02:23 PM	31.27	1.20	456.88
			09/29/09 10:40 AM	32.62	1.20	455.52
			12/09/09 02:23 PM	34.01	1.20	454.13
MW-34-55	57	460.95	09/30/09 09:57 AM	5.71	0.08	455.16
			11/17/09 01:45 PM	7.17	0.08	453.68
MW-34-80	84	461.20	01/07/09 12:57 PM	8.49	0.50	452.85
			02/03/09 10:18 AM	6.69	0.50	454.67
			03/10/09 08:19 AM	5.41	0.50	455.95
			04/06/09 03:39 PM	4.94	0.50	456.43
			04/30/09 11:06 AM	4.74	0.50	456.63
			06/09/09 09:14 AM	5.48	0.50	455.81
			07/07/09 01:08 PM	6.16	0.50	455.13
			08/04/09 12:10 PM	6.40	0.50	454.89
			09/30/09 09:11 AM	5.83	0.50	455.52
			10/13/09 03:59 PM	8.35	0.50	452.99
			11/02/09 11:33 AM	6.90	0.50	454.39
			12/09/09 09:42 AM	7.85	0.50	453.44
MW-34-100	117	460.96	01/07/09 12:10 PM	8.89	1.25	452.85
			02/03/09 11:32 AM	7.35	1.25	454.42
			03/10/09 09:35 AM	6.26	1.25	455.53
			04/06/09 04:42 PM	5.51	1.25	456.29
			04/30/09 10:15 AM	5.12	1.25	456.69
			06/09/09 08:30 AM	5.85	1.25	455.95
			07/07/09 02:42 PM	6.88	1.25	454.78
			08/04/09 02:32 PM	7.30	1.25	454.36
			09/30/09 12:57 PM	7.03	1.25	454.73
			10/14/09 11:24 AM	8.11	1.25	453.64

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells						
MW-34-100	117	460.96	11/02/09 12:29 PM	7.43	1.25	454.32
			11/17/09 10:20 AM	7.91	1.25	453.75
			12/09/09 10:49 AM	8.26	1.25	453.49
MW-35-60	57	484.33	03/11/09 03:29 PM	28.50	0.45	455.82
			09/24/09 08:57 AM	28.29	0.45	456.02
MW-35-135	159	484.24	09/24/09 08:24 AM	28.21	0.64	456.14
MW-36-20	23	469.33	09/23/09 09:32 AM	14.01	1.37	455.38
MW-36-40	43	469.59	09/30/09 02:25 PM	15.22	0.60	454.43
MW-36-50	53	469.62	09/30/09 03:13 PM	15.36	0.24	454.24
MW-36-70	72	469.27	09/22/09 02:25 PM	14.92	0.10	454.24
MW-36-90	92	469.64	03/12/09 02:49 PM	15.69	0.20	453.89
			09/23/09 11:47 AM	14.65	0.12	454.87
MW-36-100	110	469.65	03/12/09 07:15 AM	14.69	0.80	455.28
			09/23/09 12:55 PM	14.40	0.80	455.57
MW-37D	227	486.19	03/12/09 10:42 AM	31.15	1.02	455.58
			09/23/09 12:07 PM	31.02	1.05	455.76
MW-37S	87	485.97	09/23/09 11:28 AM	30.65	0.32	455.21
MW-38S	98	525.51	09/28/09 08:41 AM	70.00	0.23	455.44
MW-39-40	42	468.02	10/01/09 11:29 AM	13.75	0.85	454.37
MW-39-50	55	467.93	10/01/09 01:28 PM	13.93	0.20	453.94
MW-39-60	66	468.00	10/01/09 08:36 AM	13.74	0.24	454.21
MW-39-70	72	468.02	10/01/09 09:56 AM	14.20	0.40	453.83
MW-39-80	83	467.92	03/11/09 11:04 AM	13.79	0.80	454.32
			10/01/09 02:21 PM	14.38	0.80	453.73
MW-39-100	118	468.12	03/13/09 09:33 AM	13.72	1.30	455.07
			09/29/09 03:38 PM	14.36	1.40	454.50
MW-40D	266	566.08	03/11/09 10:49 AM	111.02	1.11	455.53
			09/28/09 11:32 AM	110.60	1.11	455.95
MW-40S	134	566.04	09/28/09 09:24 AM	109.86	0.13	456.09
			09/28/09 10:43 AM	109.89	0.13	456.06
MW-41D	313	479.42	03/11/09 12:23 PM	24.20	1.38	456.75
			09/23/09 08:15 AM	23.94	1.38	457.01
MW-41M	192	479.83	09/23/09 09:19 AM	23.99	1.03	456.37
MW-41S	62	480.07	03/11/09 01:20 PM	23.98	0.32	456.03
			09/23/09 10:22 AM	24.10	0.32	455.91
			09/28/09 08:35 AM	24.00	0.32	456.01
MW-42-30	32	463.74	09/23/09 02:49 PM	9.05	1.35	454.85
MW-42-55	56	463.85	03/09/09 02:12 PM	9.31	0.90	454.70
			04/30/09 12:56 PM	7.72	0.90	456.30

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells						
MW-42-55	56	463.85	09/23/09 04:42 PM	9.12	0.90	454.89
			12/08/09 11:42 AM	10.83	0.90	453.18
MW-42-65	80	463.37	03/09/09 03:04 PM	8.96	1.05	454.77
			04/30/09 01:33 PM	7.28	1.05	456.46
			09/23/09 01:57 PM	8.52	1.05	455.22
			12/08/09 12:45 PM	10.52	1.05	453.16
MW-43-25	27	462.54	10/01/09 01:26 PM	8.15	0.08	454.36
MW-43-75	77	462.71	10/01/09 02:02 PM	8.61	0.90	454.37
MW-43-90	102	462.76	10/01/09 02:48 PM	8.91	1.22	454.48
MW-44-70	70	471.90	03/10/09 11:17 AM	16.75	0.30	455.15
			03/12/09 08:12 AM	16.03	0.30	455.87
			05/01/09 08:14 AM	14.90	0.22	456.97
			09/21/09 01:26 PM	17.41	0.22	454.46
			12/07/09 12:35 PM	17.73	0.22	454.13
MW-44-115	114	472.01	01/07/09 12:02 PM	19.79	0.85	452.56
			02/02/09 01:56 PM	18.41	0.85	453.96
			03/10/09 02:08 PM	18.03	0.85	454.35
			04/06/09 01:22 PM	16.43	0.83	455.95
			05/01/09 11:02 AM	16.04	0.83	456.35
			06/08/09 01:53 PM	17.29	0.83	455.02
			07/06/09 02:09 PM	17.74	0.83	454.57
			08/03/09 01:54 PM	18.23	0.83	454.07
			09/21/09 02:54 PM	18.30	0.83	454.07
			10/14/09 10:37 AM	18.77	0.83	453.59
			11/03/09 08:32 AM	18.01	0.83	454.30
			12/07/09 01:46 PM	18.64	0.83	453.67
MW-44-125	129	472.04	01/07/09 08:50 AM	19.26	0.85	453.20
			02/02/09 11:41 AM	18.14	0.85	454.32
			03/10/09 11:57 AM	17.55	0.85	454.92
			04/06/09 11:04 AM	15.93	0.85	456.55
			05/01/09 08:51 AM	15.68	0.85	456.81
			06/08/09 11:55 AM	16.69	0.85	455.69
			07/06/09 11:39 AM	17.19	0.85	455.19
			08/03/09 12:25 PM	17.83	0.85	454.55
			09/23/09 09:30 AM	16.87	0.85	455.61
			10/14/09 08:18 AM	18.41	0.85	454.06
			11/03/09 09:06 AM	17.79	0.85	454.60
			12/07/09 02:37 PM	18.44	0.85	453.95
MW-45-095a	97	470.03	09/29/09 12:44 PM	16.61	0.39	453.48
MW-46-175	182	482.16	01/07/09 02:35 PM	29.99	1.10	453.02

TABLE 3-3
Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time		Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells							
MW-46-175	182	482.16	02/03/09	08:54 AM	28.27	1.10	454.76
			03/12/09	10:23 AM	27.45	1.10	455.58
			04/06/09	02:13 PM	26.61	1.10	456.44
			05/05/09	08:46 AM	26.30	1.10	456.75
			06/08/09	03:14 PM	27.45	1.10	455.45
			07/07/09	10:29 AM	27.39	1.10	455.51
			08/04/09	08:42 AM	27.50	1.10	455.40
			09/25/09	08:18 AM	27.46	1.10	455.59
			10/14/09	12:48 PM	29.08	1.10	453.82
			11/02/09	01:45 PM	28.66	1.10	454.39
			12/08/09	02:04 PM	29.58	1.10	453.32
MW-46-205	225	482.23	03/12/09	11:18 AM	28.05	1.30	455.36
			05/05/09	10:01 AM	26.72	1.30	456.70
			09/25/09	10:05 AM	28.82	1.30	454.59
			12/08/09	03:22 PM	29.72	1.30	453.69
MW-47-55	55	484.04	03/12/09	08:35 AM	27.94	0.25	456.05
			05/06/09	02:50 PM	27.15	0.28	456.85
			09/24/09	09:20 AM	28.18	0.28	455.82
			12/09/09	04:36 PM	29.93	0.28	454.07
MW-47-115	115	484.17	03/11/09	09:18 AM	28.53	0.90	455.90
			05/06/09	03:47 PM	27.65	0.92	456.78
			07/07/09	07:38 AM	28.50	0.92	455.90
			08/04/09	10:27 AM	28.65	0.92	455.75
			09/24/09	08:18 AM	28.57	0.92	455.87
			12/09/09	05:38 PM	30.18	0.92	454.21
MW-48	138	486.22	05/05/09	01:13 PM	30.16	1.25	456.58
			09/22/09	07:55 AM	30.80	1.25	455.86
			12/07/09	02:53 PM	31.54	1.25	455.12
			12/07/09	03:09 PM	31.54	1.25	455.12
MW-49-135	137	484.02	03/11/09	07:20 AM	28.00	0.83	456.37
			09/22/09	09:08 AM	28.46	0.95	455.99
MW-49-275	275	483.95	03/11/09	09:30 AM	29.51	1.52	456.16
			09/22/09	10:25 AM	29.74	1.52	455.94
MW-49-365	367	484.01	03/11/09	11:28 AM	31.39	2.50	457.23
			09/22/09	12:13 PM	31.50	2.50	457.13
MW-50-095	96	496.49	03/12/09	09:41 AM	41.02	0.31	455.38
			05/06/09	02:00 PM	40.03	0.34	456.38
			09/24/09	09:58 AM	41.02	0.34	455.37
			12/10/09	10:32 AM	42.39	0.34	454.00
MW-50-200	205	496.35	03/13/09	07:59 AM	41.68	1.30	455.45

TABLE 3-3

Manual Water Level Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Well Depth (feet BMP)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet AMSL)
Monitoring Wells						
MW-50-200	205	496.35	05/06/09 02:53 PM	40.83	1.30	456.31
			09/25/09 07:56 AM	41.68	1.30	455.45
			12/11/09 09:01 AM	42.91	1.30	454.22
MW-51	113	501.56	03/12/09 12:58 PM	46.66	0.70	454.96
			09/24/09 02:00 PM	46.27	0.75	455.34
MW-52D	90	462.16	04/29/09 08:14 AM	14.90	1.41	447.85
MW-54-85	93	466.10	03/09/09 10:58 AM	11.35	0.60	454.81
			05/05/09 08:26 AM	8.80	0.70	457.43
			09/22/09 10:45 AM	10.50	0.70	455.74
			12/08/09 08:40 AM	12.51	0.70	453.73
MW-54-140	138	465.98	03/09/09 10:49 AM	10.44	0.70	455.75
			05/05/09 09:11 AM	8.93	0.85	457.41
			09/22/09 09:52 AM	10.49	0.85	455.87
			12/08/09 09:29 AM	12.51	0.85	453.84
MW-54-195	195	466.32	03/09/09 10:53 AM	10.42	1.00	456.58
			05/05/09 10:09 AM	9.93	1.32	457.53
			09/22/09 08:47 AM	11.28	1.32	456.20
			12/08/09 10:25 AM	12.94	1.32	454.53
MW-55-45	52	463.41	03/09/09 10:42 AM	6.79	0.10	456.50
			05/04/09 12:18 PM	6.00	0.10	457.29
			09/22/09 12:50 PM	7.33	0.10	455.95
			12/07/09 12:29 PM	7.60	0.10	455.68
MW-55-120	118	463.21	03/09/09 11:30 AM	6.70	0.31	456.32
			05/04/09 11:24 AM	5.74	0.61	457.53
			09/22/09 01:22 PM	7.19	0.61	456.06
			12/07/09 01:06 PM	7.45	0.61	455.80
OW-3S	118	558.58	09/28/09 08:57 AM	101.61	0.08	456.91
TW-1	240	620.55	09/22/09 10:46 AM	164.38	0.43	456.09
TW-4	255	484.11	03/10/09 10:40 AM	29.55	1.27	455.60
			05/06/09 10:45 AM	28.32	1.27	456.84
			09/23/09 02:30 PM	29.27	1.27	455.88
			12/09/09 12:47 PM	30.47	1.27	454.68
TW-5	153	496.30	09/23/09 11:38 AM	40.87	0.95	455.67

Notes:

AMSL above mean sea level
BMP below well measure point
(---) data not collected or available.
T Results from transducers presented to fill water level data gaps

Well depths rounded off to whole foot.

Salinity used to adjust water level to freshwater equivalent. Salinity values have been averaged in accordance with the Performance Monitoring Program.

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-9	06/09/2009	3,206	29.70	7.16	32	4.85
MW-9	09/24/2009	3,175	29.30	7.55	60	3.94
MW-10	03/12/2009	3,581	28.79	7.58	145	3.86
MW-10	06/09/2009	3,074	28.90	7.34	33	4.03
MW-10	09/22/2009	3,196	29.02	7.73	16	5.19
MW-12	03/12/2009	6,879	28.27	8.27	67	5.24
MW-12	05/05/2009	6,270	28.13	8.12	1	6.95
MW-12	06/10/2009	6,544	28.30	8.03	35	6.70
MW-12	09/24/2009	6,652	28.07	8.26	19	5.59
MW-12	12/11/2009	6,836	27.81	8.30	146	5.39
MW-13	09/21/2009	1,980	28.20	7.53	50	6.83
MW-14	09/21/2009	1,509	28.85	7.71	38	7.75
MW-15	09/30/2009	1,746	30.93	7.81	46	7.98
MW-16	05/06/2009	1,143	30.38	7.99	6	9.00
MW-16	09/28/2009	1,110	30.25	7.90	57	9.47
MW-17	05/06/2009	1,779	35.40	7.79	-36	5.49
MW-17	09/30/2009	1,759	29.83	7.91	27	4.74
MW-18	03/11/2009	1,381	29.10	7.53	49	7.78
MW-18	09/22/2009	1,411	29.12	7.71	48	10.50
MW-19	09/22/2009	2,368	28.32	7.45	51	6.62
MW-20-70	03/12/2009	3,437	28.79	7.68	64	6.65
MW-20-70	09/25/2009	3,136	28.61	7.58	106	7.28
MW-20-100	03/13/2009	3,974	29.10	7.35	186	2.54
MW-20-100	09/25/2009	3,496	28.97	7.41	94	2.37
MW-20-130	03/13/2009	14,288	29.05	7.42	134	1.52
MW-20-130	09/25/2009	12,600	29.08	7.52	82	1.52
MW-21	03/11/2009	12,188	27.99	6.88	42	2.84
MW-21	05/06/2009	11,323	28.96	6.81	-27	2.03
MW-21	08/04/2009	9,061	30.38	7.53	76	4.35
MW-21	09/23/2009	12,829	28.28	7.17	49	2.15
MW-21	12/09/2009	11,010	28.00	6.78	---	0.95
MW-22	03/12/2009	25,530	22.12	6.72	-98	0.17
MW-22	04/29/2009	29,730	23.41	6.87	-100	0.62
MW-22	09/29/2009	20,840	29.39	6.90	-61	0.52
MW-22	12/10/2009	34,210	22.25	6.78	-52	0.33
MW-23	03/12/2009	18,425	28.08	7.10	43	5.49

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-24BR	03/11/2009	15,479	30.14	8.07	-202	0.22
MW-24BR	05/07/2009	14,986	32.73	7.85	-165	0.22
MW-24BR	09/28/2009	15,090	35.34	8.06	-65	0.22
MW-24BR	12/08/2009	14,860	31.76	7.75	-179	0.11
MW-25	09/21/2009	1,271	29.19	7.29	86	6.48
MW-26	03/10/2009	4,330	29.68	7.59	64	8.07
MW-26	09/22/2009	3,937	29.47	7.45	44	6.77
MW-27-20	10/01/2009	1,035	20.83	7.60	-158	0.47
MW-27-60	10/01/2009	---	18.73	7.80	-103	0.36
MW-27-60	12/08/2009	1,814	18.64	8.24	-64	1.12
MW-27-85	03/11/2009	17,175	20.23	7.24	-105	0.46
MW-27-85	04/30/2009	16,180	20.19	6.69	-103	2.36
MW-27-85	10/01/2009	15,212	19.86	7.12	-32	0.37
MW-27-85	12/08/2009	15,070	20.12	6.99	-36	0.08
MW-28-25	09/24/2009	1,141	22.79	7.42	-115	0.22
MW-28-90	03/11/2009	8,109	19.55	7.60	-160	0.72
MW-28-90	04/30/2009	7,598	19.43	7.42	-181	0.71
MW-28-90	09/24/2009	7,561	19.18	7.47	-163	0.26
MW-28-90	12/09/2009	7,646	19.38	7.32	-112	0.10
MW-29	03/12/2009	3,265	25.18	7.20	-162	0.33
MW-29	09/24/2009	2,623	24.81	7.53	-175	0.57
MW-30-30	08/04/2009	11,899	24.40	7.62	-236	0.21
MW-30-30	09/24/2009	19,497	24.29	7.27	-131	0.33
MW-30-50	09/24/2009	1,591	22.08	7.96	-90	0.32
MW-31-60	09/21/2009	3,324	28.28	7.58	55	6.62
MW-31-135	09/21/2009	11,260	28.97	7.85	65	0.73
MW-32-20	03/10/2009	44,711	23.88	6.72	-170	0.86
MW-32-20	09/22/2009	53,277	28.56	6.77	-150	0.27
MW-32-35	09/22/2009	21,898	24.89	7.03	-189	0.26
MW-33-40	03/12/2009	6,393	29.05	8.05	-36	0.22
MW-33-40	05/05/2009	5,269	29.44	8.29	-72	0.30
MW-33-40	09/24/2009	6,598	28.19	8.07	-125	0.29
MW-33-40	12/09/2009	11,380	26.88	7.81	12	0.53
MW-33-90	03/13/2009	11,097	26.80	7.46	59	0.18
MW-33-90	05/05/2009	10,690	26.77	7.44	-87	0.16
MW-33-90	09/29/2009	10,548	26.54	7.55	62	0.20

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PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-33-90	12/09/2009	10,630	26.74	7.53	38	0.07
MW-33-150	03/12/2009	17,695	27.30	7.49	-39	0.10
MW-33-150	05/05/2009	17,110	27.11	7.55	-91	0.22
MW-33-150	09/29/2009	16,888	26.86	7.58	140	0.38
MW-33-150	12/09/2009	17,570	27.13	7.58	---	0.06
MW-33-210	03/12/2009	20,497	27.58	7.31	-18	0.07
MW-33-210	05/05/2009	19,990	27.60	7.31	-88	0.19
MW-33-210	09/29/2009	19,589	27.27	7.40	59	0.21
MW-33-210	12/09/2009	19,850	27.51	7.42	26	0.03
MW-34-55	09/30/2009	1,064	19.68	7.85	-122	0.30
MW-34-55	11/17/2009	1,077	18.10	7.53	-117	0.09
MW-34-80	01/07/2009	7,611	18.84	7.18	14	0.08
MW-34-80	02/03/2009	7,667	19.00	7.60	-31	0.38
MW-34-80	03/10/2009	8,824	19.01	7.31	-72	0.24
MW-34-80	04/06/2009	8,594	18.94	7.32	11	0.19
MW-34-80	04/30/2009	8,641	19.05	7.37	-178	0.83
MW-34-80	06/09/2009	8,170	20.70	7.16	5	0.25
MW-34-80	07/07/2009	7,601	21.72	7.33	-39	0.19
MW-34-80	08/04/2009	6,845	21.57	7.90	-295	0.15
MW-34-80	09/30/2009	8,226	20.30	7.43	-47	0.30
MW-34-80	10/13/2009	8,200	17.73	7.48	-4	0.24
MW-34-80	11/02/2009	8,091	17.70	8.08	-288	0.36
MW-34-80	12/09/2009	8,048	19.05	7.38	-57	0.05
MW-34-80	01/11/2010	8,020	19.00	7.22	-58	0.07
MW-34-100	01/07/2009	17,680	20.22	7.14	18	0.17
MW-34-100	02/03/2009	13,460	20.20	7.64	27	0.23
MW-34-100	03/10/2009	19,330	20.29	7.40	-1	0.15
MW-34-100	04/06/2009	18,560	20.28	7.36	25	0.15
MW-34-100	04/30/2009	18,510	20.41	7.51	-134	0.75
MW-34-100	06/09/2009	17,990	21.10	7.17	37	0.23
MW-34-100	07/07/2009	16,823	23.60	7.45	-11	0.17
MW-34-100	08/04/2009	11,685	23.07	7.87	-250	0.13
MW-34-100	09/30/2009	18,382	21.84	7.50	-6	0.23
MW-34-100	10/14/2009	18,600	18.97	7.76	-71	0.06
MW-34-100	11/02/2009	18,491	19.00	8.13	-285	0.39
MW-34-100	11/17/2009	18,590	20.40	7.41	---	0.03

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
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Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-34-100	12/09/2009	18,390	20.28	7.58	23	0.06
MW-34-100	01/11/2010	19,953	20.10	7.98	67	0.17
MW-35-60	03/11/2009	6,974	27.03	7.37	12	1.30
MW-35-60	09/24/2009	7,406	26.77	7.56	78	0.87
MW-35-135	09/24/2009	9,915	27.00	7.95	100	0.53
MW-36-20	09/23/2009	3,919	23.11	8.07	-188	0.31
MW-36-40	09/30/2009	3,733	21.32	7.94	-179	0.28
MW-36-50	09/30/2009	1,234	20.63	7.93	-133	0.29
MW-36-70	09/22/2009	12,770	21.74	3.28	37	0.18
MW-36-90	03/12/2009	1,479	21.70	7.98	-85	0.11
MW-36-90	09/23/2009	1,492	22.30	8.18	-57	0.18
MW-36-100	03/12/2009	12,929	23.21	6.96	-100	0.53
MW-36-100	09/23/2009	11,471	22.54	7.12	-165	0.30
MW-37D	03/12/2009	17,275	29.98	7.70	79	0.70
MW-37D	09/23/2009	15,708	30.20	7.92	49	0.62
MW-37S	09/23/2009	5,145	29.07	7.91	38	2.04
MW-39-40	10/01/2009	8,487	24.12	7.40	-125	0.45
MW-39-50	10/01/2009	1,993	23.94	8.07	---	0.35
MW-39-60	10/01/2009	2,723	23.43	7.88	38	0.48
MW-39-70	10/01/2009	4,087	23.94	7.59	49	0.52
MW-39-80	03/11/2009	12,330	24.42	6.93	-90	0.06
MW-39-80	10/01/2009	10,780	24.33	7.07	34	0.41
MW-39-100	03/13/2009	22,478	25.53	6.71	19	0.32
MW-39-100	09/29/2009	20,888	24.99	6.76	61	0.26
MW-40D	03/11/2009	16,977	31.39	7.49	-45	0.38
MW-40D	09/28/2009	16,310	31.42	7.53	53	0.73
MW-40S	09/28/2009	2,250	30.54	7.69	78	7.95
MW-41D	03/11/2009	22,829	30.47	7.67	-150	0.08
MW-41D	09/23/2009	22,420	30.27	7.90	63	0.35
MW-41M	09/23/2009	15,530	29.37	7.69	29	0.93
MW-41S	03/11/2009	5,280	28.53	7.80	-28	1.33
MW-41S	09/23/2009	5,217	28.82	8.04	32	1.40
MW-42-30	09/23/2009	6,154	23.83	7.69	-176	0.36
MW-42-55	03/09/2009	13,292	23.69	7.18	-167	0.22
MW-42-55	04/30/2009	12,180	23.57	7.40	-174	0.27
MW-42-55	09/23/2009	10,639	23.22	7.42	-187	0.39

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
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PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-42-55	12/08/2009	10,790	23.32	7.20	-118	0.04
MW-42-65	03/09/2009	15,615	23.66	6.96	-130	0.18
MW-42-65	04/30/2009	13,660	23.56	7.22	-172	1.09
MW-42-65	09/23/2009	12,783	23.27	7.10	-111	0.32
MW-42-65	12/08/2009	13,170	23.38	6.97	-25	0.05
MW-43-25	10/01/2009	1,303	21.07	7.46	-171	0.32
MW-43-75	10/01/2009	11,920	20.82	7.57	-140	0.32
MW-43-90	10/01/2009	18,863	21.13	6.86	-95	0.29
MW-44-70	03/12/2009	3,472	19.77	7.45	-170	0.16
MW-44-70	05/01/2009	3,468	19.59	7.35	-137	0.46
MW-44-70	09/21/2009	3,026	19.55	7.72	-191	0.53
MW-44-70	12/07/2009	2,997	19.15	7.49	-97	1.39
MW-44-115	01/07/2009	12,840	21.96	7.15	14	0.27
MW-44-115	02/02/2009	10,685	22.20	7.77	-61	0.17
MW-44-115	03/10/2009	13,337	22.08	7.24	-142	0.11
MW-44-115	04/06/2009	12,740	22.17	7.77	5	0.17
MW-44-115	05/01/2009	12,940	22.05	7.90	-211	0.18
MW-44-115	06/08/2009	12,660	22.00	7.65	-20	0.31
MW-44-115	07/06/2009	11,965	22.04	7.86	-148	0.39
MW-44-115	08/03/2009	10,413	21.73	8.18	-358	0.16
MW-44-115	09/21/2009	12,026	21.62	8.10	-249	0.37
MW-44-115	10/14/2009	12,250	20.49	8.03	-110	0.06
MW-44-115	11/03/2009	12,251	20.50	7.90	-25	0.22
MW-44-115	12/07/2009	12,344	21.39	7.94	-94	0.65
MW-44-115	01/12/2010	12,630	21.90	7.86	-174	0.04
MW-44-125	01/07/2009	14,350	22.09	7.35	-32	0.23
MW-44-125	02/02/2009	11,015	22.40	8.00	-78	0.19
MW-44-125	03/10/2009	12,525	22.49	7.93	-194	0.15
MW-44-125	04/06/2009	12,810	22.43	7.71	-5	0.17
MW-44-125	05/01/2009	13,440	22.48	7.87	-192	0.15
MW-44-125	06/08/2009	13,020	22.50	7.73	-35	0.26
MW-44-125	07/06/2009	12,572	22.60	7.93	-149	0.52
MW-44-125	08/03/2009	11,005	22.48	8.35	-375	0.25
MW-44-125	09/23/2009	12,733	22.10	7.95	-198	0.24
MW-44-125	10/14/2009	13,400	20.99	8.12	-117	0.06
MW-44-125	11/03/2009	13,076	20.94	8.08	-245	0.07

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-44-125	12/07/2009	13,421	21.65	8.18	-97	0.32
MW-44-125	01/12/2010	13,810	22.00	8.03	-193	0.03
MW-45-095a	09/29/2009	9,695	19.98	7.61	-1	0.27
MW-46-175	01/07/2009	16,850	23.94	9.01	-5	0.08
MW-46-175	02/03/2009	12,570	24.11	8.39	7	0.24
MW-46-175	03/12/2009	18,232	23.62	8.28	-213	0.07
MW-46-175	04/06/2009	17,740	23.63	8.20	-8	0.14
MW-46-175	05/05/2009	17,820	24.03	8.33	-164	0.19
MW-46-175	06/08/2009	18,160	23.66	8.15	-26	0.22
MW-46-175	07/07/2009	15,894	24.02	8.37	-133	0.24
MW-46-175	08/04/2009	11,299	23.54	8.59	-304	0.18
MW-46-175	09/25/2009	17,567	23.56	8.38	-122	0.29
MW-46-175	10/14/2009	17,680	22.44	8.56	-99	0.06
MW-46-175	11/02/2009	17,178	22.40	8.64	-328	0.19
MW-46-175	12/08/2009	17,820	23.66	8.26	-97	0.03
MW-46-175	01/12/2010	18,270	23.60	8.37	-158	0.04
MW-46-205	03/12/2009	22,290	24.80	8.29	-75	0.07
MW-46-205	05/05/2009	21,590	24.94	8.27	-100	0.14
MW-46-205	09/25/2009	21,500	24.20	8.37	-91	0.22
MW-46-205	12/08/2009	21,910	24.39	8.20	-49	0.06
MW-47-55	03/12/2009	4,510	27.40	7.55	110	2.43
MW-47-55	05/06/2009	4,437	28.63	7.53	-17	2.44
MW-47-55	09/24/2009	4,907	27.92	7.65	51	1.77
MW-47-55	12/09/2009	4,145	26.57	7.44	-13	2.68
MW-47-115	03/11/2009	13,940	27.72	7.58	-73	0.24
MW-47-115	05/06/2009	13,313	28.89	7.53	42	0.21
MW-47-115	07/07/2009	12,068	29.10	7.55	76	0.68
MW-47-115	08/04/2009	9,306	29.12	7.76	-204	0.17
MW-47-115	09/24/2009	13,180	28.16	7.69	46	0.41
MW-47-115	12/09/2009	14,270	26.49	7.46	-55	0.13
MW-48	03/11/2009	20,059	29.68	7.22	41	1.92
MW-48	05/06/2009	17,552	31.30	7.37	-10	2.85
MW-48	09/23/2009	18,289	31.83	7.33	122	2.81
MW-48	12/09/2009	18,410	29.62	7.23	17	1.58
MW-49-135	03/11/2009	15,088	23.39	7.80	-97	0.74
MW-49-135	09/22/2009	13,535	25.72	7.85	---	2.13

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-49-275	03/11/2009	27,452	26.82	8.88	-237	0.19
MW-49-275	09/22/2009	24,443	26.71	8.16	-154	0.25
MW-49-365	03/11/2009	42,113	27.45	8.15	-240	0.14
MW-49-365	09/22/2009	37,874	27.42	8.03	-230	0.17
MW-50-095	03/12/2009	5,421	28.88	7.83	100	2.26
MW-50-095	05/06/2009	5,262	28.91	7.79	-42	2.29
MW-50-095	09/24/2009	5,118	28.92	8.08	56	1.95
MW-50-095	12/10/2009	5,220	28.50	8.17	5	1.81
MW-50-200	03/13/2009	24,236	29.52	7.70	156	2.69
MW-50-200	05/06/2009	22,120	29.70	7.84	-20	2.91
MW-50-200	09/25/2009	20,932	29.75	8.02	77	2.70
MW-50-200	12/11/2009	22,280	29.40	7.79	92	2.48
MW-51	03/12/2009	12,497	29.64	7.44	73	1.61
MW-51	09/24/2009	11,310	29.53	7.47	42	1.39
MW-52D	03/12/2009	21,900	20.94	7.34	-111	0.31
MW-52D	04/29/2009	21,840	21.99	7.66	-117	0.21
MW-52D	09/29/2009	22,560	22.16	8.04	-150	0.57
MW-52D	12/10/2009	22,090	19.17	8.31	-196	0.54
MW-52M	03/12/2009	14,480	21.13	7.67	-174	0.06
MW-52M	04/29/2009	17,180	22.13	7.91	-156	0.27
MW-52M	09/29/2009	17,360	22.09	7.72	-146	0.15
MW-52M	12/10/2009	17,190	18.90	7.78	-204	0.08
MW-52S	03/12/2009	11,450	20.06	6.56	-100	0.40
MW-52S	04/29/2009	10,710	21.29	7.20	-145	0.46
MW-52S	09/29/2009	11,250	21.28	7.37	-130	0.40
MW-52S	12/10/2009	10,960	18.91	7.62	-163	1.72
MW-53D	03/12/2009	26,760	19.94	8.46	-19	0.34
MW-53D	04/29/2009	27,020	21.83	8.59	-203	0.18
MW-53D	09/29/2009	27,290	27.29	8.60	-195	0.15
MW-53D	12/10/2009	26,870	17.31	8.74	-217	0.43
MW-53M	03/12/2009	17,220	19.62	8.16	-173	0.10
MW-53M	04/29/2009	20,040	21.25	8.10	-182	0.20
MW-53M	09/29/2009	20,680	21.74	8.39	-159	0.18
MW-53M	12/10/2009	20,630	18.42	8.29	-209	0.07
MW-54-85	03/09/2009	11,381	26.04	7.73	-251	0.38
MW-54-85	05/05/2009	10,136	25.87	7.30	-174	0.23

TABLE 3-4
Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Monitoring Wells						
MW-54-85	12/08/2009	10,770	25.85	7.29	-158	0.20
MW-54-140	03/09/2009	14,047	25.19	8.09	-235	0.26
MW-54-140	05/05/2009	12,540	24.99	7.69	-151	0.12
MW-54-140	12/08/2009	13,280	24.97	7.72	-104	0.11
MW-54-195	03/09/2009	21,151	25.20	8.42	-260	0.34
MW-54-195	05/05/2009	18,922	24.92	8.01	-236	0.09
MW-54-195	12/08/2009	19,740	24.96	7.97	-216	0.09
MW-55-45	03/09/2009	1,552	27.91	7.65	-271	0.28
MW-55-45	05/04/2009	1,549	27.87	7.63	-171	0.23
MW-55-45	12/07/2009	1,524	27.60	7.77	-108	0.19
MW-55-120	03/09/2009	9,737	28.51	7.85	-142	0.70
MW-55-120	05/04/2009	9,106	28.52	7.87	-87	0.62
MW-55-120	12/07/2009	9,433	28.12	7.94	-42	0.86
MW-56D	03/13/2009	21,347	20.21	7.71	-38	2.93
MW-56D	05/04/2009	21,460	23.16	8.53	-234	0.30
MW-56D	12/10/2009	21,530	19.98	8.01	-145	2.49
MW-56M	03/13/2009	15,079	20.36	7.14	-58	0.52
MW-56M	05/04/2009	14,710	23.01	7.27	-133	1.28
MW-56M	12/10/2009	14,890	20.48	7.35	-156	0.06
MW-56S	03/13/2009	6,479	20.44	7.25	-71	0.53
MW-56S	05/04/2009	6,494	21.74	7.29	-143	1.82
MW-56S	12/10/2009	5,966	20.52	7.59	-173	0.30
PE-1	10/01/2009	5,633	20.90	7.49	216	5.20
Park Moabi-3	10/01/2009	1,428	29.40	7.72	345	3.91
Park Moabi-4	10/01/2009	1,866	29.60	7.91	726	2.26
TW-1	09/22/2009	7,180	29.73	7.39	88	2.99
TW-2D	10/01/2009	8,690	26.10	7.22	253	3.40
TW-2S	10/01/2009	2,529	28.20	7.70	230	5.90
TW-4	03/10/2009	23,426	29.03	7.51	31	0.14
TW-4	05/06/2009	20,735	29.08	7.65	-68	0.17
TW-4	09/23/2009	21,780	30.39	7.71	41	0.23
TW-4	12/09/2009	21,750	28.35	7.49	-63	0.06
TW-5	09/23/2009	13,770	29.21	7.97	-30	0.34
Shoreline Surface Water Station						
R-28	01/21/2009	1,540	13.32	7.88	225	12.90
R-28	04/09/2009	1,053	16.40	8.19	---	8.05

TABLE 3-4

Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Shoreline Surface Water Station						
R-28	07/08/2009	1,035	21.34	7.84	132	7.84
R-28	09/09/2009	979	22.33	7.80	155	7.57
R-28	12/14/2009	1,038	13.02	8.18	101	10.11
R-28	01/19/2010	977	11.40	7.30	266	10.53
R63	04/10/2009	1,051	17.05	7.31	195	9.28
R63	07/08/2009	1,088	25.88	6.87	167	5.08
R63	09/08/2009	987	23.16	8.36	139	7.87
R63	12/14/2009	1,037	13.31	8.25	126	10.11
R63	01/19/2010	1,012	11.56	8.31	260	12.97
RRB	01/21/2009	1,240	11.68	7.94	239	10.00
RRB	04/10/2009	971	16.32	8.10	152	9.13
RRB	07/08/2009	1,043	23.25	7.90	174	6.99
RRB	09/09/2009	944	22.53	7.95	200	6.04
RRB	12/14/2009	1,144	10.40	7.98	91	9.78
RRB	01/20/2010	1,009	11.48	7.74	218	7.49
In-Channel Surface Water Station						
C-BNS-D	01/20/2009	1,140	11.68	8.33	245	12.00
C-BNS-D	04/09/2009	1,051	16.19	8.07	64	8.10
C-BNS-D	07/07/2009	1,015	21.89	8.20	143	6.72
C-BNS-D	09/08/2009	985	22.30	8.49	131	7.18
C-BNS-D	12/14/2009	1,035	13.20	8.17	109	9.94
C-BNS-D	01/19/2010	992	11.30	8.28	266	12.11
C-CON-D	01/21/2009	1,230	11.55	8.05	247	11.94
C-CON-S	01/21/2009	1,220	11.55	7.89	253	11.09
C-CON-D	07/08/2009	1,019	20.72	8.06	122	7.55

TABLE 3-4

Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
In-Channel Surface Water Station						
C-CON-S	07/08/2009	1,026	20.58	8.00	118	8.14
C-CON-D	09/09/2009	971	22.22	8.09	162	7.29
C-CON-S	09/09/2009	942	21.99	7.99	151	6.85
C-CON-D	12/15/2009	1,074	12.76	8.15	103	10.43
C-CON-S	12/15/2009	1,072	12.78	8.14	102	10.43
C-CON-D	01/20/2010	976	11.17	8.24	229	10.30
C-CON-S	01/20/2010	975	11.02	8.18	232	10.61
C-I-3-D	01/20/2009	1,170	11.12	7.87	279	12.06
C-I-3-S	01/20/2009	1,160	11.11	7.89	274	12.03
C-I-3-D	04/09/2009	1,050	16.02	8.11	---	8.11
C-I-3-S	04/09/2009	1,050	16.02	8.11	---	8.11
C-I-3-D	07/07/2009	1,007	21.35	8.16	126	6.43
C-I-3-S	07/07/2009	1,011	21.05	8.10	127	6.61
C-I-3-D	09/08/2009	980	21.79	8.37	102	7.23
C-I-3-S	09/08/2009	979	21.63	8.33	100	7.18
C-I-3-D	12/14/2009	1,039	12.83	8.22	137	10.12
C-I-3-S	12/14/2009	1,037	12.82	8.20	134	10.01
C-I-3-D	01/19/2010	992	11.29	8.31	253	13.41
C-I-3-S	01/19/2010	992	11.17	8.22	262	12.20
C-MAR-D	01/20/2009	1,250	12.37	7.94	261	10.71
C-MAR-S	01/20/2009	1,260	12.38	7.75	263	9.82
C-MAR-D	04/09/2009	1,145	18.01	7.40	---	6.77
C-MAR-S	04/09/2009	1,145	18.01	7.40	---	6.77
C-MAR-D	07/07/2009	1,088	25.92	7.75	134	5.11
C-MAR-S	07/07/2009	1,096	26.34	7.64	106	4.32
C-MAR-D	09/08/2009	1,017	24.26	8.19	122	6.42
C-MAR-S	09/08/2009	1,018	24.45	8.09	103	6.10
C-MAR-D	12/14/2009	1,243	12.72	8.78	115	8.76
C-MAR-D	01/19/2010	1,910	11.83	7.76	287	10.06
C-MAR-S	01/19/2010	1,915	11.94	7.79	286	10.07
C-NR1-D	01/21/2009	1,210	11.64	8.32	241	10.60
C-NR1-S	01/21/2009	1,210	11.69	8.32	241	10.60
C-NR1-D	04/10/2009	15,630	15.62	8.10	130	9.07
C-NR1-S	04/10/2009	15,630	15.62	8.10	130	9.07
C-NR1-D	07/08/2009	1,021	20.70	8.01	127	7.76
C-NR1-S	07/08/2009	1,020	20.78	8.00	117	7.74
C-NR1-D	09/09/2009	939	22.01	7.97	119	6.51

TABLE 3-4

Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
In-Channel Surface Water Station						
C-NR1-S	09/09/2009	938	22.18	7.97	114	7.03
C-NR1-D	12/15/2009	1,075	12.74	8.13	95	10.63
C-NR1-S	12/15/2009	1,074	12.85	8.13	92	10.42
C-NR1-D	01/20/2010	973	11.16	8.26	242	10.22
C-NR1-S	01/20/2010	974	11.12	8.27	245	9.82
C-NR3-D	01/21/2009	1,200	11.20	8.31	244	11.43
C-NR3-S	01/21/2009	1,200	11.55	8.34	242	11.10
C-NR3-D	04/10/2009	970	15.69	8.05	169	9.03
C-NR3-S	04/10/2009	970	15.69	8.05	169	9.03
C-NR3-D	07/08/2009	1,025	21.52	7.99	119	7.40
C-NR3-S	07/08/2009	1,024	21.16	7.97	99	7.46
C-NR3-D	09/09/2009	941	21.81	7.95	97	6.88
C-NR3-S	09/09/2009	944	21.67	7.95	112	7.46
C-NR3-D	12/15/2009	1,072	12.81	8.12	91	10.51
C-NR3-S	12/15/2009	1,074	12.82	8.11	94	10.76
C-NR3-D	01/20/2010	969	11.18	8.27	253	10.02
C-NR3-S	01/20/2010	970	11.06	8.23	255	9.86
C-NR4-D	01/21/2009	1,200	11.95	8.25	249	12.71
C-NR4-S	01/21/2009	1,200	11.87	8.29	242	11.10
C-NR4-D	04/10/2009	971	15.86	8.05	130	9.03
C-NR4-S	04/10/2009	971	15.86	8.05	130	9.03
C-NR4-D	07/08/2009	1,019	21.39	7.98	104	7.61
C-NR4-S	07/08/2009	1,019	21.17	7.97	85	7.55
C-NR4-D	09/09/2009	955	22.15	7.95	94	6.86
C-NR4-S	09/09/2009	946	22.03	7.94	95	6.73
C-NR4-D	12/15/2009	1,074	13.01	8.10	100	10.26
C-NR4-S	12/15/2009	1,075	12.96	8.10	93	10.18
C-NR4-D	01/20/2010	969	11.13	8.24	257	9.97
C-NR4-S	01/20/2010	969	11.01	8.17	262	10.26
C-R22A-D	01/20/2009	1,170	11.39	8.24	265	12.65
C-R22A-S	01/20/2009	1,170	11.40	8.14	268	12.01
C-R22A-D	04/09/2009	1,055	15.79	8.11	61	7.99
C-R22A-S	04/09/2009	1,055	15.79	8.11	61	7.99
C-R22A-D	07/07/2009	988	22.25	8.15	150	7.09
C-R22A-S	07/07/2009	1,008	22.50	8.15	136	6.86
C-R22A-D	09/08/2009	984	22.57	8.39	78	7.38
C-R22A-S	09/08/2009	978	22.44	8.50	64	7.21

TABLE 3-4

Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
In-Channel Surface Water Station						
C-R22A-D	12/14/2009	1,044	13.21	8.23	112	10.56
C-R22A-S	12/14/2009	1,043	13.08	8.19	112	10.20
C-R22A-D	01/19/2010	996	11.32	8.29	273	12.67
C-R22A-S	01/19/2010	996	11.35	8.28	274	12.04
C-R27-D	01/20/2009	1,180	12.09	8.35	256	13.86
C-R27-S	01/20/2009	1,150	11.94	8.13	255	11.00
C-R27-D	04/10/2009	963	15.25	7.99	---	9.03
C-R27-S	04/10/2009	963	15.25	7.99	---	9.03
C-R27-D	07/07/2009	1,006	22.09	8.11	120	6.71
C-R27-S	07/07/2009	1,003	22.05	8.10	133	6.39
C-R27-D	09/08/2009	983	22.72	8.42	108	7.15
C-R27-S	09/08/2009	982	22.54	8.36	93	7.07
C-R27-D	12/14/2009	1,040	13.04	8.14	96	10.04
C-R27-S	12/14/2009	1,041	13.24	8.15	99	9.94
C-R27-D	01/19/2010	993	11.27	8.27	276	11.93
C-R27-S	01/19/2010	993	11.30	8.28	278	11.86
C-TAZ-D	01/20/2009	1,170	11.03	7.91	275	11.93
C-TAZ-S	01/20/2009	1,190	11.29	7.72	220	12.72
C-TAZ-D	04/09/2009	1,054	15.30	8.06	---	8.00
C-TAZ-S	04/09/2009	1,054	15.30	8.06	---	8.00
C-TAZ-D	07/07/2009	1,022	21.25	7.59	164	6.92
C-TAZ-S	07/07/2009	1,008	21.23	8.02	156	6.74
C-TAZ-D	09/08/2009	988	21.65	7.97	146	---
C-TAZ-S	09/08/2009	985	21.86	8.23	136	7.89
C-TAZ-D	12/14/2009	1,049	12.76	8.26	157	10.62
C-TAZ-S	12/14/2009	1,041	12.27	8.24	146	10.15
C-TAZ-D	01/19/2010	992	11.10	7.20	287	11.81
C-TAZ-S	01/19/2010	993	11.11	7.64	273	10.54
C-TM-1	01/20/2009	1,320	12.81	7.86	253	10.30
C-TM-2	01/20/2009	1,390	13.02	7.89	257	10.00

TABLE 3-4

Field Water Quality Measurements, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sampling Date	Specific Conductance (µS/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
Other Surface Water Station						
SW1	01/21/2009	1,450	12.30	7.92	267	10.54
SW1	04/10/2009	1,092	16.30	7.27	186	9.16
SW1	07/08/2009	1,103	26.76	7.15	132	4.80
SW1	09/09/2009	1,044	26.60	7.43	143	4.37
SW1	12/15/2009	1,103	9.49	7.83	144	10.63
SW1	01/20/2010	1,006	11.42	7.87	239	8.58
SW2	04/09/2009	1,055	15.89	7.87	---	7.84
SW2	07/07/2009	1,014	22.77	8.22	155	11.47
SW2	09/09/2009	1,008	24.06	7.62	-41	4.59
SW2	12/15/2009	1,096	9.52	7.84	173	9.01
SW2	01/20/2010	1,065	10.43	7.41	231	5.48

NOTES:

µS/cm microSiemens per centimeter
°C degree celsius
ORP oxidation reduction potential, results rounded off to whole point
mV millivolts
mg/L milligrams per liter
(---) data not collected, not available, or rejected

All field measurements were collected during groundwater and surface water sampling using a Horiba U-22 water quality meter, a YSI multi-parameter water quality meter, or an Orion pH/ORP meter.

TABLE 3-5
Surface Water Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Specific Conductance (µS/cm)	Lab pH
In-channel Locations					
C-BNS-D	01/20/2009	ND (0.2)	ND (1.0)	944	8.38 J
C-BNS-D	04/09/2009	ND (0.2)	ND (1.0)	945	8.31 J
C-BNS-D	07/07/2009	ND (0.2)	ND (1.0)	987	8.25 J
C-BNS-D	09/08/2009	ND (0.2)	ND (1.0)	982	8.24 J
C-BNS-D	12/14/2009	ND (0.2)	ND (1.0)	984	8.33 J
C-BNS-D	01/19/2010	ND (0.2)	ND (1.0)	967	8.26 J
C-CON-S	01/21/2009	ND (10)	ND (1.0)	959	8.53 J
C-CON-S	04/10/2009	ND (0.2)	ND (1.0)	978	8.32 J
C-CON-S	07/08/2009	ND (0.2)	ND (1.0)	988	8.34 J
C-CON-S	09/09/2009	ND (0.2)	ND (1.0)	972	8.28 J
C-CON-S	12/15/2009	ND (0.2)	ND (1.0)	985	8.34 J
C-CON-S	01/20/2010	ND (0.2)	ND (1.0)	964	8.34 J
C-CON-D	01/21/2009	ND (0.2)	ND (1.0)	955	8.55 J
C-CON-D	04/10/2009	ND (0.2)	ND (1.0)	969	8.31 J
C-CON-D	07/08/2009	ND (0.2)	ND (1.0)	996	8.32 J
C-CON-D	09/09/2009	ND (0.2)	ND (1.0)	979	8.29 J
C-CON-D	12/15/2009	ND (0.2)	ND (1.0)	1000	8.32 J
C-CON-D	01/20/2010	ND (0.2)	ND (1.0)	953	8.33 J
C-I-3-S	01/20/2009	ND (10)	ND (1.0)	938	8.51 J
C-I-3-S	04/09/2009	ND (0.2)	ND (1.0)	970	8.33 J
C-I-3-S	07/07/2009	ND (0.2)	ND (1.0)	992	8.30 J
C-I-3-S	09/08/2009	ND (0.2)	ND (1.0)	973	8.28 J
C-I-3-S	12/14/2009	ND (0.2)	ND (1.0)	991	8.30 J
C-I-3-S	01/19/2010	ND (0.2)	ND (1.0)	936	8.36 J
C-I-3-D	01/20/2009	ND (0.2)	ND (1.0)	947	8.53 J
C-I-3-D	04/09/2009	ND (0.2)	ND (1.0)	963	8.30 J
C-I-3-D	07/07/2009	ND (0.2)	ND (1.0)	965	8.33 J
C-I-3-D	09/08/2009	ND (0.2)	ND (1.0)	975	8.29 J
C-I-3-D	12/14/2009	ND (0.2)	ND (1.0)	989	8.27 J
C-I-3-D	01/19/2010	ND (0.2)	ND (1.0)	975	8.34 J
C-MAR-S	01/20/2009	ND (10)	ND (1.0)	1060	8.07 J
C-MAR-S	04/09/2009	ND (0.2)	ND (1.0)	1040	7.60 J
C-MAR-S	07/07/2009	ND (0.2)	ND (1.0)	1080	7.82 J
C-MAR-S	09/08/2009	ND (0.2)	ND (1.0)	992	7.98 J
C-MAR-S	01/19/2010	ND (0.2)	ND (1.0)	1890	7.89 J
C-MAR-D	01/20/2009	ND (0.2)	ND (1.0)	1040	8.08 J

TABLE 3-5
Surface Water Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Specific Conductance (µS/cm)	Lab pH
C-MAR-D	04/09/2009	ND (0.2)	ND (1.0)	1040	7.63 J
C-MAR-D	07/07/2009	ND (0.2)	ND (1.0)	1070	7.85 J
C-MAR-D	09/08/2009	ND (0.2)	ND (1.0)	1010	8.04 J
C-MAR-D	12/14/2009	ND (0.2)	ND (1.0)	1160	7.89 J
C-MAR-D	01/19/2010	ND (0.2)	ND (1.0)	1860	7.86 J
C-NR1-S	01/21/2009	ND (10)	ND (1.0)	956	8.46 J
C-NR1-S	04/10/2009	ND (0.2)	ND (1.0)	956	8.31 J
C-NR1-S	07/08/2009	ND (0.2)	ND (1.0)	981	8.28 J
C-NR1-S	09/09/2009	ND (0.2)	ND (1.0)	970	8.27 J
C-NR1-S	12/15/2009	ND (0.2)	ND (1.0)	987	8.34 J
C-NR1-S	01/20/2010	ND (0.2)	ND (1.0)	955	8.34 J
C-NR1-D	01/21/2009	ND (0.2)	ND (1.0)	952	8.44 J
C-NR1-D	04/10/2009	ND (0.2)	ND (1.0)	962	8.32 J
C-NR1-D	07/08/2009	ND (0.2)	ND (1.0)	994	8.29 J
C-NR1-D	09/09/2009	ND (0.2)	ND (1.0)	1010	8.24 J
C-NR1-D	12/15/2009	ND (0.2)	ND (1.0)	990	8.30 J
C-NR1-D	01/20/2010	ND (0.2)	ND (1.0)	958	8.35 J
C-NR3-S	01/21/2009	ND (10)	ND (1.0)	964	8.49 J
C-NR3-S	04/10/2009	ND (0.2)	ND (1.0)	965	8.32 J
C-NR3-S	07/08/2009	ND (0.2)	ND (1.0)	977	8.27 J
C-NR3-S	09/09/2009	ND (0.2)	ND (1.0)	969	8.24 J
C-NR3-S	12/15/2009	ND (0.2)	ND (1.0)	988	8.32 J
C-NR3-S	01/20/2010	ND (0.2)	ND (1.0)	958	8.31 J
C-NR3-D	01/21/2009	ND (0.2)	ND (1.0)	968	8.48 J
C-NR3-D	04/10/2009	ND (0.2)	ND (1.0)	961	8.32 J
C-NR3-D	07/08/2009	ND (0.2)	ND (1.0)	988	8.30 J
C-NR3-D	09/09/2009	ND (0.2)	ND (1.0)	964	8.26 J
C-NR3-D	12/15/2009	ND (0.2)	ND (1.0)	982	8.31 J
C-NR3-D	01/20/2010	ND (0.2)	ND (1.0)	951	8.33 J
C-NR4-S	01/21/2009	ND (10)	ND (1.0)	956	8.45 J
C-NR4-S	04/10/2009	ND (0.2)	ND (1.0)	969	8.30 J
C-NR4-S	07/08/2009	ND (0.2)	ND (1.0)	987	8.29 J
C-NR4-S	09/09/2009	ND (0.2)	ND (1.0)	962	8.24 J
C-NR4-S	12/15/2009	ND (0.2)	ND (1.0)	992	8.31 J
C-NR4-S	01/20/2010	ND (0.2)	ND (1.0)	950	8.21 J
C-NR4-D	01/21/2009	ND (0.2)	ND (1.0)	949	8.47 J
C-NR4-D	04/10/2009	ND (0.2)	ND (1.0)	971	8.31 J

TABLE 3-5
Surface Water Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Specific Conductance (µS/cm)	Lab pH
C-NR4-D	07/08/2009	ND (0.2)	ND (1.0)	992	8.25 J
C-NR4-D	09/09/2009	ND (0.2)	ND (1.0)	975	8.25 J
C-NR4-D	12/15/2009	ND (0.2)	ND (1.0)	984	8.29 J
C-NR4-D	01/20/2010	ND (0.2)	ND (1.0)	962	8.32 J
C-R22a-S	01/20/2009	ND (10)	ND (1.0)	964	8.45 J
C-R22a-S	04/09/2009	ND (0.2)	ND (1.0)	960	8.32 J
C-R22a-S	07/07/2009	ND (0.2)	ND (1.0)	988	8.35 J
C-R22a-S	09/08/2009	ND (0.2)	ND (1.0)	959	8.31 J
C-R22a-S	12/14/2009	ND (0.2)	ND (1.0)	1000	8.21 J
C-R22a-S	01/19/2010	ND (0.2)	ND (1.0)	965	8.36 J
C-R22a-D	01/20/2009	ND (0.2)	ND (1.0)	960	8.48 J
C-R22a-D	04/09/2009	ND (0.2)	ND (1.0)	965	8.32 J
C-R22a-D	07/07/2009	ND (0.2)	ND (1.0)	995	8.32 J
C-R22a-D	09/08/2009	ND (0.2)	ND (1.0)	967	8.28 J
C-R22a-D	12/14/2009	ND (0.2)	ND (1.0)	1010	8.31 J
C-R22a-D	01/19/2010	ND (0.2)	ND (1.0)	994	8.35 J
C-R27-S	01/20/2009	ND (10)	ND (1.0)	962	8.43 J
C-R27-S	04/10/2009	ND (0.2)	ND (1.0)	963	8.32 J
C-R27-S	07/07/2009	ND (0.2)	ND (1.0)	996	8.32 J
C-R27-S	09/08/2009	ND (0.2)	ND (1.0)	965	8.28 J
C-R27-S	12/14/2009	ND (0.2)	ND (1.0)	982	8.28 J
C-R27-S	01/19/2010	ND (0.2)	ND (1.0)	985	8.32 J
C-R27-D	01/20/2009	ND (0.2)	ND (1.0)	953	8.47 J
C-R27-D	04/10/2009	ND (0.2)	ND (1.0)	975	8.33 J
C-R27-D	07/07/2009	ND (0.2)	ND (1.0)	992	8.29 J
C-R27-D	09/08/2009	ND (0.2)	ND (1.0)	963	8.26 J
C-R27-D	12/14/2009	ND (0.2)	ND (1.0)	997	8.26 J
C-R27-D	01/19/2010	ND (0.2)	ND (1.0)	976	8.33 J
C-TAZ-S	01/20/2009	ND (10)	ND (1.0)	949	8.55 J
C-TAZ-S	04/09/2009	ND (0.2)	ND (1.0)	962	8.37 J
C-TAZ-S	07/07/2009	ND (0.2)	ND (1.0)	994	8.37 J
C-TAZ-S	09/08/2009	ND (0.2)	ND (1.0)	972	8.27 J
C-TAZ-S	12/14/2009	ND (0.2)	ND (1.0)	991	8.34 J
C-TAZ-S	01/19/2010	ND (0.2)	ND (1.0)	971	8.27 J
C-TAZ-D	01/20/2009	ND (0.2)	ND (1.0)	943	8.52 J
C-TAZ-D	04/09/2009	ND (0.2)	ND (1.0)	936	8.30 J
C-TAZ-D	07/07/2009	ND (0.2)	ND (1.0)	993	8.34 J

TABLE 3-5
Surface Water Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Specific Conductance (µS/cm)	Lab pH
C-TAZ-D	09/08/2009	ND (0.2)	ND (1.0)	962	8.29 J
C-TAZ-D	12/14/2009	ND (0.2)	ND (1.0)	976	8.32 J
C-TAZ-D	01/19/2010	ND (0.2)	ND (1.0)	971	8.37 J
C-TM-1-D	01/20/2009	ND (10)	ND (1.0)	---	---
C-TM-2-D	01/20/2009	ND (10)	ND (1.0)	---	---
Shoreline Samples					
R-19	01/21/2009	ND (10)	ND (1.0)	951	8.55 J
R-19	04/10/2009	ND (0.2)	ND (1.0)	967	8.33 J
R-19	07/08/2009	ND (0.2)	ND (1.0)	983	8.43 J
R-19	09/09/2009	ND (0.2)	ND (1.0)	1000	8.31 J
R-19	12/14/2009	ND (0.2)	ND (1.0)	981	8.26 J
R-19	01/19/2010	ND (0.2)	ND (1.0)	967	8.32 J
R-28	01/21/2009	ND (10)	ND (1.0)	957	8.51 J
R-28	04/09/2009	ND (0.2)	ND (1.0)	951	8.34 J
R-28	07/08/2009	ND (0.2)	ND (1.0)	981	8.44 J
R-28	09/09/2009	ND (0.2)	ND (1.0)	987	8.27 J
R-28	12/14/2009	ND (0.2)	ND (1.0)	998	8.28 J
R-28	01/20/2010	ND (0.2)	ND (1.0)	964	8.34 J
R63	04/10/2009	ND (0.2)	ND (1.0)	1010	7.95 J
R63	07/08/2009	ND (0.2)	ND (1.0)	1020	7.86 J
R63	07/08/2009 FD	ND (0.2)	ND (1.0)	1020	7.92 J
R63	09/08/2009	ND (0.2)	ND (1.0)	1000	8.21 J
R63	12/14/2009	ND (0.2)	ND (1.0)	992	8.34 J
R63	01/19/2010	ND (0.2)	ND (1.0)	1030	8.34 J
RRB	01/21/2009	ND (10)	ND (1.0)	977	8.36 J
RRB	04/10/2009	ND (0.2)	ND (1.0)	969	8.32 J
RRB	07/08/2009	ND (0.2)	ND (1.0)	984	8.27 J
RRB	09/09/2009	ND (0.2)	ND (1.0)	998	8.11 J
RRB	12/15/2009	ND (0.2)	ND (1.0)	1060	8.07 J
RRB	01/20/2010	ND (0.2)	ND (1.0)	1150	7.85 J

TABLE 3-5
Surface Water Sampling Results, January 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (total) (µg/L)	Specific Conductance (µS/cm)	Lab pH
Other Surface Water Samples					
SW1	01/21/2009	ND (10)	ND (1.0)	1090	7.83 J
SW1	04/10/2009	ND (0.2)	ND (1.0)	1010	7.69 J
SW1	07/08/2009	ND (0.2)	ND (1.0)	1040	7.88 J
SW1	09/09/2009	ND (0.2)	ND (1.0)	1040	7.89 J
SW1	12/15/2009	ND (0.2)	ND (1.0)	1010	7.90 J
SW1	01/20/2010	ND (0.2)	ND (1.0)	1040	7.81 J
SW2	04/09/2009	ND (0.2)	ND (1.0)	968	8.34 J
SW2	07/07/2009	ND (0.2)	ND (1.0)	990	8.47 J
SW2	09/09/2009	ND (0.2)	ND (1.0)	1010	8.04 J
SW2	12/15/2009	ND (0.2)	ND (1.0)	1000	8.02 J
SW2	01/20/2010	ND (0.2)	ND (1.0)	973	7.55 J

Notes:

µg/L micrograms per liter
µS/cm microSiemens per centimeter
ND not detected at listed reporting limit
J concentration or reporting limit estimated by laboratory or data validation
(---) data not collected or not available

Hexavalent chromium analytical method EPA 218.6 (reporting limit 0.2 µg/L for undiluted samples).

Other analytical methods: dissolved chromium (total) - Method SW6020A, specific conductance - USEPA 120.1, pH -SM4500-HB.

TABLE 3-6

Unfiltered Hexavalent and Chromium (total) Results, Risk Assessment Data Collection, January 2009 River Monitoring Event

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

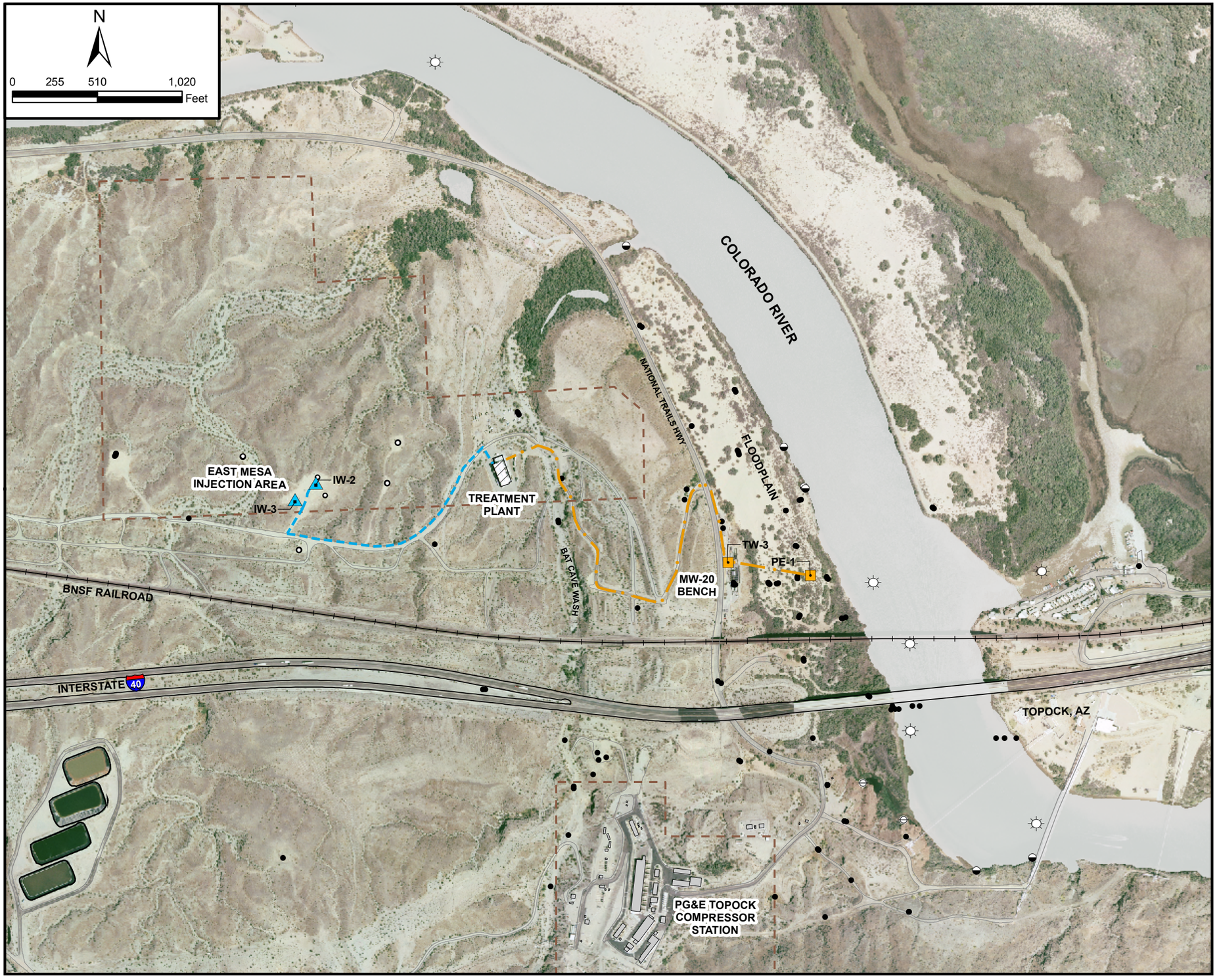
Location	Sample Date	Hexavalent Chromium (µg/L)	Chromium (total) (µg/L)
In-channel Locations			
C-CON-S	01/21/2009	ND (10)	ND (1.0)
C-I-3-S	01/20/2009	ND (10)	ND (1.0)
C-MAR-S	01/20/2009	ND (10)	ND (1.0)
C-NR1-S	01/21/2009	ND (10)	ND (1.0)
C-NR3-S	01/21/2009	ND (10)	ND (1.0)
C-NR4-S	01/21/2009	ND (10)	ND (1.0)
C-R22A-S	01/20/2009	ND (10)	ND (1.0)
C-R27-S	01/20/2009	ND (10)	ND (1.0)
C-TAZ-S	01/20/2009	ND (10)	ND (1.0)
C-TM-1	01/20/2009	ND (10)	ND (1.0)
C-TM-2	01/20/2009	ND (10)	ND (1.0)
Shoreline Samples			
R-19	01/21/2009	ND (10)	ND (1.0)
R-28	01/21/2009	ND (10)	ND (1.0)
RRB	01/21/2009	ND (10)	ND (1.0)
Other Surface Water Station			
SW1	01/21/2009	ND (10)	ND (1.0)

Notes:

µg/L micrograms per liter
ND not detected at listed reporting limit
(---) data not collected or not available

Analytical methods: unfiltered chromium, total (Method SW 6020A), unfiltered hexavalent chromium (E218.6)

Figures



VICINITY MAP



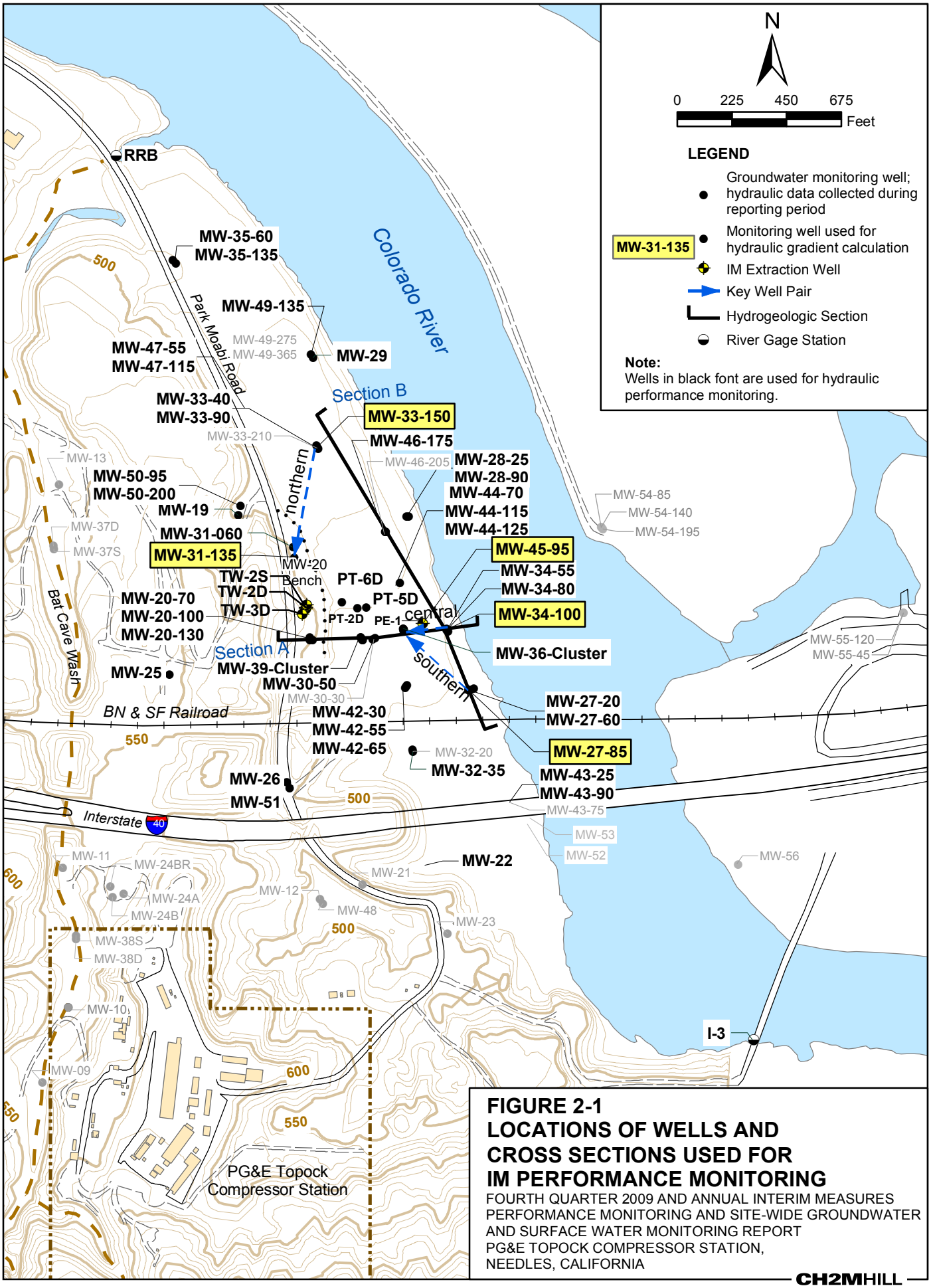
LEGEND

- IM-3 Extraction Well (Active)
- IM-3 Injection Well
- Monitoring Well in 2009 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
- PG&E Property Line

Note: 1. Location map shows Interim Measure No.3 (IM-3) active facilities as of January 2006.

2. See Figures 3-1 and 4-1 for complete GMP and surface water locations and identifications.

FIGURE 1-1
LOCATIONS OF IM-3 FACILITIES AND GMP MONITORING LOCATIONS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

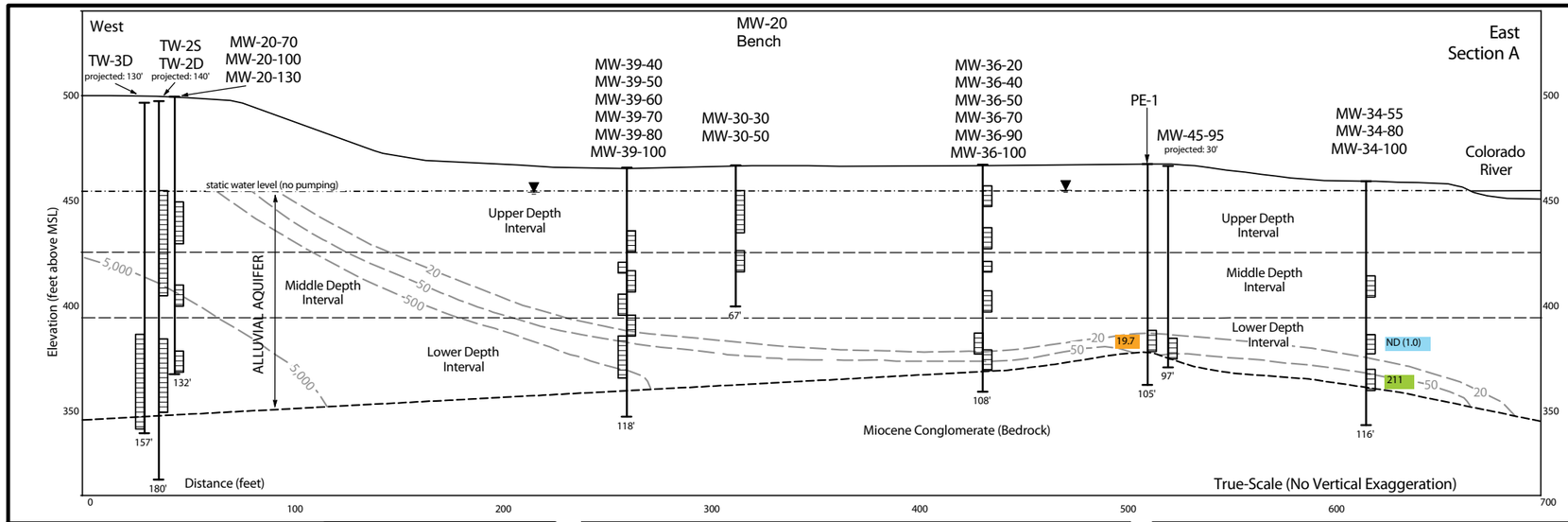


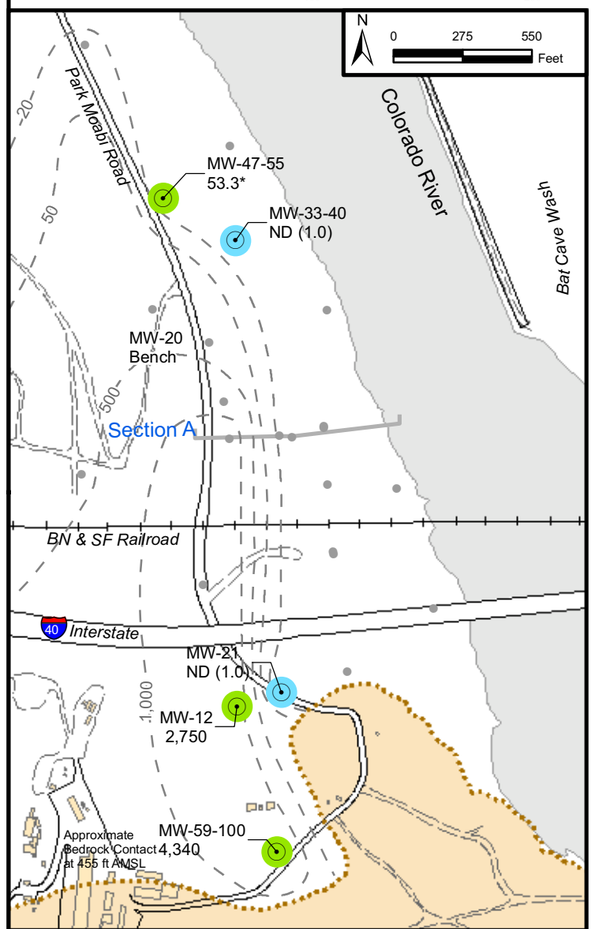
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FIGURE 2-1
LOCATIONS OF WELLS AND CROSS SECTIONS USED FOR IM PERFORMANCE MONITORING

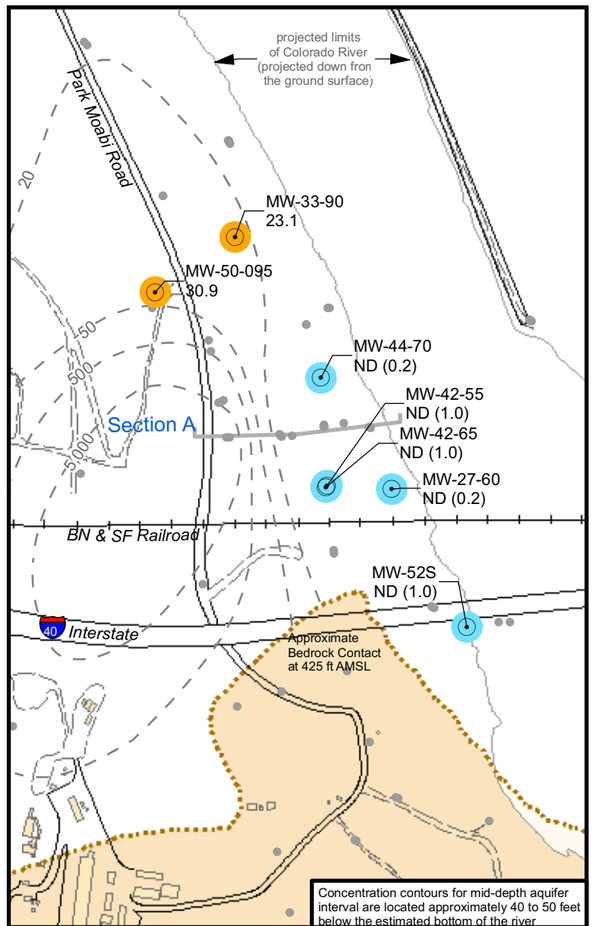
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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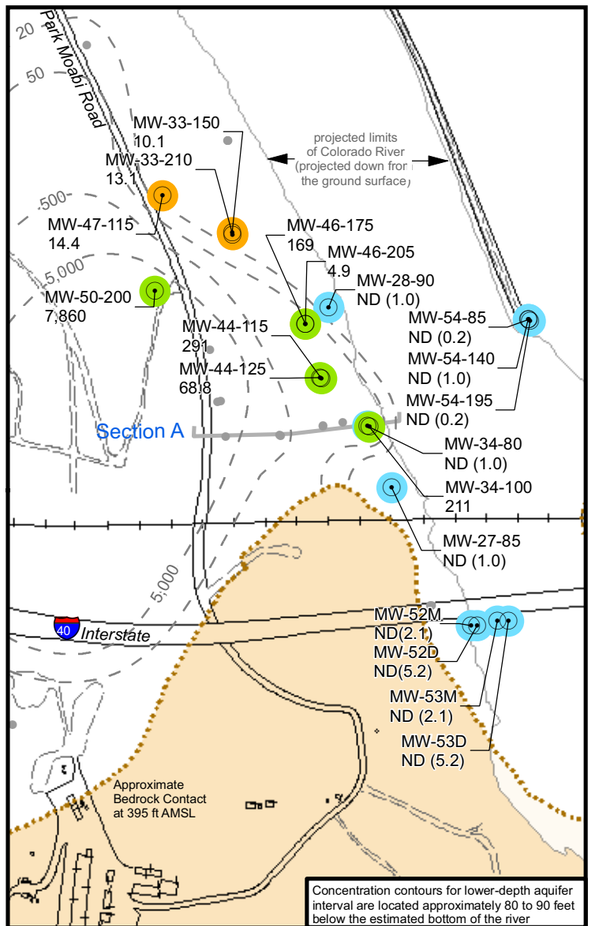




Shallow Wells (Upper Depth Interval)



Mid-Depth Wells (Mid-Depth Interval)



Deep Wells (Lower Depth Interval)

LEGEND

⊙ Alluvial Aquifer Well Sampled During December 2009 Sampling Event

6.48 Concentration of hexavalent chromium [Cr(VI)] in groundwater, micrograms per liter (µg/L). Results posted are maximum Cr(VI) concentrations from December 2009 groundwater sampling.

ND (0.2) Cr(VI) not detected at listed reporting limit

Cr(VI) Concentrations - December 2009

- Not detected at analytical reporting limit
- Concentrations between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- 50 Inferred Cr(VI) concentration contour within Alluvial aquifer depth interval based on September 2009 sampling results.
- Hydrogeologic Section A showing aquifer depth intervals and December 2009 Cr(VI) sampling results

NOTES ON CONTOUR MAPS

1. The Cr(VI) concentration contours of 20 and 50 µg/L are shown in accordance with DTSC's 2005 IM performance monitoring directive.

2. In the floodplain area, the 20 µg/L line for Cr(VI) in deep zone (80-90 feet below Colorado River) 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.

3. For data presentation, the December 2009 sampling results are posted on the Cr(VI) contour maps and cross-sections that were prepared from the most recent comprehensive sampling event (September 2009). The new sampling results which do not match prior Cr(VI) contours are asterisked (*).

4. The beige shading shows areas of bedrock groundwater. The IM performance standard was established for containment of Cr(VI) concentrations greater than 20 µg/L in the floodplain portion of the Alluvial Aquifer.

FIGURE 2-2
MAXIMUM Cr(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER, DECEMBER 2009
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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North

South
Section B

Cross-Section Parallel to the Colorado River

BN & SF
Railroad

MW-33-40
MW-33-90
MW-33-150
MW-33-210

MW-46-175
MW-46-205

MW-28-25
MW-28-90
projected: 110'

MW-44-70
MW-44-115
MW-44-125

MW-34-55
MW-34-80
MW-34-100

MW-27-20
MW-27-60
MW-27-85

Elevation (feet above MSL)

700
600
500
400
300
200
100
0

water table (average 455' MSL)

ALLUVIAL AQUIFER

Oldest Alluvium

Fluvial Deposits

Upper Depth Interval

Middle Depth Interval

Lower Depth Interval

Approximate geologic contact
between alluvial fan
and fluvial deposits

ND (1.0)
23.1
10.1
13.1
237'

-20
-50
169
4.92
216'
ND (1.0)

ND (0.2)
291
68.8
134'

ND (1.0)
211
116'

Upper Depth Interval
Middle Depth Interval
Lower Depth Interval
ND (0.2)
ND (1.0)
107'

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:
ND = Not detected at listed concentration.

For data presentation, the December 2009 sampling results are posted on the Cr(VI) contour cross-section that was prepared from the most recent comprehensive sampling event (September 2009).

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

water level
well screen
3,810
boring depth (feet)
103'

50
Inferred Cr(VI) concentration contour from September 2009 sampling.

Hexavalent Chromium [Cr(VI)] concentration in micrograms per liter (µg/L), equivalent to parts per billion (ppb).

ND (1)	Not detected at listed reporting limit (ppb)
29	Less than 32 µg/L
3,810	Greater than 32 µg/L

FIGURE 2-3
Cr(VI) CONCENTRATIONS
FLOODPLAIN CROSS-SECTION B,
DECEMBER 2009

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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C:\DOCUMENTS AND SETTINGS\CHALL6\MY DOCUMENTS\GINT\ANNUAL_2009\FIGURE_2-3B_XSECB_CR.GDW;

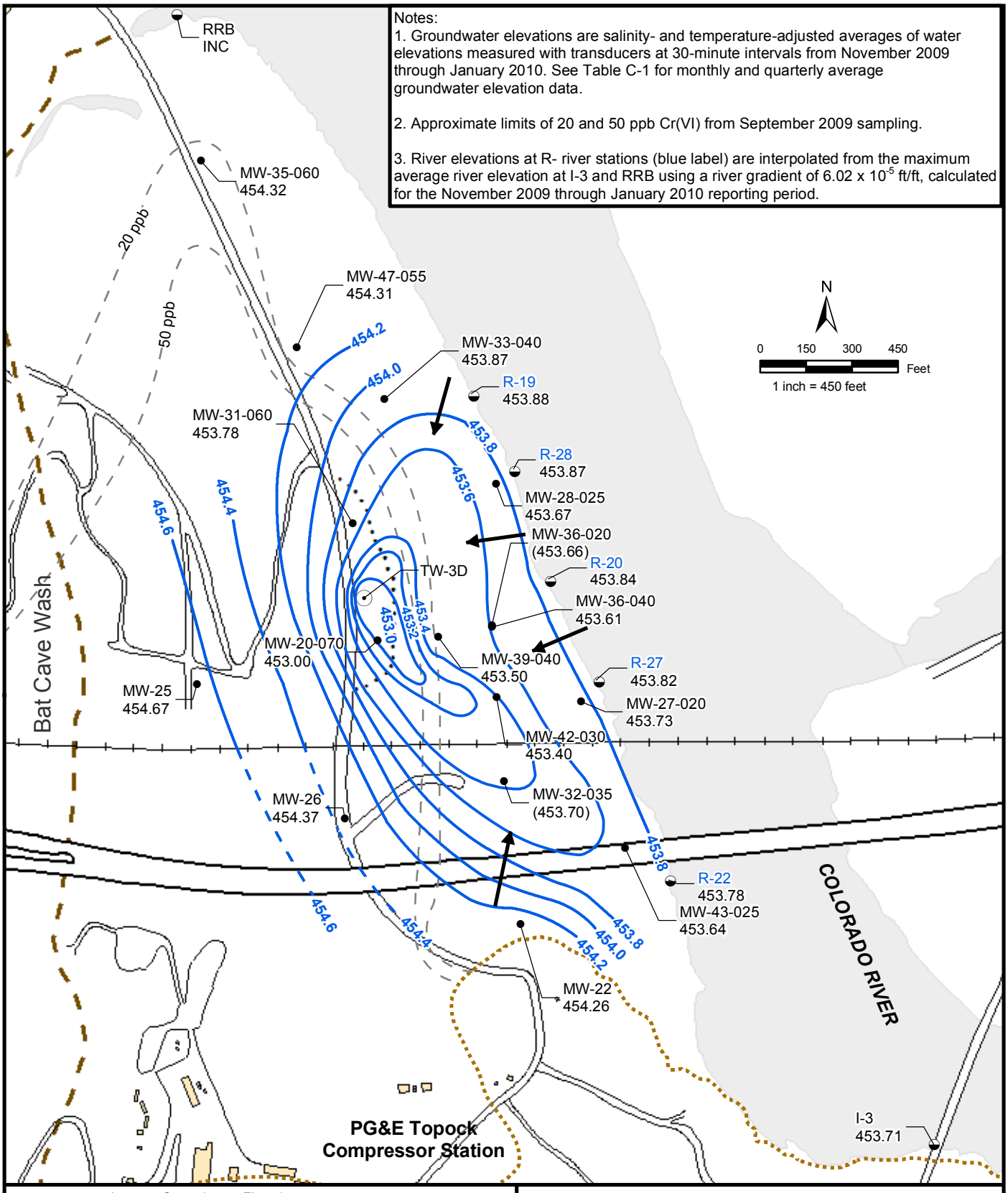


FIGURE 2-4a
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS, NOVEMBER 2009 THROUGH JANUARY 2010

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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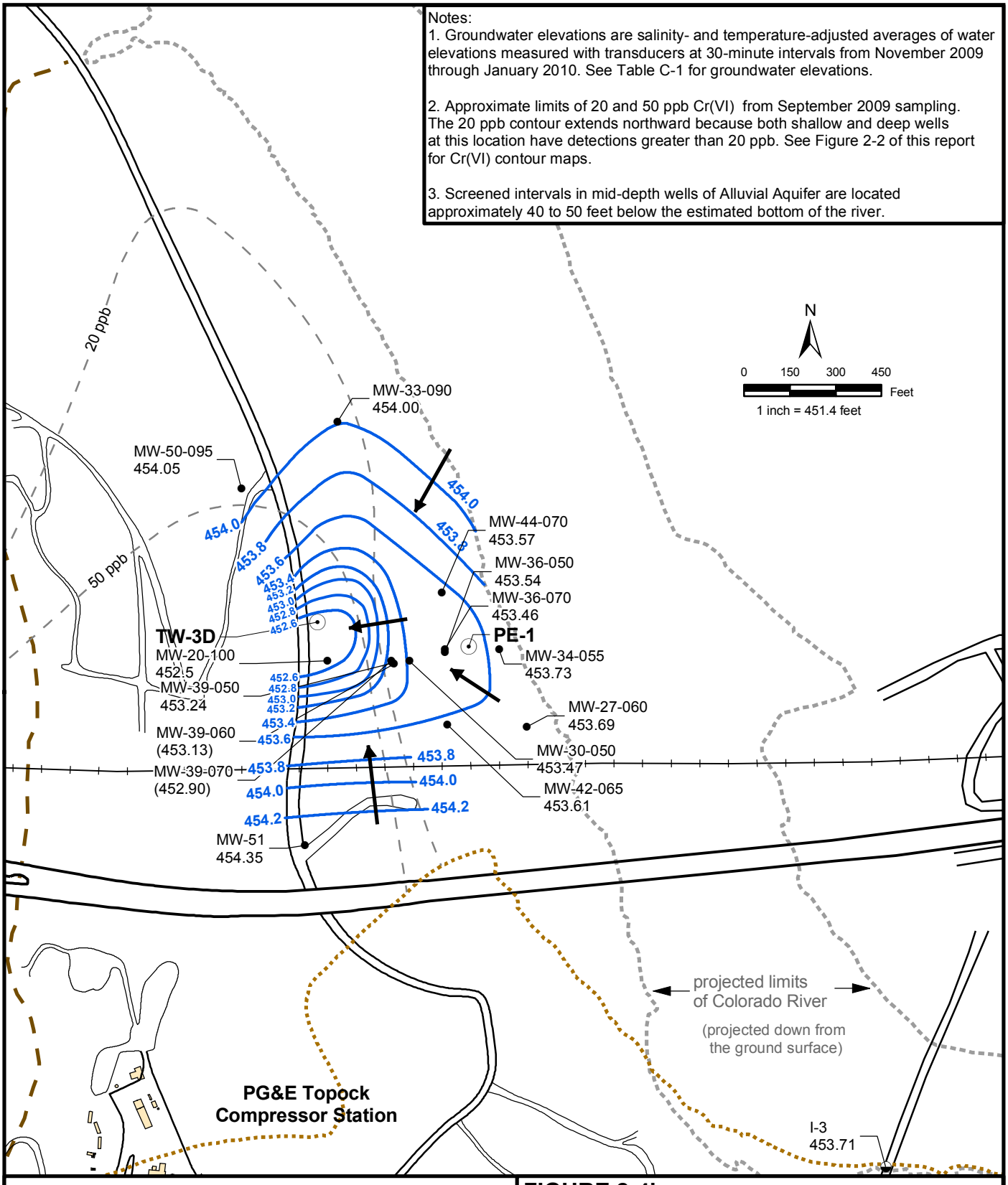


FIGURE 2-4b
AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, NOVEMBER 2009 THROUGH JANUARY 2010

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
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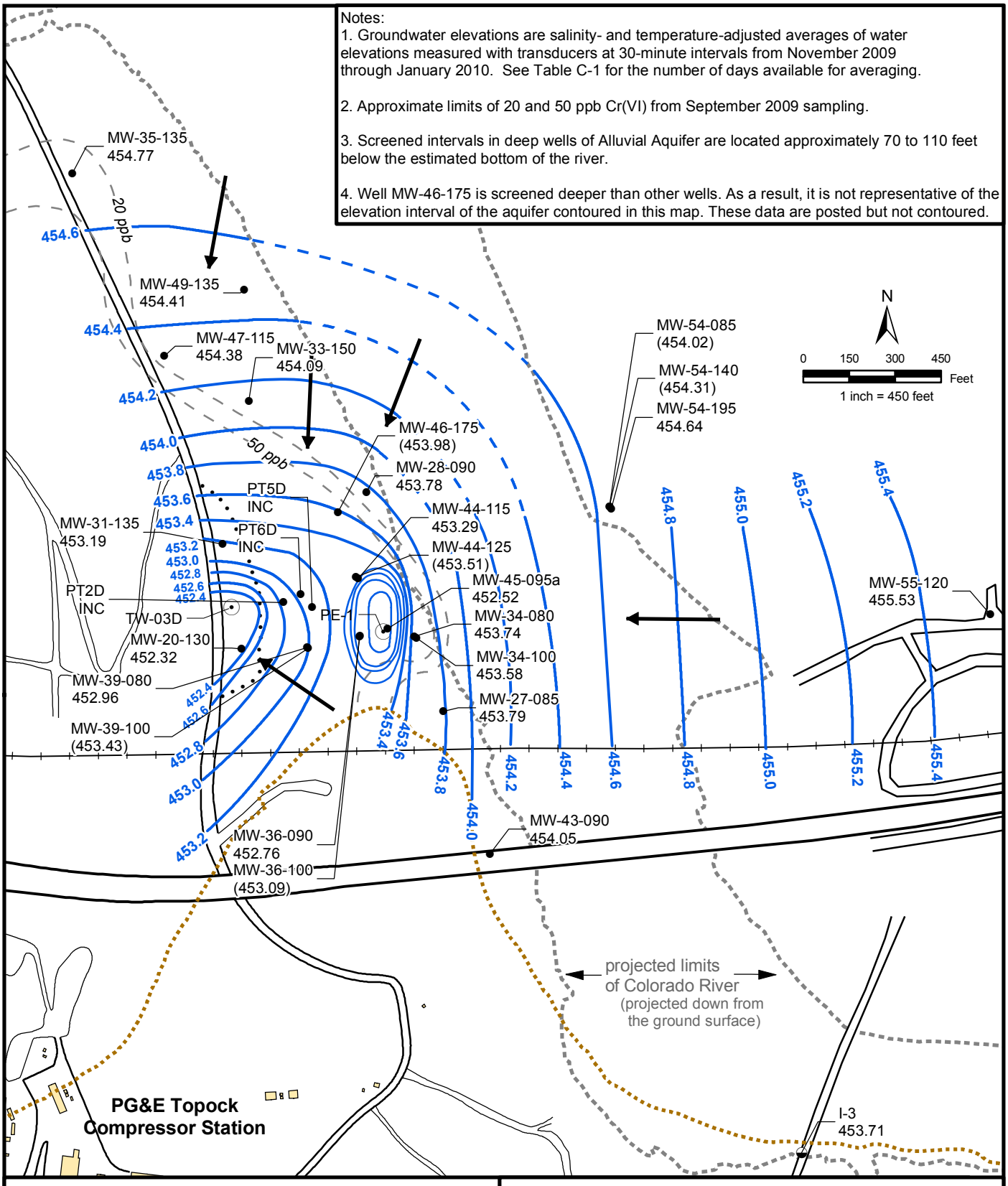
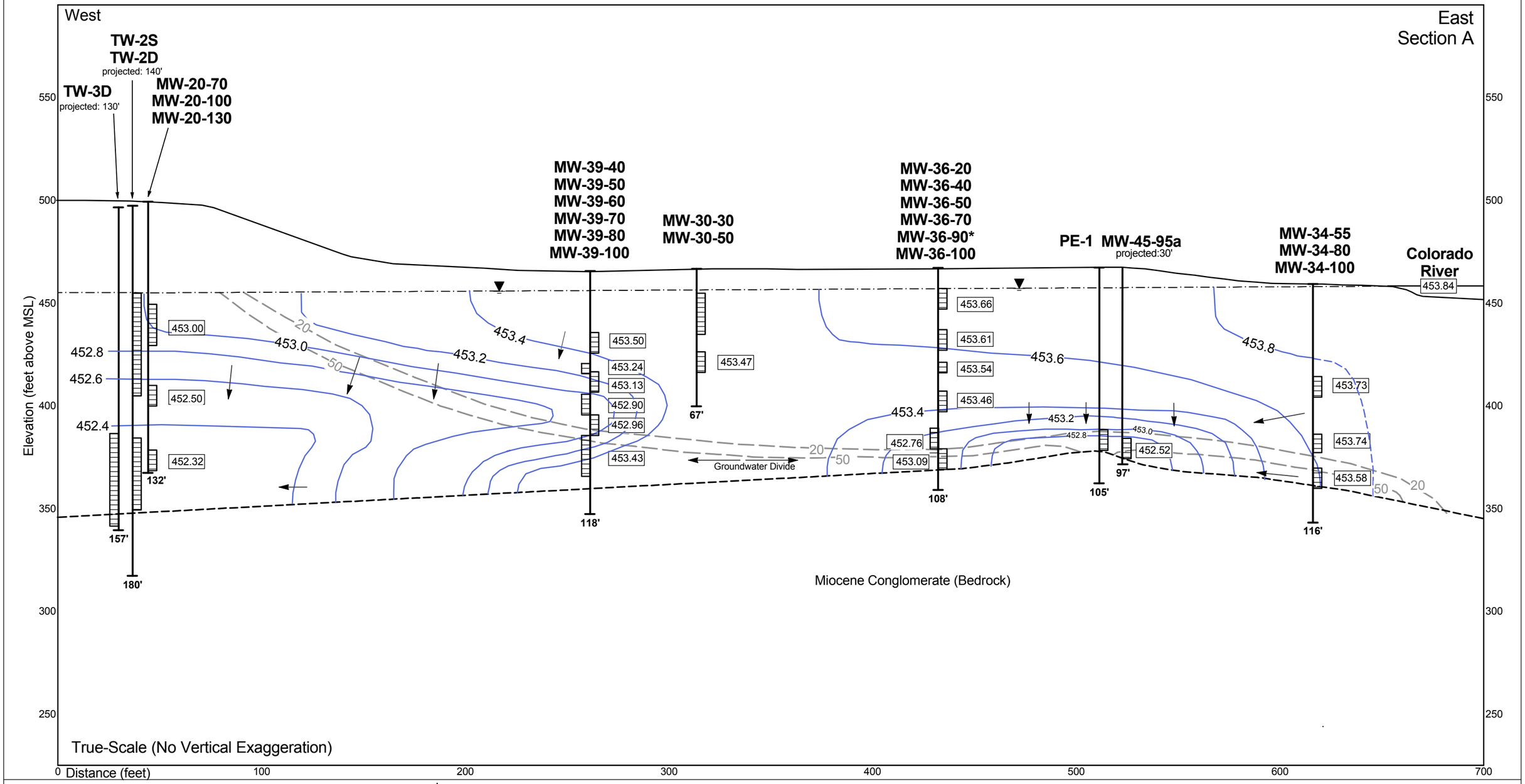


FIGURE 2-4c
AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, NOVEMBER 2009 THROUGH JANUARY 2010

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNA

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Notes:
Results show average groundwater elevations for November 1, 2009 through January 31, 2010 measured with transducers at 30-minute intervals.

Groundwater elevations adjusted for salinity and temperature.
Well MW-36-90* is excluded from contouring.
River elevation (R-20) is the calculated average river level based upon the river gradient between RRB and I-3.

Legend:

MW-30-50 — Inferred water table

well screen

455.23 — Monthly average groundwater head (ft AMSL)

103 — boring depth (feet)

20 — Inferred hexavalent chromium contour (ppb) from September 2009 sampling.

453.5 — Groundwater head contour

453.5 — Inferred groundwater head contour

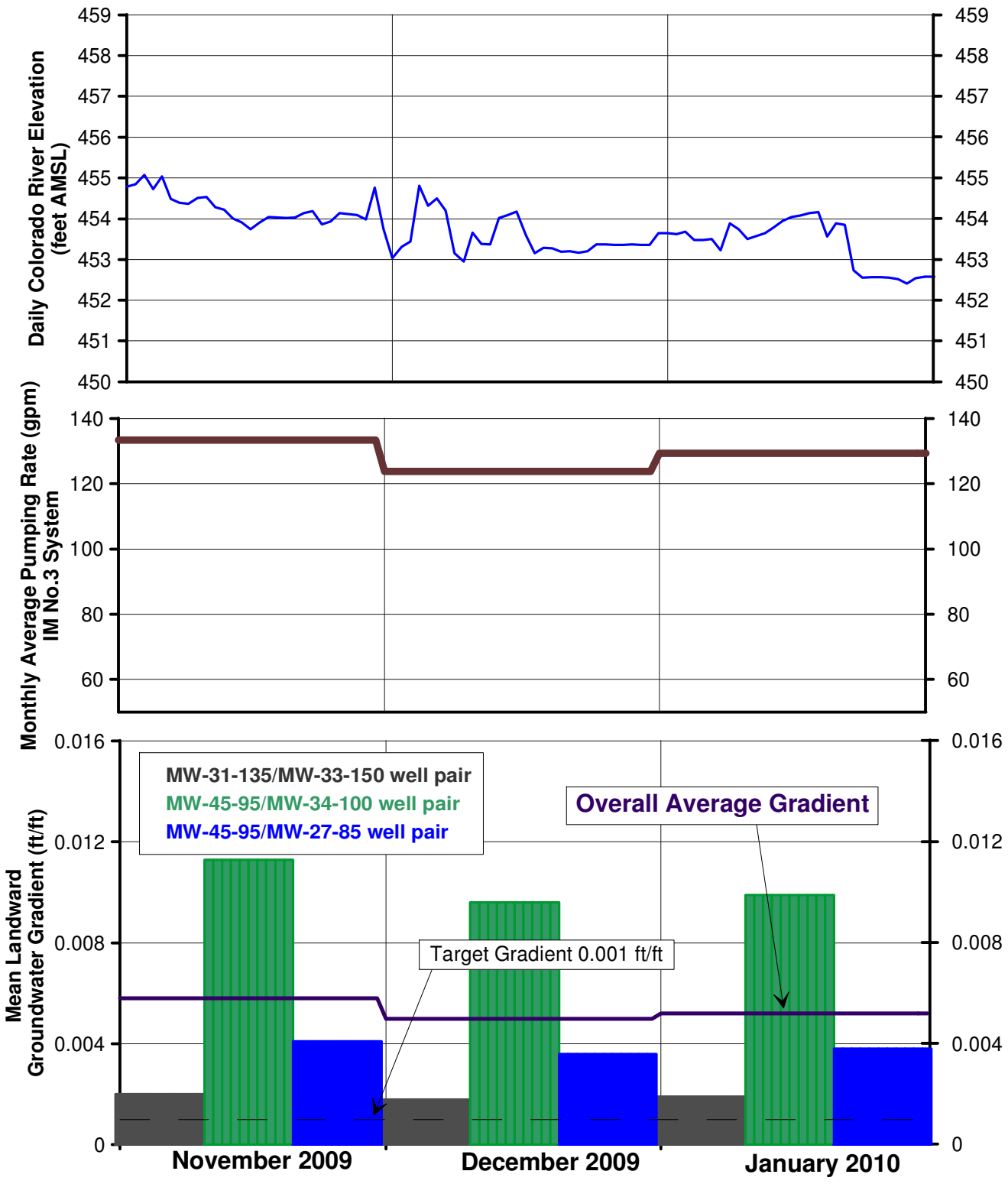
Interpreted groundwater flow direction

FIGURE 2-5
AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A NOVEMBER 2009 THROUGH JANUARY 2010

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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C:\DOCUMENTS AND SETTINGS\CHALL6\MY DOCUMENTS\GINT\ANNUAL_2009\FIGURE_2-5_XSECA_GW.GDW;

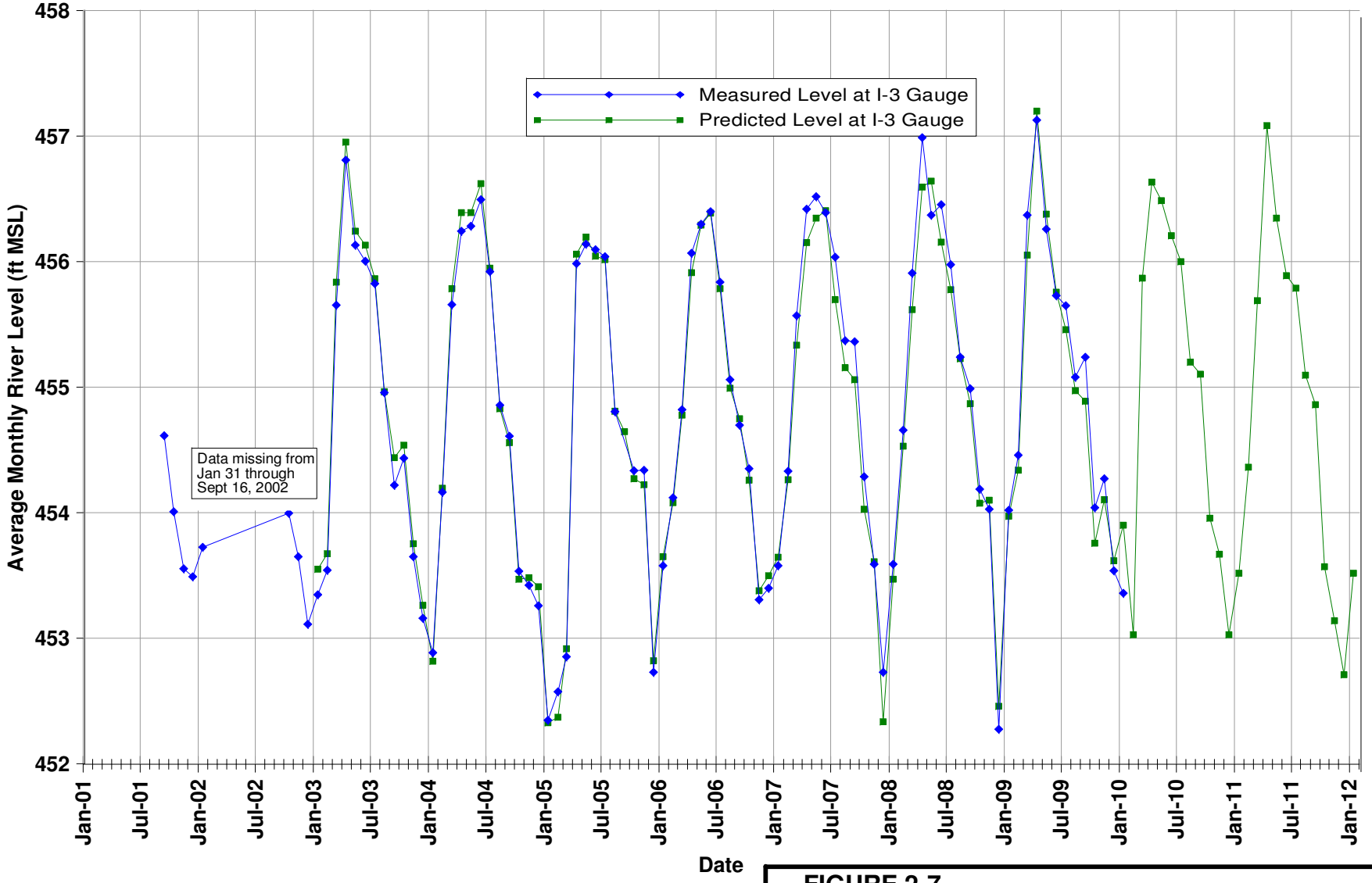


Notes:

1) For IM pumping, the target landward gradient is 0.001 feet/foot.
2) Refer to Table 2-1 and Section 2.1.2 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 2-4 and Section 2.1.6 for discussion of gradient data.

FIGURE 2-6
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION AND PUMPING RATE NOVEMBER 2009 THROUGH JANUARY 2010
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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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 February 2010 USBR projections. These data are reported monthly by the US Department of Interior, at http://www.usbr.gov/lc/region/g4000/24mo.pdf

FIGURE 2-7
PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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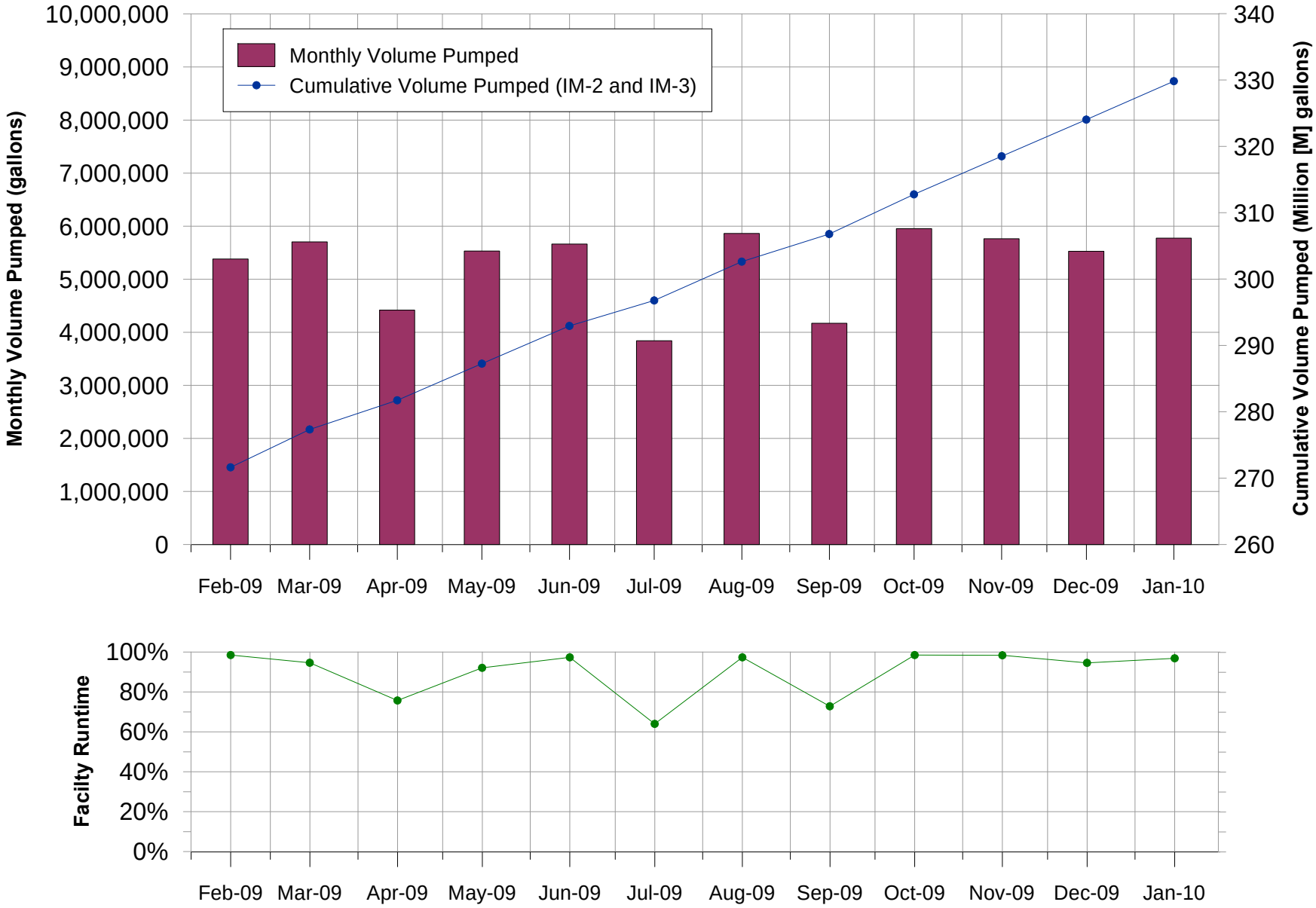
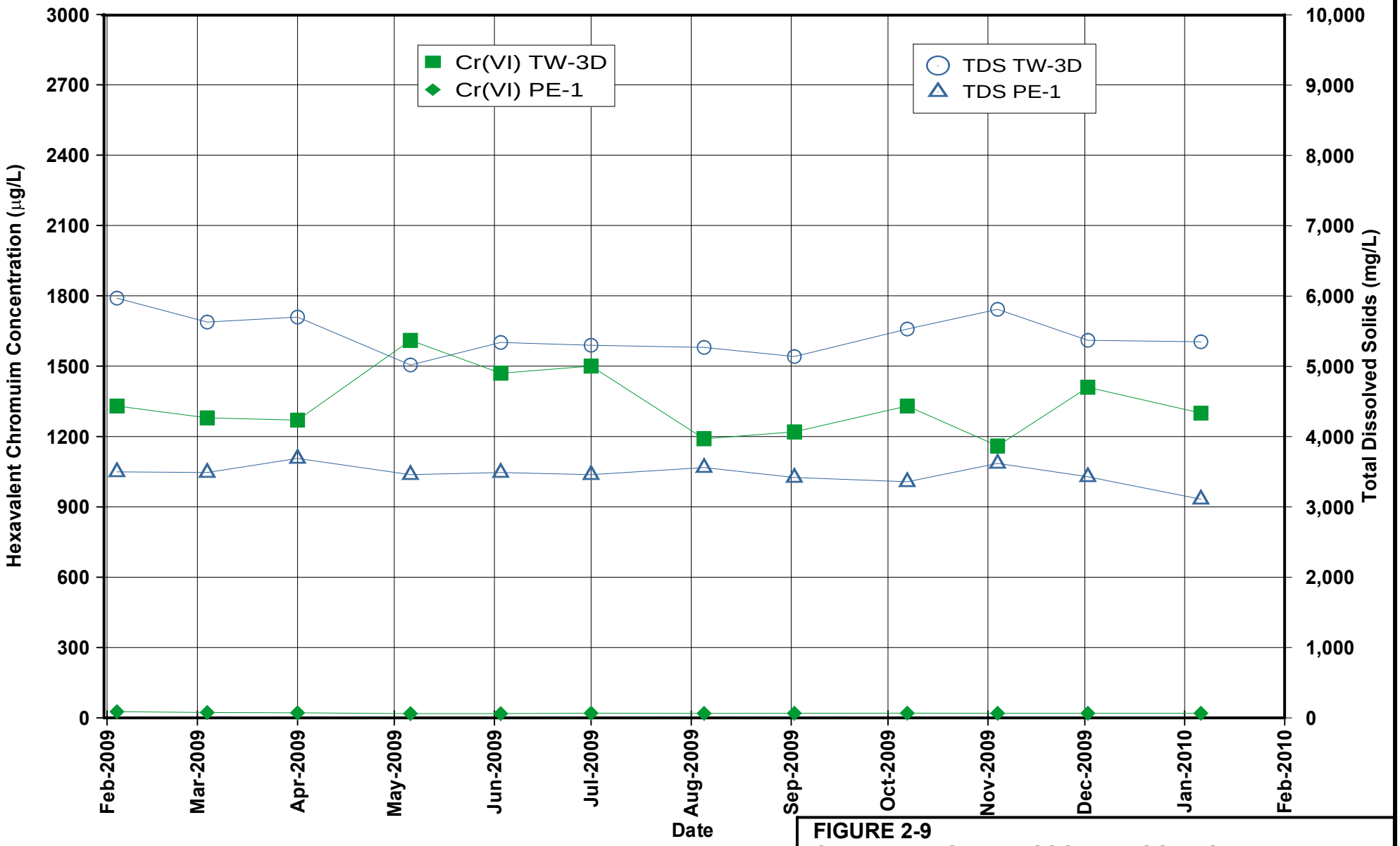


FIGURE 2-8
MONTHLY COMBINED PUMPING VOLUMES AND PERCENT UPTIME, 2009 REPORTING PERIOD
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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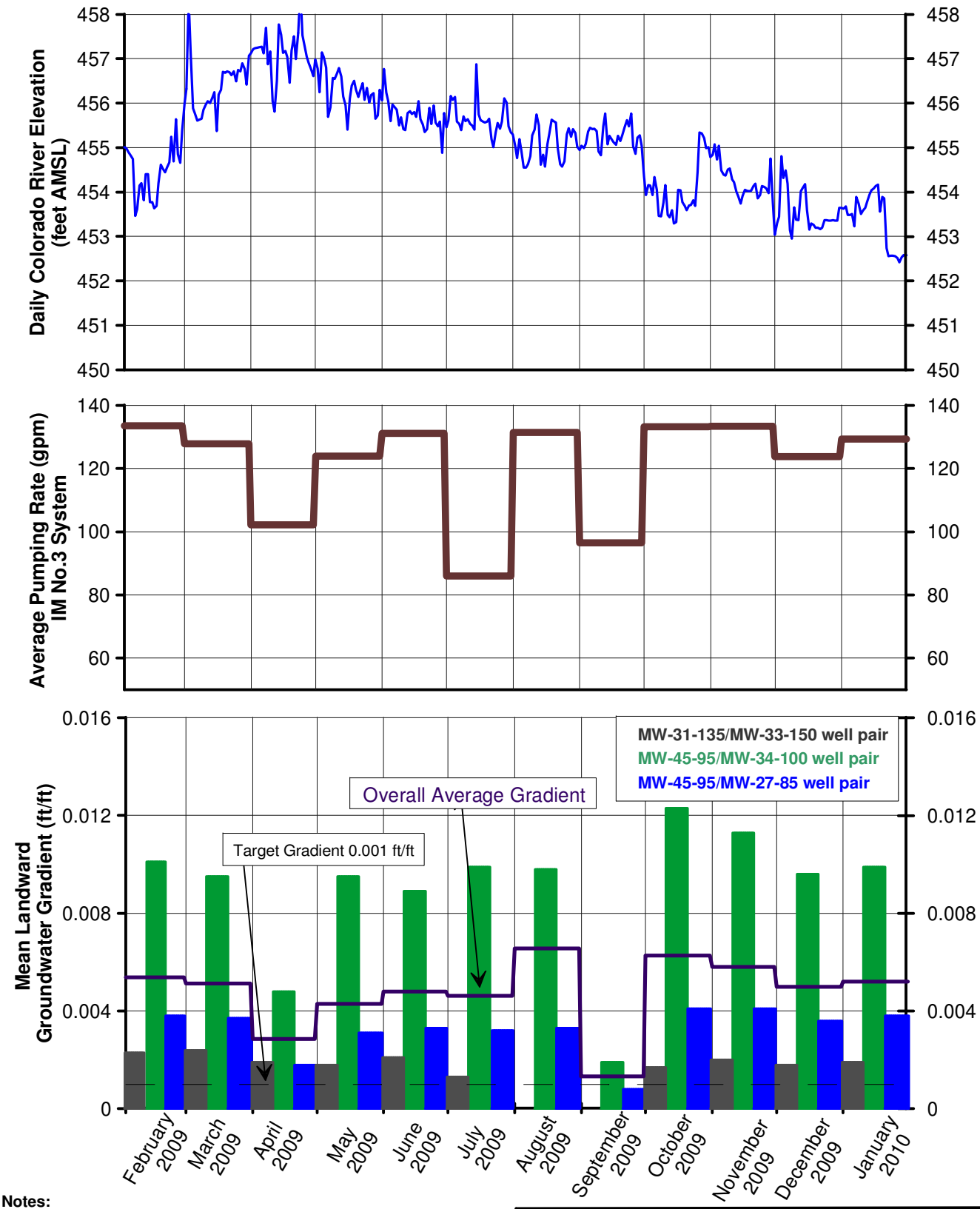
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Notes:
TW-3D pumping began on 20-Dec-05.
TW-3D average extraction rate during 2009 was 96.82 gpm.
PE-1 pumping began on 26-Jan-06.
PE-01 average extraction rate during 2009 was 24.18 gpm.

FIGURE 2-9
Cr(VI) AND TOTAL DISSOLVED SOLIDS CONCENTRATIONS IN EXTRACTION WELLS TW-3D AND PE-1, 2009 REPORTING PERIOD
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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Notes:

1) For IM pumping, the target landward gradient is 0.001 feet/foot.
2) Refer to Table 2-6 and Section 2.2.1 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 2-8 and Section 2.3.2 for discussion of gradient data.
5) No gradient was calculated at pair MW-31-135/ MW-33-150 during August and September due to less than 75% of data available due to rejection or field equipment malfunction.

FIGURE 2-10
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION AND PUMPING RATE
2009 REPORTING PERIOD
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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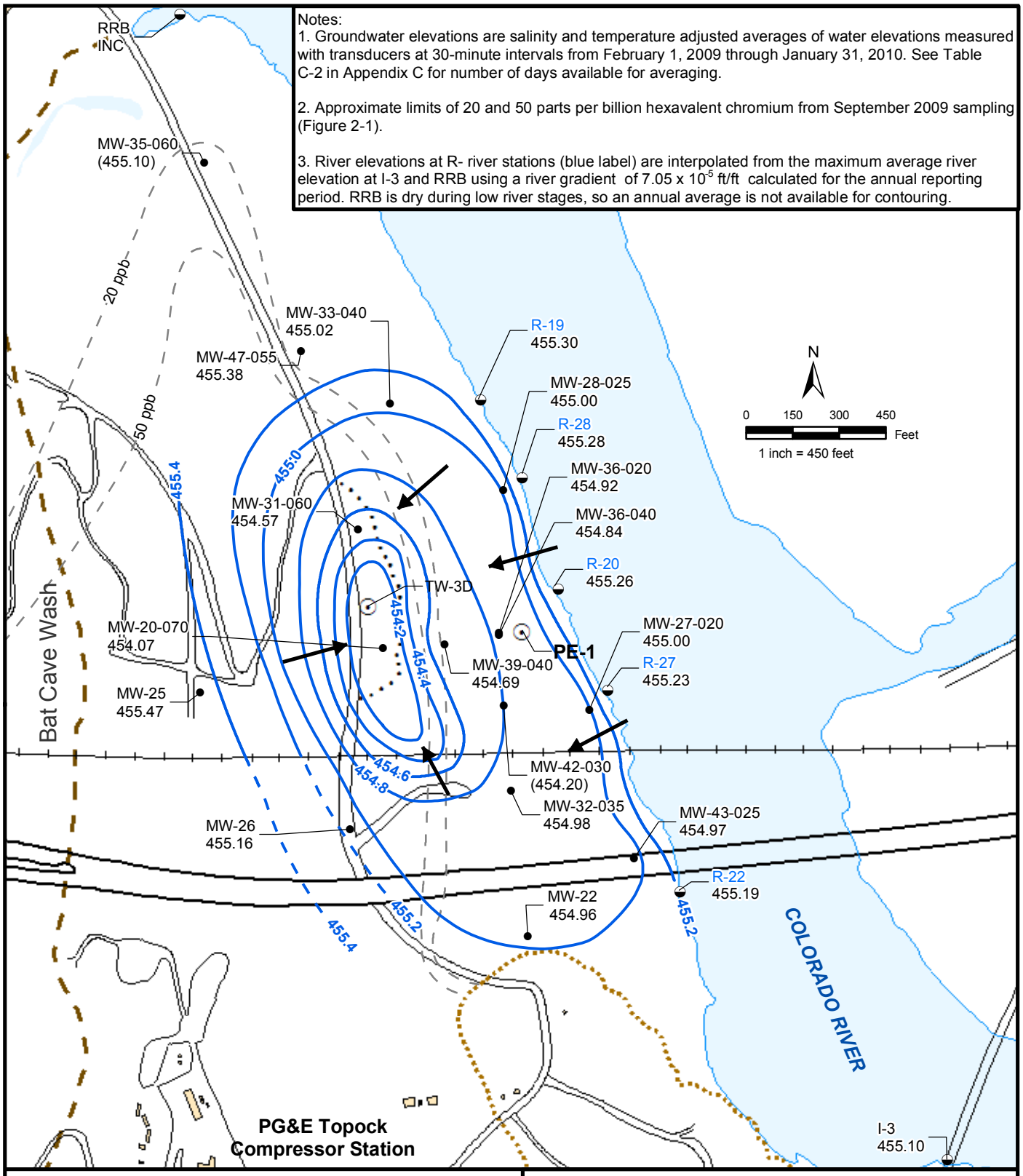


FIGURE 2-11a
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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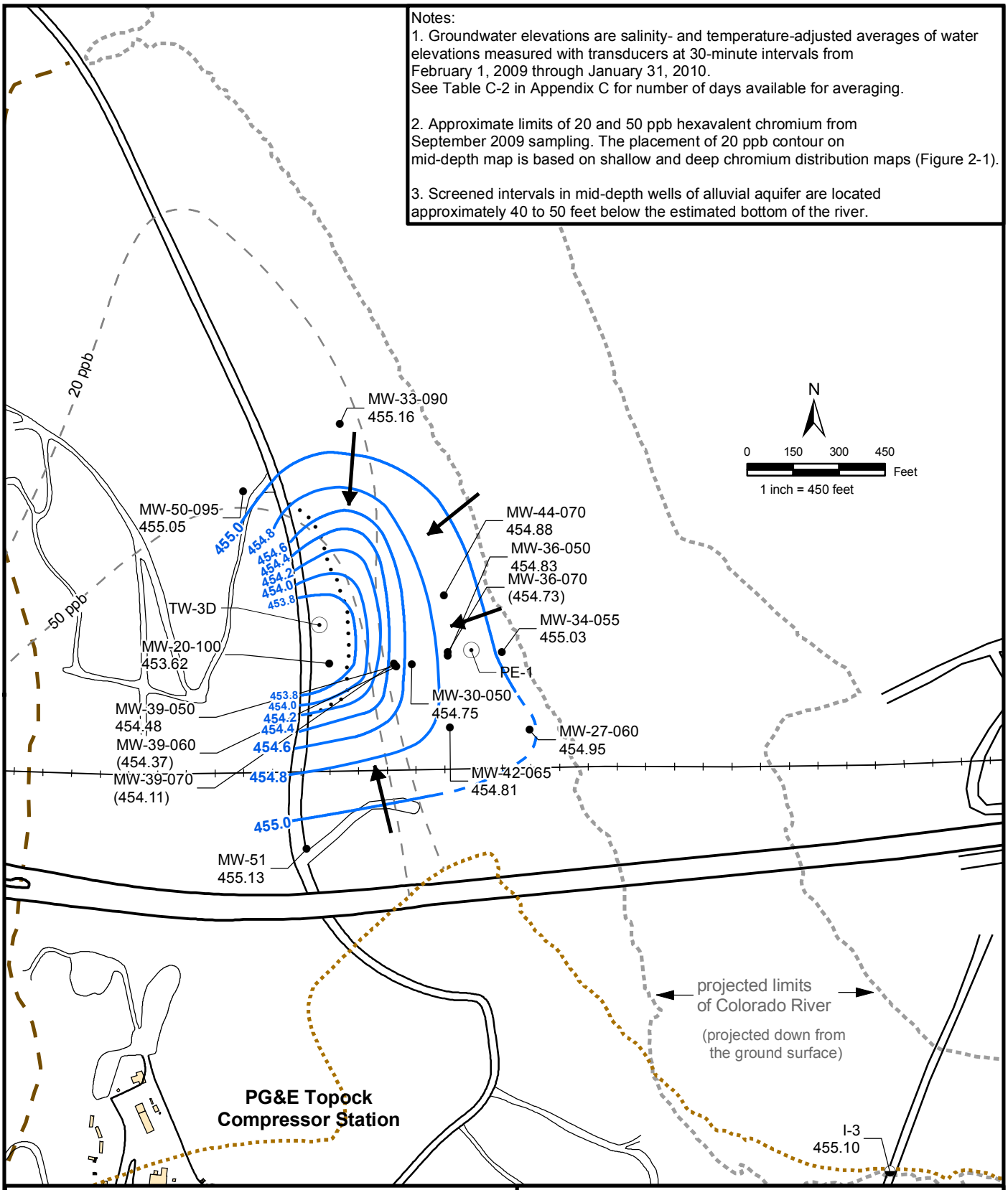


FIGURE 2-11b
AVERAGE GROUNDWATER ELEVATIONS MID-DEPTH WELLS 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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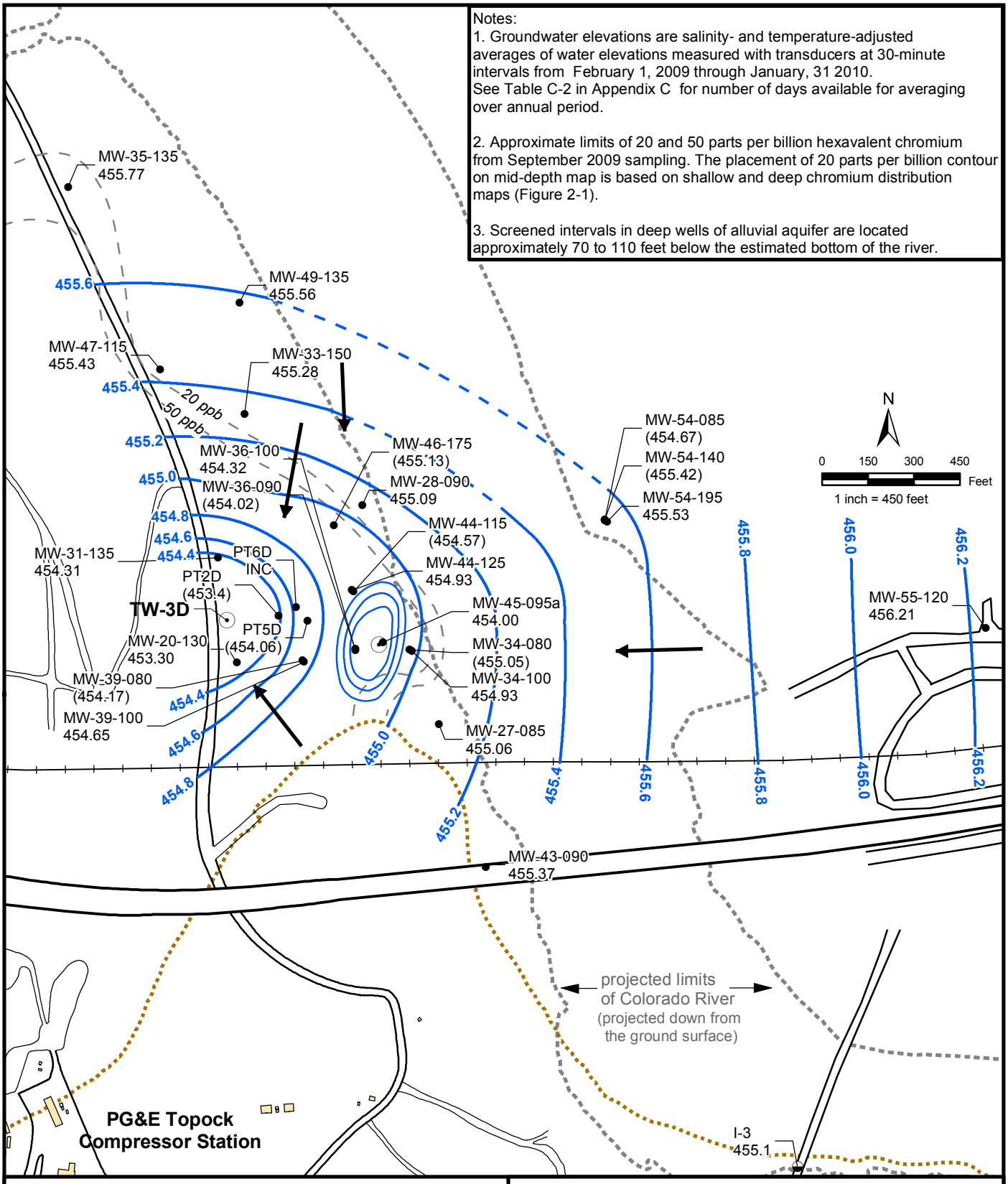


FIGURE 2-11c
AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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West

East
Section A

TW-2S
TW-2D
projected: 140'

TW-3D
projected: 130'

MW-20-70
MW-20-100
MW-20-130

MW-39-40
MW-39-50
MW-39-60
MW-39-70
MW-39-80
MW-39-100

MW-30-30
MW-30-50

MW-36-20
MW-36-40
MW-36-50
MW-36-70
MW-36-90*
MW-36-100

PE-1

MW-45-95
projected:30'

MW-34-55
MW-34-80
MW-34-100

Colorado River
455.26

Elevation (feet above MSL)

550
500
450
400
350
300
250

454.07
453.62
453.30
454.69
454.48
454.37
454.11
454.17
454.65
454.75
454.92
454.84
454.83
454.73
454.02
454.32
454.02
455.03
455.05
454.96

454.0
453.8
453.6
453.4
454.2
454.4
454.6
454.8
455.0
455.2
20
50

132'
157'
180'
118'
67'
108'
105'
97'
116'

Groundwater Divide

Miocene Conglomerate (Bedrock)

True-Scale (No Vertical Exaggeration)

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

Notes:
Results show average groundwater elevations for February 1, 2009 through January 31, 2010 measured with transducers at 30-minute intervals.

Groundwater elevations adjusted for salinity and temperature.
Well MW-36-90* is excluded from contouring.
River elevation (R-20) is the calculated average river level based upon the river gradient between RRB and I-3.

Legend:

MW-30-50
Inferred water table
well screen
455.23 Annual average groundwater head (ft AMSL)
103 boring depth (feet)

20 Inferred hexavalent chromium contour (ppb) from September 2009 sampling.

453.5 Groundwater head contour

453.5 Inferred groundwater head contour

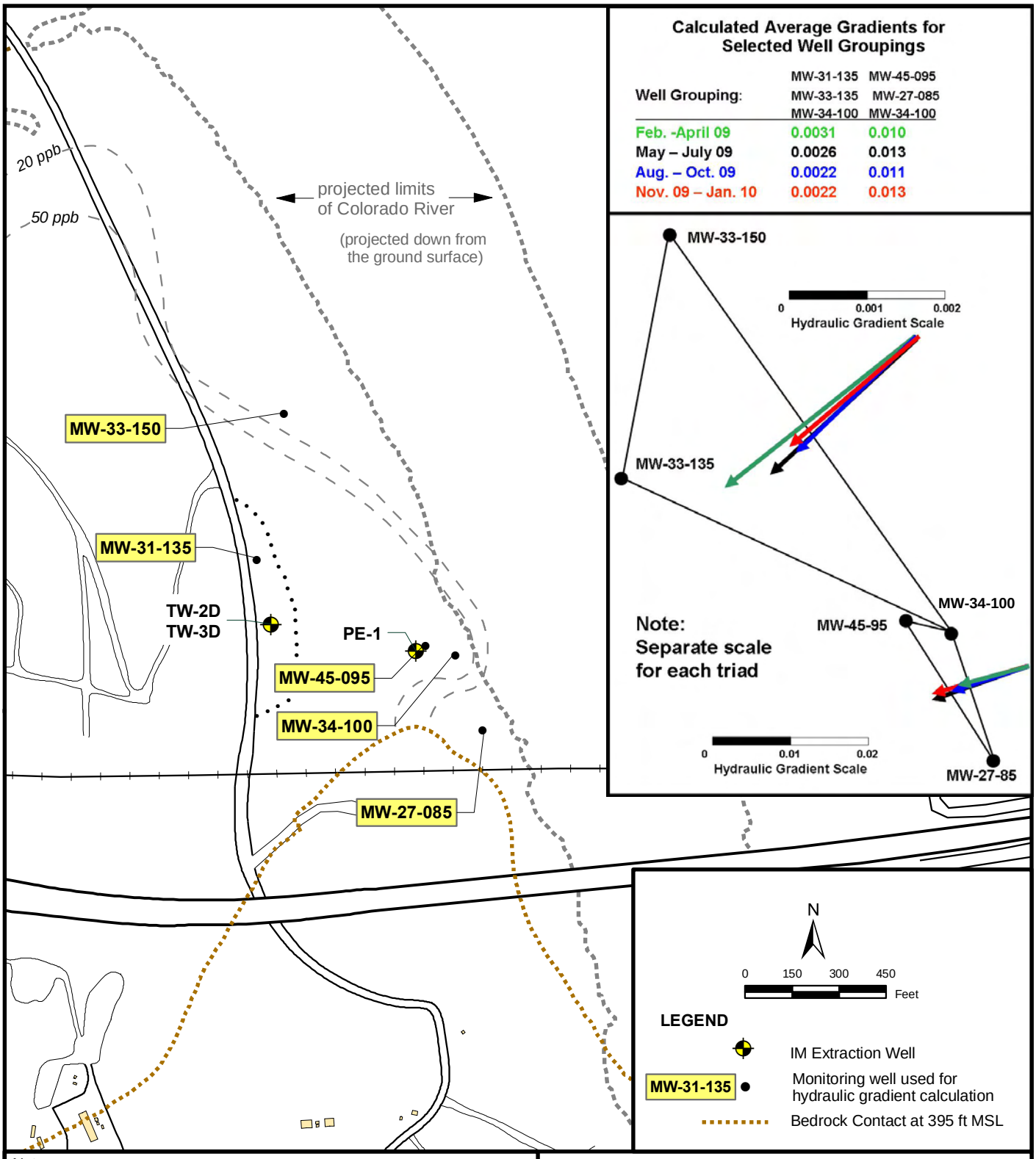
Interpreted groundwater flow direction

FIGURE 2-12
AVERAGE GROUNDWATER ELEVATIONS FOR WELLS ON FLOODPLAIN CROSS-SECTION A, 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
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C:\DOCUMENTS AND SETTINGS\CHALL6\MY DOCUMENTS\GINT\ANNUAL_2009\FIGURE_2-12_XSECA_GW.GDW;



Notes:

1. Direction and magnitude of hydraulic gradient for each well triad (MW-45-095, MW-33-150, MW-31-135 and MW-45-095, MW-34-100, MW-27-085) were calculated using triangulation with linear interpretation and average head values for each quaterly reporting period.

2. Data incomplete for wells MW-31-135 (missing 22 days) and MW-33-150 (missing 24 days) during the Third Quarter 2009.

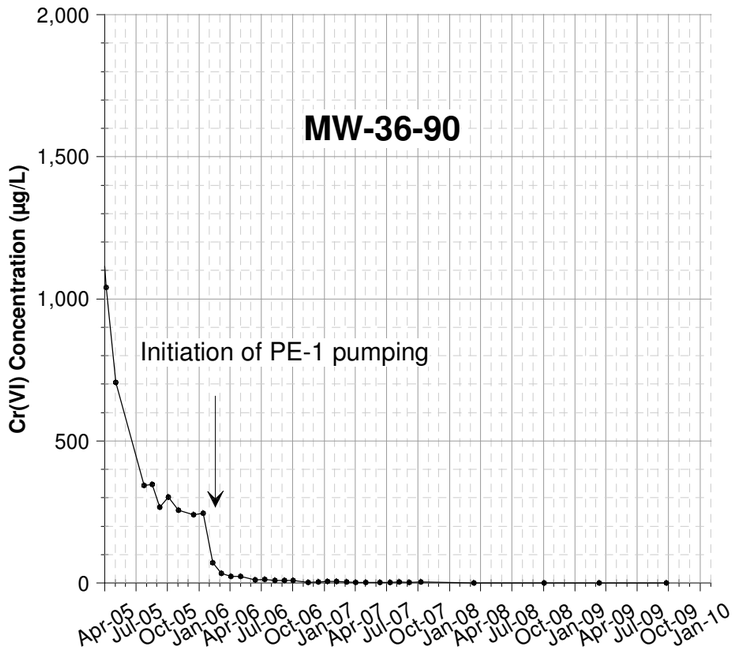
2. Approximate limits of 20 and 50 ppb hexavalent chromium from September 2009 sampling.

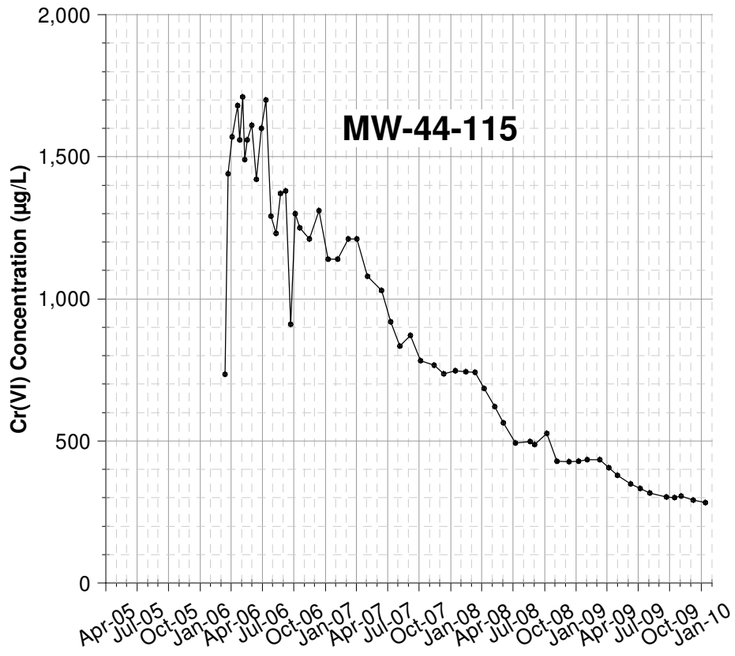
3. Screened intervals in deep wells of alluvial aquifer are located approximately 80 to 90 feet below the estimated bottom of the river

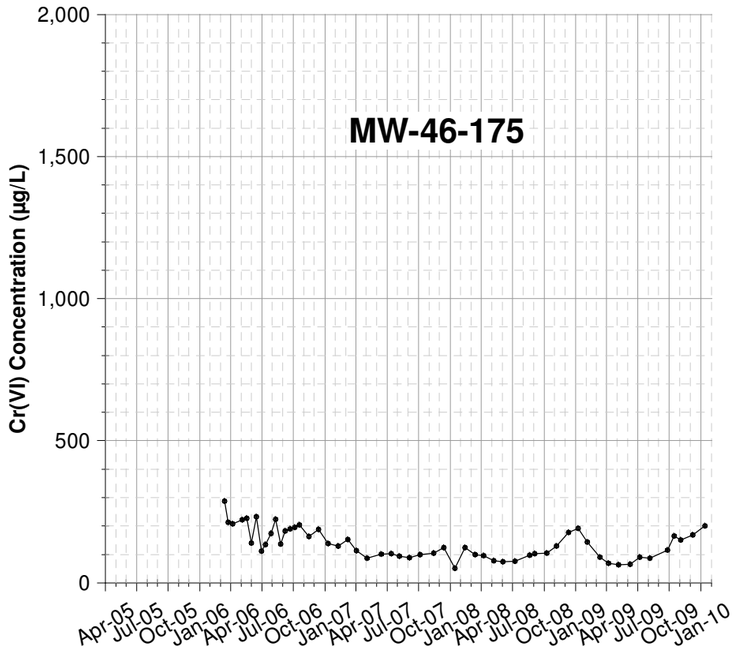
FIGURE 2-13
MAGNITUDE AND DIRECTION OF HYDRAULIC GRADIENTS IN LOWER DEPTH INTERVAL DURING 2009 ANNUAL PERIOD

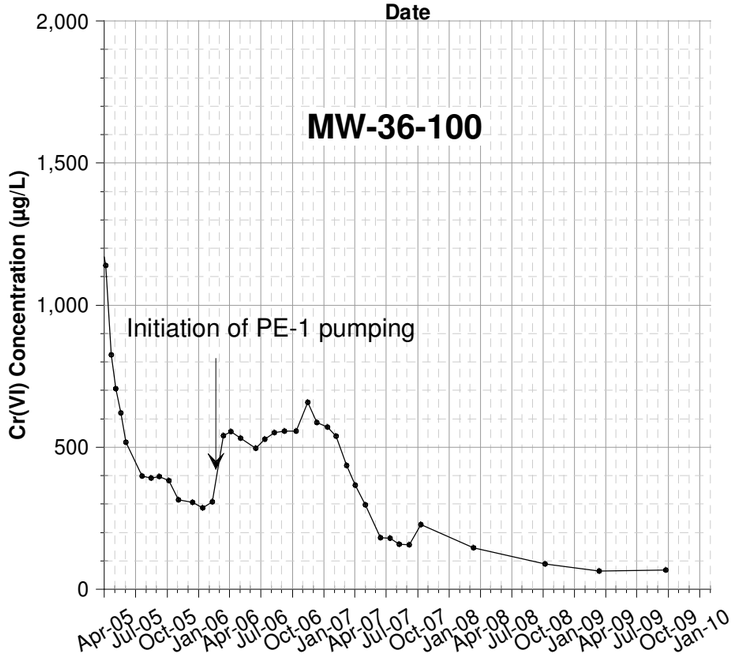
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNA

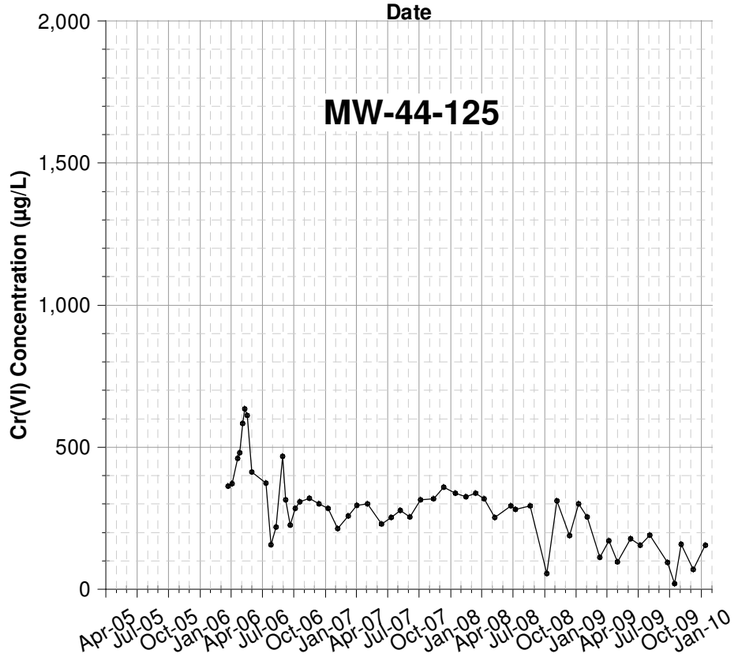
CH2MHILL

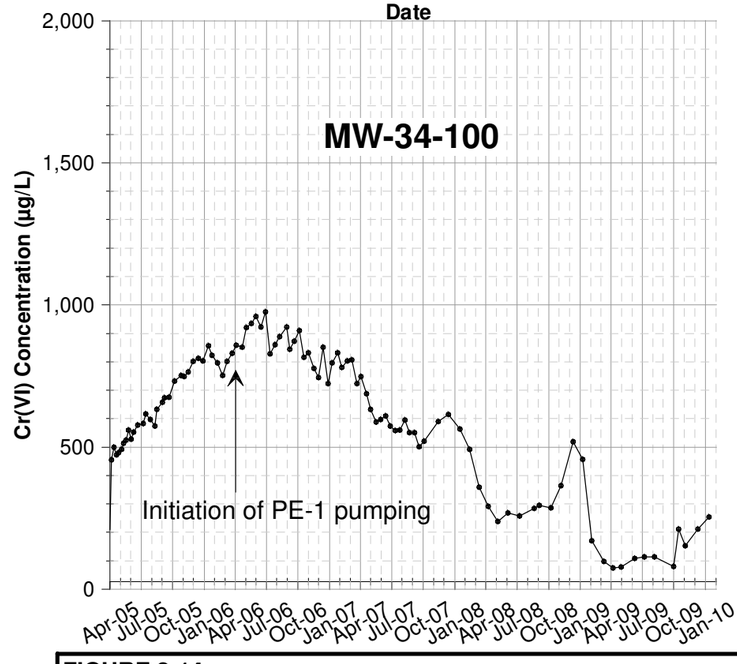










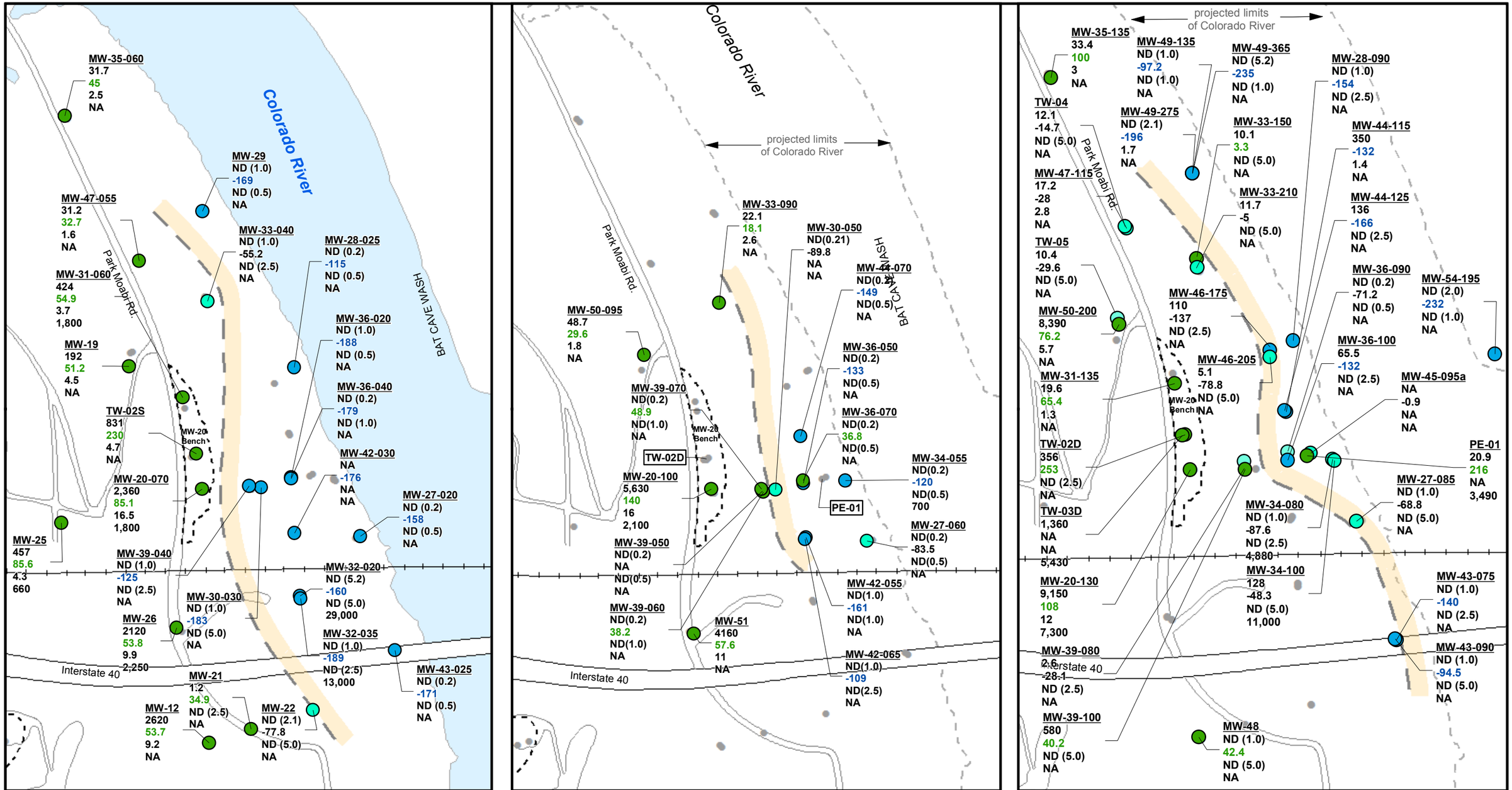


Notes
1. Hexavalent chromium [Cr(VI)] results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Results plotted are maximum concentrations from primary and duplicate samples; see Table 2-2 for complete results.
3. MW-36 wells selected to monitor effects of PE-1 pumping on plume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

FIGURE 2-14
Cr(VI) CONCENTRATION TRENDS IN SELECTED PERFORMANCE MONITORING WELLS, APRIL 2005 THROUGH JANUARY 2010
FOURTH QUARTER 2009 AND ANNUAL 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

- Groundwater ORP < -90 mV
- Groundwater ORP > -90 mV < 1 mV
- Groundwater ORP > 1 mV

Notes:
ND = not detected at listed reporting limit
NA = data not collected during reporting period

MW-22
ND (1.0)
-115.0
ND (4)
NA

Average Groundwater Results From February 2009- January 2010 Sampling
Hexavalent chromium, micrograms per liter (µg/L)
Oxidation reduction potential (ORP), millivolts (mV)
Nitrate as N, milligrams per liter (mg/L)
Total Dissolved Solids (TDS), milligrams per liter (mg/L)

ORP values less than -90mV highlighted blue. Positive ORP values highlighted green.

Approximate limit of reducing groundwater (ORP less than -90mV)

N

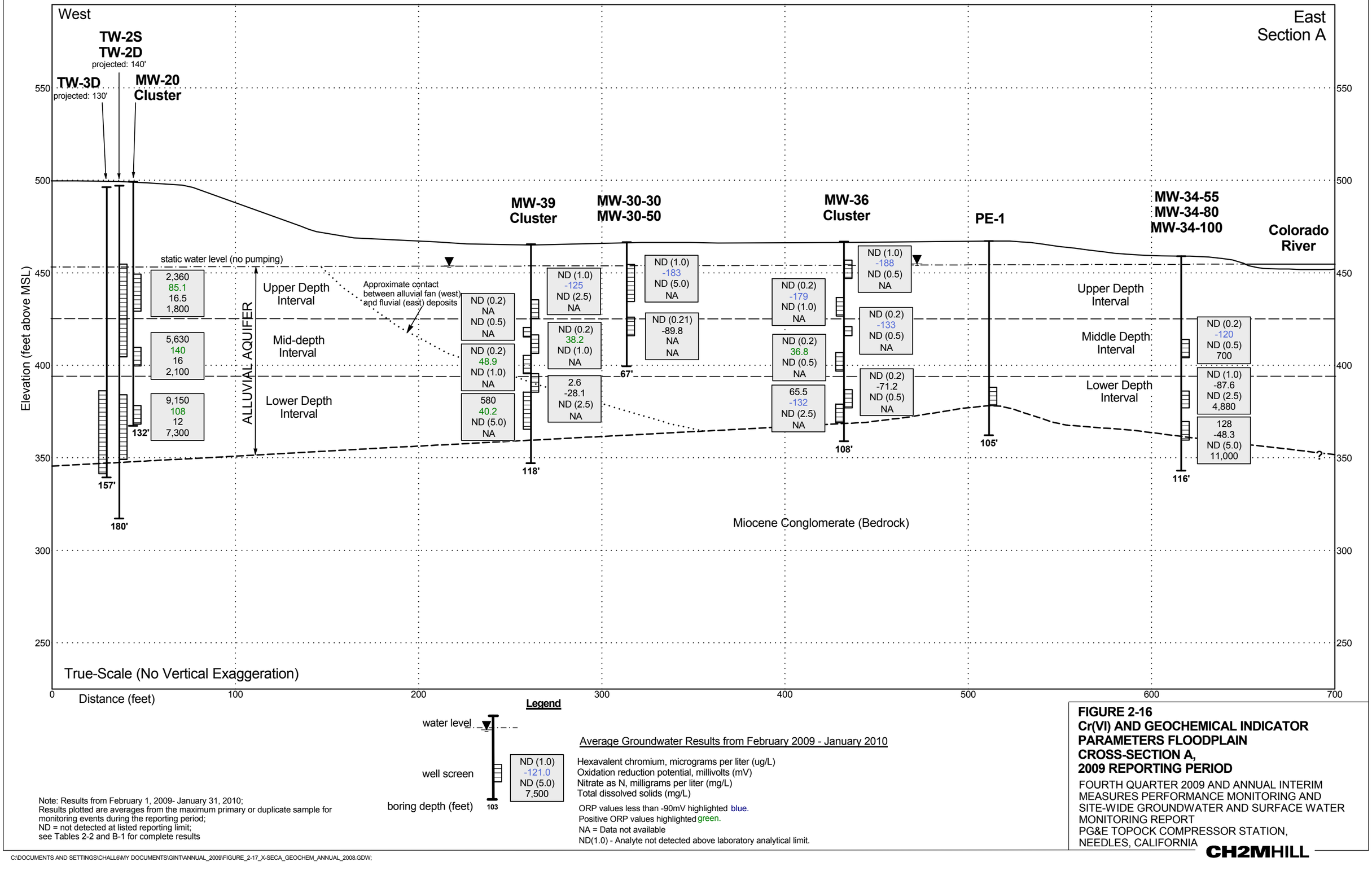
0 400 800 Feet

FIGURE 2-15
DISTRIBUTION OF Cr(VI) AND GEOCHEMICAL INDICATOR PARAMETERS IN FLOODPLAIN WELLS, 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL 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

water level

well screen

boring depth (feet) 103

ND (1.0)
-121.0
ND (5.0)
7,500

Average Groundwater Results from February 2009 - January 2010

Hexavalent chromium, micrograms per liter (ug/L)
Oxidation reduction potential, millivolts (mV)
Nitrate as N, milligrams per liter (mg/L)
Total dissolved solids (mg/L)

ORP values less than -90mV highlighted blue.
Positive ORP values highlighted green.
NA = Data not available
ND(1.0) - Analyte not detected above laboratory analytical limit.

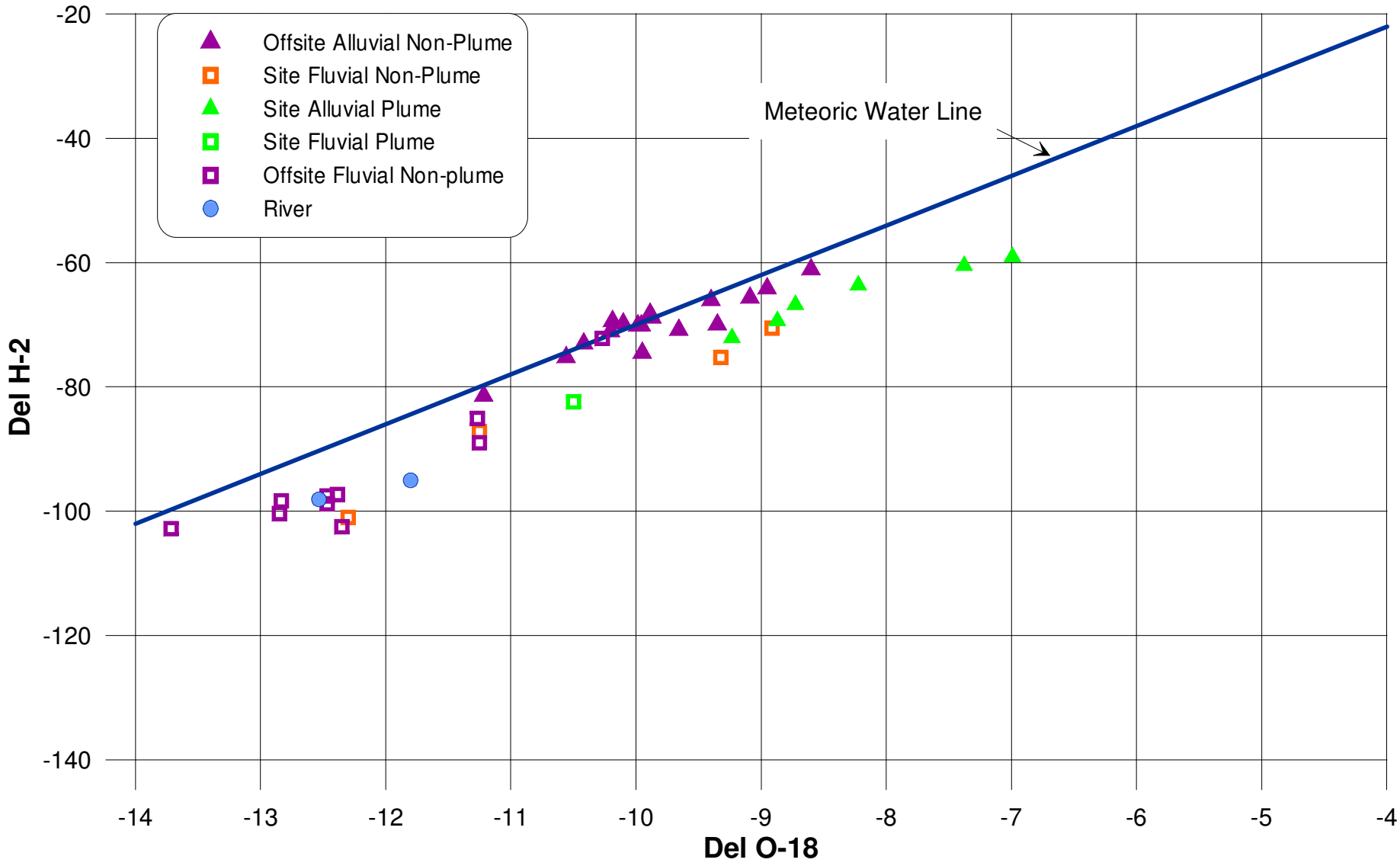
Note: Results from February 1, 2009- January 31, 2010;
Results plotted are averages from the maximum primary or duplicate sample for monitoring events during the reporting period;
ND = not detected at listed reporting limit;
see Tables 2-2 and B-1 for complete results

FIGURE 2-16
Cr(VI) AND GEOCHEMICAL INDICATOR PARAMETERS FLOODPLAIN CROSS-SECTION A, 2009 REPORTING PERIOD

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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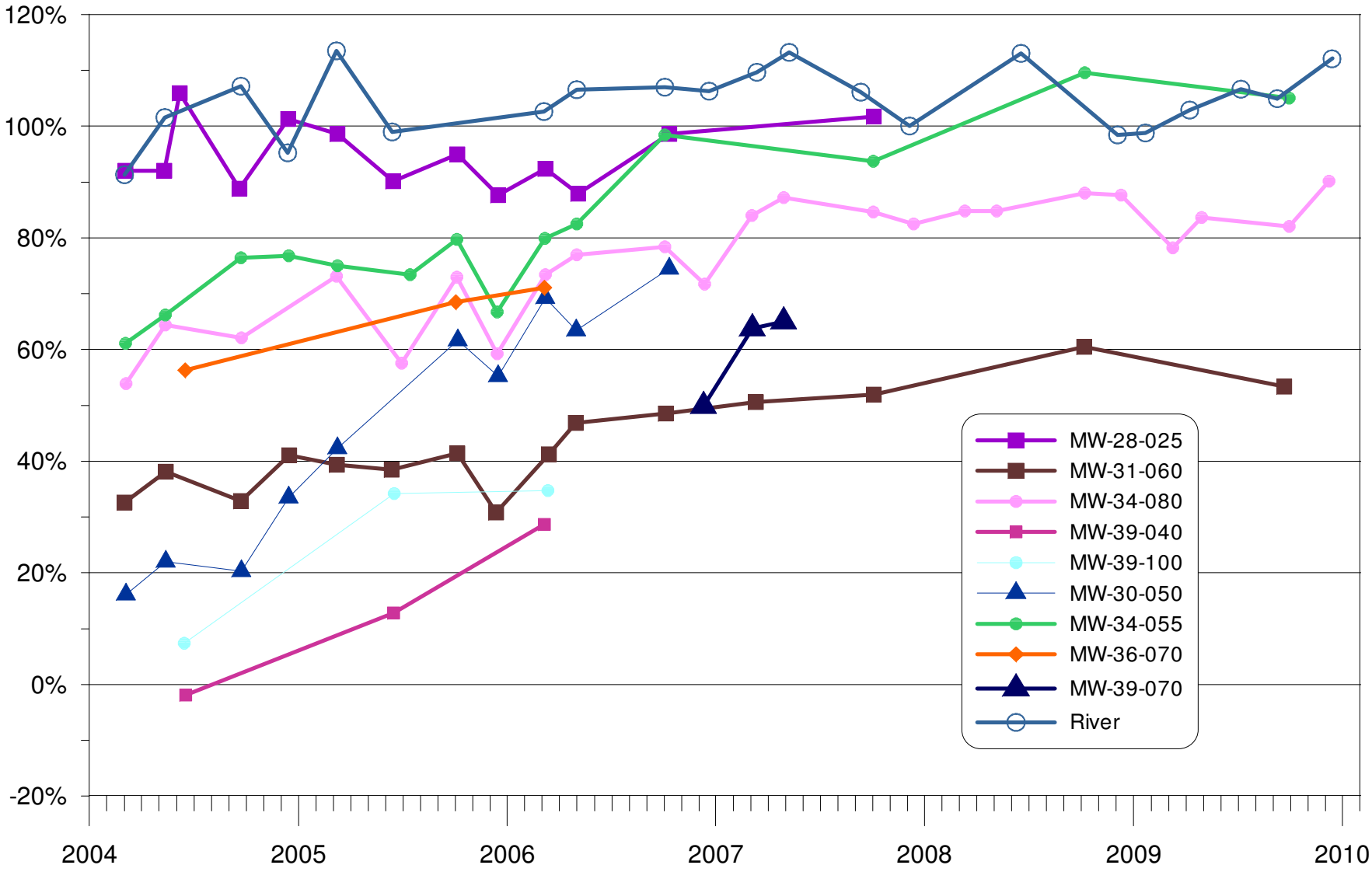
C:\DOCUMENTS AND SETTINGS\CHALL6\MY DOCUMENTS\GINT\ANNUAL_2009\FIGURE_2-17_X-SECA_GEOCHEM_ANNUAL_2008.GDW;



Notes:
This Figure is also presented in Appendix B, Figure B-9 with each well labeled.
Values for PMP wells are averages from the 2009 reporting period.
Values for background wells are cummulative averages from all years.

FIGURE 2-17
AVERAGE STABLE ISTOPES OF OXYGEN AND DEUTERIUM, FEBRUARY 2009 THROUGH JANUARY 2010
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

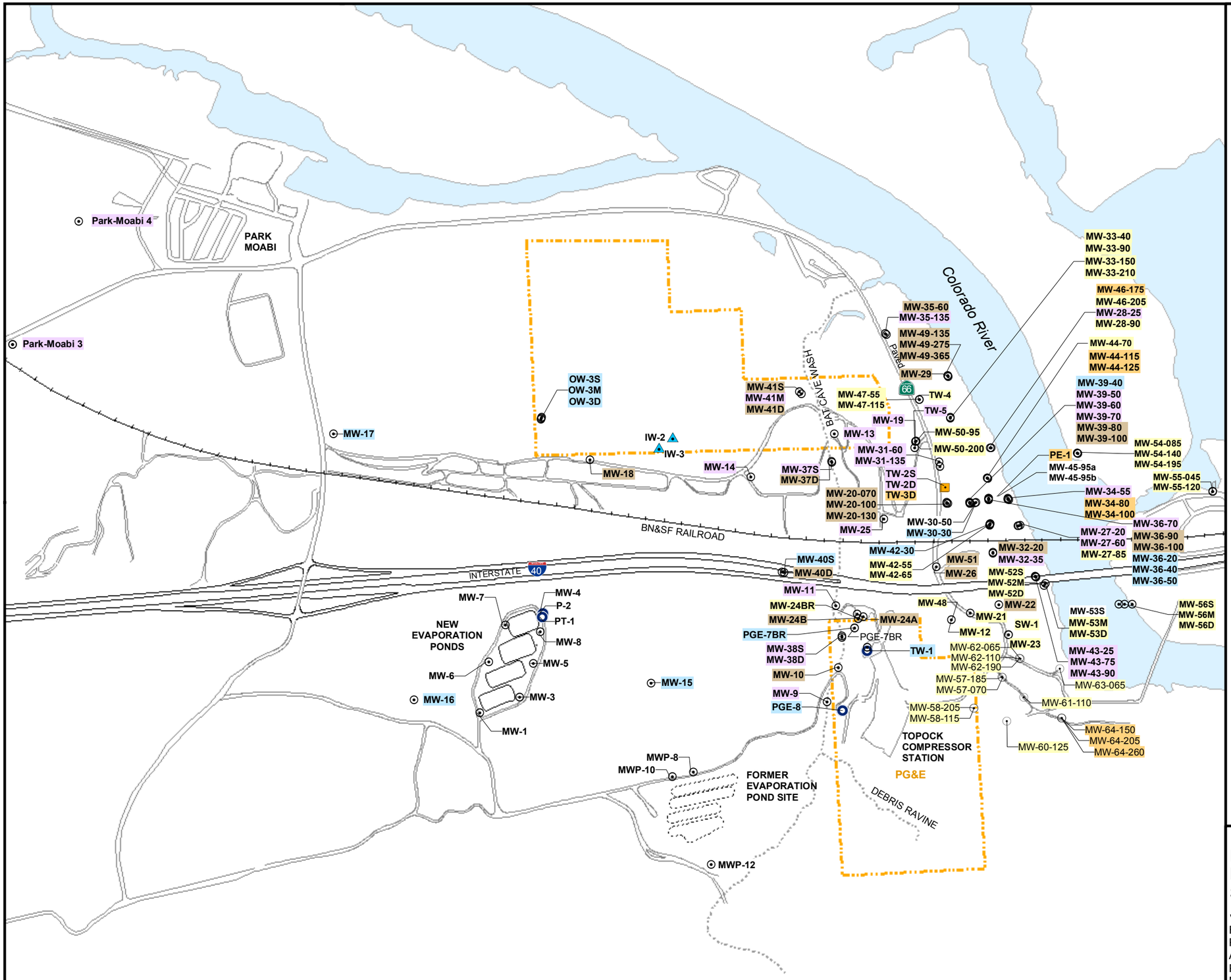
CH2MHILL



NOTES:
Due to a change in sampling frequency in 2006, some wells were not sampled for stable istopes after 2006.

FIGURE 2-18
CALCULATED PERCENTAGE OF RIVER WATER IN SELECT FLOODPLAIN WELLS FROM STABLE ISTOPES
FOURTH QUARTER 2009 AND ANNUAL 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

- Groundwater Monitoring Well
- Test Well or Supply Well (Inactive)
- Extraction Well
- Injection Well
- PG&E Property Boundary

Sampling Frequency for Groundwater Water Monitoring Program (GMP) - January 2010

MW-17	Biennial Sampling
MW-9	Annual Sampling
MW-22	Semiannual Sampling
MW-12	Quarterly Sampling
MW-34-100	Monthly Sampling

N

0 500 1,000 Feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 3-1
MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR GMP, JANUARY 2010

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

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Colorado River

BAT CAVE WASH

BNSF RAILROAD

INTERSTATE 40

NEW EVAPORATION PONDS

FORMER EVAPORATION POND SITE

TOPOCK COMPRESSOR STATION

MW-47-55
53.3

MW-33-40
ND(1.0)

MW-12
2,750

MW-21
ND(1.0)

MW-23-080
21.8

MW-23-060
25.8

MW-56D
ND(2.0)

MW-62-065
219

MW-57-070
84.4

MW-63-065
ND(0.6)

MW-59-100
4,340

MW-61-110
433

MW-64-150
ND(1.0)

MW-60-125
532

32

32

32

LEGEND

Alluvial Aquifer Well Sampled During December 2009 Sampling Event

Bedrock Well Sampled During December 2009 Sampling Event

6.48 Concentration of hexavalent chromium [Cr(VI)] in groundwater, micrograms per liter (µg/L)

Results shown are maximum concentrations in primary and duplicate samples from wells completed in **Shallow zone** of Alluvial Aquifer and Bedrock.

ND (0.2) Cr(VI) not detected at listed reporting limit

Cr(VI) Concentrations - December 2009

Not detected at analytical reporting limit

Concentration between reporting limit and 32 µg/L

Concentration ≥ 32 µg/L

Approximate outline of monitoring wells in Alluvial Aquifer and Bedrock with Cr(VI) concentrations ≥ 32 µg/L based on December 2009 groundwater sampling.

Approximate bedrock contact at 455 ft AMSL elevation

N

0 500 1,000 Feet

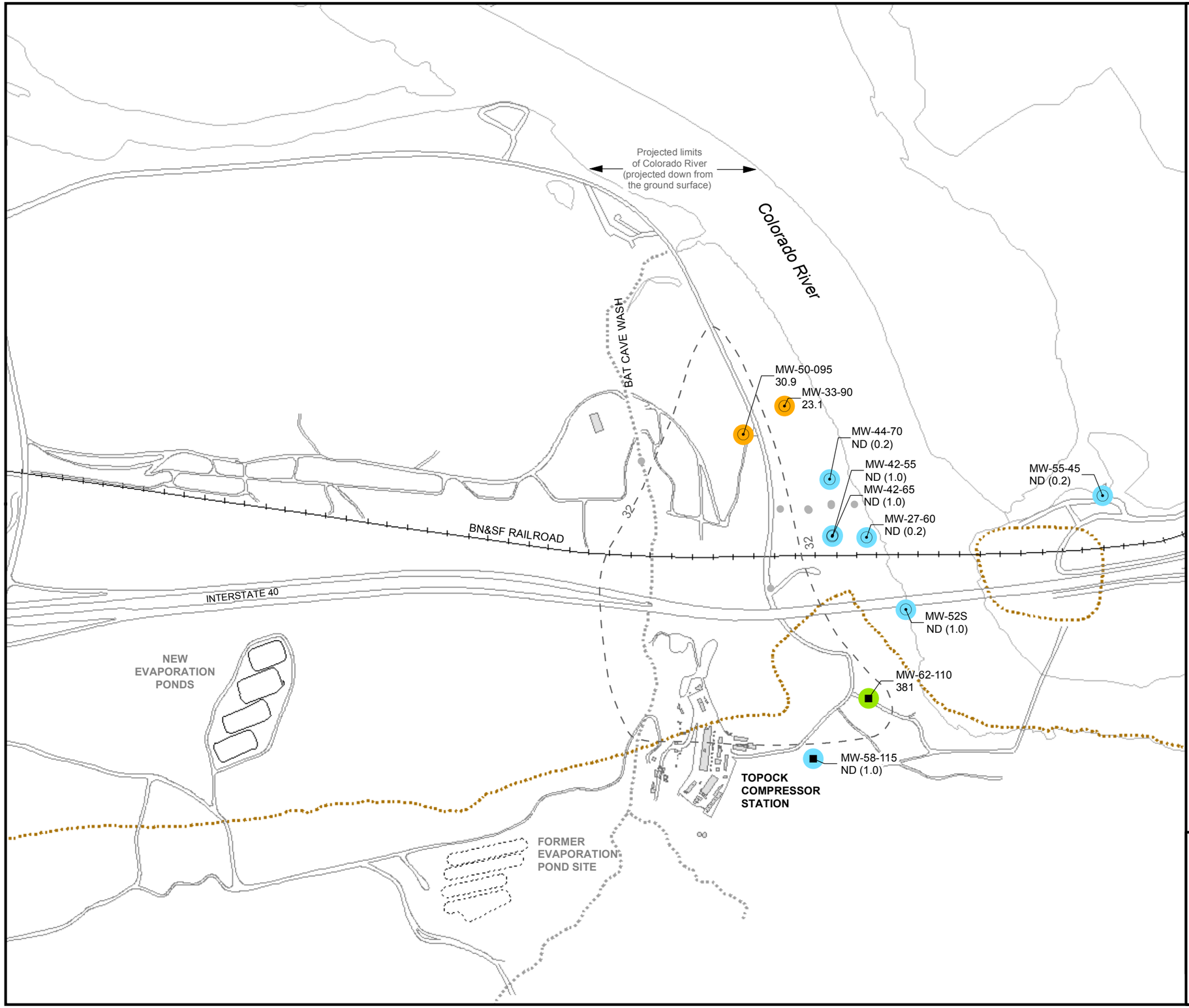
FIGURE 3-2a
Cr(VI) SAMPLING RESULTS, SHALLOW WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2009 MONITORING

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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REGIONAL



LEGEND

- Alluvial Aquifer Well Sampled During December 2009 Sampling Event
- Bedrock Well Sampled During December 2009 Sampling Event

6.48 Concentration of hexavalent chromium [Cr(VI)] in groundwater, micrograms per liter (µg/L)

Results shown are maximum concentrations in primary and duplicate samples from wells completed in **Mid-Depth zone** of Alluvial Aquifer and Bedrock.

ND (0.2) Cr(VI) not detected at listed reporting limit

Cr(VI) Concentrations - December 2009

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

-32- Approximate outline of monitoring wells in Alluvial Aquifer and Bedrock with Cr(VI) concentrations ≥ 32 µg/L based on December 2009 groundwater sampling. Cr(VI) outline is extended east of MW-50-095 due to concentrations greater than greater than 32 ug/L in shallow well MW-47-055 located east of MW-50-095. See Figure 3-2a.

Approximate bedrock contact at 425 ft AMSL elevation

N

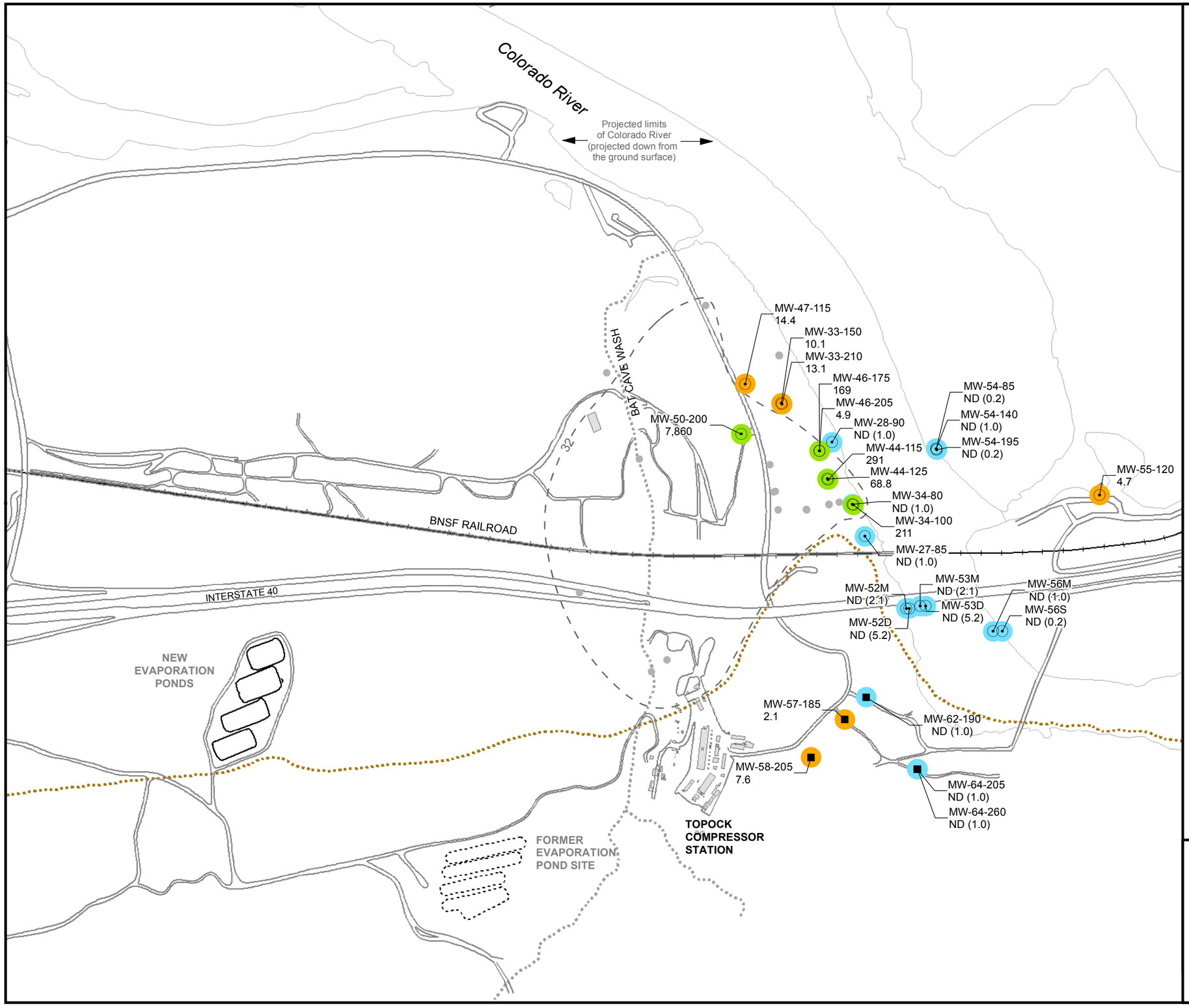
0 500 1,000 Feet

FIGURE 3-2b
Cr(VI) SAMPLING RESULTS
MID-DEPTH WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2009 MONITORING

FOURTH QUARTER 2009 AND ANNUAL 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

- ■ Bedrock Well Sampled During December 2009 Sampling Event
- ⊙ Alluvial Aquifer Well Sampled During December 2009 Sampling Event

6.48 Concentration of hexavalent chromium [Cr(VI)] in groundwater, micrograms per liter (µg/L)

Results shown are maximum concentrations in primary and duplicate samples from wells completed in **Deep zone** of Alluvial Aquifer and Bedrock.

ND (0.2) Cr(VI) not detected at listed reporting limit

Cr(VI) Concentrations - December 2009

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

-32- Approximate outline of monitoring wells in Alluvial Aquifer and Bedrock with Cr(VI) concentrations ≥ 32 µg/L based on December 2009 groundwater sampling.

Approximate bedrock contact at 395 ft MSL elevation

Note:
1.In the floodplain area, the 32 µg/L line for Cr(VI) in deep zone (80-90 feet below Colorado River) 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.

N

0 500 1,000 Feet

FIGURE 3-2c
Cr(VI) SAMPLING RESULTS, DEEP WELLS IN ALLUVIAL AQUIFER AND BEDROCK, 4th QUARTER 2009 MONITORING

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

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PARK
MOABI

Colorado River

N

0 700 1,400
Feet

LEGEND

- Extraction well
- Groundwater monitoring / observation well
- MW-14 456.38 — Well name with water level elevation (ft MSL)
- MW-10 (528.31) — Well name with water level elevation (ft MSL) not used in contouring
- Groundwater Elevation Contour 0.5 ft
- Approximate Bedrock/Alluvial Conctact at 455 ft MSL

Notes:
1. Water level contours for the floodplain area are presented in IM Performance Monitoring Reports.
2. Extraction wells TW-3D and PE-1 are pumping from lower portion of the aquifer.
3. Floodplain well data taken from pressure transducers at the time of manual measurements (approximately 9:00 AM, 9/28/09).
4. Gradients shown on this figure show transient conditions in the aquifer at the time of measurement and may not reflect the expected average groundwater flow directions.

MW-17 457.26
OW-03S 456.91
OW-02S 456.63
OW-01S (457.05)
MW-18 456.89
MW-14 456.43
MW-35-060 455.69
MW-41S 456.01
MW-13 456.08
MW-19 455.26
MW-31-060 455.17
TW-3D
TW-2D
PE-1
MW-20-070 454.73
MW-25 455.7
MW-26 455.37
MW-40S 456.09
MW-11 456.20
MW-24A 456.27
MW-12 455.58
MW-38S (455.44)
MW-10 (456.01)
MW-09 456.39
MW-07 (456.40)
MW-08 457.07
MW-06 457.14
MW-16 457.36
MW-01 (456.60)
MW-15 456.86

457.0
456.5
456.0
455.5
455.0

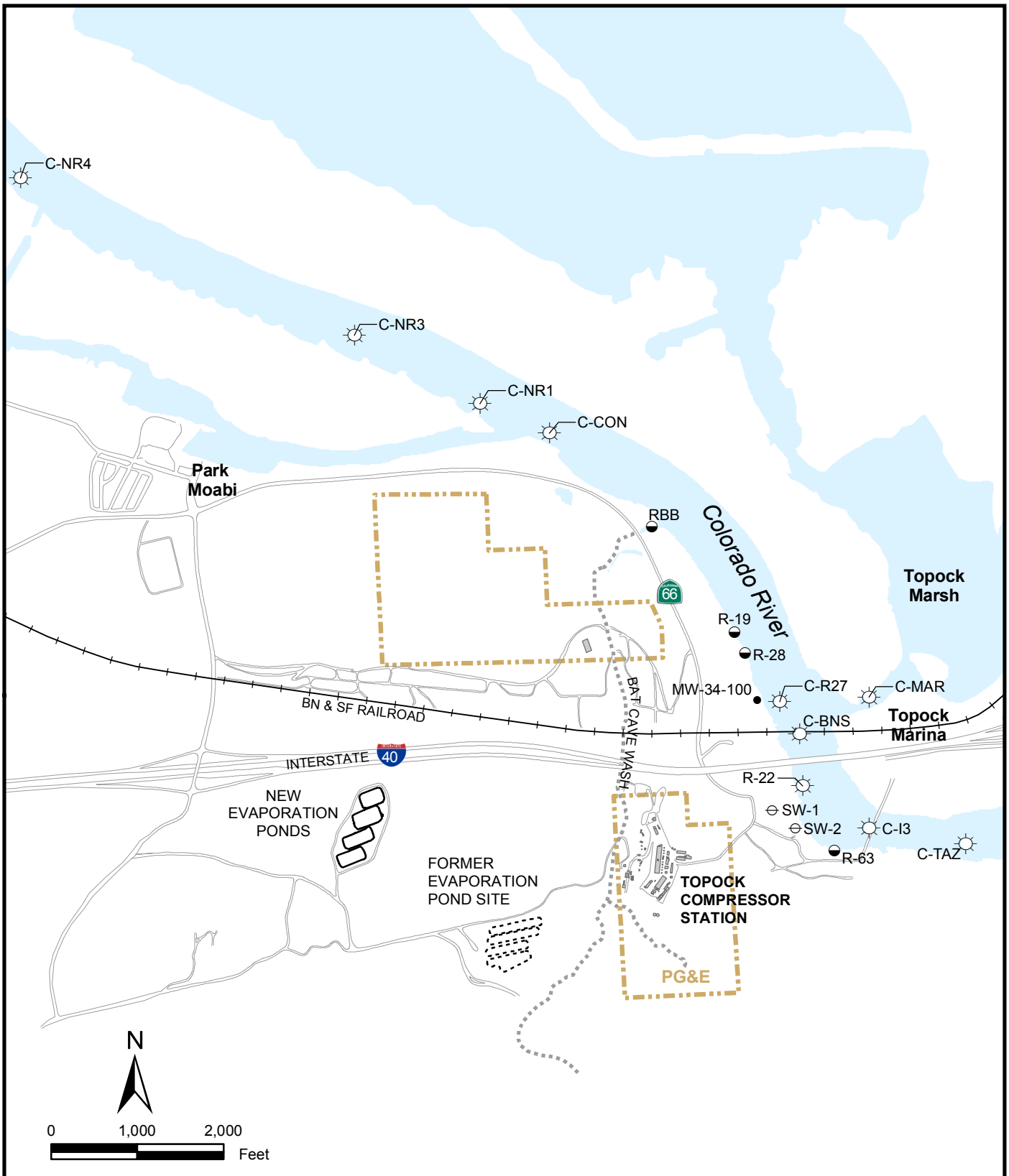
BN & SF RAILROAD
INTERSTATE 40
BAT CAVE WASH
DEBRIS RAVINE
66

NEW EVAPORATION PONDS
FORMER EVAPORATION POND SITE
TOPOCK COMPRESSOR STATION

FIGURE 3-3
GROUNDWATER ELEVATION MAP SHALLOW ZONE OF THE ALLUVIAL AQUIFER (WATER TABLE), SEPTEMBER 28, 2009
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

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LEGEND

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

* Location for SW-2 is approximate. GPS coverage was not available.

FIGURE 3-4
SURFACE WATER MONITORING LOCATIONS, FOURTH QUARTER 2009

FOURTH QUARTER 2009 AND ANNUAL 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
Interim Measure Extraction System Operations Log, November 2009 through January 2010

APPENDIX A

Extraction System Operations Log for November through January 2010, PG&E Topock Interim Measures Performance Monitoring Program

During Fourth Quarter 2009 (November through January), extraction wells TW-3D and PE-1 operated at a target pump rate of at 135 gallons per minute (gpm), excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during Fourth Quarter 2009. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 96.6 percent during Fourth Quarter 2010.

The Interim Measure Number 3 (IM-3) facility treated approximately 17,064,630 gallons of extracted groundwater during Fourth Quarter 2009. The IM-3 facility also treated approximately 4,715 gallons of water generated from the groundwater monitoring program and 27,000 gallons of water from IM-3 injection well development. One container of solids from the IM-3 facility was transported offsite during the reporting period.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 3.4 percent of downtime during Fourth Quarter 2009) are summarized below. The times shown are in Pacific Standard Time to be consistent with other data collected (e.g., water level data) at the site.

A.1 November 2009

- **November 4, 2009 (unplanned):** The extraction well system was offline from 8:38 a.m. to 1:56 p.m. for maintenance on the loop reactor. Extraction system downtime was 5 hours and 18 minutes.
- **November 4, 2009 (planned):** The extraction well system was offline from 3:15 p.m. to 3:52 p.m. to lower the level in the raw water storage tank. Extraction system downtime was 37 minutes.
- **November 4, 2009 (unplanned):** The extraction well system was offline from 4:17 p.m. to 4:55 p.m. due to electrical failure at the reverse osmosis booster pump A. Extraction system downtime was 38 minutes.
- **November 10, 2009 (planned):** The extraction well system was offline from 5:11 p.m. to 5:42 p.m. to load a new programmable logic controller (PLC) program. Extraction system downtime was 31 minutes.

- **November 15, 2009 (unplanned):** The extraction well system was offline from 1:41 p.m. to 4:43 p.m. due to low flow of sodium hydroxide. Extraction system downtime was 3 hours and 2 minutes.
- **November 17, 2009 (planned):** The extraction well system was offline from 4:13 p.m. to 4:59 p.m. and 5:53 p.m. to 6:26 p.m. due to power hookup at the Bench. Extraction system downtime was 1 hour and 19 minutes.
- **November 20, 2009 (unplanned):** The extraction well system was offline from 5:22 p.m. to 5:23 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 1 minute.
- **November 24, 2009 (unplanned):** The extraction well system was offline from 4:17 p.m. to 4:18 p.m. and from 5:05 p.m. to 5:06 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 2 minutes.

A.2 December 2009

- **December 1, 2009 (planned):** The extraction well system was offline from 1:45 p.m. to 5:44 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 59 minutes.
- **December 8, 2009 (unplanned):** The extraction well system was offline from 11:06 a.m. to 11:07 a.m. due to control panel power outage that shut down extraction pumps. Extraction system downtime was 1 minute.
- **December 9, 2009 (planned):** The extraction well system was offline from 11:24 a.m. to 7:25 p.m. for microfilter maintenance. Extraction system downtime was 8 hours and 1 minute.
- **December 10, 2009 (planned):** The extraction well system was offline from 5:30 p.m. to 9:29 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 59 minutes.
- **December 11, 2009 (unplanned):** The extraction well system was offline from 3:46 p.m. to 3:51 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 5 minutes.
- **December 13, 2009 (unplanned):** The extraction well system was offline from 7:03 a.m. to 7:06 a.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 3 minutes.
- **December 19, 2009 (unplanned):** The extraction well system was offline from 4:04 p.m. to 4:12 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **December 21, 2009 (planned):** The extraction well system was offline from 10:36 a.m. to 4:19 p.m. for loop reactor maintenance. Extraction system downtime was 5 hours and 43 minutes.

- **December 26, 2009 (planned):** The extraction well system was offline from 9:49 p.m. to 11:06 p.m. for microfilter maintenance. Extraction system downtime was 1 hour and 17 minutes.
- **December 26 - 30, 2009 (planned):** The extraction well system was offline from 11:31 p.m. December 26th to 12:22 a.m. on December 27th, 12:47 a.m. to 4:57 a.m. on December 27th, 4:31 p.m. to 7:26 p.m. on December 27th, 10:43 p.m. December 27th to 12:21 a.m. on December 28th, 10:30 a.m. to 11:50 a.m. on December 28th, 2:02 p.m. to 3:23 p.m. on December 28th, 12:37 p.m.to 2:04 p.m. on December 29th, and 12:32 p.m. to1:19 p.m. on December 30th to add banks to the microfilter. Extraction system downtime was 14 hours and 29 minutes.
- **December 30 - 31, 2009 (planned):** The extraction well system was offline from 7:23 p.m. to 7:54 p.m. on December 30th, 1:14 p.m. to 1:59 p.m. on December 31st, and 7:33 p.m. to 8:28 p.m. on December 31st for microfilter maintenance. Extraction system downtime was 2 hours and 11 minutes.

A.3 January 2010

- **January 1, 2010 (planned):** The extraction well system was offline from 12:50 p.m. to 1:02 p.m. for microfilter maintenance. Extraction system downtime was 12 minutes.
- **January 5, 2010 (planned):** The extraction well system was offline from 7:24 p.m. to 10:48 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 24 minutes.
- **January 10, 2010 (planned):** The extraction well system was offline from 6:32 a.m. to 7:40 a.m. for reverse osmosis system maintenance. Extraction system downtime was 1 hour and 8 minutes.
- **January 12, 2010 (planned):** The extraction well system was offline from 12:48 p.m. to 12:52 p.m. while the plant was run in recirculation mode. Extraction system downtime was 4 minutes.
- **January 13, 2010 (planned):** The extraction well system was offline from 12:30 p.m. to 12:32 p.m. and 1:18 p.m. to 1:20 p.m. for critical alarm testing. Extraction system downtime 4 minutes.
- **January 13, 2010 (planned):** The extraction well system was offline from 5:50 p.m. to 6:48 p.m. for microfilter maintenance. Extraction system downtime 58 minutes.
- **January 14, 2010 (planned):** The extraction well system was offline from 12:30 p.m. to 2:38 p.m. for microfilter maintenance. Extraction system downtime was 2 hours and 8 minutes.
- **January 15, 2010 (planned):** The extraction well system was offline from 11:46 a.m. to 12:40 p.m. for microfilter maintenance. Extraction system downtime was 54 minutes.
- **January 19, 2010 (planned):** The extraction well system was offline from 3:22 p.m. to 4:08 p.m. to reduce water level in T-100. Extraction system downtime was 46 minutes.

- **January 19, 2010 (unplanned):** The extraction well system was offline from 9:12 p.m. to 9:20 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **January 20, 2010 (planned):** The extraction well system was offline from 3:00 p.m. to 4:06 p.m. to clean out microfilter strainer filter. Extraction system downtime was 1 hour and 6 minutes.
- **January 21, 2010 (unplanned):** The extraction well system was offline from 4:44 p.m. to 8:30 p.m. due to failure of chemical feed pumps. Extraction system downtime was 3 hours and 46 minutes.
- **January 23, 2010 (planned):** The extraction well system was offline from 10:48 a.m. to 2:38 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 50 minutes.
- **January 25, 2010 (planned):** The extraction well system was offline from 1:38 p.m. to 2:38 p.m. for microfilter maintenance. Extraction system downtime was 1 hour.
- **January 28, 2010 (planned):** The extraction well system was offline from 2:06 p.m. to 3:56 p.m. for microfilter maintenance. Extraction system downtime was 1 hour and 50 minutes.
- **January 29, 2010 (planned):** The extraction well system was offline from 7:06 p.m. to 8:31 p.m. for microfilter maintenance. Extraction system downtime was 1 hour and 25 minutes.

Appendix B
Groundwater Monitoring Data for GMP and Interim Measure Monitoring Wells

TABLE B-1
Chemical Performance Monitoring Analytical Results, March 2005 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-20-70	10-Mar-05	1940	-7.1	-59.0	740	378	9.98	ND (1.0)	81.7	198	55.4	9.89	431	0.412
	15-Jun-05	1980	-7.0	-60.0	749	388	9.79	ND (1.0)	73.8	189	55.4	10.5	433	0.414
	15-Jun-05 FD	2050	-8.3	-57.0	760	392	9.81	ND (1.0)	71.3	204	60.7	11.4	468	0.445
	11-Oct-05	1950	-7.2	-57.0	737	359	9.48	0.641	69.9	198	49.9	14.6	323	0.402
	15-Dec-05	1830	-7.1	-49.0	645	326	9.90	ND (1.0)	77.8	138	42.3	14.5	267	0.441
	10-Mar-06	1940	-7.2	-54.0	679	358	10.5	ND (0.5)	82.2	161	48.6	9.22	424	0.427
	05-May-06	1750	-8.2	-55.9	696	376	9.86	0.574	74.5	162	49.2	9.55	461	0.476
	03-Oct-06	1890	-8.1	-60.4	677	357	13.0	ND (5.0)	85.0	158	47.6	9.82	472	0.535
	03-Oct-06 FD	1840	-8.1	-60.5	669	352	12.9	ND (5.0)	80.0	154	45.9	9.51	466	0.515
	13-Dec-06	1910	-7.6	-61.2	678	352	12.7	0.699	77.5	149	44.3	9.09	458	0.459
	14-Mar-07	1740	-8.5	-64.3	689	358	13.7	0.641	80.0	139	42.2	8.83	451	0.503
	03-May-07	1750	-8.4	-66.7	697	344	25.1	ND (1.0)	77.5	139	41.2	8.65	390	0.477
	11-Oct-07	1820	-8.2	-63.9	699	367	15.6	ND (1.0)	80.0	130	39.1	11.0	600	0.54
	12-Mar-08	1790	-7.6	-65.2	695	360	22.1	ND (1.0)	77.0	139	41.2	10.7	403	0.51
	07-Oct-08	1900	-8.5	-64.4	650	360	15.0	0.61	83.0	136	37.9	10.5	400	0.608
	12-Mar-09	1900	-7.74	-60.8	670	330	17.0	ND (1.0)	79.0	128	40.2	9.95	496	0.549
	25-Sep-09	1700	-8.7	-66.4	700	310	16.0	ND (2.5)	74.0	130	33.0	9.70	390	0.42
MW-20-100	10-Mar-05	2490	-5.2	-49.0	466	511	9.98	ND (1.0)	84.2	133	19.8	8.98	712	0.859
	15-Jun-05	2500	-4.7	-46.0	921	506	9.02	ND (1.0)	84.0	137	21.3	9.06	592	0.713
	11-Oct-05	2400	-5.3	-48.0	887	484	8.87	0.731	82.3	170	23.7	15.2	500	0.718
	15-Dec-05	2340	-5.4	-40.0	813	404	9.65	ND (1.0)	82.7	136	21.4	14.8	406	0.709
	10-Mar-06	2500	-5.6	-50.3	861	475	9.94	ND (0.5)	92.5	171	27.0	7.75	597	0.803
	05-May-06	2260	-5.1	-46.4	927	522	9.99	ND (1.0)	82.5	193	32.0	10.8	577	0.716
	03-Oct-06	2320	-5.8	-51.5	863	456	13.4	ND (5.0)	90.0	202	34.4	10.9 J	568	0.874
	13-Dec-06	1960	-6.2	-54.4	861	459	12.3	0.83	97.5	205	32.2	11.4	579	0.889
	13-Dec-06 FD	2200	-6.2	-54.5	874	457	12.2	0.851	92.5	205	32.2	9.55	575	0.881
	14-Mar-07	2180	-6.8	-57.8	847	477	14.2	0.785	87.5	194	31.7	9.90	521	0.715
	03-May-07	2300	-7.3	-59.2	879	493	23.2	ND (1.0)	87.5	209	36.0	12.0 J	559	0.699
	03-May-07 FD	2330	-6.7	-59.3	888	484	19.7	ND (1.0)	87.5	208	34.6	9.63 J	532	0.686

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Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-20-100	10-Oct-07	2160	-7.2	-57.2	858	468	3.25	ND (1.0)	92.0	190	32.0	15.0	560	0.81
	12-Mar-08	2470	-6.9	-58.3	827	442	19.2	ND (1.0)	870	218	35.4	11.9	469	0.702
	08-Oct-08	2200	-7.9	-60.2	760	420	16.0	ND (1.0)	90.0	215	36.8	10.3	453	0.669
	13-Mar-09	2200	-7.08	-58.2	770	420	16.0	ND (1.0)	97.0	213	36.4	11.6	543	0.89
	25-Sep-09	2000	-7.67	-62.8	750	400	16.0	ND (2.5)	89.0	200	30.0	12.0	430	0.70
MW-20-130	09-Mar-05	5520	-5.8	-56.0	3120	1080	10.9	ND (1.0)	68.9	219	12.1	24.7	2250	1.90
	09-Mar-05 FD	6200	-5.4	-51.0	3080	1080	10.9	ND (1.0)	68.9	231	12.8	25.4	2390	1.99
	15-Jun-05	7790	-5.0	-48.0	3410	1230	11.1	ND (1.0)	68.7	352	23.2	31.3	2980	2.75
	07-Oct-05	7330	-5.0	-47.0	3010	1210	10.9	1.04 J	72.4	349	13.9	38.4	2070	2.41
	16-Dec-05	7860	-5.8	-43.0	3260	1000	10.7	ND (2.5)	63.2	324	16.3	44.4	1780	1.98
	10-Mar-06	8610	-5.5	-48.8	3370	1250	10.6	ND (0.5)	74.5	312	18.9	27.7	2730	2.03
	05-May-06	7700	-5.3	-47.2	3900	1280	8.95	ND (1.0)	69.2	349	20.3	27.7	2810	2.40
	18-Oct-06	8450	-6.3	-51.4	3680	1100	11.5	ND (5.0)	70.0	358	20.9	28.0	2870	2.28
	13-Dec-06	7890	-6.0	-54.9	3970	1250	10.6	0.896	72.5	335	19.7	27.6	2900	2.31
	13-Dec-06 FD	8250	-5.9	-54.4	3950	1260	10.5	1.09	72.5	328	19.1	27.3	2830	2.24
	08-Mar-07	8450	-6.5	-57.7	3930	1240	11.3	1.08	70.0	353	21.3	27.0	2760	2.24
	08-Mar-07 FD	8510	-6.6	-57.4	3900	1210	11.3	1.06	72.5	351	21.3	26.8	2750	2.19
	03-May-07	8150	-7.7	-60.0	4020	1310	9.80 J	ND (1.0)	75.0	338	22.5	27.8	2550	2.49
	03-May-07 FD	8100	-6.9	-60.1	3950	1290	20.4 J	ND (1.0)	72.5	338	21.9	27.3	2550	2.47
	05-Oct-07	7980	-7.0	-57.5	3670	1070	11.6	ND (1.0)	77.0	310	19.0	31.0	2900	2.40
	12-Mar-08	8460	-6.2	-58.7	3690	1220	14.3	ND (1.0)	75.0	342	23.4	47.0	2260	2.07
	08-Oct-08	7800	-7.3	-59.6	3500	1200	12.0	ND (2.5)	81.0	329	22.0	40.1	1990	2.23
	13-Mar-09	8100	-6.58	-56.4	3600	1100	11.0	ND (2.5)	79.0	350	22.7	41.4	2550	2.16
	25-Sep-09	6500	-7.59	-61.7	3500	1100	13.0	ND (2.5)	76.0	280	17.0	33.0	2400	2.00
MW-25	09-Mar-05	877	-8.4	-62.0	247	169	3.64	ND (0.5)	158	77.6	16.1	6.24	211	0.441
	14-Jun-05	942	-8.6	-61.0	289	183	3.89	ND (0.5)	137	93.5	20.0	8.91	253	0.464
	14-Jun-05 FD	980	-7.2	-59.0	294	185	3.94	ND (0.5)	137	100	20.9	9.06	268	0.475
	04-Oct-05	950	-8.2	-68.0	252	171	3.77	ND (0.5)	141	83.3	14.9	9.93	164	0.362
	04-Oct-05 FD	910	-8.3	-60.0	251	171	3.75	ND (0.5)	146	94.6	15.3	10.2	185	0.371

TABLE B-1
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Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-25	14-Dec-05	838	-8.4	-55.0	224	158	3.74	ND (0.5)	153	75.5	14.5	9.80	143	0.396
	14-Dec-05 FD	896	-8.4	-50.0	219	155	3.75	ND (0.5)	156	73.0	14.1	9.71	151	0.382
	09-Mar-06	910	-8.4	-64.1	245	164	3.83	ND (0.5)	170	76.4	15.6	6.97	210	0.39
	03-May-06	907	-9.0	-59.4	272	172	3.95	ND (0.5)	150	78.0	17.3	7.38	222	0.418
	03-May-06 FD	924	-9.0	-61.0	274	173	3.94	ND (0.5)	155	79.7	17.8	7.53	245	0.431
	03-Oct-06	892	-8.9	-62.7	222	158	4.09	ND (0.5)	163	73.3	15.0	7.25	206	0.466
	06-Mar-07	843	-9.0	-66.9	221	164	3.95	ND (0.5)	160	72.9	14.4	6.85	203	0.459
	02-Oct-07	796	-9.0	-65.8	189	155	4.58	ND (1.0)	180	66.0	14.0	7.90	200	0.49
	02-Oct-07 FD	758	-9.0	-65.7	195	157	4.40	ND (1.0)	190	63.0	13.0	7.70	220	0.46
	07-Oct-08	740	-9.9	-68.5	170	150	4.30	ND (0.5)	200	59.2	12.9	9.89	143	0.559
	07-Oct-08 FD	730	-10.1	-69.1	170	150	4.40	ND (0.5)	210	58.4	12.9	10.2	144	0.559
	21-Sep-09	660	-8.91	-69.9	180	130	4.30	ND (0.5)	200	64.0	12.0	7.20	180	0.46
	21-Sep-09 FD	650	-8.87	-69.5	180	130	4.30	ND (0.5)	200	64.0	12.0	7.90	190	0.47
MW-26	08-Mar-05	1840	-8.8	-70.0	756	370	4.48	ND (0.5)	98.7	166	41.6	10.7	439	0.557
	08-Mar-05 FD	1800	-8.7	-70.0	708	338	4.45	ND (0.5)	96.1	166	40.9	11.4	438	0.559
	13-Jun-05	2130	-8.2	-65.0	847	371	4.90	ND (0.5)	103	178	44.6	14.0	511	0.663
	04-Oct-05	2120	-7.8	-68.0	779	372	4.88	0.601	109	166	40.4	19.8	352	0.526
	12-Dec-05	2610	-8.5	-55.0	788	372	4.88	0.546	99.7	162	39.9	20.3	349	0.613
	08-Mar-06	2070	-8.6	-60.4	772	324	4.90	ND (0.5)	121	155	38.1	11.7	434 J	0.621
	01-May-06	2130	-8.9	-62.7	927	382	4.87	ND (0.5)	121	165	42.0	12.8	555	0.723
	03-Oct-06	2220	-8.8	-63.0	894	370	6.22	ND (2.5)	105	170	43.9	12.8	510	0.692
	12-Mar-07	2280	-9.0	-67.0	917	387	6.02	0.646	90.0	163	41.6	12.9	621	0.622
	02-Oct-07	2180	-8.6	-66.3	945	391	7.84	ND (1.0)	100	170	42.0	15.0	620	0.66
	12-Mar-08	2500	-8.1	-67.2	908	398	10.7 J	ND (1.0)	103	176	44.1 J	16.2 J	498	0.589
	12-Mar-08 FD	2420	-8.9	-68.2	905	398	7.61 J	ND (1.0)	102	160	32.8 J	12.7 J	462	0.601
	08-Oct-08	2400	-8.7	-66.5	930	440	10.0	ND (1.0)	110	183	45.8	14.6	555	0.591
	10-Mar-09	2300	-8.41	-65.3	870	440 J	9.80	1.40	100	172	47.9	14.8	585	0.604
	10-Mar-09 FD	2300	-8.68	-65.8	860	440 J	9.70	1.50	100	174	46.2	15.6	631	0.65
	22-Sep-09	2200	-9.04	-68.3	870	450	10.0	ND (1.0)	100	170	39.0	14.0	550	0.59

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										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-27-20	08-Mar-05	1250	-12	-102.0	190	432	ND (0.5)	ND (0.5)	215	137	56.6	4.89	195	ND (0.2)
	18-Jul-05	---	-11.9	-98.0	81.9	228	ND (0.5)	ND (0.5)	160	96.1	30.1	4.27	94.8	ND (0.2)
	05-Oct-05	742	-11.8	-102.0	91.1	252	ND (0.5)	ND (0.5)	175	88.6	31.4	5.48	81.0	ND (0.2)
	14-Dec-05	1020	-11.7	-91.0	118	347	ND (0.5)	ND (0.5)	216	116	41.8	6.96	116	ND (0.2)
	06-Mar-06	664	-12.1	-90.9	89.7	231	ND (0.2)	ND (0.2)	385	89.1	28.8	4.90	103	ND (0.2)
	14-Jun-06	730	-12	-89.8	98.3	272	ND (0.5)	ND (0.5)	195	91.1	28.5	2.79 J	96.9	ND (0.2)
	03-Oct-06	600	-13.1	-96.6	90.8	261	ND (0.5)	ND (0.5)	160	102	34.5	6.45	113	ND (0.2)
	02-Oct-07	802	-12.5	-96.3	102	320	ND (1.0)	ND (1.0)	170	97.0	34.0	5.30	150	0.22
	03-Oct-08	---	---	---	94.0	240	ND (0.5)	---	---	87.9	29.5	---	110	---
	01-Oct-09	---	---	---	88.0	230	ND (0.5)	---	130	84.0	25.0	---	87.0	---
MW-28-25	10-Mar-05	880	-12.2	-95.0	112	302	ND (0.5)	ND (0.5)	204	129	36.3	3.50	122	ND (0.2)
	15-Jun-05	974	-11.6	-91.0	108	359	ND (0.5)	ND (0.5)	221	133	38.9	6.54	117	ND (0.2)
	06-Oct-05	884	-11.7	-95.0	99.8	300	ND (0.5)	ND (0.5)	197	123	37.0	6.61	88.7	ND (0.2)
	16-Dec-05	1010	-11.4	-90.0	128	348	ND (0.5)	ND (0.5)	212	134	41.5	6.46	107	ND (0.2)
	09-Mar-06	746	-11.5	-93.9	84.4	225	ND (0.5)	ND (0.5)	244	98.5	27.5	4.15 J	88.5	ND (0.2)
	05-May-06	741	-11.4	-90.3	110	302	ND (0.5)	ND (0.5)	216	117	35.7	5.77	118	ND (0.2)
	11-Oct-06	1050	-12.2	-95.0	86.3	247	ND (0.5)	ND (0.5)	225	133	40.8	5.47	132	ND (0.2)
	04-Oct-07	812	-12.1	-98.7	110	307	ND (1.0)	ND (1.0)	230	120	37.0 J	4.80	150	0.26 J
	08-Oct-08	---	---	---	100	280	ND (0.5)	---	220	109	34.7	---	102	---
	24-Sep-09	---	---	---	94.0	240	ND (0.5)	---	200	100	27.0	---	100 J	---
MW-30-30	10-Mar-05	38800	-9.8	-79.0	16000	4270	ND (5.0)	7.91	421	1590	1600	95.4	13600	4.97
	07-Oct-05	36400	-8.5	-75.0	17600	4000	ND (0.5)	ND (10)	521	1020	842	93.6	7650	5.20
	15-Dec-05	35700	-8.7	-59.0	19700	4070	ND (1.0)	3.13	504	1060	894	110	8540	6.14
	13-Mar-06	39700 J	-8.8	-70.5	18600	4530	ND (0.5)	ND (50)	650	1050	892	77.2	11300	4.62
	02-May-06	32400	-10.3	-70.7	15400	3300	ND (0.5)	ND (5.0)	756	882	828	59.4	10300	3.95
	10-Oct-06	29400	-9.4	-68.7	17800	4400	ND (2.5)	ND (2.5)	550	729	653	55.0	10200	4.32
	08-Oct-07	27400	-9.0	-73.9	13700	3370	ND (1.0)	3.88	800	650	540	56.0	9600	4.50
	24-Sep-09	---	---	---	5800	1700	ND (5.0)	---	550	280	220	---	3800	---
MW-30-50	10-Mar-05	6470 J	-8.3	-68.0	4660	672	ND (0.5)	1.03	324	335	107	16.5	2040	1.15

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										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-30-50	07-Oct-05	6860	-9.4	-79.0	3060	857	ND (0.5)	0.899 J	252	438	101	37.0	1780	1.27
	16-Dec-05	5850	-10.5	-65.0	2360	578	ND (0.5)	0.645	212	265	77.9	32.9	1260	1.19
	09-Mar-06	5380	-9.8	-83.5	2420	651	ND (0.5)	ND (0.5)	275	226	66.2	14.6	1640	1.18
	02-May-06	5420	-10.4	-73.6	2380	612	ND (0.5)	3.41	261	243	70.3	16.4	1750	1.22
	11-Oct-06	4170	-10.7	-82.2	1980	468	ND (0.5)	ND (0.5)	290	171	48.5	14.0	1370	1.11
	11-Oct-06 FD	3930	-11	-82.6	1810	462	ND (0.5)	ND (0.5)	298	163	46.1	14.1	1340	1.08
	24-Sep-09	---	---	---	---	---	---	---	220	19.0	4.80	---	270	---
MW-31-60	09-Mar-05	1540	-8.6	-63.0	649	210	4.94	ND (0.5)	76.6	108	17.3	5.97	424	0.401
	13-Jun-05	1660	-8.2	-65.0	745	207	4.12	ND (0.5)	70.0	121	18.9	6.57	403	0.388
	06-Oct-05	1660	-8.6	-65.0	691	206	4.01	ND (0.5)	77.3	109	16.5	9.75	308	0.462
	13-Dec-05	1620	-8.7	-54.0	669	199	4.14	ND (0.5)	73.0	87.0	15.4	9.32	275	0.359
	15-Mar-06	1560 J	-8.6	-65.6	661	191	4.37	ND (0.5)	89.3	106	17.5	7.30	403	0.393
	15-Mar-06 FD	1640 J	-8.6	-64.9	662	192	4.34	ND (0.5)	81.9	101	16.8	6.94	391	0.383
	01-May-06	1630	-9.6	-63.2	691	209	4.58	ND (0.5)	79.6	118	20.1	7.78	467	0.449
	05-Oct-06	1620	-9.4	-66.3	687	205	5.00	ND (0.5)	80.0	113	20.6	9.60 J	325	0.464
	12-Mar-07	1750	-9.3	-69.0	757	222	4.93	ND (0.5)	72.5	116	20.3	6.05	454	0.402 J
	04-Oct-07	1720	-9.4	-69.6	799	208	5.15	ND (1.0)	80.0	150	26.0	7.30	580	0.64
	06-Oct-08	2000	-10.2	-72.2	810	240	4.20	ND (1.0)	81.0	150	26.0	9.39	460	0.399
	21-Sep-09	1800	-9.23	-72.1	870	220	3.70	ND (1.0)	75.0	160	26.0	9.60	480	0.43
MW-32-20	09-Mar-05	12500	-7.2	-65.0	6930	1660	ND (0.5)	3.51	123	838	302	36.9	4000	2.76
	17-Jun-05	10200	-9.0	-67.0	4810	690	ND (0.5)	ND (2.5)	676	566	231	23.3	2620	1.75
	04-Oct-05	28800	-7.8	-65.0	14200	2420	ND (5.0)	6.19	733	1380 J	613 J	91.1 J	5400 J	4.75 J
	16-Dec-05	24600	-7.8	-61.0	12200	2140	ND (1.0)	3.48	861	1470	552	90.4	4950	4.16
	10-Mar-06	20900	-8.3	-65.5	10600	1970	ND (0.5)	ND (0.5)	432	1350	530	56.1	6440	3.54
	04-May-06	16900	-8.1	-64.9	9430	1380	ND (0.5)	2.35	218	937	445	46.0	4780	2.87
	02-Oct-06	46200 J	-8.6	-67.1	20200	3190	ND (2.5)	7.30	660	1870	1070	87.0	11300	6.34
	11-Dec-06	37900	-8.0	-67.0	17900	3020	ND (5.0)	7.67	825	1530	785	81.7	8420	4.98
	06-Mar-07	27600	-8.7	-72.7	16200	2210	0.925	5.93	765	1460	635	64.4	7110	3.92
	30-Apr-07	17700	-9.6	-78.1	9820	1310	ND (0.2)	3.78	770	965	484	51.4	5520	3.02

TABLE B-1
Chemical Performance Monitoring Analytical Results, March 2005 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-32-20	01-Oct-07	37200	-8.3	-70.1	20600	3160	ND (1.0)	6.44	700	1800	1100	93.0	9900	5.70
	10-Mar-08	26000	-9.4	-72.6	15800	2280	ND (1.0)	5.66	800	1190	710	67.4	11600	2.31
	03-Oct-08	---	---	---	21000	3500	ND (5.0)	---	640	1700	1080	---	9550	---
	10-Mar-09	29000	-8.91	-70.5	15000	2100 J	ND (5.0)	15.0	750	1620	970	96.6	7020	3.53
	22-Sep-09	---	---	---	20000	3600	ND (5.0)	---	730	1800	740	---	9300	---
MW-32-35	09-Mar-05	3560	-8.2	-68.0	1770	465	ND (0.5)	0.845	260	312	85.5	13.0	944	1.07
	17-Jun-05	7550	-9.5	-72.0	3520	787	ND (0.5)	ND (2.5)	223	506	120	14.8	2110	1.18
	04-Oct-05	8340	-8.3	-70.0	3840	765	ND (0.5)	ND (5.0)	208	567	134	29.3	1530	1.26
	16-Dec-05	7660	-8.8	-63.0	3510	710	ND (1.0)	1.02	219	606	128	30.0	1580	1.25
	10-Mar-06	9230	-8.6	-74.0	4210	1010	ND (0.5)	ND (0.5)	234	654	129	19.2	2360	1.13
	04-May-06	9840	-9.1	-67.8	4960	1130	ND (0.5)	ND (0.5)	218	693	148	19.5	2800	1.38
	02-Oct-06	11200	-9.4	-71.4	5430	1050	ND (2.5)	ND (2.5)	290	839	165	23.9	3260	1.48
	11-Dec-06	10400	-9.0	-70.4	5090	1000	ND (0.5)	1.90	338	845	173	22.5	2620	1.43
	06-Mar-07	12600	-10.2	-75.4	6070	1200	ND (0.5)	2.65	360	1080	209	23.5	2910	1.35
	30-Apr-07	12100	-9.9	-78.7	6610	1280	ND (0.2)	2.60	475	1250	273	26.2	3280	1.35
	01-Oct-07	13700	-8.9	-72.7	6830	1120	ND (1.0)	2.62	490	1000	390	29.0	4000	1.70
	03-Oct-08	15000	-9.8	-73.1	7600	1300	ND (2.5)	3.10	550	829	150	52.3	3490	1.49
	22-Sep-09	13000	-9.32	-75.2	6900	1400	ND (2.5)	2.80	530	880	400	53.0	3100	1.70
MW-34-55	10-Mar-05	6230	-10.8	-82.0	2620	739	ND (0.5)	0.654	240	366	71.3	29.1	1900	1.19
	15-Jul-05	---	-10.3	-84.0	2250	607	ND (0.5)	ND (0.5)	242	247	52.0	16.5	1420	1.02
	05-Oct-05	5150	-10.6	-88.0	2170	619	ND (0.5)	ND (0.5)	232	272	59.1	25.8	1230	1.20
	14-Dec-05	5100	-10.8	-74.0	2150	552	ND (0.5)	0.588	236	217	45.0	27.2	965	0.937
	08-Mar-06	4850	-10.8	-86.8	2080	593	ND (0.5)	ND (0.5)	272	256	54.2	13.5	1640	0.956
	03-May-06	4320	-11.5	-84.3	2070	500	ND (0.5)	ND (0.5)	302	198	44.8	11.1	1360	0.846
	04-Oct-06	1680 J	-12.2	-94.8	443	230	ND (0.5)	ND (0.5)	368	37.6	8.08	4.59	536	0.54
	03-Oct-07	730	-11.3	-96.6	109	266	ND (1.0)	ND (1.0)	190	15.0	3.30	3.30	290	0.26
	07-Oct-08	700	-13	-100.0	100	250	ND (0.5)	---	170	72.4	16.9	5.26	192	0.248
	30-Sep-09	700	-12.3	-101.0	---	---	---	---	160	77.0	17.0	4.40	120	0.15
MW-34-80	08-Mar-05	6940	-10.4	-83.0	4180	1040	ND (0.5)	1.01	304	439	68.1	28.0	2750	1.65

TABLE B-1
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Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-34-80	15-Mar-05	8980	---	---	3920	ND (5.0)	ND (1.0)	---	288	445	65.7	29.7	2990	---
	30-Jun-05	7840	-8.4	-82.0	3910	979	ND (0.5)	ND (0.5)	302	497	76.5	27.7	2670	1.66
	05-Oct-05	10200	-10.1	-85.0	3880	1060	ND (0.5)	ND (0.5)	302	429	72.5	47.4	1660	1.57
	14-Dec-05	8800	-10.2	-71.0	3700	880	ND (0.5)	0.854	297	432	68.3	54.9	1710	1.54
	09-Mar-06	7830	-9.9	-86.8	3520	986	ND (0.5)	ND (0.5)	313	383	65.8	24.0	2420	1.49
	03-May-06	7950	-11.7	-77.6	3700	921	ND (0.5)	ND (0.5)	297	425	70.3	23.9	2480	1.38
	04-Oct-06	7080	-11.3	-81.8	3210	786	ND (0.5)	0.737	268	341	65.4	21.1	2170	1.31
	12-Dec-06	6510	-10.5	-80.9	3190	789	ND (0.5)	0.742	288	298	62.9	18.9	2040	1.26
	05-Mar-07	6360 J	-11.5	-85.8	3300	783	ND (0.5)	0.72	205	315	68.3	19.4	2020	1.29
	30-Apr-07	6390	-11.5	-88.9	3320 J	889 J	ND (0.2)	ND (1.0)	245	282	57.0	18.6	2080	1.33
	03-Oct-07	5490	-11.3	-87.8	2630	696	ND (1.0)	ND (1.0)	240	220	53.0	21.0	2000	1.20
	13-Dec-07	5420	-10.9	-88.6	2380	698	ND (1.0)	ND (1.0)	264	193	49.1	25.4	1450	1.09
	12-Mar-08	5500	-11.4	-87.3	2510	739	ND (1.0)	ND (1.0)	238	237	52.6	19.2	2030	1.14
	06-May-08	5820	-11.4	-87.3	2460	753	ND (0.2)	0.525	216	230	49.0	30.0	1600	1.20
	07-Oct-08	5300	-11.8	-87.6	2400	720	ND (2.0)	ND (2.0)	250	223	46.3	22.0	1220	0.765
	10-Dec-08	5300	-11	-93.1	2190	698	ND (1.0)	ND (1.0)	253	147	45.2	20.6	3880	1.11
	10-Mar-09	5100	-10.9	-84.8	2300	700 J	ND (2.5)	ND (2.5)	240	219	46.3	22.2	1480	1.08
	30-Apr-09	5830	-11.5	-85.8	2340	768	ND (1.0)	ND (1.0)	237	219	50.0	24.6	1510	1.11
	30-Sep-09	4000	-10.8	-88.9	2300	710	ND (1.0)	ND (1.0)	230	240	46.0	22.0	1500	0.98
	09-Dec-09	4580	-11.9	-89.1	2200	690	ND (1.0)	ND (1.0)	230	---	---	---	---	---
MW-34-100	14-Mar-05	10800	---	---	5010	1210	ND (1.0)	---	175	221	17.4	34.1	3600	---
	21-Jun-05	11300	-9.7	-75.0	5350	1270	1.05	ND (0.5)	179	229	17.4	27.1	3510	2.22
	21-Jun-05 FD	10900 J	-9.5	-77.0	4920	1180	1.03	ND (0.5)	179	243	18.2	32.1	3740	2.36
	05-Oct-05	10400	-9.9	-83.0	4530	1150	1.20	ND (0.5)	172	171	13.8	55.2	2450	2.57
	05-Oct-05 FD	10400	-9.9	-83.0	4680	1200	1.21	ND (0.5)	172	228	14.1	50.9	2730	2.57
	14-Dec-05	---	---	---	---	---	---	---	---	226	14.9	62.9	2530	2.32
	14-Dec-05 FD	---	---	---	---	---	---	---	---	220	15.1	64.2	2530	2.40
	08-Mar-06	10000	-11.4	-75.5 J	4720	1180	1.39	---	152	179	12.1	32.5	3580	2.41
	08-Mar-06 FD	10100	-10.1	-102 J	4920	1220	1.39	---	159	182	11.9	36.5	3530	2.46

TABLE B-1
Chemical Performance Monitoring Analytical Results, March 2005 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Monitoring Wells														
MW-34-100	30-Apr-07	10600	-10.9	-80.7	5920	1040	1.38	---	123	186	12.0	31.5	3840	2.39
	30-Apr-07 FD	11900	-11.2	-82.1	5880	1050	1.37	---	123	189	12.0	32.1	3920	2.40
	03-Oct-07	10700	-10.2	-78.2	5350	970	1.19	ND (1.0)	120	170	11.0	44.0	4300	2.50
	03-Oct-07 FD	10500	-10.6	-78.4	5360	953	1.03	ND (1.0)	120	160	10.0	43.0	4300	2.40
	07-Oct-08	11000	-10.9	-80.8	5400	1200	ND (2.5)	ND (2.5)	140	158	10.6	54.5	2970 J	2.35
	07-Oct-08 FD	11000	-11	-81.3	5600	1200	ND (2.5)	ND (2.5)	140	184	11.5	56.7	3880 J	2.59
	30-Sep-09	---	---	---	5500	1300	ND (5.0)	---	170	200	11.0	73.0	3800	2.30
	30-Sep-09 FD	---	---	---	5600	1300	ND (5.0)	---	170	---	---	---	---	---
	17-Nov-09	11000	-10.5	-82.4	---	---	---	ND (1.0)	---	---	---	---	---	---
Surface Water Stations														
R-27	07-Mar-05	669	-12.3	-102.0	92.7	244	ND (0.5)	ND (0.5)	136	82.8	31.3	4.72	108	ND (0.2)
	14-Jun-05	686	-11.4	-92.0	90.9	266	ND (0.5)	ND (0.5)	127	81.9	29.8	6.04	98.9	ND (0.2)
	05-Oct-05	678	-11.6	-94.0	85.1	255	ND (0.5)	ND (0.5)	130	101	36.2	6.56	91.2	ND (0.2)
	16-Dec-05	718	-11.7	-87.0	87.9	253	ND (0.5)	ND (0.5)	126	85.5	29.5	5.99	75.6	ND (0.2)
	06-Mar-06	656	-11.8	-92.1	90.6	268	ND (0.5)	ND (0.5)	144	83.5	29.4	5.44 J	101	ND (0.2)
	03-May-06	567	-12.8	-93.9	93.1	267	ND (0.5)	ND (0.5)	139	87.0	31.1	3.12 J	106	ND (0.2)
	04-Oct-06	752 J	-12.2	-94.9	91.5	261	ND (0.5)	ND (0.5)	128	82.9	31.5	6.24 J	98.1	ND (0.2)
	20-Dec-06	680	-12.7	-98.1	94.5	266	ND (0.5)	ND (0.5)	138	83.2	30.9	3.64	106	ND (0.2)
	13-Mar-07	750 J	-13	-99.5	96.5	267	0.537	ND (0.5)	130	86.9	31.3	4.73	106	ND (0.2)
	08-May-07	715 J	-12.9	-104.0	92.6	269	ND (0.5)	ND (0.5)	143	84.3	29.8	5.55	100	ND (0.2)
	11-Sep-07	650	-12.5	-101.0	89.4	253	0.336	ND (0.2)	132	74.2	28.9	5.47	86.5	ND (0.2)
	05-Dec-07	---	-11.7	-99.0	94.7	256	ND (1.0)	ND (0.2)	137	89.8	31.7	6.60	93.4	0.157
	02-Apr-08	---	---	---	93.0	267	ND (1.0)	ND (1.0)	136	80.2	30.7	5.50	106	0.432
	17-Jun-08	682	-13	-101.0	91.6	254	ND (1.0)	ND (1.0)	134	76.2	31.8	6.69	89.7	ND (0.2)
R-28	08-Mar-05	651	-12.5	-102.0	90.4	231	ND (13)	ND (0.5)	132	83.7	31.4	5.02	107	ND (0.2)
	14-Jun-05	680	-11.6	-95.0	91.2	268	ND (0.5)	ND (0.5)	127	78.5	28.5	5.08	94.5	ND (0.2)
	05-Oct-05	672	-11.6	-94.0	85.5	255	ND (0.5)	ND (0.5)	122	85.7	30.4	6.30	77.0	ND (0.2)
	16-Dec-05	710	-11.5	-83.0	88.1	254	ND (0.5)	ND (0.5)	126	87.2	29.8	6.11	76.8	ND (0.2)
	06-Mar-06	675	-12.3	-93.4	91.0	270	ND (0.5)	ND (0.5)	146	76.6	26.6	5.22 J	91.5	ND (0.2)

TABLE B-1

Chemical Performance Monitoring Analytical Results, March 2005 through January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Location	Sample Date	Total Dissolved Solids	Oxygen-18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Alkalinity (total)	Dissolved Metals				
										Calcium	Magnesium	Potassium	Sodium	Boron
Surface Water Stations														
R-28	03-May-06	586	-13	-92.1	93.4	270	ND (0.5)	ND (0.5)	136	88.1	31.4	4.04 J	107	ND (0.2)
	04-Oct-06	644 J	-12.6	-95.3	90.9	259	ND (0.5)	ND (0.5)	133	84.2	32.1	6.17 J	96.5	ND (0.2)
	20-Dec-06	615	-12.4	-99.6	93.3	262	ND (0.5)	ND (0.5)	143	85.7	32.0	4.66	108	ND (0.2)
	14-Mar-07	710	-12.8	-100.0	96.7	268	0.534	ND (0.5)	133	87.9	31.0	5.71	105	ND (0.2)
	09-May-07	690	-13	-102.0	95.8	271	ND (0.5)	ND (0.5)	143	86.1	30.5	5.92	103	ND (0.2)
	12-Sep-07	682	-12.4	-99.4	106	296	0.372	ND (0.2)	122	73.8	29.9	6.36	89.2	ND (0.2)
	06-Dec-07	---	-11.7	-98.6	96.5	258	0.345	ND (0.2)	139	75.7	30.4	6.62	79.4	ND (0.2)
	02-Apr-08	---	---	---	92.5	309	ND (1.0)	ND (1.0)	137	84.7	31.4	5.58	108	0.467
	18-Jun-08	672	-13.2	-102.0	89.4	248	ND (1.0)	ND (1.0)	132	43.3	31.1	6.95	93.9	ND (0.2)
	17-Sep-08	640	---	---	91.4	256	ND (0.5)	ND (0.5)	132	83.4	31.2	6.48	78.0	ND (0.2)
	04-Dec-08	649	-11.9	-97.0	97.4	260	ND (1.0)	ND (1.0)	135	81.7	30.0	5.95	114	0.262
	21-Jan-09	652	-12	-96.7	91.5	253	ND (0.5)	ND (0.5)	134	79.2	27.8	6.01	91.7	ND (0.2)
	09-Apr-09	643	-12.4	-97.8	92.7	250	ND (1.0)	ND (0.5)	138	79.6	28.8	5.44	97.0	ND (0.2)
	08-Jul-09	632	-12.8	-98.6	84.5	239	ND (0.5)	ND (0.5)	131	79.6	27.3	6.17	86.9	ND (0.2)
	09-Sep-09	640	-12.5	-99.1	86.0	236	ND (1.0)	ND (1.0)	131	74.8	26.2	6.01	78.7	ND (0.2)
	14-Dec-09	612	-13	-98.3	89.7	244	ND (1.0)	ND (1.0)	131	73.5	26.7	4.98	88.2	ND (0.2)

TABLE B-1
Chemical Performance Monitoring Analytical Results, March 2005 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

NOTES:

FD = field duplicate sample
ND =parameter not detected at the listed reporting limit
J = concentration or reporting limit estimated by laboratory or data validation
R = result exceeded analytical criteria for precision and accuracy; should not be used for project decisionmaking
--- = data not collected or available

General chemistry results in milligrams per liter (mg/L), except Oxygen-18 and Deuterium, which are expressed as differences from global standards in parts per thousand.

Alkalinity (total) reported as calcium carbonate. Nitrate reported as Nitrogen (N).

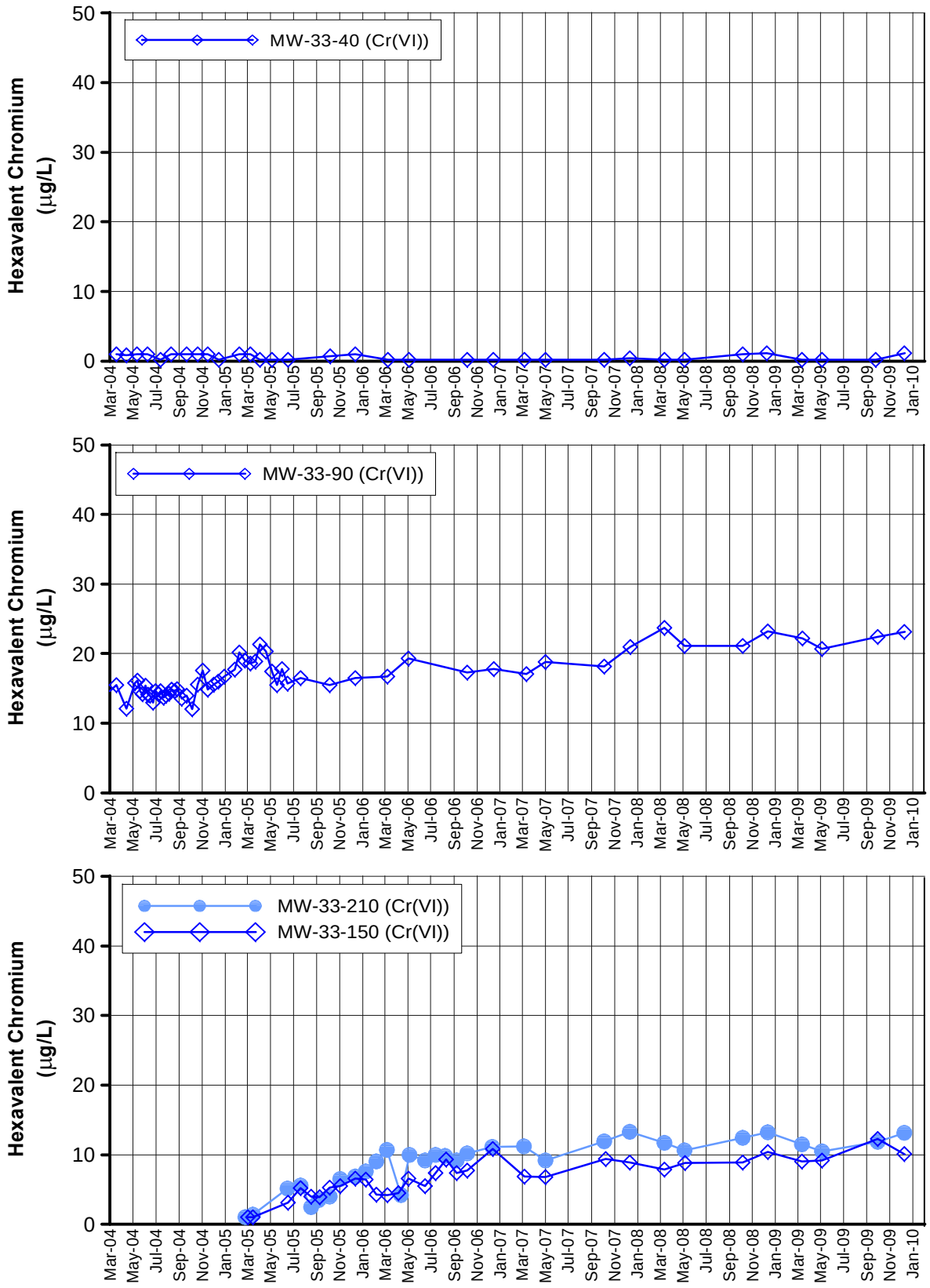


FIGURE B-1
HEXAVALENT CHROMIUM
IN MW-33 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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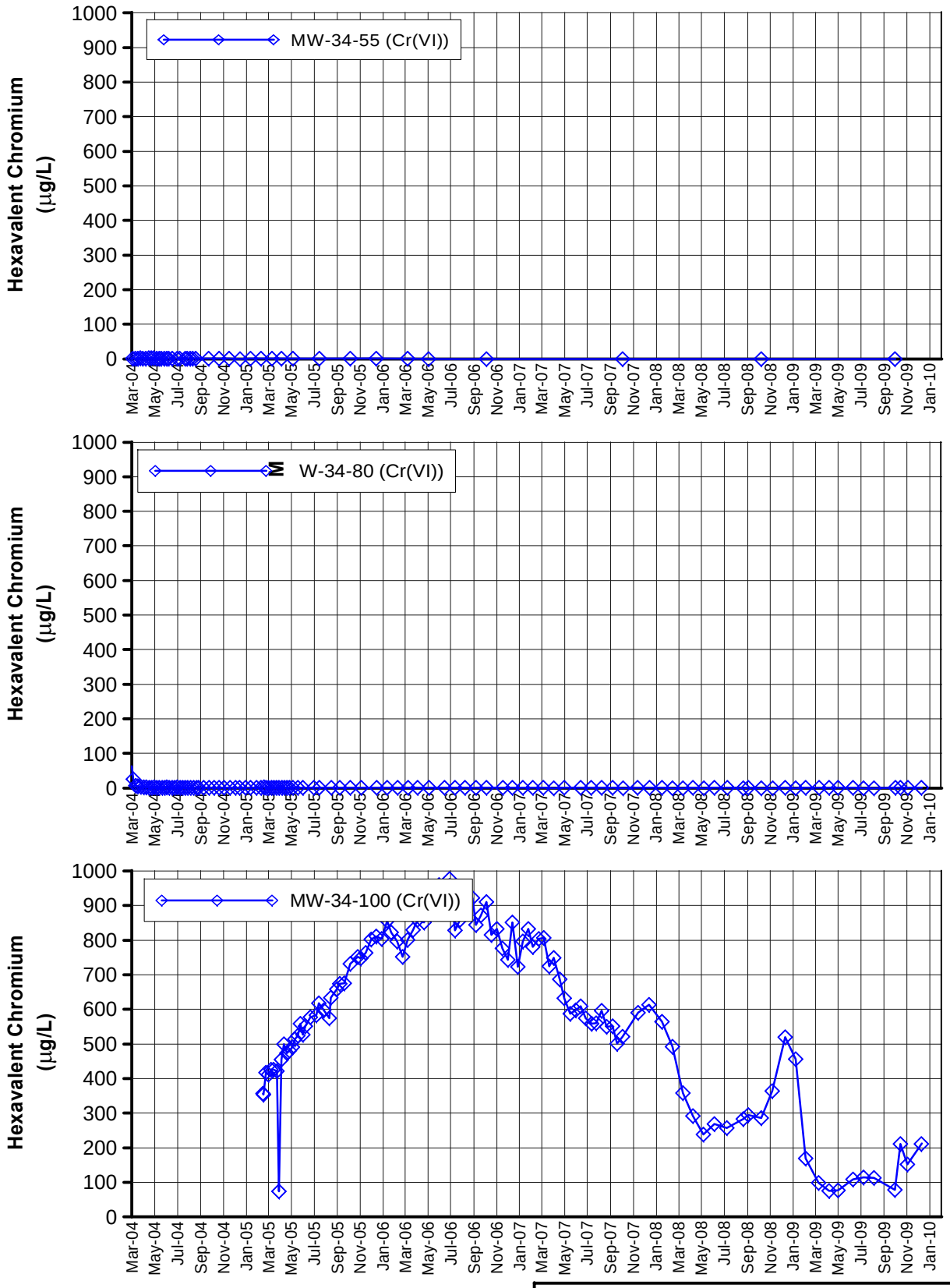


FIGURE B-2
HEXAVALENT CHROMIUM
IN MW-34 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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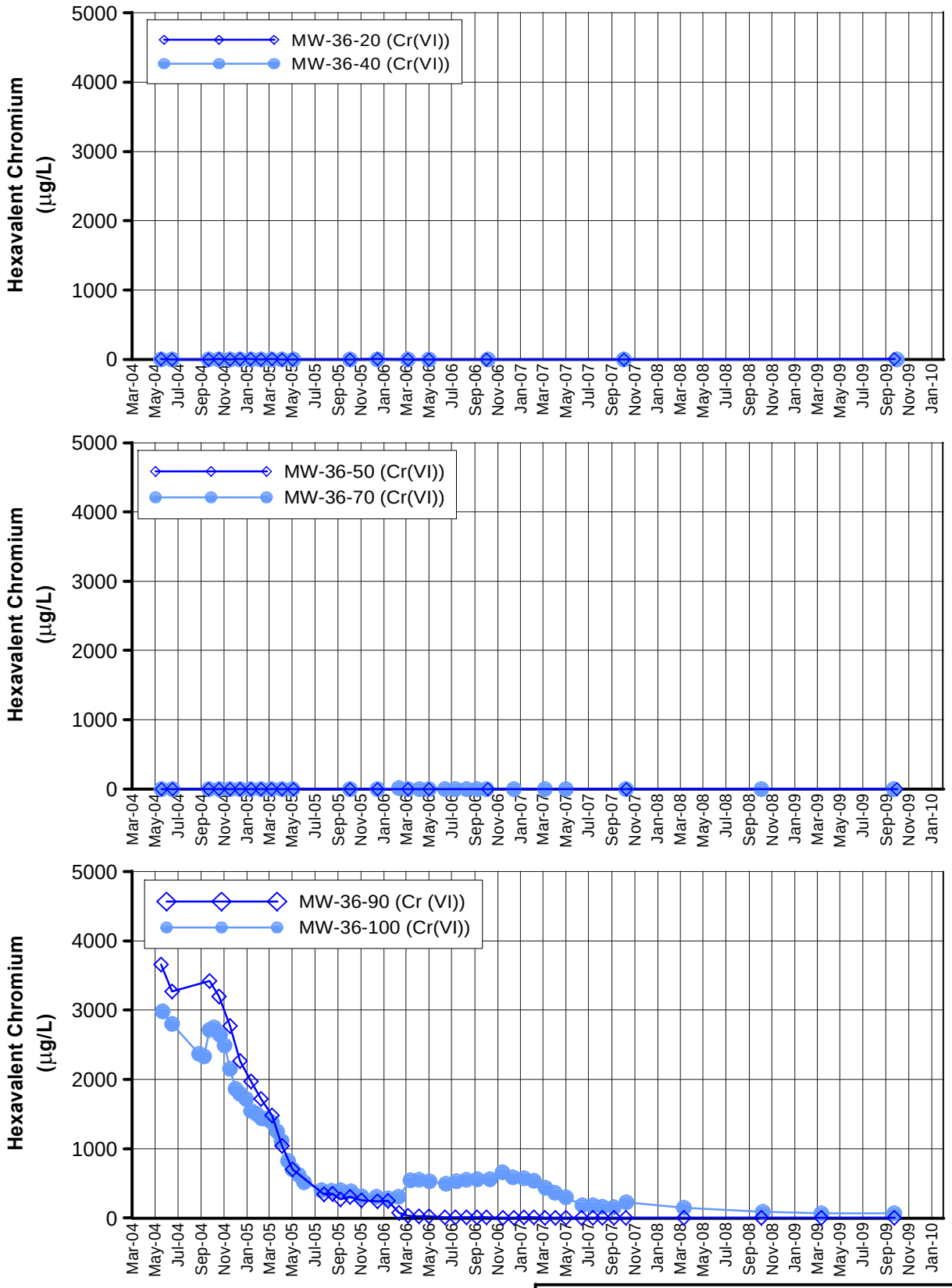


FIGURE B-3
HEXAVALENT CHROMIUM
IN MW-36 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
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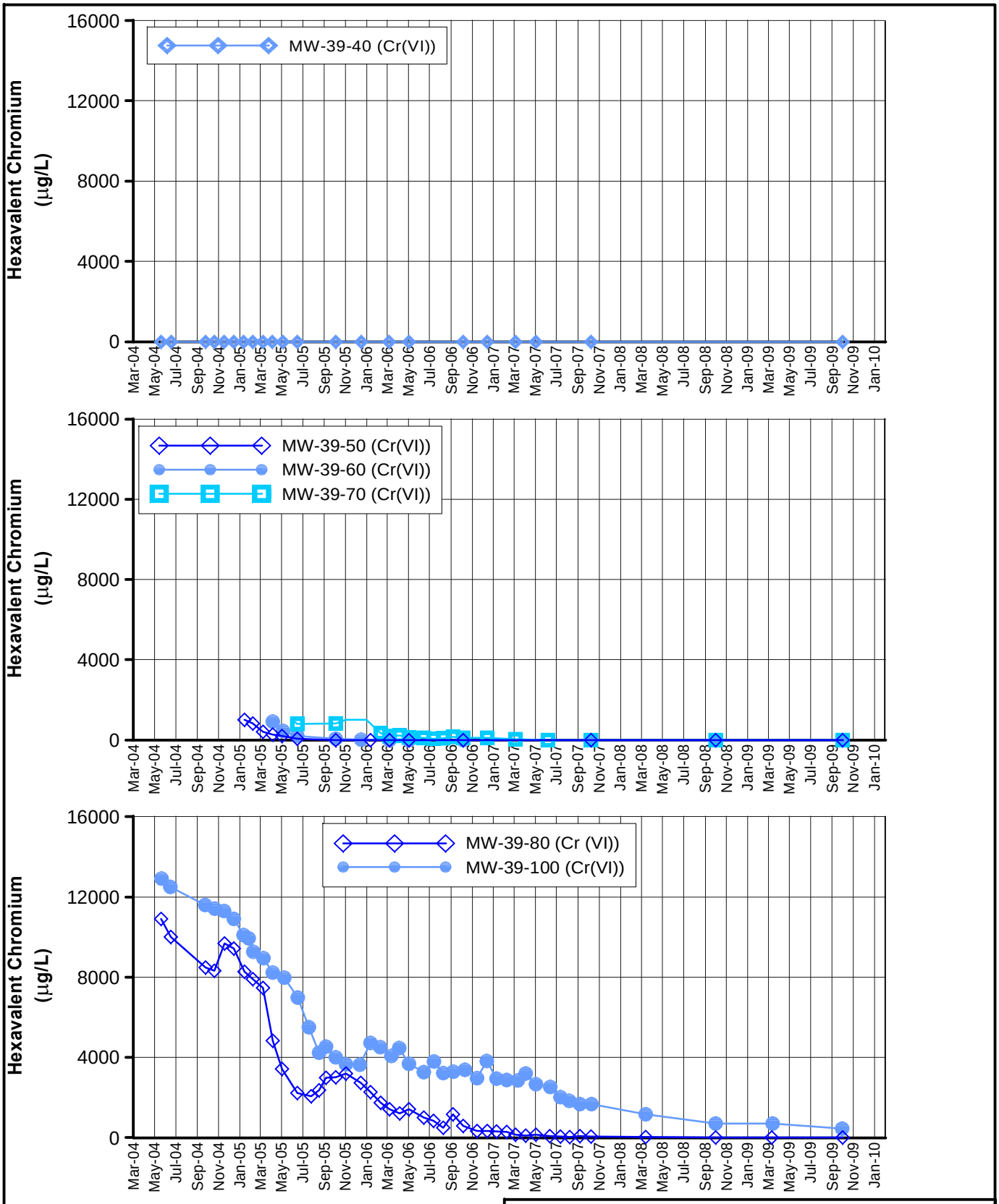


FIGURE B-4
HEXAVALENT CHROMIUM
IN MW-39 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
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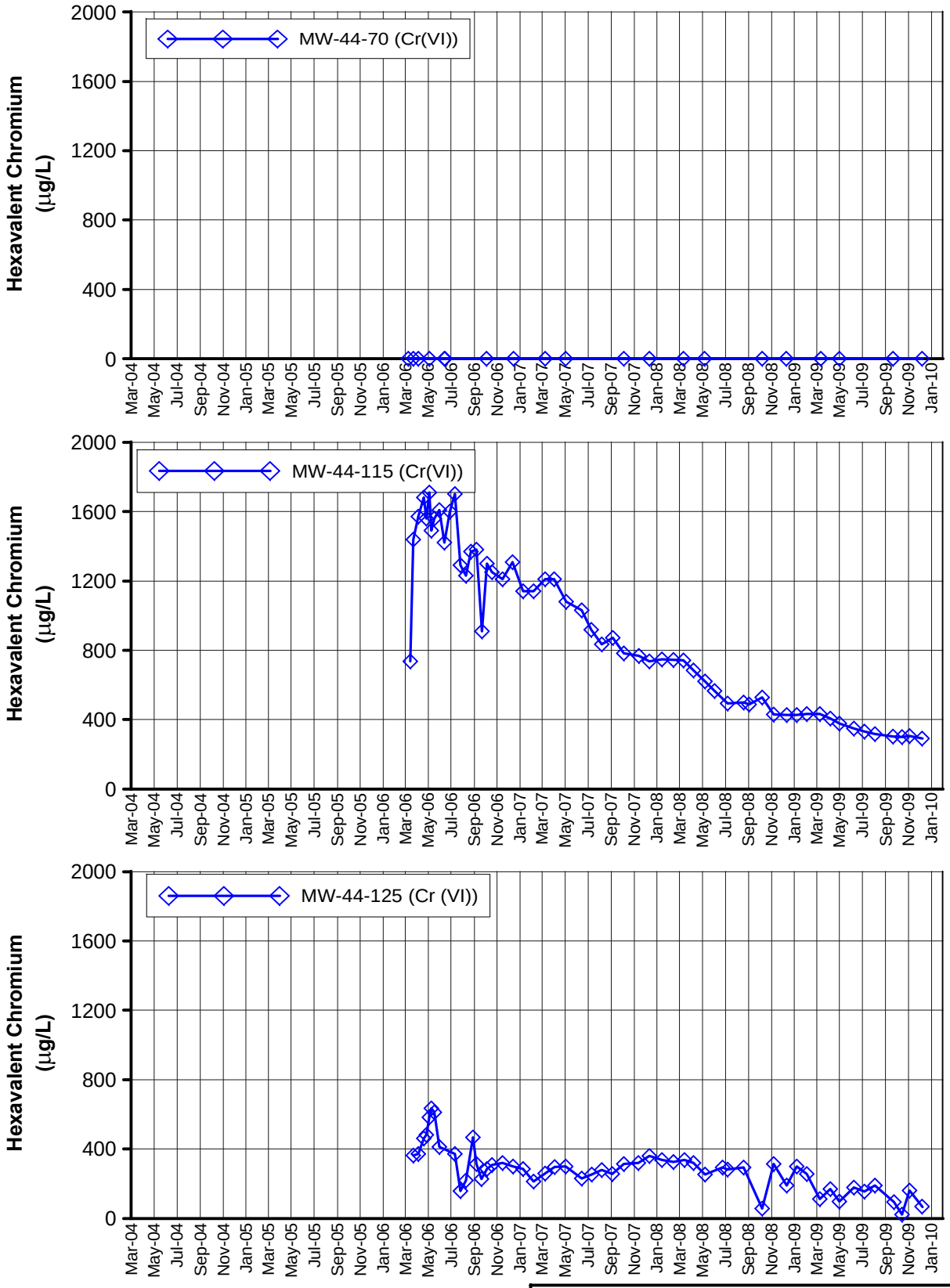


FIGURE B-5
HEXAVALENT CHROMIUM
IN MW-44 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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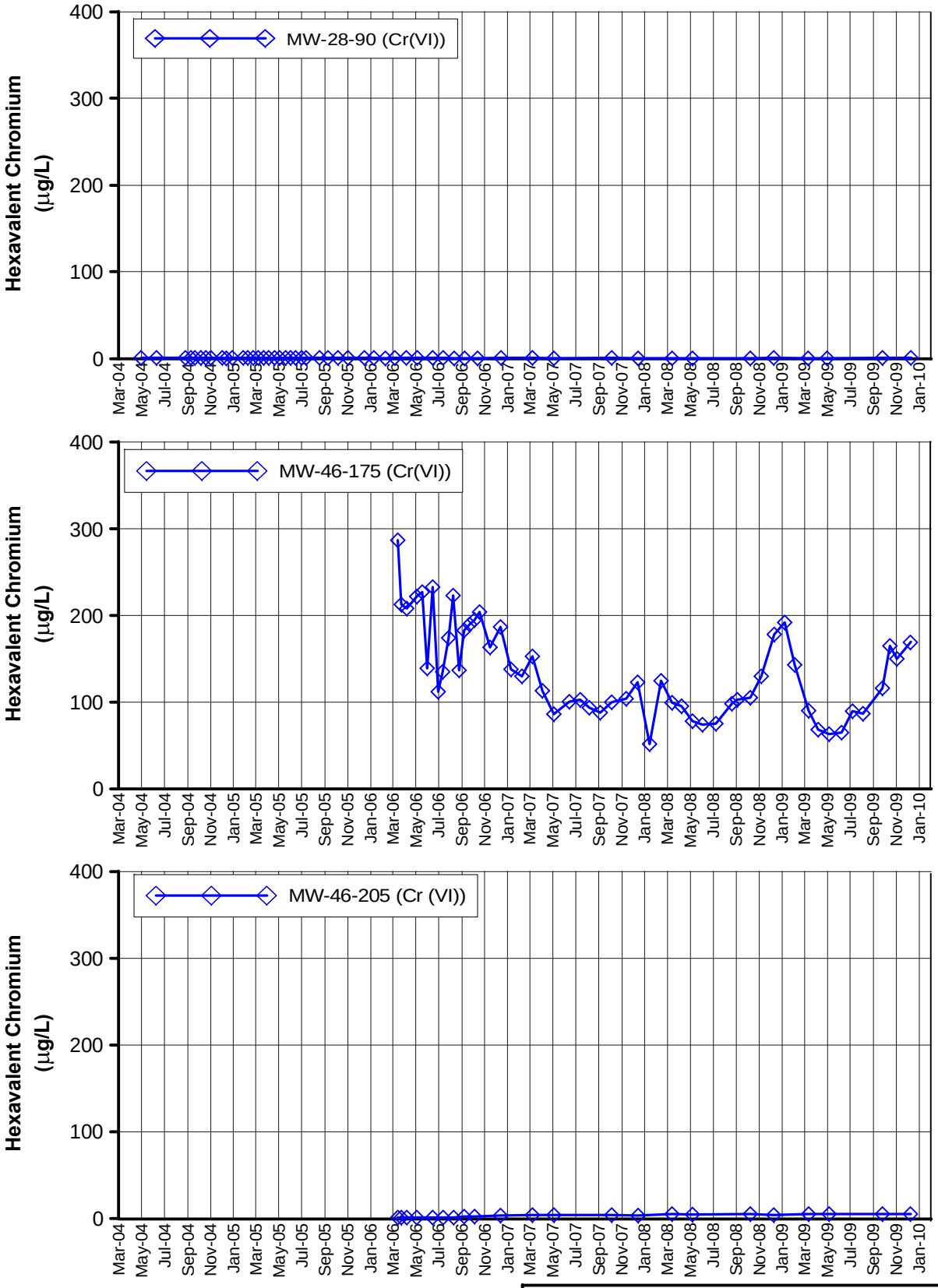


FIGURE B-6
HEXAVALENT CHROMIUM
IN MW-46 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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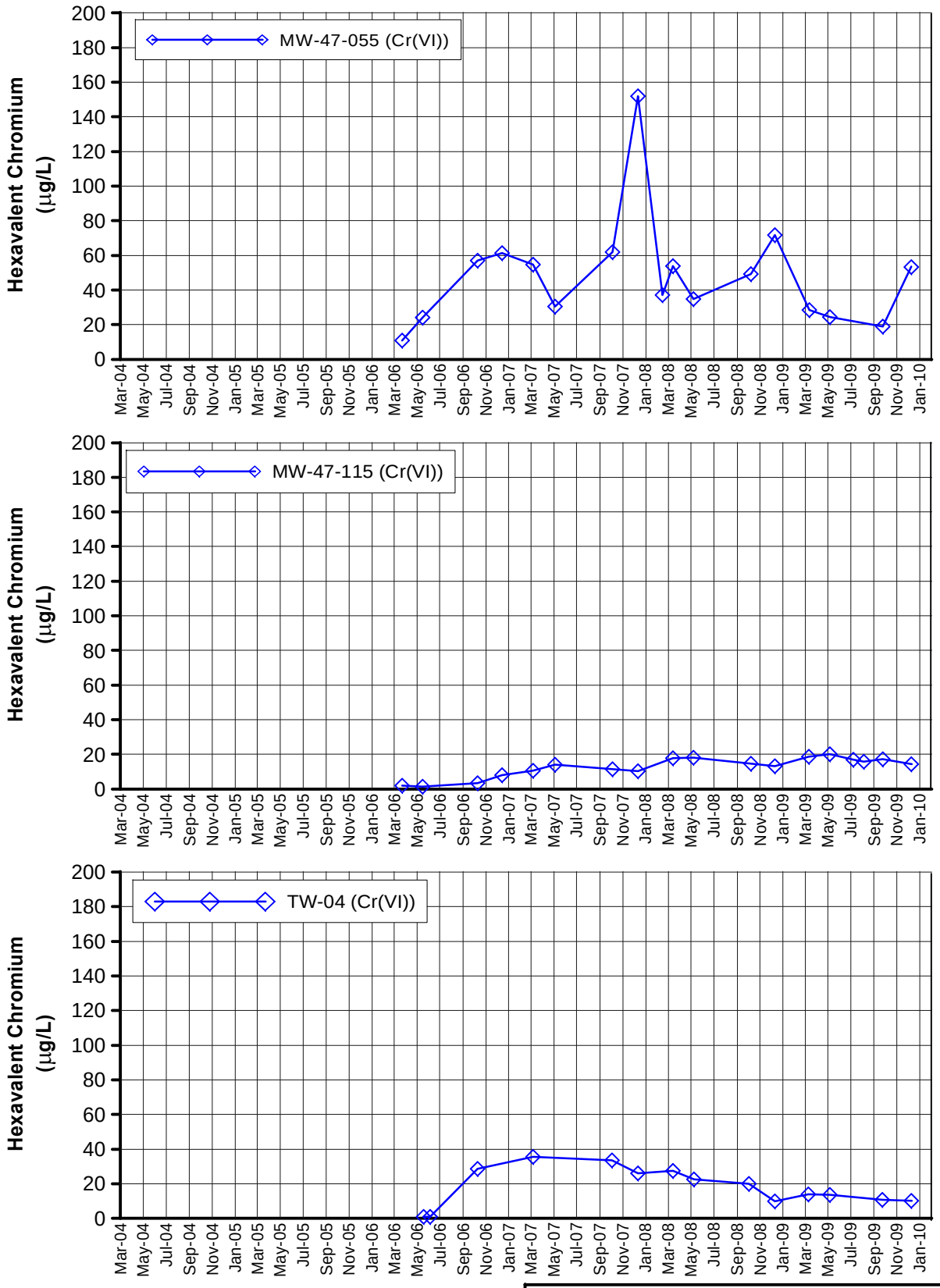


FIGURE B-7
HEXAVALENT CHROMIUM
IN MW-47 CLUSTER AND TW-04
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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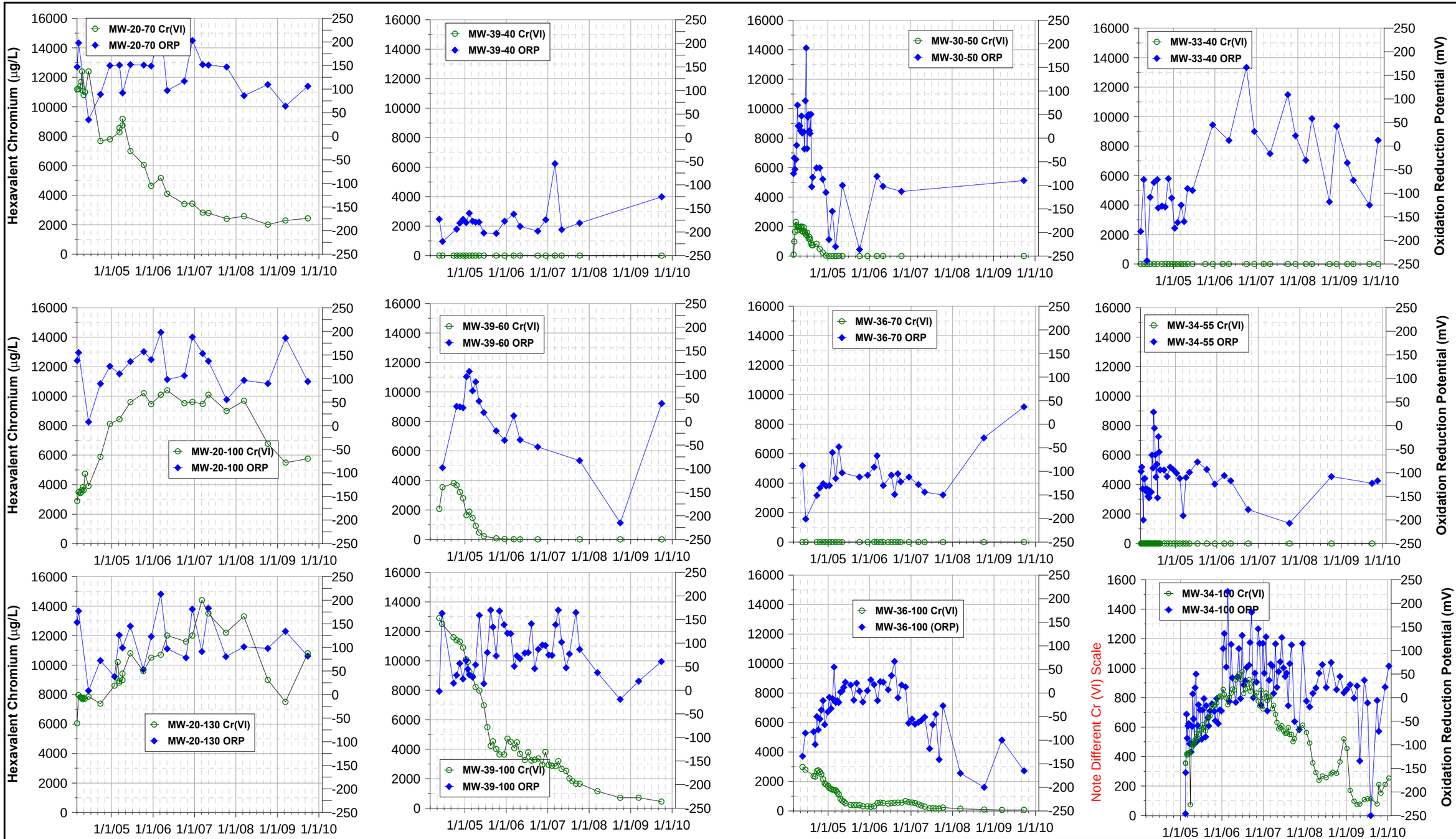
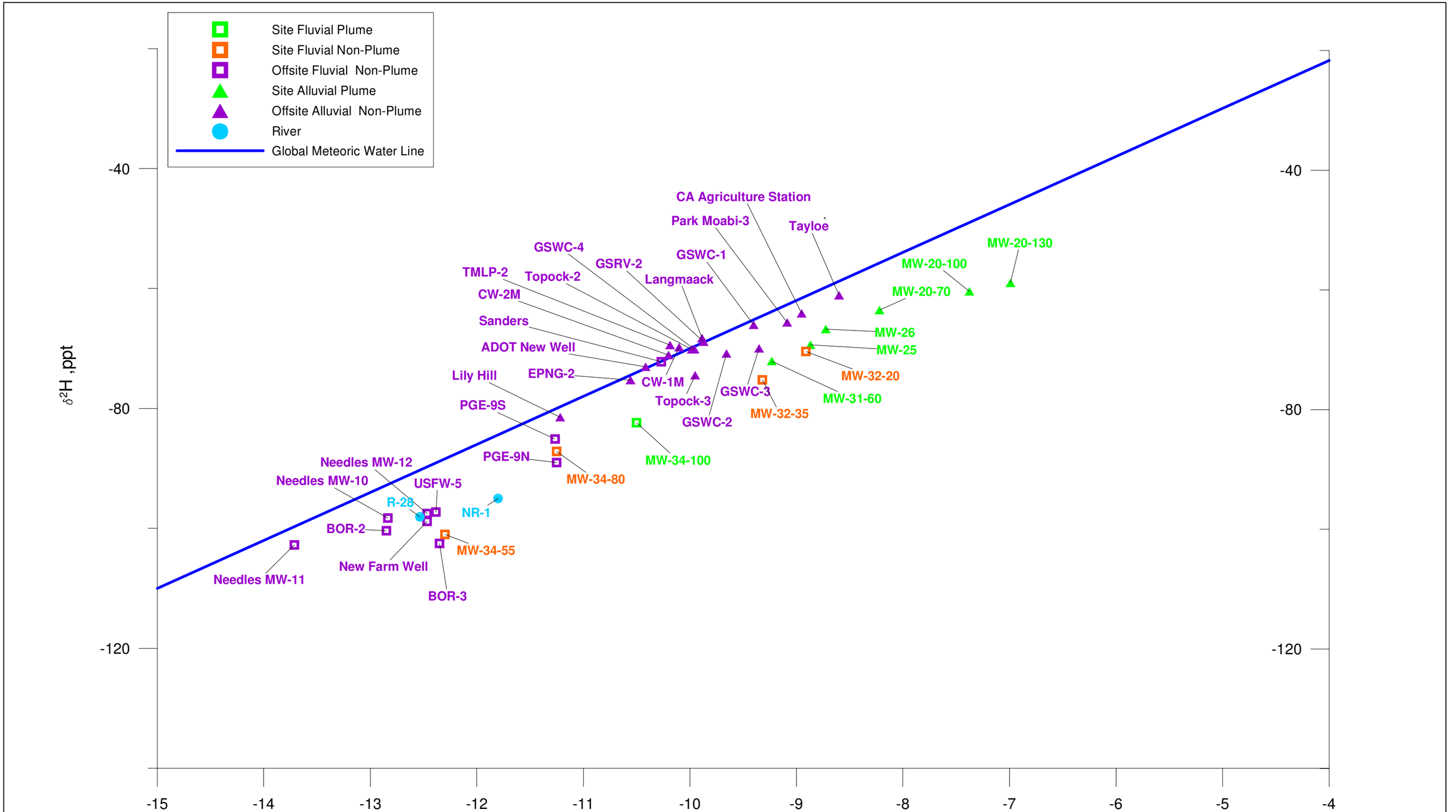


FIGURE B-8
GRAPHS OF HEXAVALENT CHROMIUM AND OXIDATION-REDUCTION POTENTIAL FOR WELLS ALONG FLOODPLAIN CROSS SECTION A

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

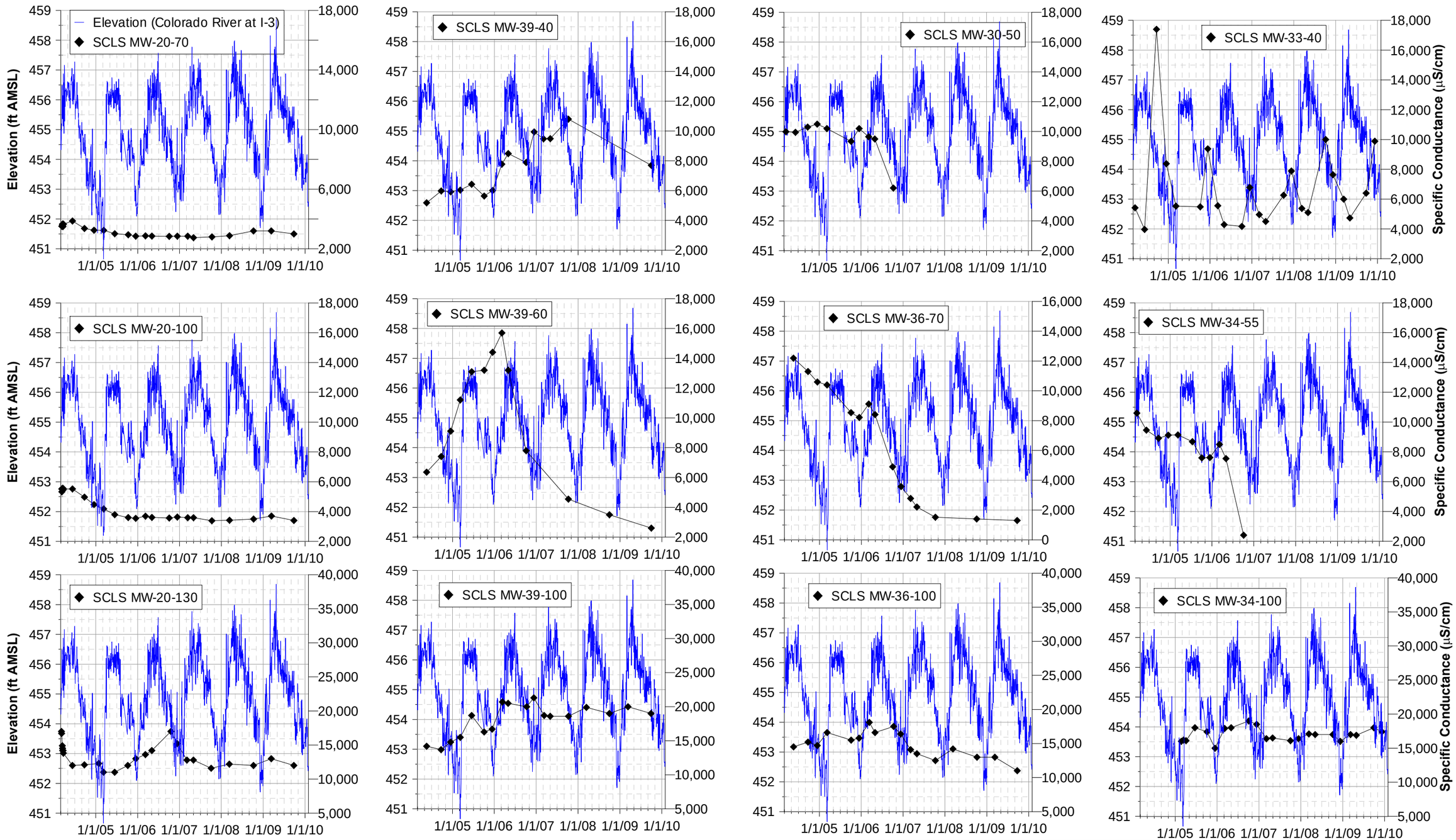
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Notes:
Values for Performance Monitoring Program Wells are averages from the 2009 Reporting Period.
Values from Background Wells are cumulative averages from all years.

FIGURE B-9
AVERAGE STABLE ISOTOPES OF OXYGEN AND DEUTERIUM
FEBRUARY 2009 THROUGH JANUARY 2010
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATIO, NEEDLES, CALIFORNIA

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Note:
Elevation = Colorado River Elevation at I-3.
SCLS = specific conductance lab sample.

FIGURE B-10
GRAPHS OF RIVER ELEVATION (I-3) AND SPECIFIC CONDUCTANCE FOR FLOODPLAIN WELLS IN CROSS-SECTION A
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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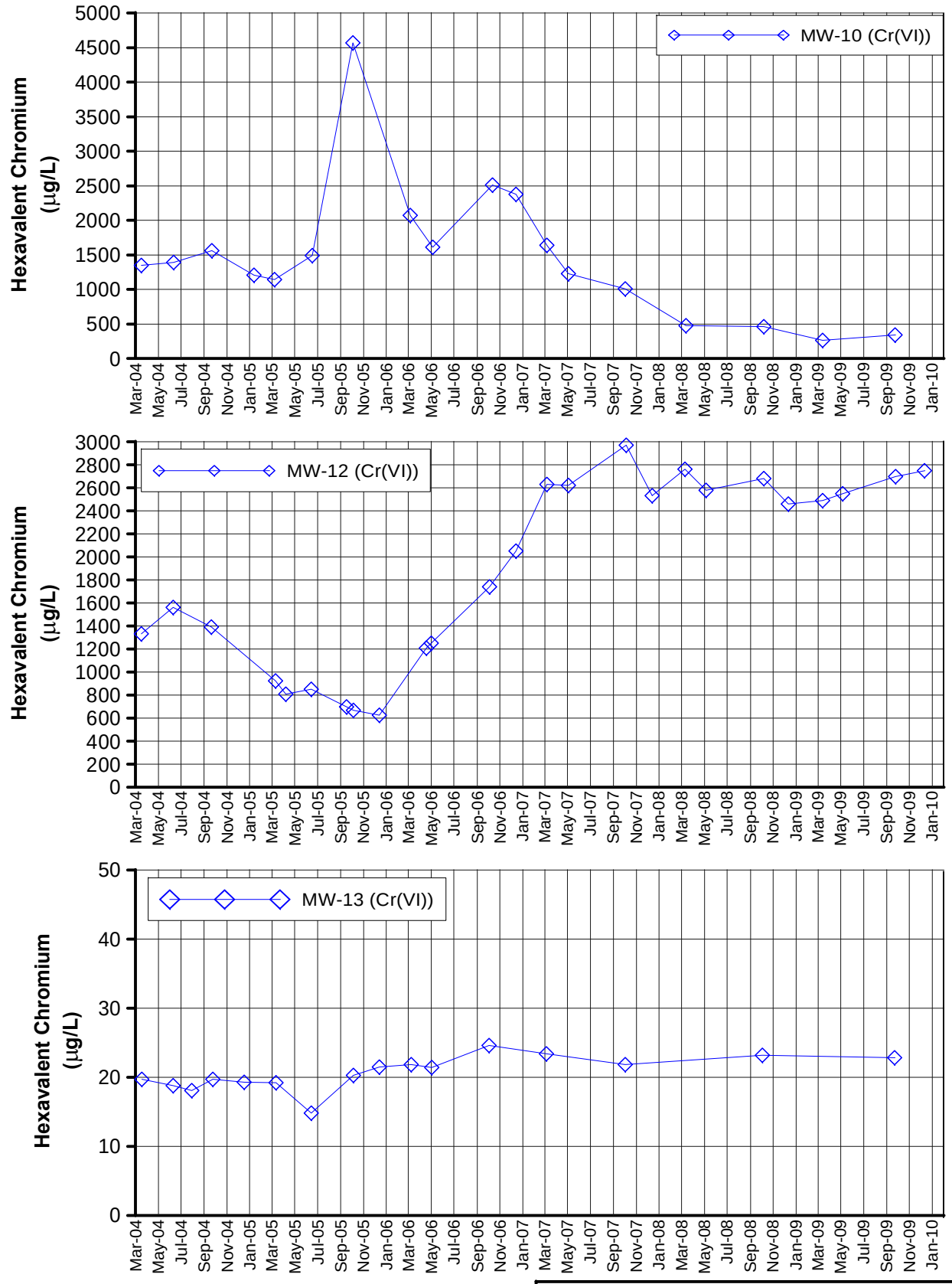


FIGURE B-11
HEXAVALENT CHROMIUM
IN MW-10, MW-12, AND MW-13
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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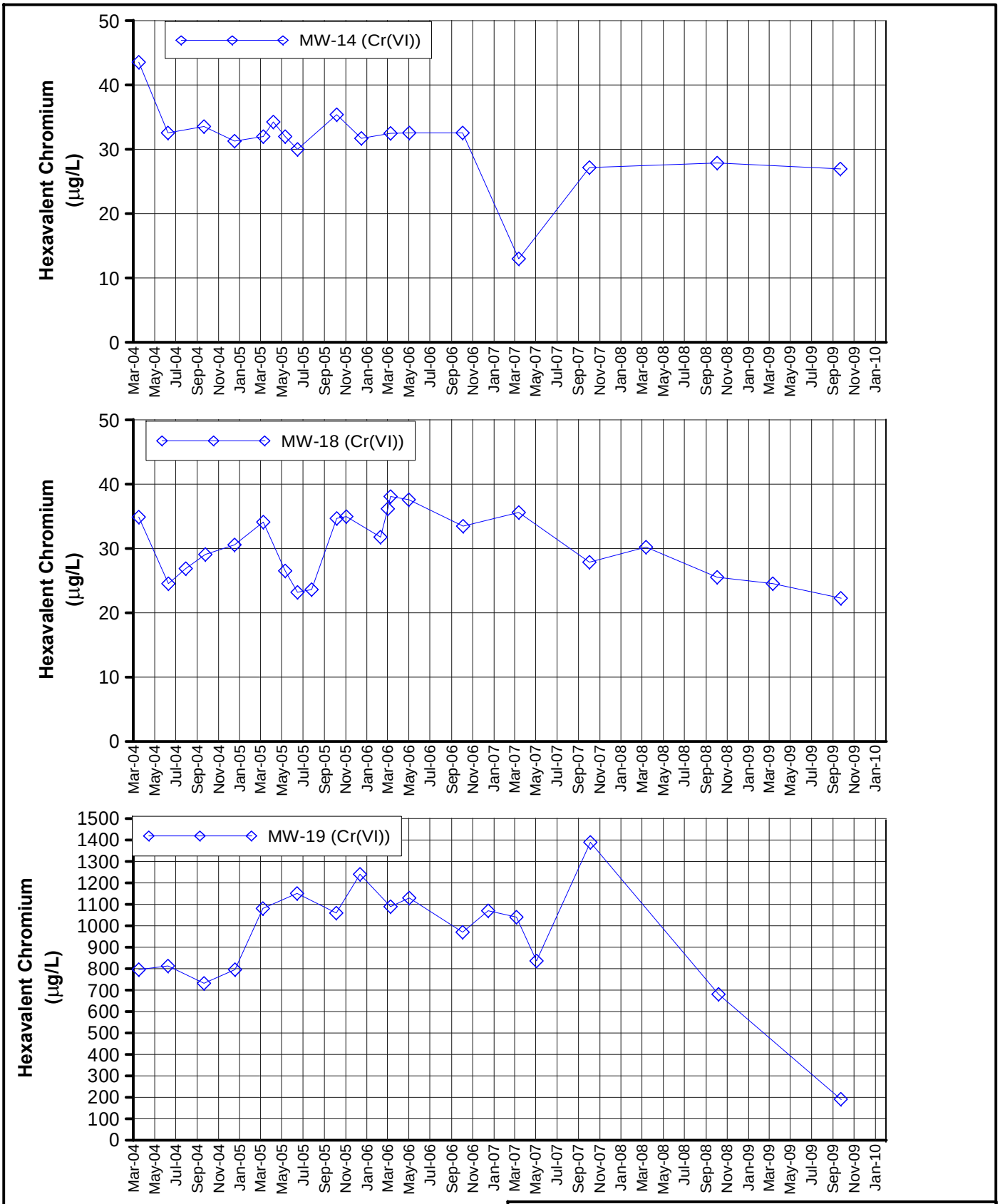


FIGURE B-12
HEXAVALENT CHROMIUM
IN MW-14, MW-18, AND MW-19
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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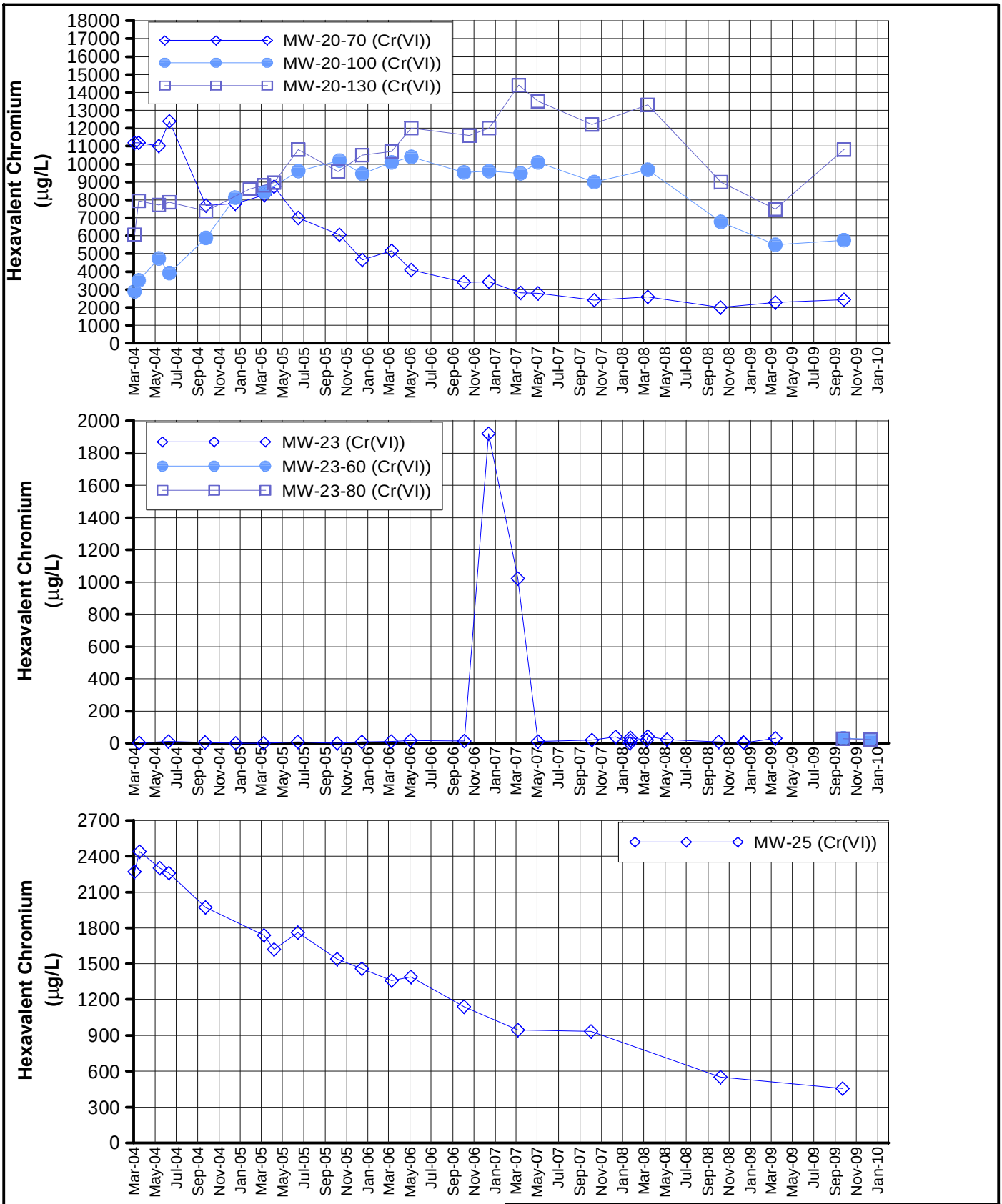


FIGURE B-13
HEXAVALENT CHROMIUM
IN MW-20, MW-23, AND MW-25 CLUSTERS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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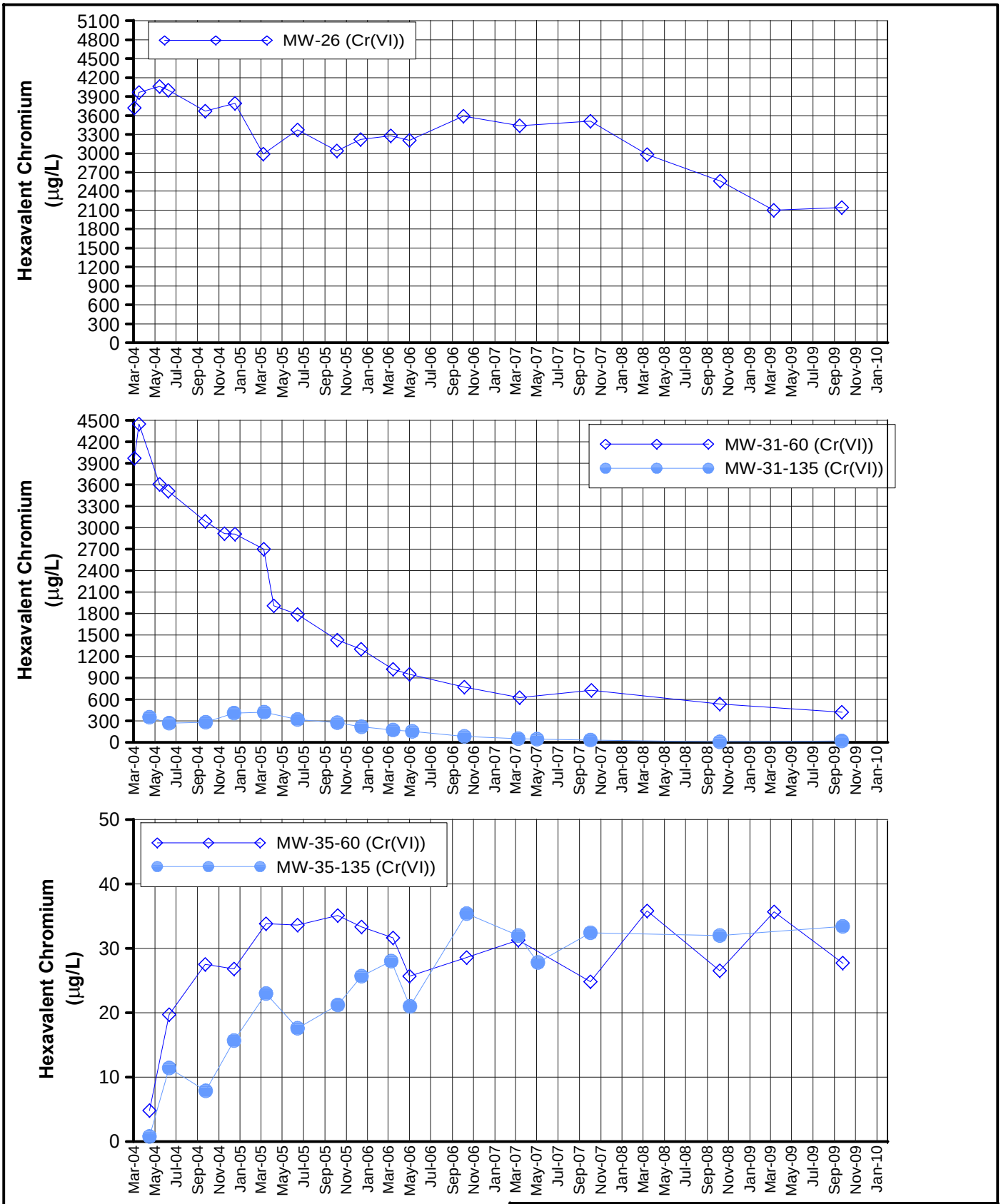


FIGURE B-14
HEXAVALENT CHROMIUM
IN MW-26, MW-31, AND MW-35 CLUSTERS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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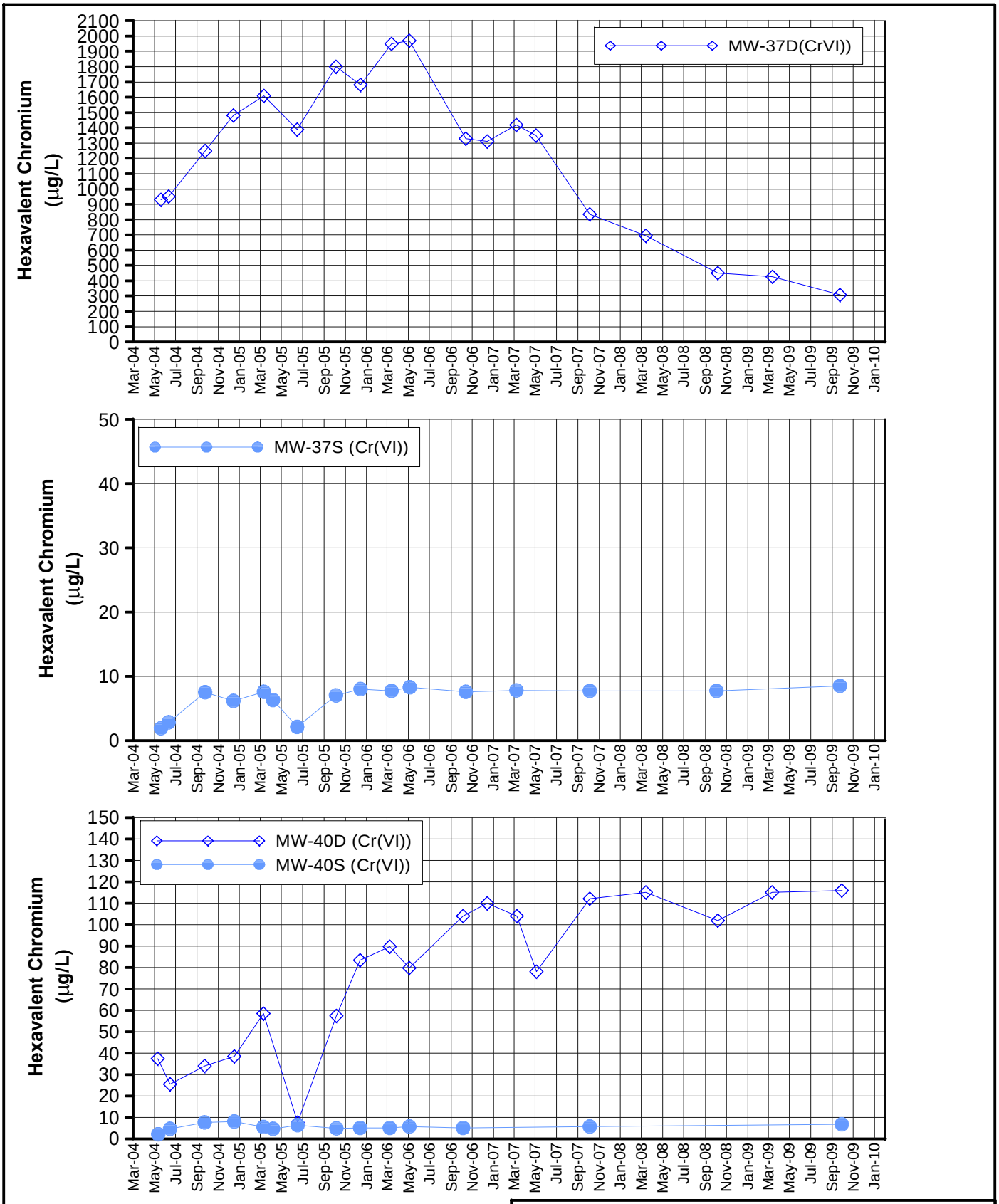


FIGURE B-15
HEXAVALENT CHROMIUM
IN MW-37 AND MW-40 CLUSTERS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES
PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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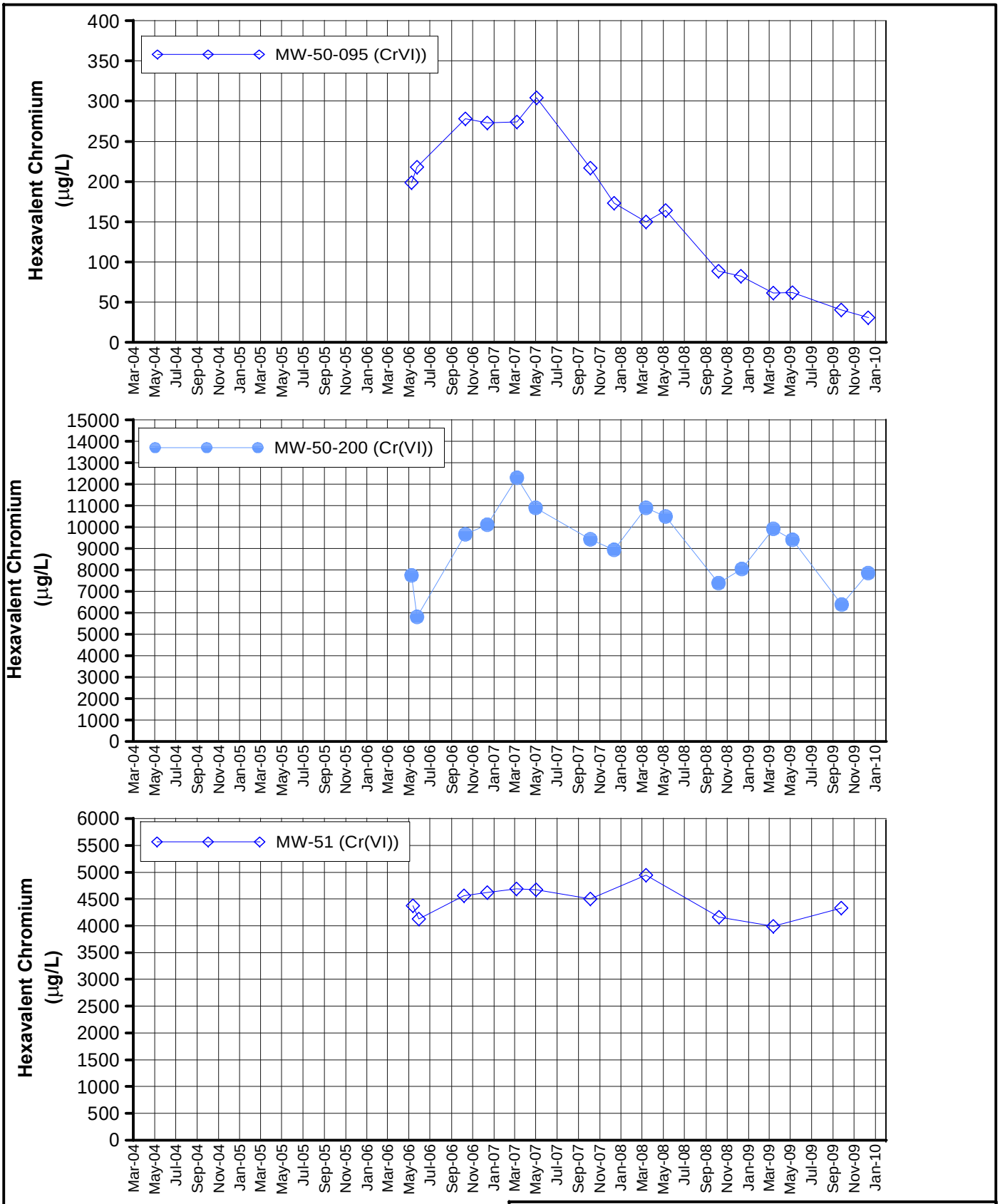


FIGURE B-16
HEXAVALENT CHROMIUM
IN MW-50 AND MW-51 CLUSTERS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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Appendix C
Hydraulic Data for Interim Measure Reporting Period

TABLE C-1

Average Monthly and Quarterly Groundwater Elevations, November 2009 through January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance

Monitoring and Site-Wide Groundwater and Surface Water

PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	November 2009	December 2009	January 2010	Quarter Average	Days in Quarter Average
I-3	River Station	454.26	453.54	453.36	453.71	92
MW-20-070	Shallow Zone	453.32	452.92	452.76	453.00	92
MW-20-100	Middle Zone	452.81	452.43	452.26	452.50	92
MW-20-130	Deep Wells	452.53	452.31	452.13	452.32	92
MW-22	Shallow Zone	454.27	453.95	454.56	454.26	92
MW-25	Shallow Zone	454.99	454.61	454.43	454.67	92
MW-26	Shallow Zone	454.63	454.31	454.18	454.37	92
MW-27-020	Shallow Zone	454.18	453.51	453.48	453.73	88
MW-27-060	Middle Zone	454.12	453.48	453.44	453.69	88
MW-27-085	Deep Wells	454.25	453.63	453.50	453.79	92
MW-28-025	Shallow Zone	454.15	453.48	453.38	453.67	89
MW-28-090	Deep Wells	454.28	453.59	453.47	453.78	89
MW-30-050	Middle Zone	453.90	453.34	453.18	453.47	92
MW-31-060	Shallow Zone	454.14	453.68	453.52	453.78	92
MW-31-135	Deep Wells	453.56	453.09	452.92	453.19	92
MW-32-035	Shallow Zone	454.08	453.55	453.49	453.70	92
MW-33-040	Shallow Zone	454.26	453.72	453.61	453.87	89
MW-33-090	Middle Zone	454.41	453.85	453.73	454.00	89
MW-33-150	Deep Wells	454.51	453.96	453.82	454.09	92
MW-34-055	Middle Zone	454.17	453.53	453.47	453.73	88
MW-34-080	Deep Wells	454.19	453.54	453.47	453.74	88
MW-34-100	Deep Wells	454.06	453.43	453.26	453.58	92
MW-35-060	Shallow Zone	454.69	454.13	454.15	454.32	92
MW-35-135	Deep Wells	455.13	454.63	454.58	454.77	92
MW-36-020	Shallow Zone	454.11	453.54	453.36	453.66	92
MW-36-040	Shallow Zone	454.07	453.47	453.30	453.61	92
MW-36-050	Middle Zone	454.02	453.39	453.24	453.54	92
MW-36-070	Middle Zone	453.93	453.33	453.15	453.46	92
MW-36-090	Deep Wells	453.17	452.65	452.47	452.76	92
MW-36-100	Deep Wells	453.48	452.98	452.81	453.09	92
MW-39-040	Shallow Zone	453.93	453.37	453.20	453.50	92
MW-39-050	Middle Zone	453.67	453.12	452.95	453.24	92
MW-39-060	Middle Zone	453.54	453.02	452.85	453.13	92
MW-39-070	Middle Zone	453.28	452.81	452.63	452.90	92
MW-39-080	Deep Wells	453.33	452.87	452.69	452.96	92
MW-39-100	Deep Wells	453.76	453.35	453.21	453.43	92
MW-42-030	Shallow Zone	453.82	453.27	453.12	453.40	92
MW-42-065	Middle Zone	454.04	453.47	453.34	453.61	92
MW-43-025	Shallow Zone	454.12	453.46	453.34	453.64	92
MW-43-090	Deep Wells	454.52	453.88	453.76	454.05	92
MW-44-070	Middle Zone	454.06	453.43	453.22	453.57	92
MW-44-115	Deep Wells	453.75	453.18	452.96	453.29	92
MW-44-125	Deep Wells	453.99	453.31	453.23	453.51	92
MW-45-095a	Deep Wells	452.90	452.44	452.24	452.52	92
MW-46-175	Deep Wells	454.39	453.84	453.69	453.98	89
MW-47-055	Shallow Zone	454.67	454.17	454.10	454.31	89

TABLE C-1

Average Monthly and Quarterly Groundwater Elevations, November 2009 through January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance

Monitoring and Site-Wide Groundwater and Surface Water

PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	November 2009	December 2009	January 2010	Quarter Average	Days in Quarter Average
MW-47-115	Deep Wells	454.74	454.24	454.16	454.38	89
MW-49-135	Deep Wells	454.80	454.23	454.19	454.41	89
MW-50-095	Middle Zone	454.38	453.96	453.83	454.05	92
MW-51	Middle Zone	454.57	454.28	454.20	454.35	92
MW-54-085	Deep Wells	454.50	453.86	453.70	454.02	92
MW-54-140	Deep Wells	454.70	454.18	454.07	454.31	92
MW-54-195	Deep Wells	454.99	454.51	454.43	454.64	92
MW-55-045	Middle Zone	455.45	455.20	455.26	455.30	92
MW-55-120	Deep Wells	455.68	455.43	455.48	455.53	92
PT2D	Deep Wells	452.92	INC	452.31	INC	55
PT5D	Deep Wells	453.36	452.86	452.67	452.96	92
PT6D	Deep Wells	453.45	452.96	452.78	453.06	92
RRB	River Station	454.52	453.87	INC	454.15	81

NOTES:

Averages reported in ft AMSL (feet above mean sea level).

Quarterly 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

TABLE C-2
Average, Minimum, and Maximum Groundwater Elevations, February 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	Minimum[a] (ft AMSL)	Maximum[a] (ft AMSL)	Average[a] (ft AMSL)	Number of Days Reporting Data
I-3	River Station	452.42	458.69	455.10	365
MW-20-070	Shallow Zone	452.43	456.76	454.07	365
MW-20-100	Middle Zone	451.90	456.96	453.62	365
MW-20-130	Deep Wells	451.54	456.89	453.30	365
MW-22	Shallow Zone	453.73	457.76	454.96	364
MW-25	Shallow Zone	454.35	456.68	455.47	365
MW-26	Shallow Zone	454.02	456.49	455.16	365
MW-27-020	Shallow Zone	452.73	458.13	455.00	361
MW-27-060	Middle Zone	452.68	458.23	454.95	360
MW-27-085	Deep Wells	452.77	458.36	455.06	365
MW-28-025	Shallow Zone	452.49	458.03	455.00	362
MW-28-090	Deep Wells	452.63	458.33	455.09	362
MW-30-050	Middle Zone	452.55	458.06	454.75	365
MW-31-060	Shallow Zone	453.16	455.90	454.57	365
MW-31-135	Deep Wells	452.49	457.36	454.31	343
MW-32-035	Shallow Zone	452.97	457.78	454.98	343
MW-33-040	Shallow Zone	453.06	457.41	455.02	362
MW-33-090	Middle Zone	453.16	457.72	455.16	362
MW-33-150	Deep Wells	453.38	457.85	455.28	341
MW-34-055	Middle Zone	452.65	458.42	455.03	361
MW-34-080	Deep Wells	452.66	458.49	455.05	361
MW-34-100	Deep Wells	452.54	458.56	454.93	365
MW-35-060	Shallow Zone	453.58	457.36	455.10	278
MW-35-135	Deep Wells	454.26	457.72	455.77	365
MW-36-020	Shallow Zone	452.74	457.78	454.92	365
MW-36-040	Shallow Zone	452.61	458.01	454.84	365
MW-36-050	Middle Zone	452.55	458.06	454.83	365
MW-36-070	Middle Zone	452.45	457.98	454.73	365
MW-36-090	Deep Wells	451.87	457.77	454.02	365
MW-36-100	Deep Wells	452.21	458.07	454.32	365
MW-39-040	Shallow Zone	452.60	457.85	454.69	365
MW-39-050	Middle Zone	452.35	457.71	454.48	365
MW-39-060	Middle Zone	452.28	457.67	454.37	365
MW-39-070	Middle Zone	452.11	457.62	454.11	365
MW-39-080	Deep Wells	452.17	457.70	454.17	365
MW-39-100	Deep Wells	452.70	458.04	454.65	365
MW-42-030	Shallow Zone	452.55	455.82	454.20	365
MW-42-065	Middle Zone	452.76	457.74	454.81	365
MW-43-025	Shallow Zone	452.57	458.31	454.97	365
MW-43-090	Deep Wells	452.99	458.67	455.37	365
MW-44-070	Middle Zone	452.46	458.31	454.88	365
MW-44-115	Deep Wells	452.33	457.94	454.57	365
MW-44-125	Deep Wells	452.69	458.36	454.93	365
MW-45-095a	Deep Wells	451.47	459.67	454.00	365
MW-46-175	Deep Wells	453.14	457.93	455.13	362
MW-47-055	Shallow Zone	453.72	457.45	455.38	362
MW-47-115	Deep Wells	453.85	457.50	455.43	362
MW-49-135	Deep Wells	453.63	458.14	455.56	362

TABLE C-2

Average, Minimum, and Maximum Groundwater Elevations, February 2009 through January 2010

Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

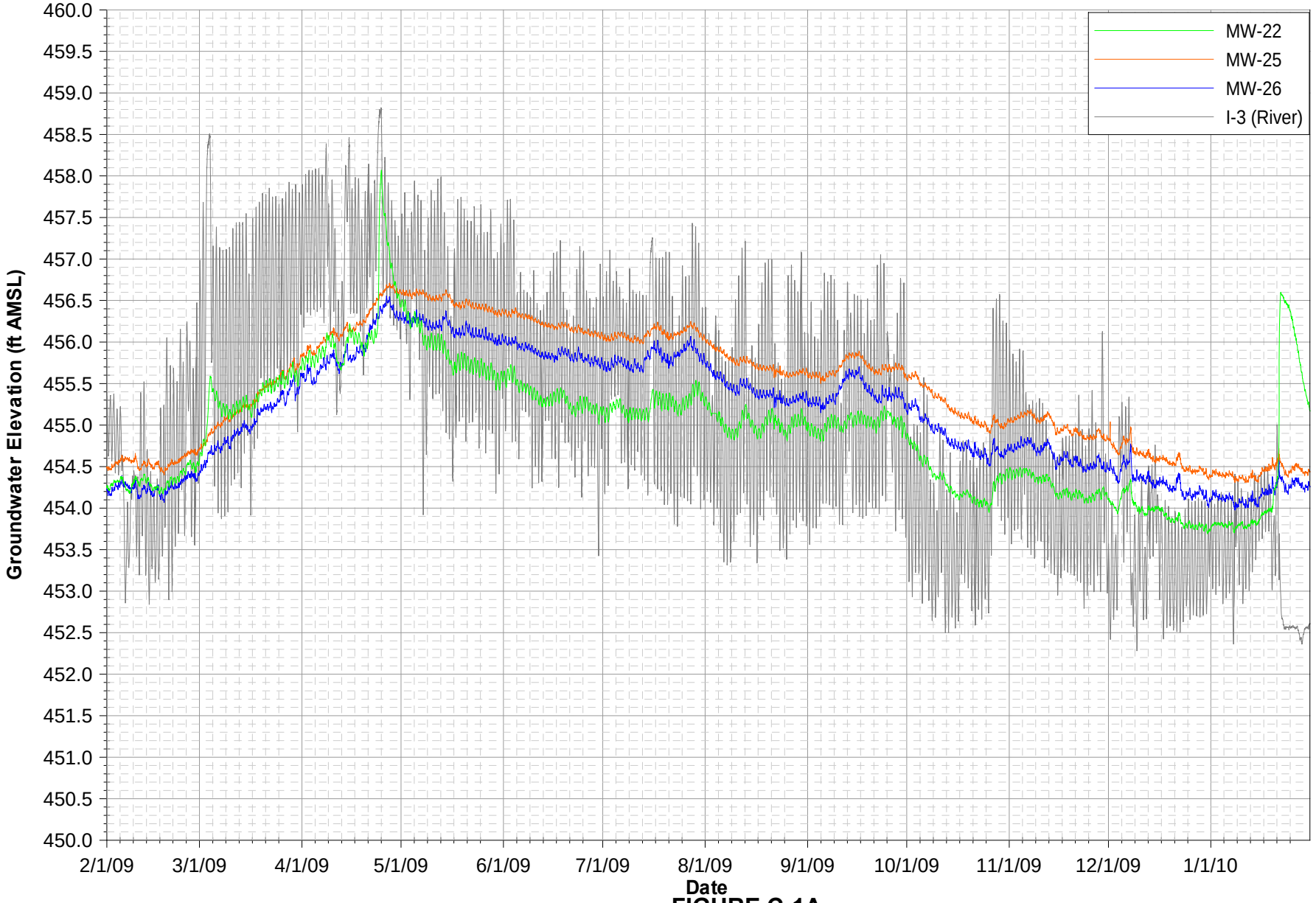
Well ID	Aquifer Zone	Minimum[a] (ft AMSL)	Maximum[a] (ft AMSL)	Average[a] (ft AMSL)	Number of Days Reporting Data
MW-50-095	Middle Zone	453.57	456.97	455.05	365
MW-51	Middle Zone	454.04	456.56	455.13	365
MW-54-085	Deep Wells	452.91	457.13	454.67	287
MW-54-140	Deep Wells	453.49	457.96	455.42	365
MW-54-195	Deep Wells	453.68	457.79	455.53	365
MW-55-045	Middle Zone	455.04	457.92	456.10	365
MW-55-120	Deep Wells	455.29	457.82	456.21	365
PT2D	Deep Wells	451.78	457.47	453.94	329
PT5D	Deep Wells	452.12	457.59	454.06	338
PT6D	Deep Wells	452.23	457.76	454.15	220
RRB	River Station	453.49	459.17	455.48	355

NOTES:

[a] minimium, maximum and average of daily groundwater elevation averages

Averages include data collected from 2/1/2009 through 1/31/2010

ft AMSL = feet above mean sea level



Notes:
Data subject to review.

FIGURE C-1A

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

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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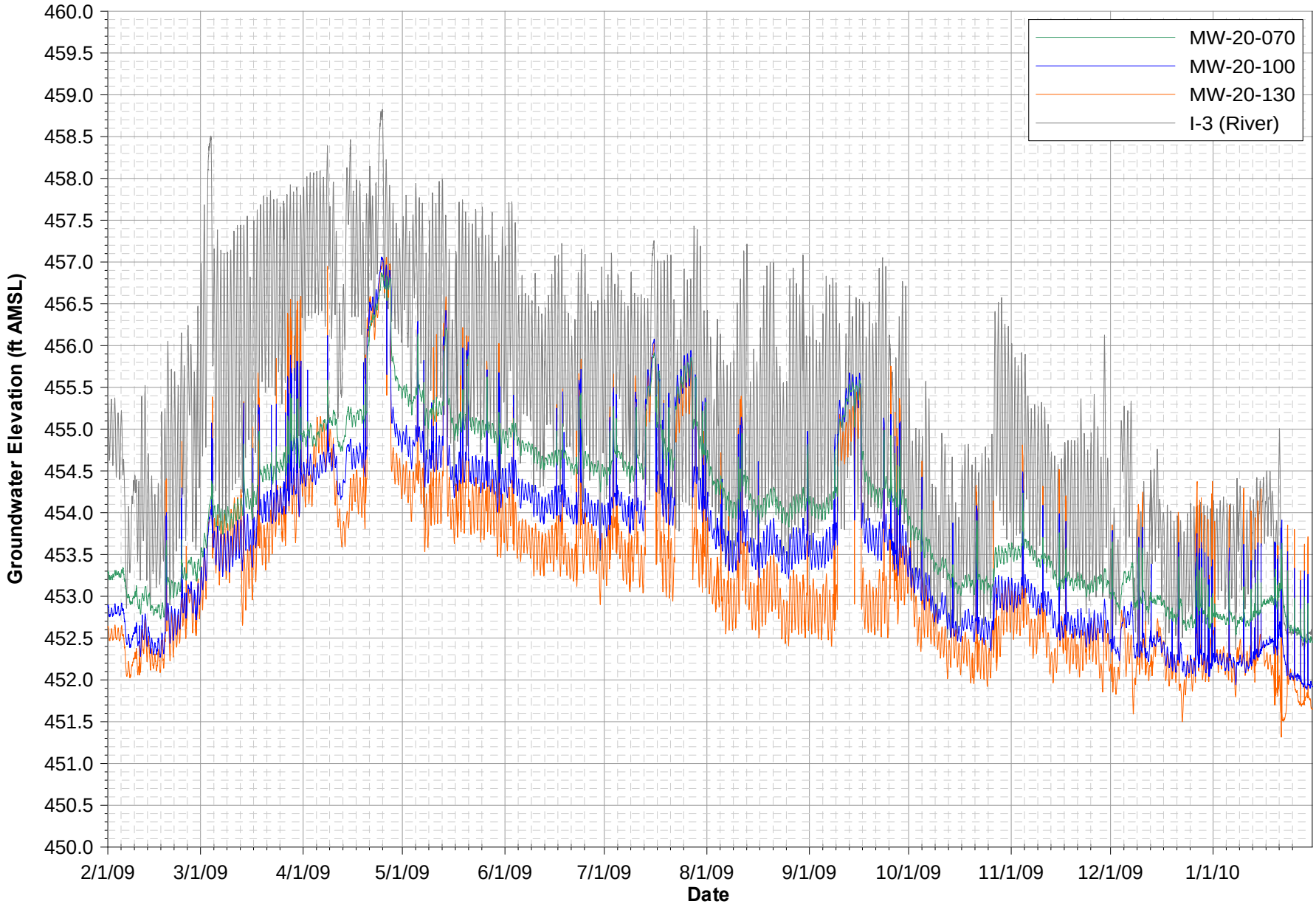
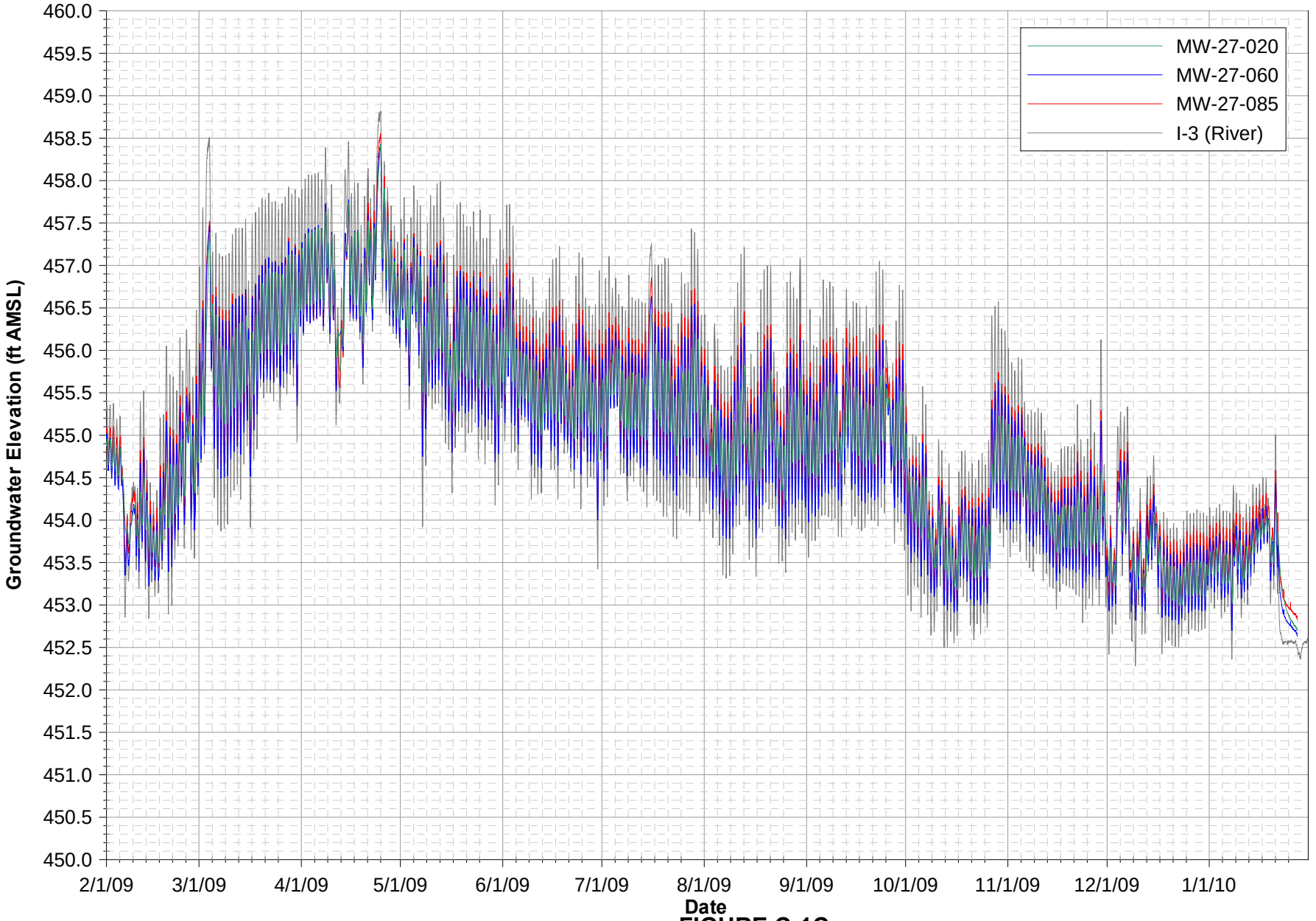


FIGURE C-1B
MW-20 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.

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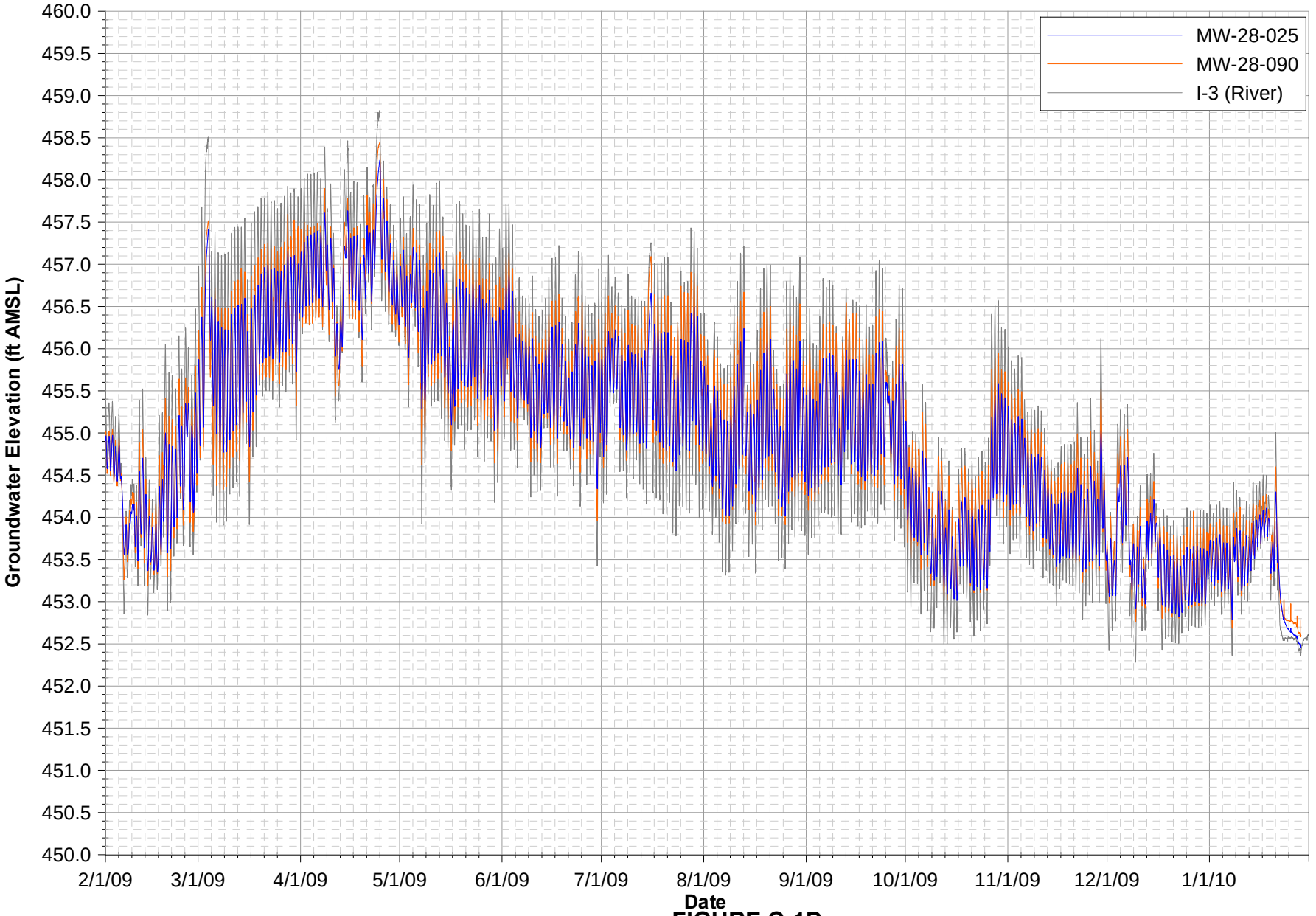
Notes:
Data subject to review.

FIGURE C-1C

MW-27 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



Notes:
Data subject to review.

FIGURE C-1D

MW-28 WELL HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

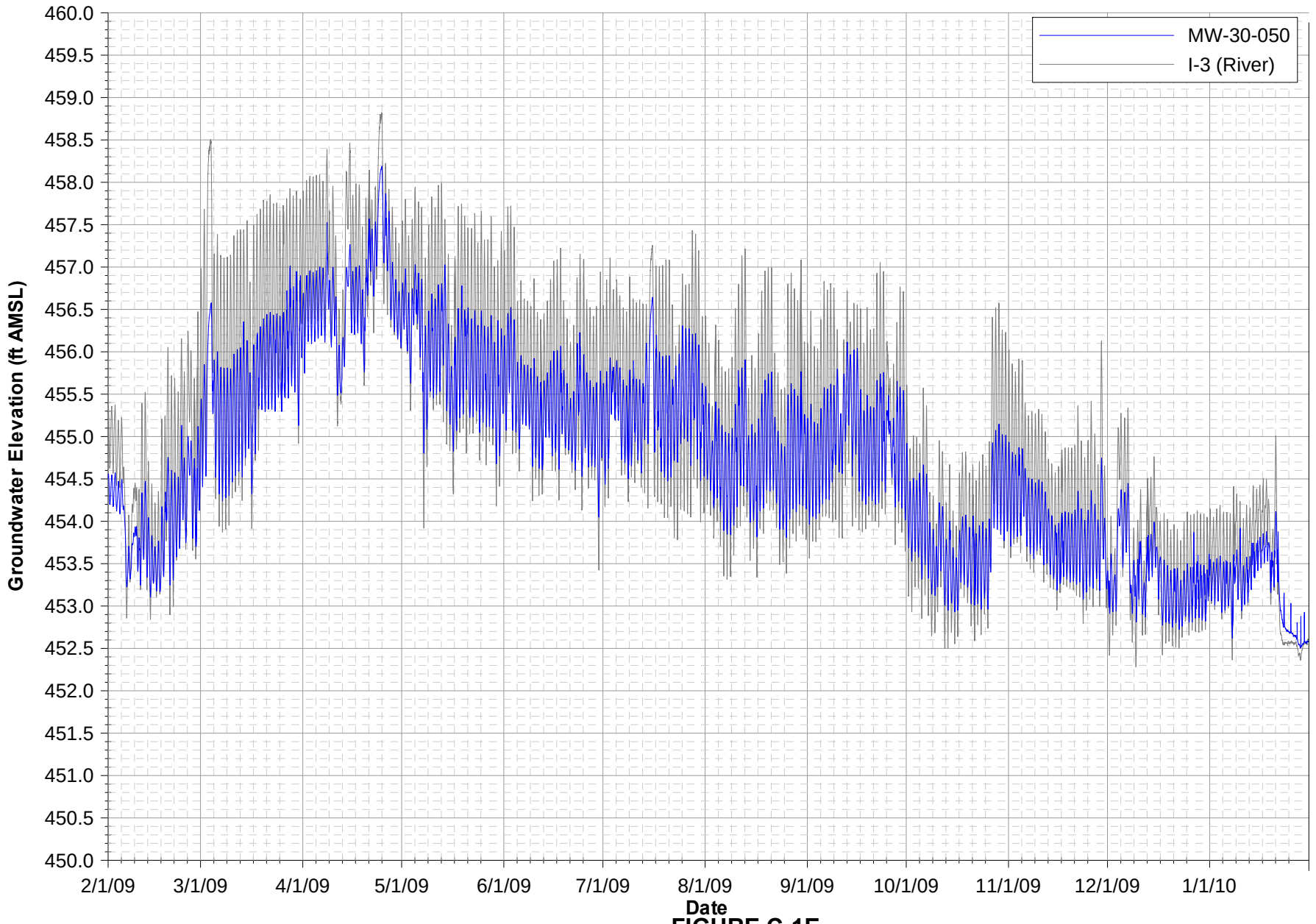


FIGURE C-1E

MW-30-50 WELL HYDROGRAPH

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.

CH2MHILL

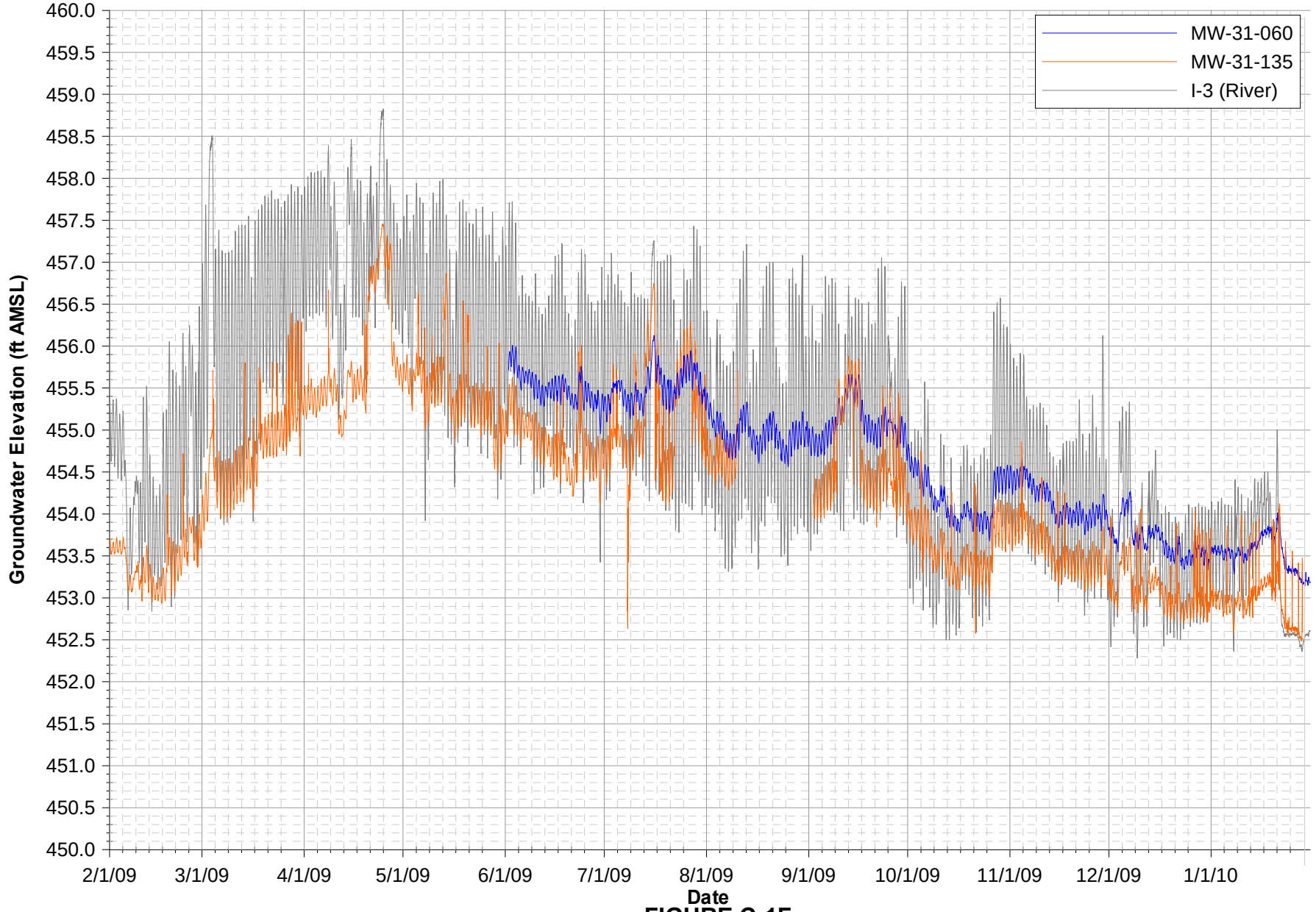


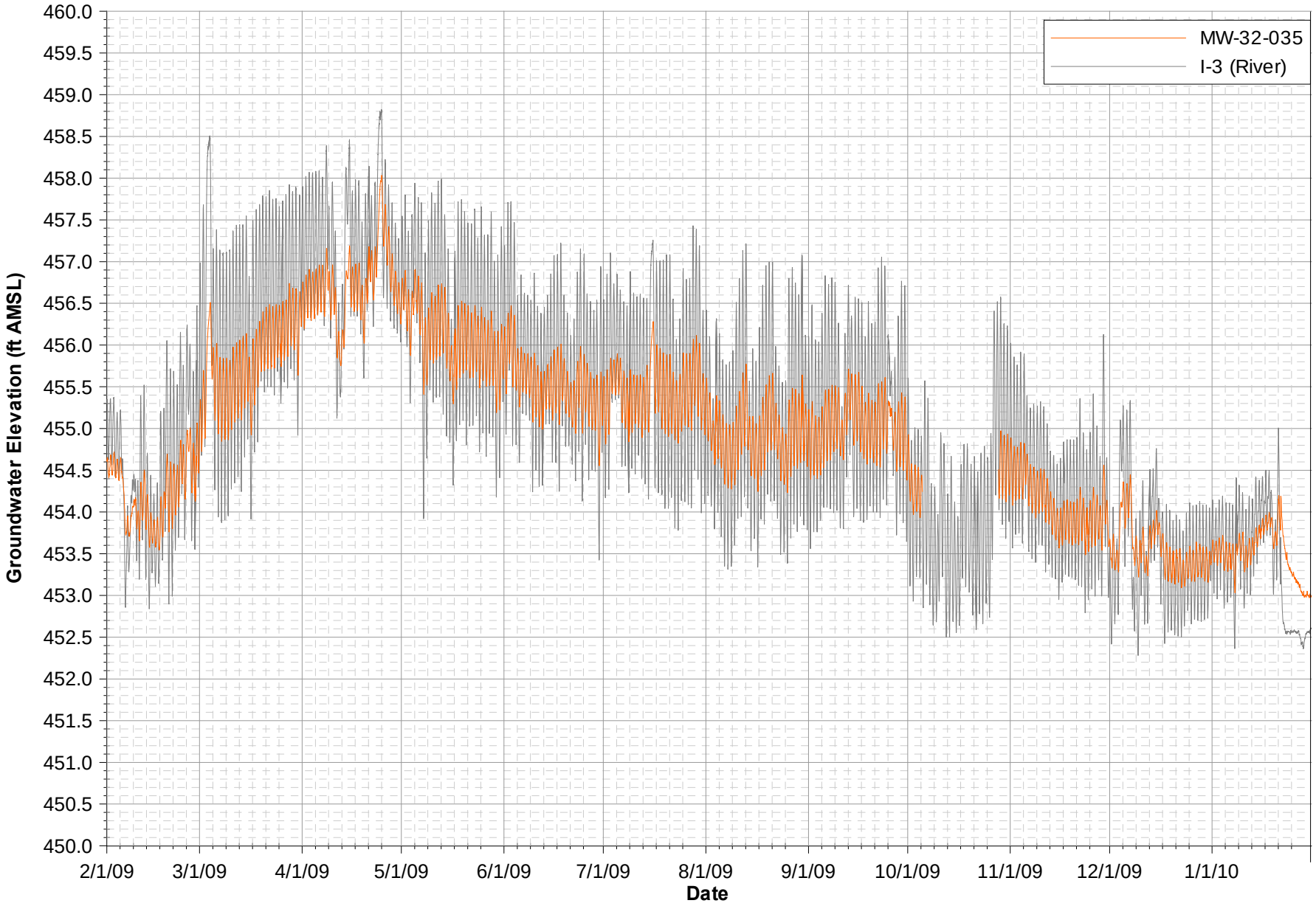
FIGURE C-1F

MW-31 WELL HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.
MW-31-060 data unavailable until June 2, 2009 due to transducer failure.
MW-31-135 data unavailable from August 10, 2009 until September 2, 2009 due to transducer failure.

CH2MHILL



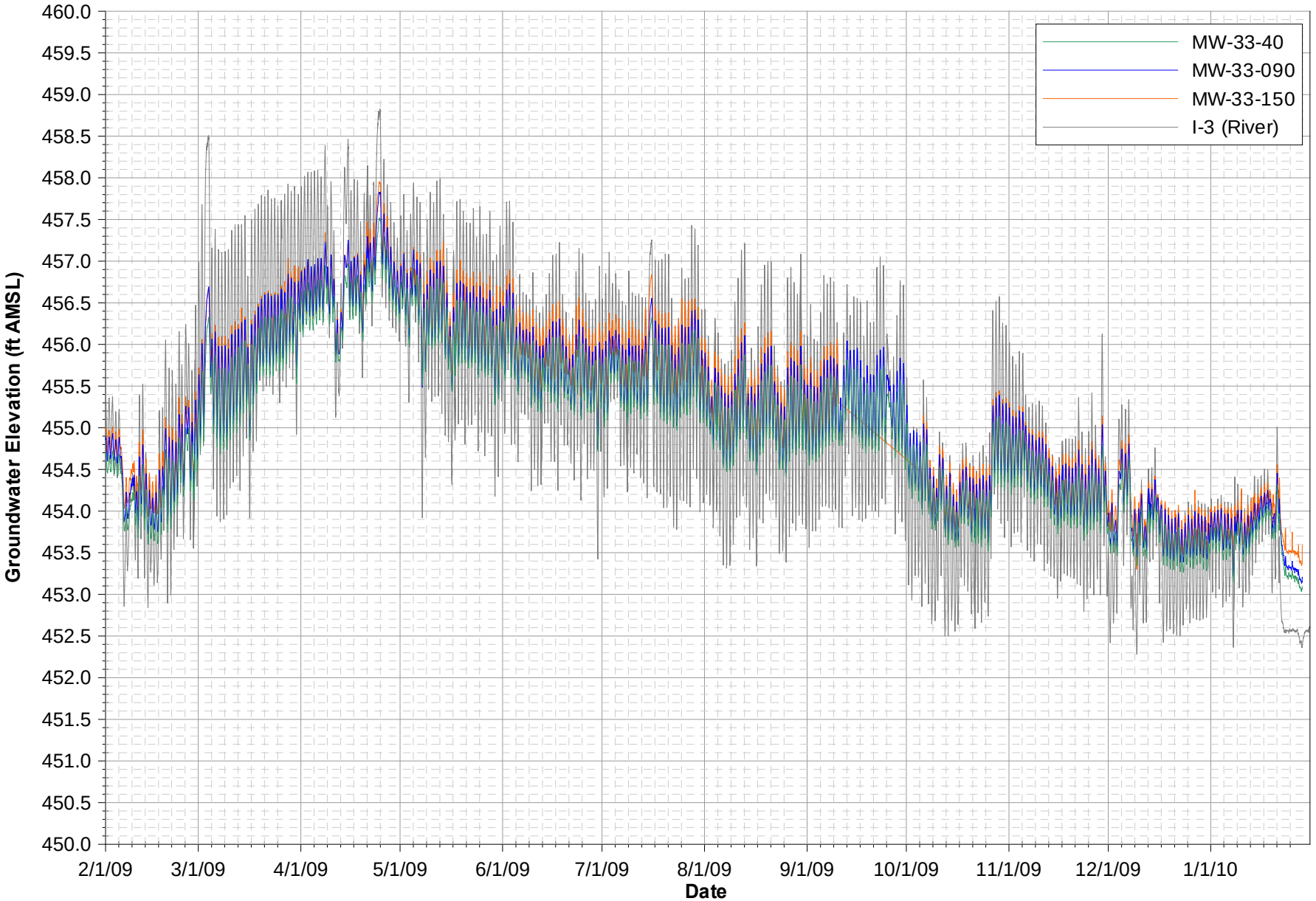
Notes:
Data subject to review.
MW-32-035 data unavailable from October 5, 2009 until October 28, 2009.

FIGURE C-1G

MW-32 WELL HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

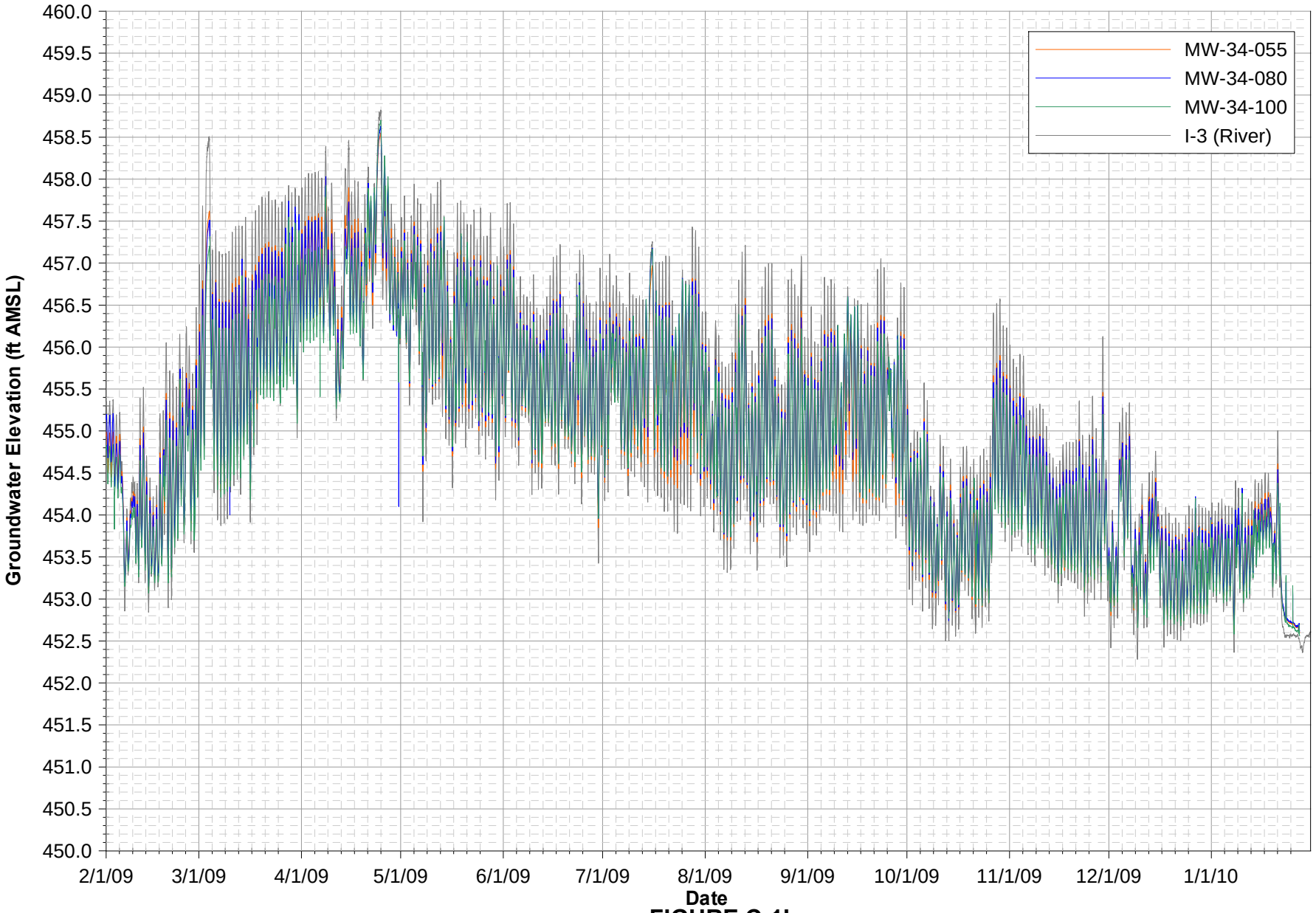
CH2MHILL



Notes:
Data subject to review.

FIGURE C-1H
MW-33 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



Notes:
Data subject to review.

FIGURE C-1I

MW-34 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

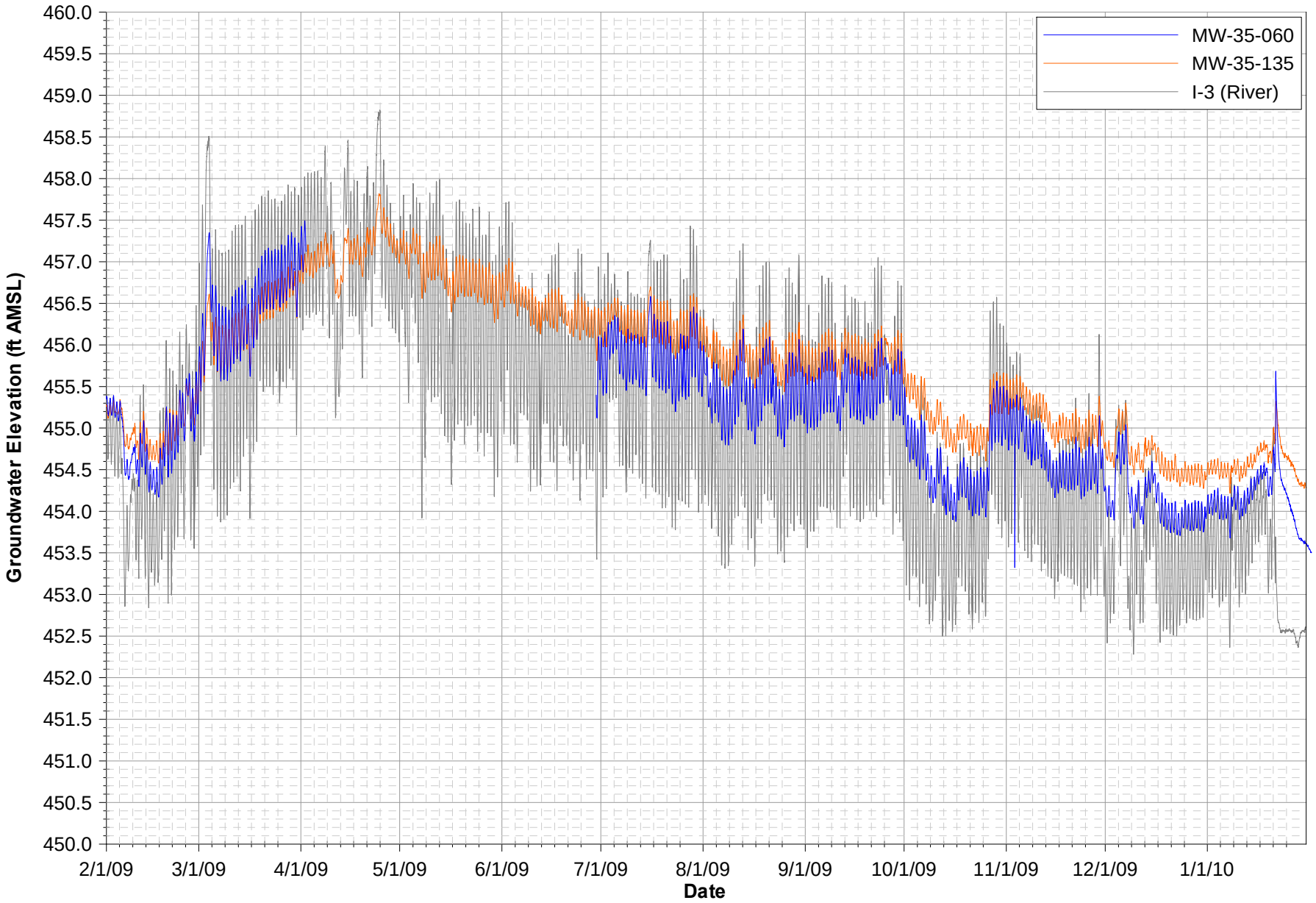


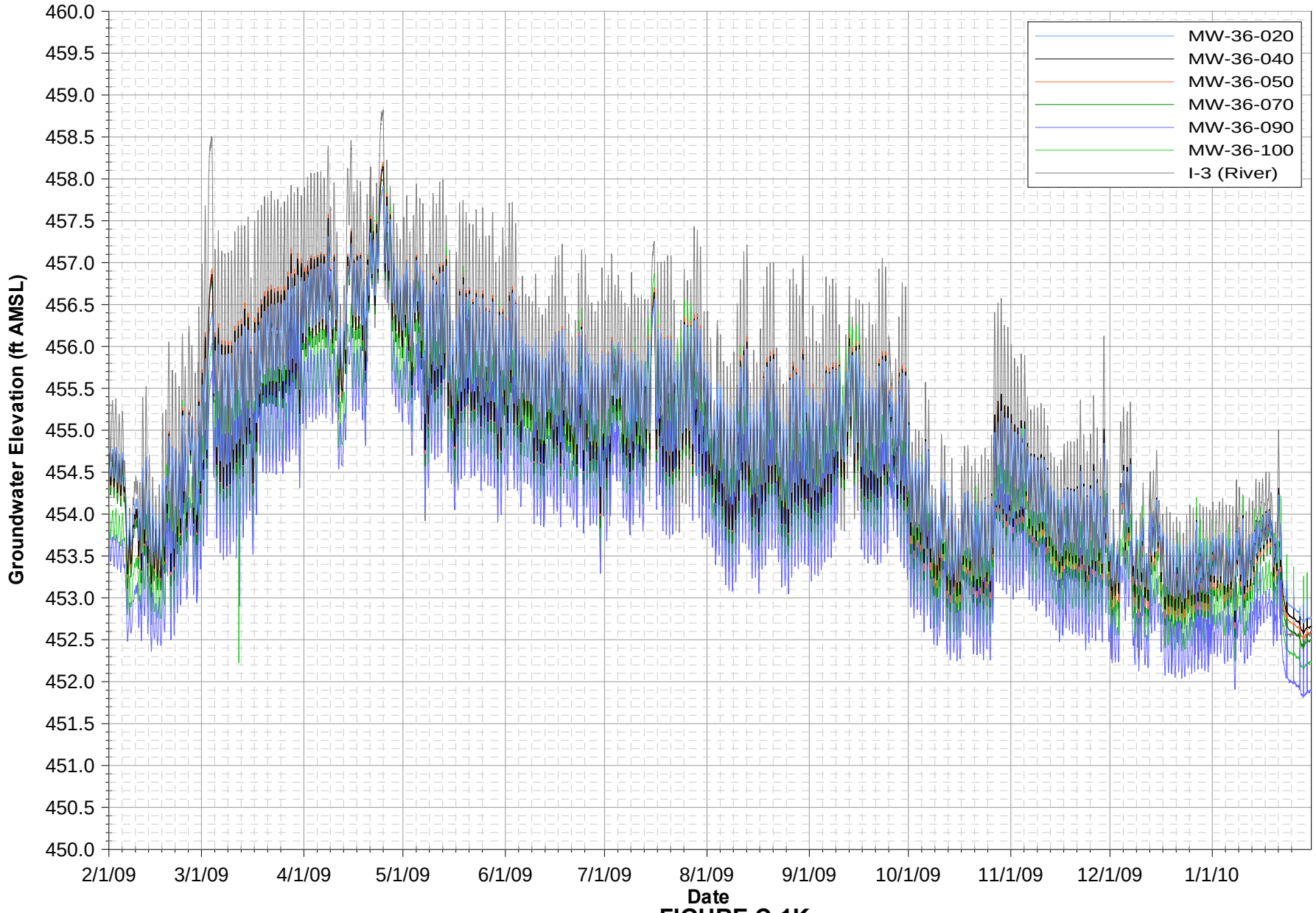
FIGURE C-1J

MW-35 WELL HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.
MW-35-135 data unavailable from April 2, 2009 until June 29, 2009 due to transducer failure.

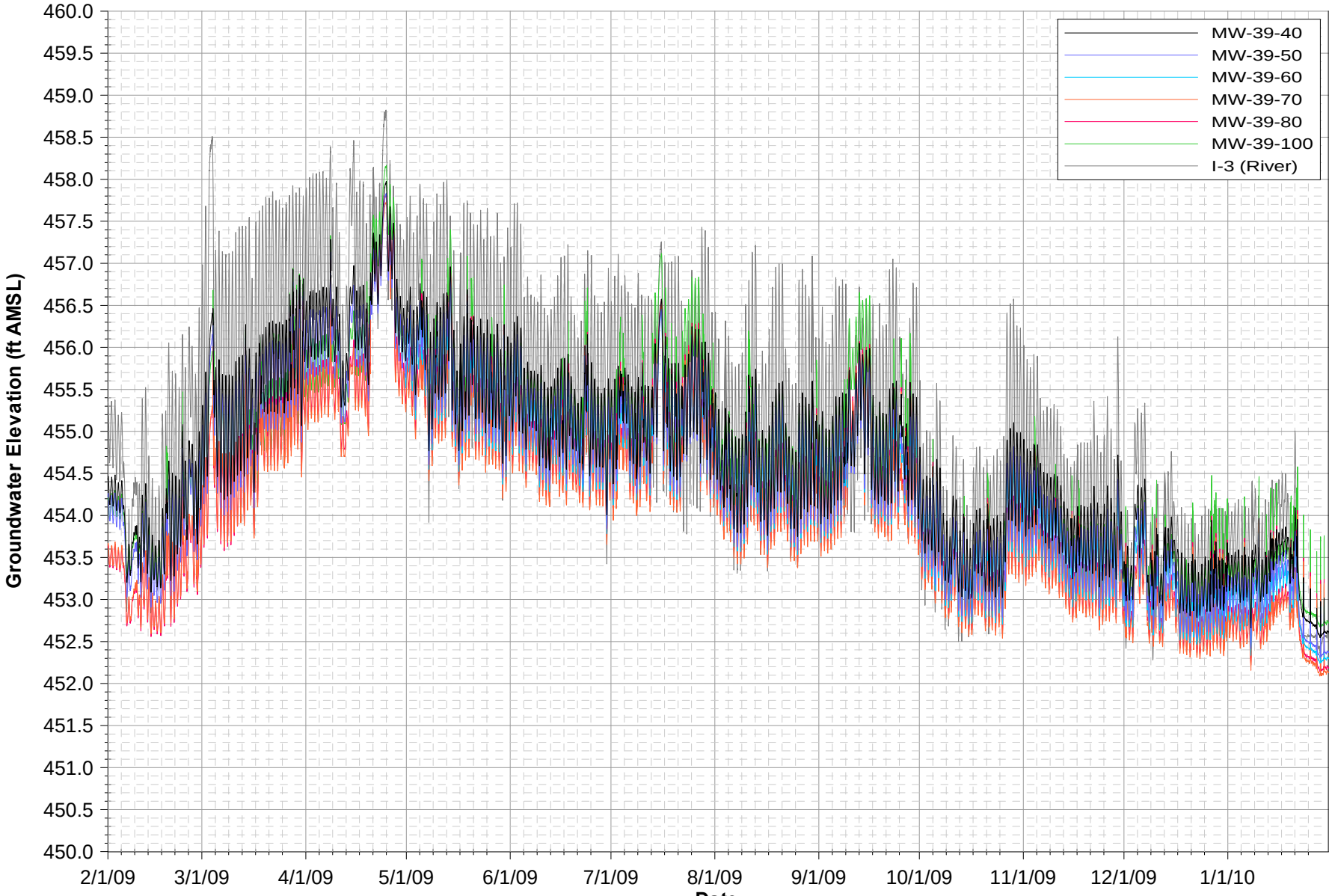
CH2MHILL



Notes:
Data subject to review.

FIGURE C-1K
MW-36 CLUSTER
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

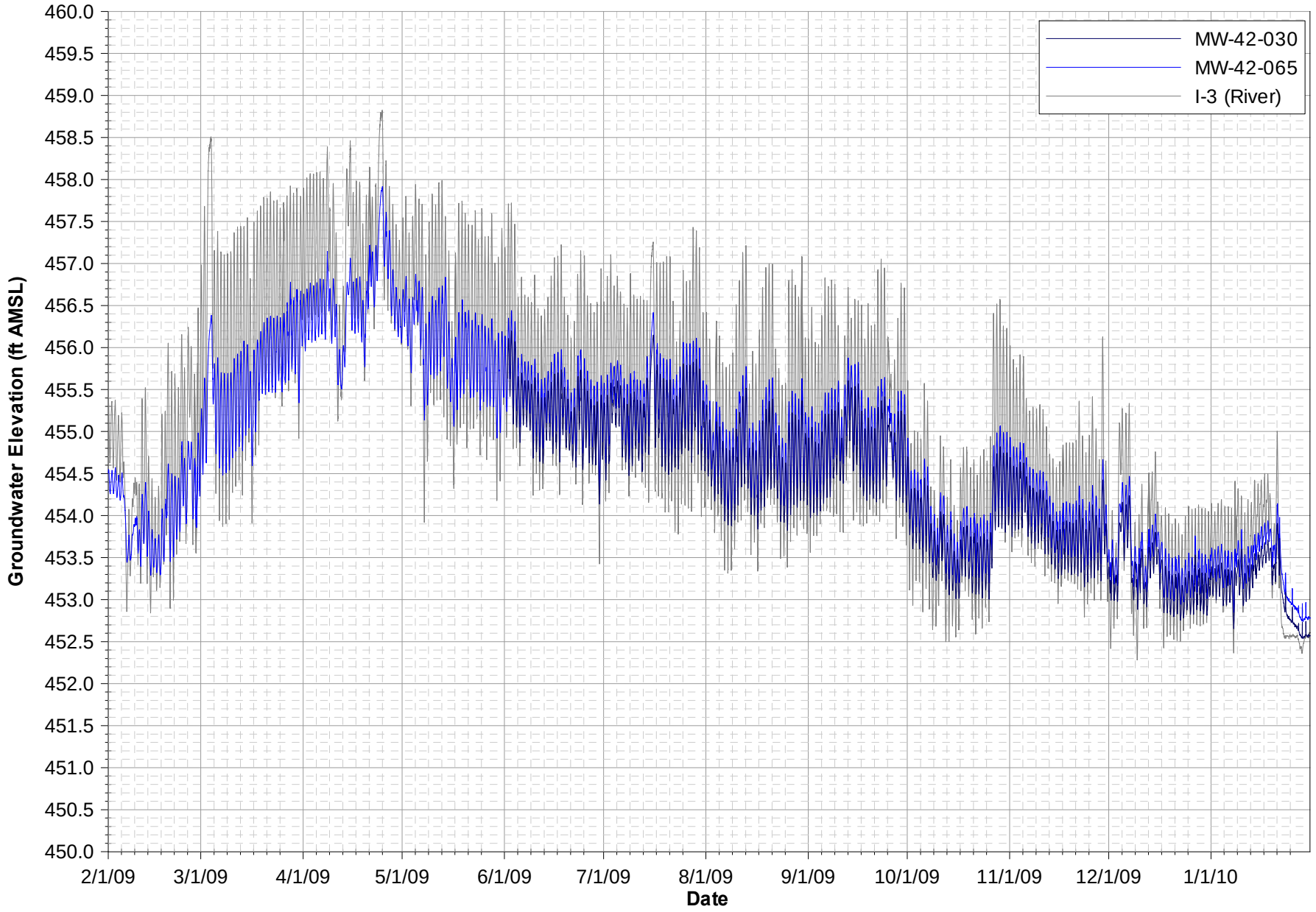
CH2MHILL



Notes:
Data subject to review.

FIGURE C-1L
MW-39 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

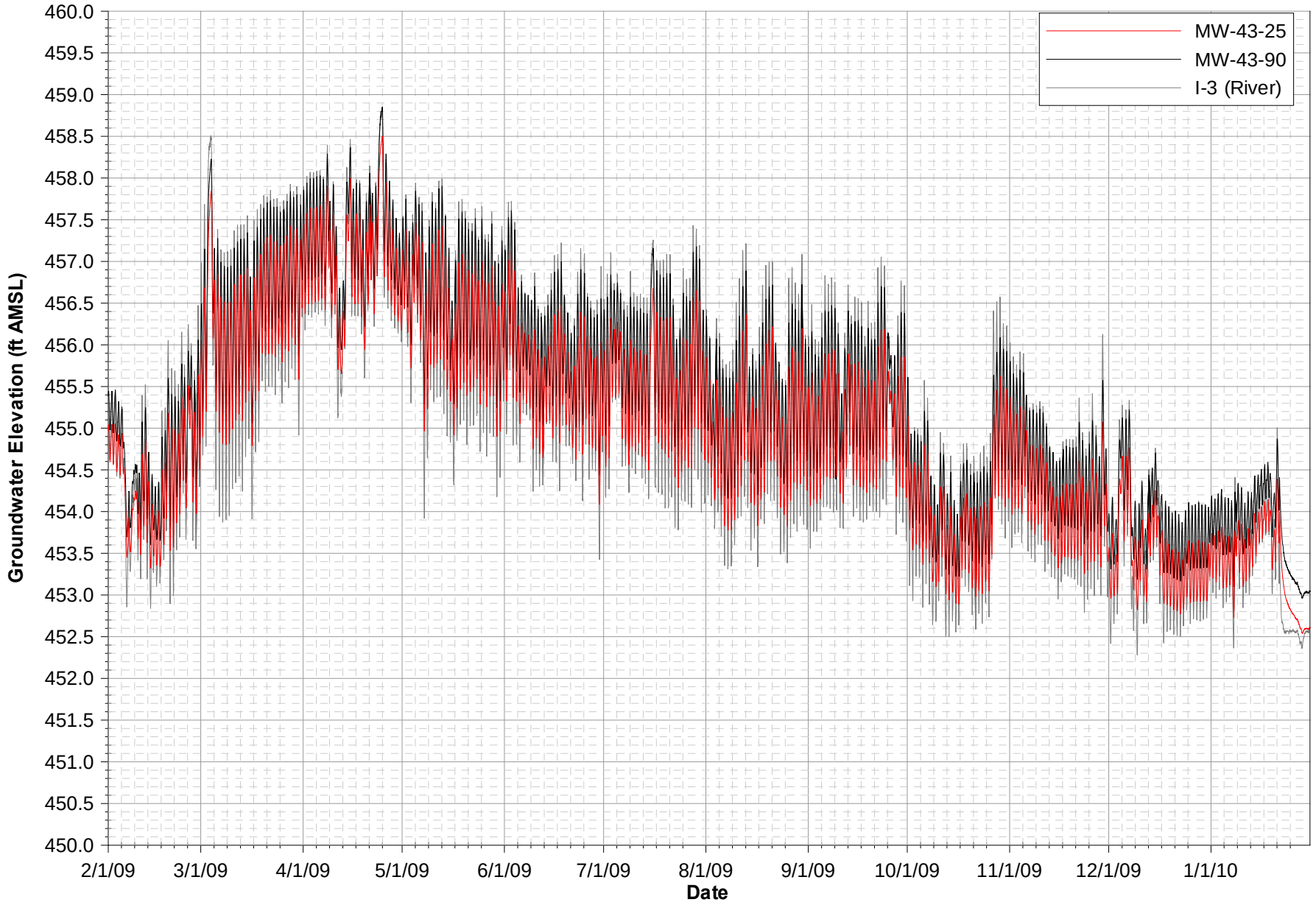
CH2MHILL



Notes:
Data subject to review.
MW-42-30 data unavailable until June 6, 2009 due to transducer failure.

FIGURE C-1M
MW-42 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

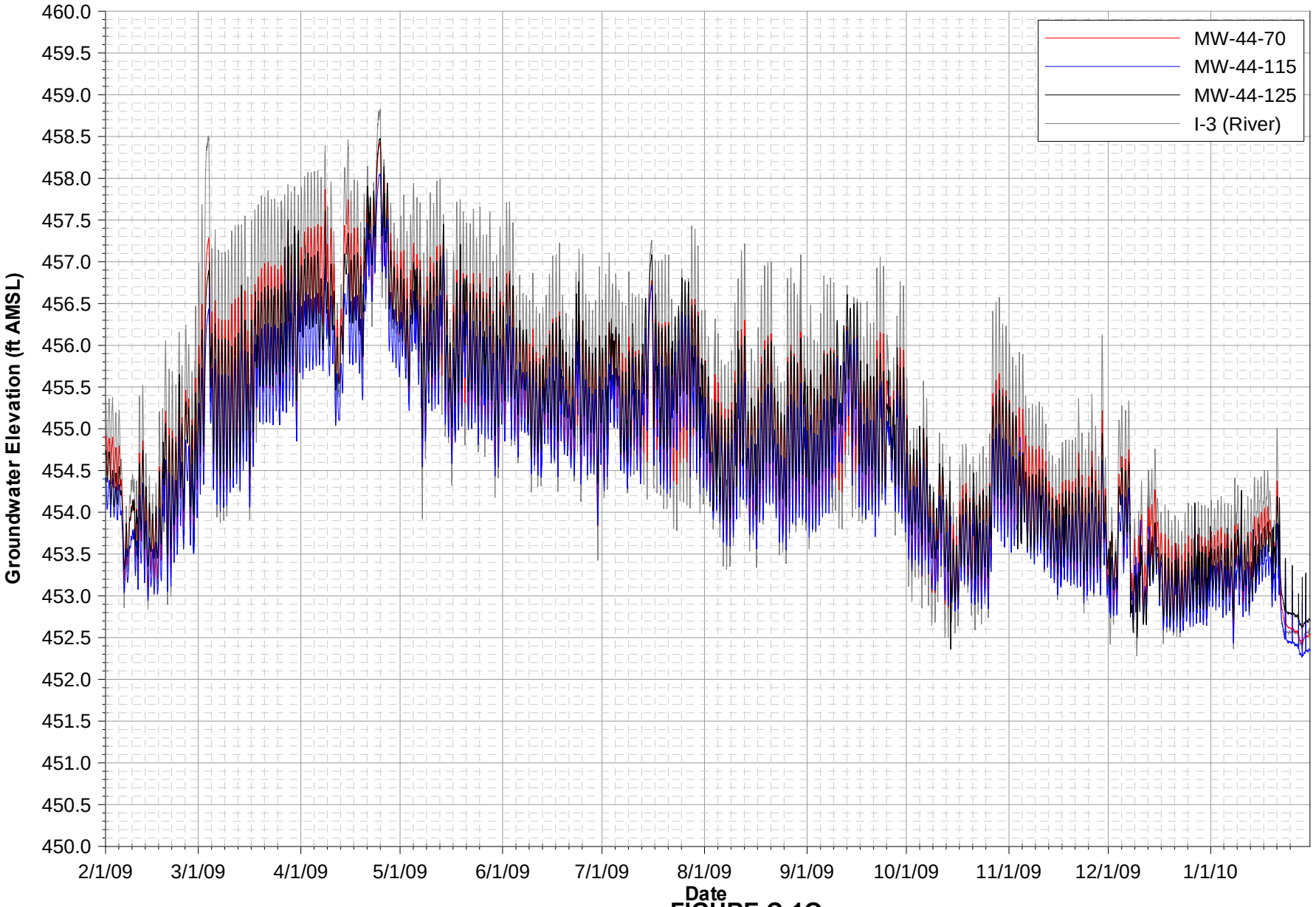
CH2MHILL



Notes:
Data subject to review.

FIGURE C-1N
MW-43 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



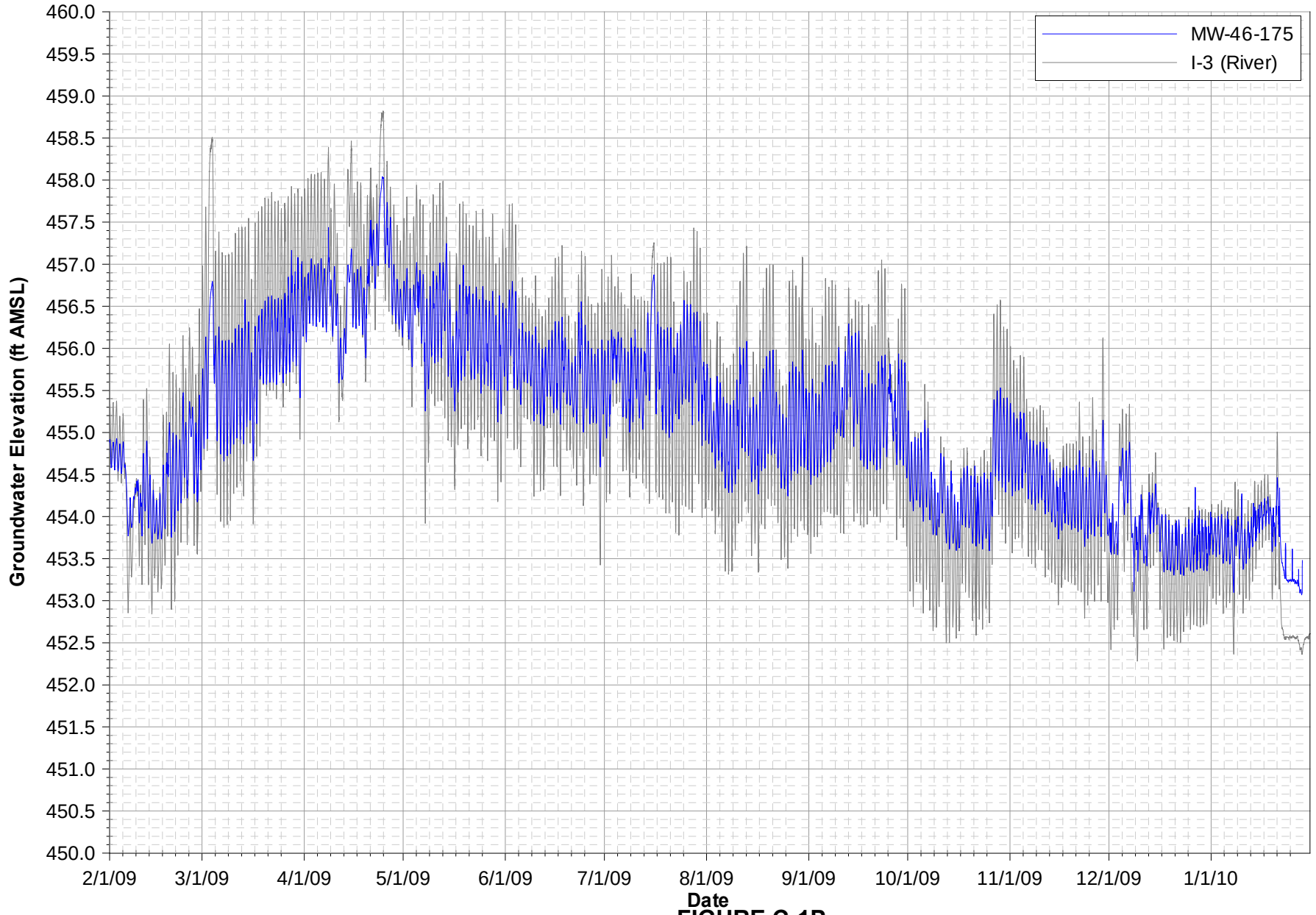
Notes:
Data subject to review.

FIGURE C-1O

MW-44 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



Notes:
Data subject to review.

FIGURE C-1P

MW-46 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

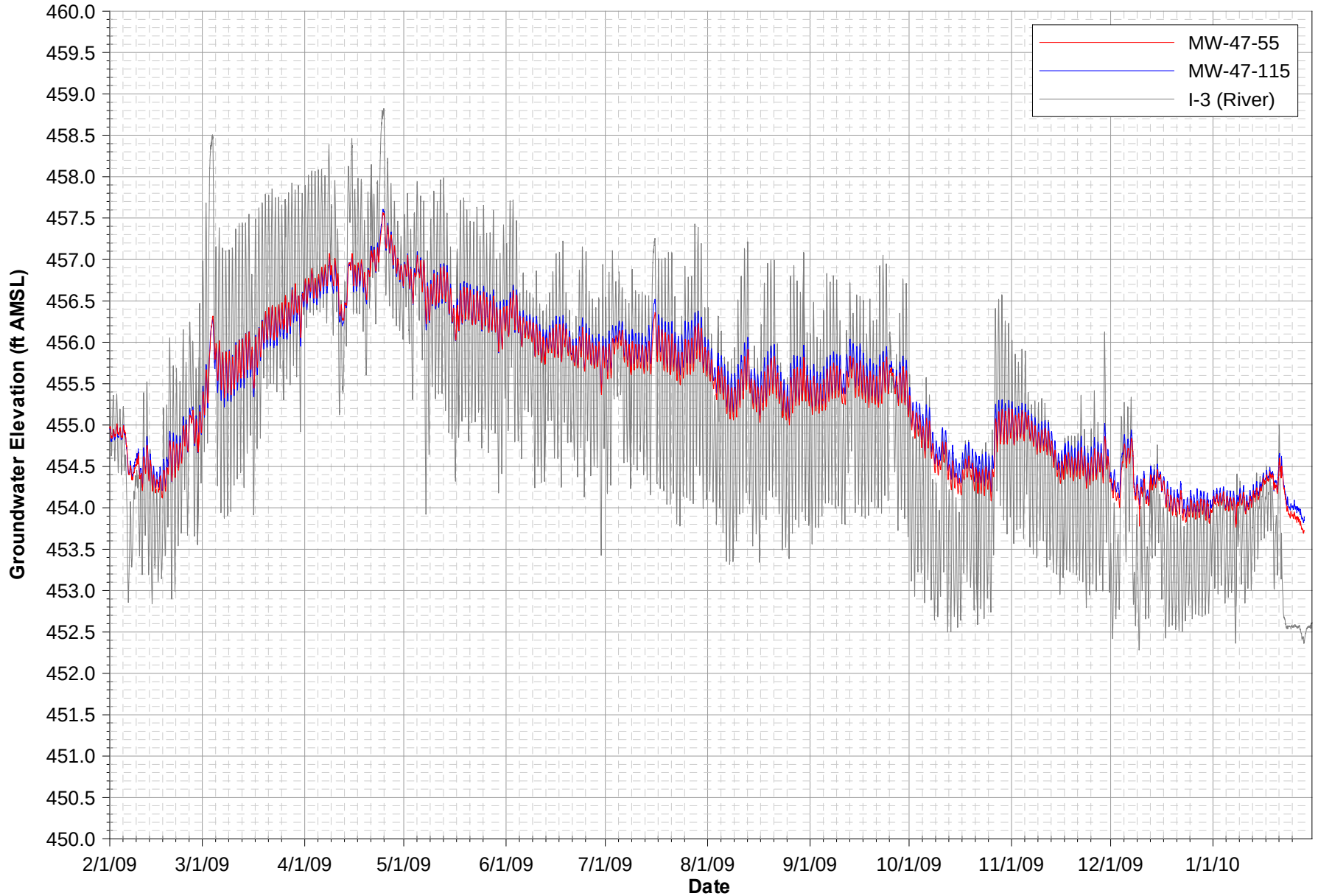


FIGURE C-1Q

MW-47 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.

CH2MHILL

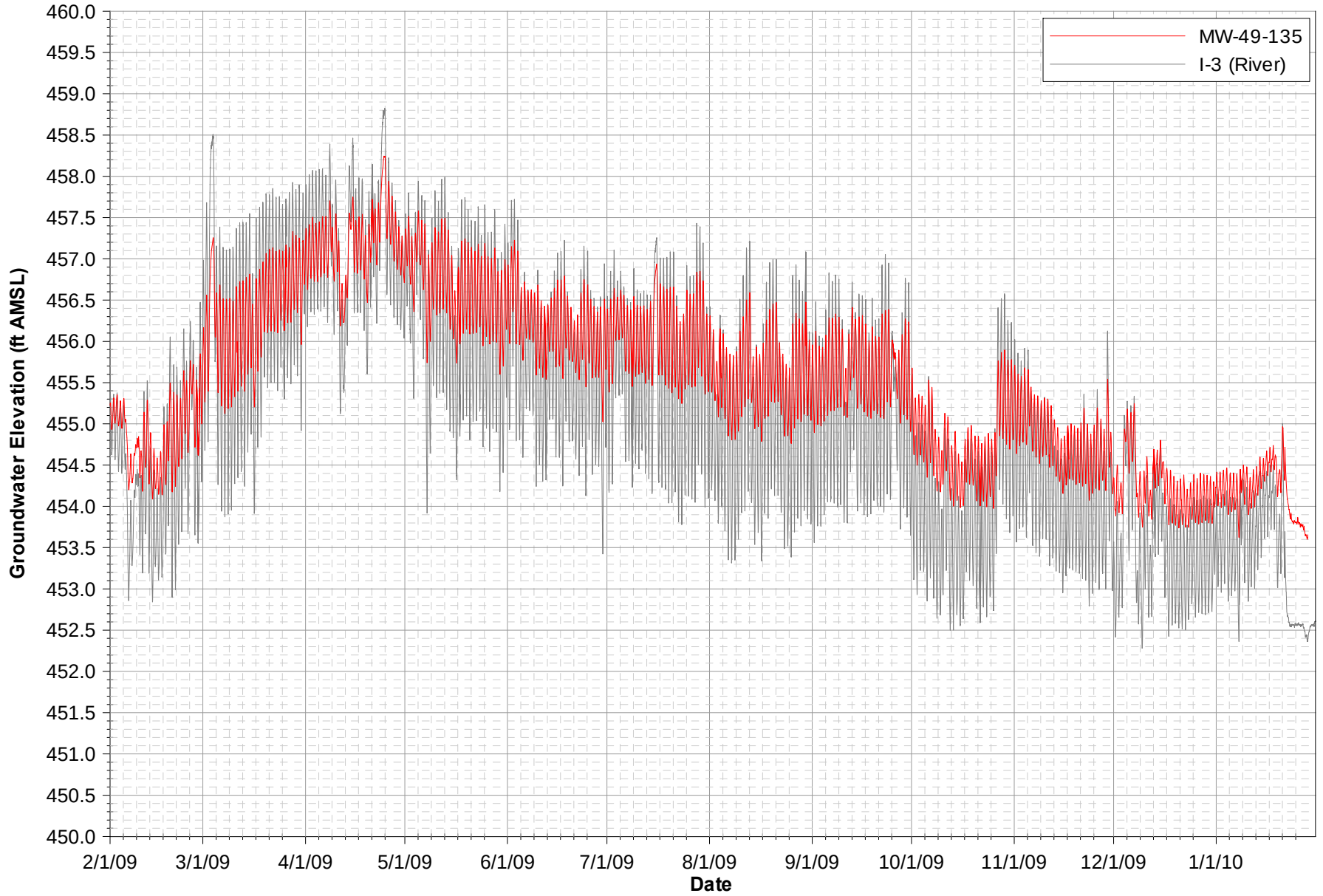
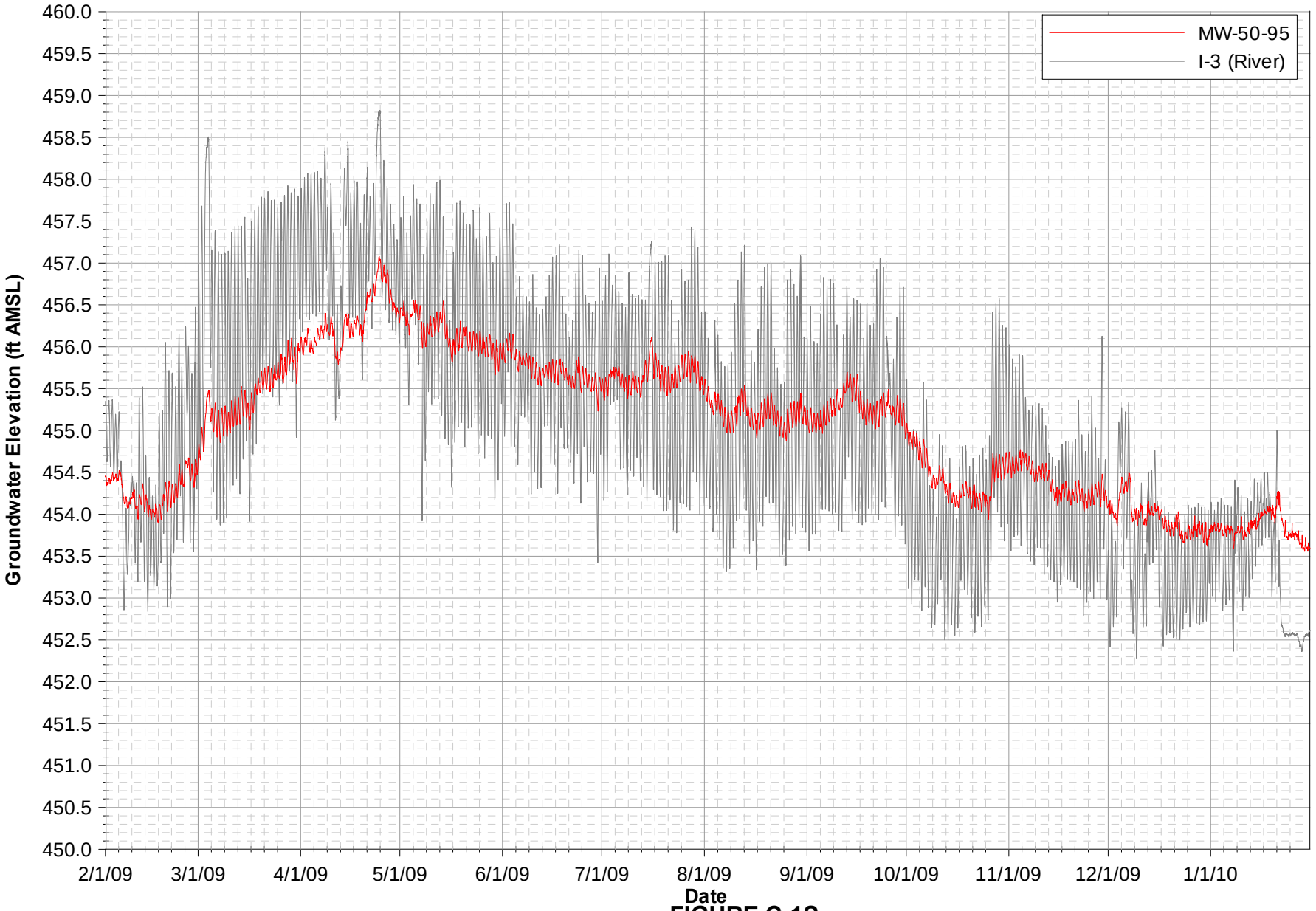


FIGURE C-1R
MW-49 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.

CH2MHILL



Notes:
Data subject to review.

FIGURE C-1S

MW-50 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

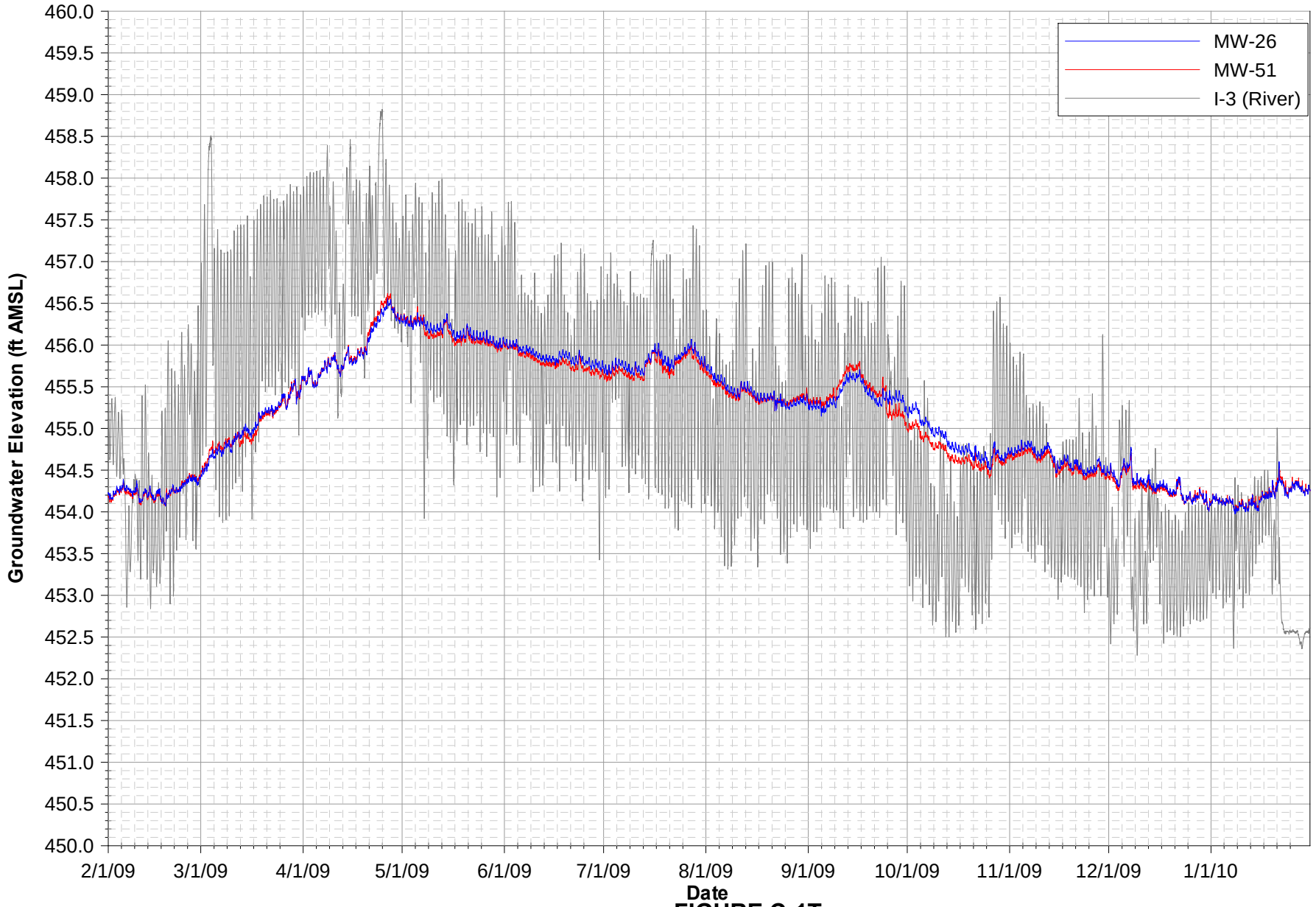


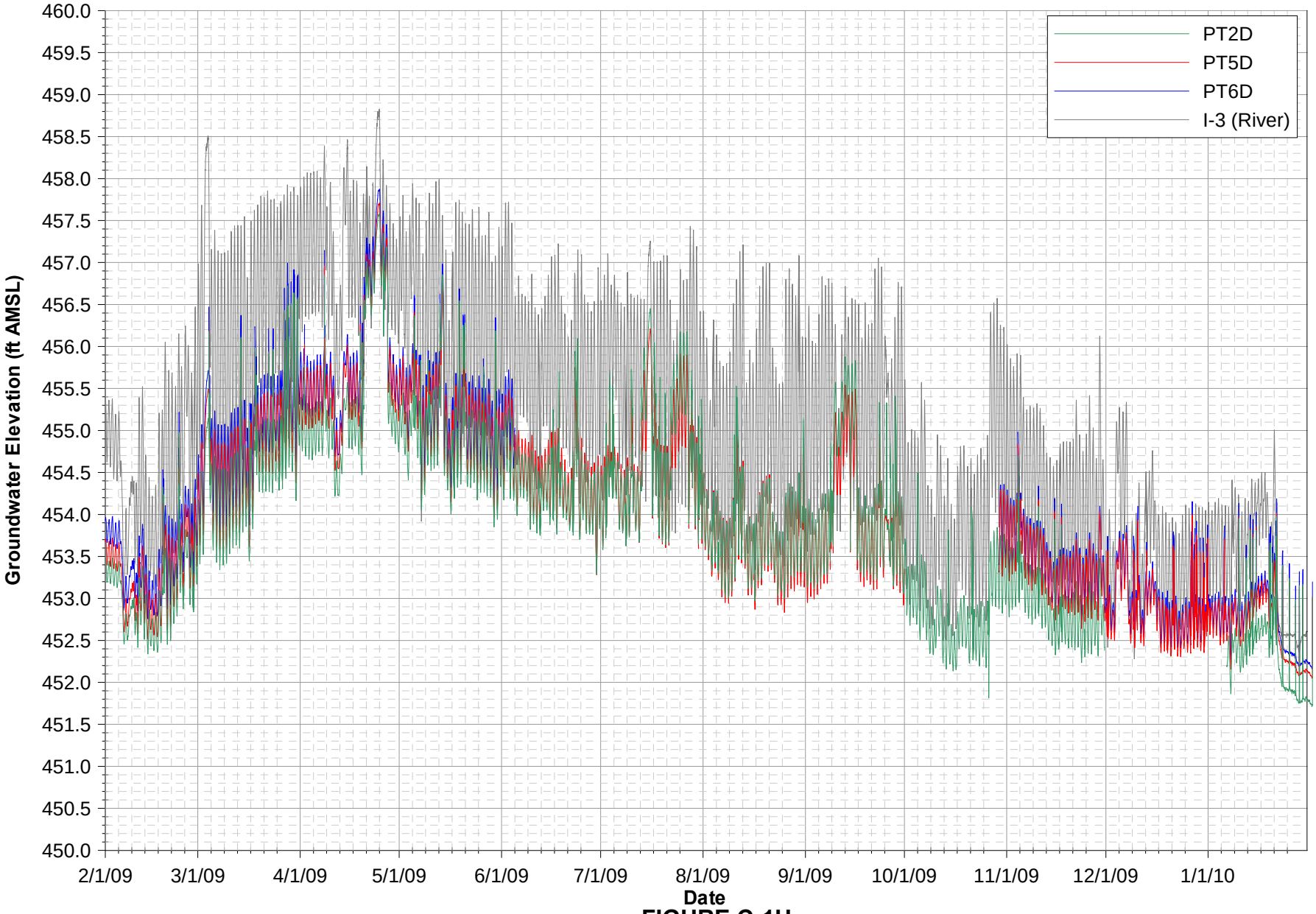
FIGURE C-1T

MW-26 & MW-51 HYDROGRAPHS

FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
Data subject to review.

CH2MHILL



Note:
Data subject to review.
PT2D data unavailable from November 30, 2009 until January 6, 2010 due to transducer failure.
PT5D data unavailable from October 1, 2009 until October 29, 2009 due to transducer failure.
PT6D data unavailable from June 5, 2009 until October 29, 2009 due to transducer failure.

FIGURE C-1U
INSITU PILOT STUDY WELL HYDROGRAPHS
FOURTH QUARTER 2009 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



Notes:
Data subject to review.

FIGURE C-1V
MW-45-95a HYDROGRAPH
FOURTH QUARTER 2009 AND ANNUAL 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 D
Summary Information for Interim Measures Performance Monitoring

TABLE D-1

Summary of IM Extraction and Performance Monitoring Wells, January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Description & Well Use in 2009 PMP	Date Incorporated in Hydraulic Monitoring Network	Well Elevation		TOP of Screen		BASE of Screen	
			Measure Pt. Elevation	Ground Elevation	Depth	Elevation	Depth	Elevation
			feet AMSL	feet AMSL	feet BGS	feet AMSL	feet BGS	feet AMSL
Wells in Upper Interval								
MW-20-70	Monitoring well for gradient mapping	Feb-04	500.15	499	50	449	70	429
MW-22	very shallow well - not used for grad. mapping	Apr-05	460.72	458	6	453	11	447
MW-25	Monitoring well for gradient mapping	Mar-04	542.90	541	85	457	105	437
MW-26	Monitoring well for gradient mapping	Mar-04	502.22	503	52	451	72	431
MW-27-20	Monitoring well for gradient mapping	Apr-04	460.56	459	7	452	17	442
MW-28-25	Monitoring well for gradient mapping	Feb-04	466.85	465	13	452	23	442
MW-29	well in floodplain silt - not used for gradient mapping	Feb-04	485.21	483	30	454	40	444
MW-30-30	saline well - not used for grad. mapping	Jan-04	468.12	466	12	454	32	434
MW-31-60	Monitoring well for gradient mapping	Feb-04	496.81	495	42	454	62	434
MW-32-35	Redundant well with MW-32-20 (not used)	Mar-04	461.63	459	28	432	35	424
MW-33-40	Monitoring well for gradient mapping	Mar-04	487.41	485	30	455	40	445
MW-35-60	Monitoring well for gradient mapping	Apr-04	484.19	481	37	444	57	424
MW-36-20	Monitoring well for gradient mapping	Jun-04	469.55	467	10	457	20	447
MW-36-40	Monitoring well for gradient mapping	Jun-04	469.83	467	30	437	40	427
MW-42-30	Monitoring well for gradient mapping	Feb-05	463.91	461	10	451	30	431
MW-43-25	Monitoring well for gradient mapping	Mar-05	462.54	460	15	445	25	435
MW-47-55	Monitoring well for gradient mapping	Apr-06	483.87	483	45	438	55	428
Wells in Middle Interval								
MW-20-100	Monitoring well for gradient mapping	Feb-04	500.58	499	90	410	100	400
MW-27-60	Monitoring well for gradient mapping	Feb-05	461.38	458	47	411	57	401
MW-30-50	Monitoring well for gradient mapping	Jan-04	468.81	466	41	426	51	416
MW-33-90	Monitoring well for gradient mapping	Mar-04	487.57	485	67	418	87	398
MW-34-55	Monitoring well for gradient mapping	Jan-04	460.88	459	45	414	55	404
MW-36-50	Monitoring well for gradient mapping	Jun-04	469.82	467	46	421	51	416
MW-36-70	Monitoring well for gradient mapping	Jun-04	469.55	467	60	407	70	397
MW-39-40	Monitoring well for gradient mapping	Apr-04	467.98	465	30	435	40	425
MW-39-50	Monitoring well for gradient mapping	Apr-04	468.43	465	47	418	52	413
MW-39-60	Monitoring well for gradient mapping	Apr-04	468.21	465	49	416	59	406
MW-39-70	Monitoring well for gradient mapping	Apr-04	467.98	465	60	405	70	395
MW-42-65	Monitoring well for gradient mapping	Feb-05	463.37	461	56	405	66	395
MW-44-70	Monitoring well for gradient mapping	Apr-06	471.88	471	61	410	71	400
MW-50-95	Monitoring well for gradient mapping (not used)	May-06	496.55	495	85	410	95	400
MW-51	Monitoring well for gradient mapping	May-06	501.56	502	97	405	112	390
TW-2S	Standby Extraction Well (MW-20 bench)	Apr-04	499.95	497	43	454	93	404
Wells in Lower Interval-1								
MW-27-85	Current Gradient Control Well	Feb-05	460.99	458	78	380	88	370
MW-28-90	Monitoring well for gradient mapping	Jun-04	467.86	465	70	395	90	375
MW-34-80	Key monitoring well for gradient mapping	Jan-04	460.99	459	73	386	83	376
MW-36-90	Monitoring well for gradient mapping	Jun-04	469.83	467	80	387	90	377
MW-39-80	Monitoring well for gradient mapping	Apr-04	468.43	465	70	395	80	385
MW-43-90	Monitoring well for gradient mapping	Mar-05	462.76	460	80	380	90	370
MW-45-95	Current Gradient Control Well	Apr-06	470.03	467	83	384	93	374
PE-01	Active Extraction Well (Floodplain)	May-05	469.65	467	79	388	89	378

TABLE D-1
Summary of IM Extraction and Performance Monitoring Wells, January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Description & Well Use in 2009 PMP	Date Incorporated in Hydraulic Monitoring Network	Well Elevation		TOP of Screen		BASE of Screen	
			Measure Pt. Elevation	Ground Elevation	Depth	Elevation	Depth	Elevation
			feet AMSL	feet AMSL	feet BGS	feet AMSL	feet BGS	feet AMSL
PT-2D	IS pilot test well - used for grad. mapping	Jun-06	473.52	472	95	377	105	367
PT-5D	IS pilot test well - used for grad. mapping	Jun-06	473.63	471	95	376	105	366
PT-6D	IS pilot test well - used for grad. mapping	Jun-06	476.01	474	95	379	105	369
Wells in Lower Interval-2								
MW-20-130	Key monitoring well for gradient mapping	Feb-04	500.66	499	121	378	131	368
MW-31-135	Current Gradient Control Well	Apr-05	498.40	495	113	382	133	362
MW-33-150	Current Gradient Control Well	Mar-05	487.77	485	132	353	152	333
MW-34-100	Current Gradient Control Well	Feb-05	460.97	459	90	369	100	359
MW-35-135	Monitoring well for gradient mapping	Apr-04	484.07	481	117	364	137	344
MW-36-100	Monitoring well for gradient mapping	May-04	469.82	467	88	379	98	369
MW-39-100	Monitoring well for gradient mapping	Apr-04	468.21	465	80	385	100	365
MW-44-115	Key monitoring well for gradient mapping	Apr-06	471.99	471	105	366	115	356
MW-44-125	Redundant well with MW-44-115 (not used)	Apr-06	471.99	471	114	357	124	347
MW-47-115	Monitoring well for gradient mapping	Apr-06	484.06	483	105	378	115	368
TW-2D	Standby Extraction Well (MW-20 bench)	Apr-04	500.38	497	113	384	148	349
TW-3D	Active Extraction Well (MW-20 bench)	Nov-05	498.09	497	111	386	156	341
TW-05	Hydraulic test well (40-foot screen)	May-06	496.30	497	110	387	150	347
MW-49-135	Monitoring well for gradient mapping	May-06	483.97	483	125	358	135	348
Wells in Lower Interval-3								
MW-46-175	Deep well - not used for gradient mapping	Apr-06	482.16	481	165	316	175	306
Wells in Lower Interval-4								
TW-04	Hydraulic test well (40-foot screen)	Apr-06	484.11	483	210	273	250	233

NOTES:
MSL = mean sea level, bgs = below ground surface, IS = Floodplain In-situ pilot test

Alluvial Aquifer elevation intervals in feet above mean sea level (MSL):
Upper Interval (Upper) = water table (ave. 455' MSL) to 425', Mid-Depth Interval (Middle) = 425-395, Lower Interval-1 (Lower-1) = 395-370, Lower Interval-2 (Lower-2) = 370-330, Lower Interval-3 (Lower-3) = 330-250, and Lower Interval-4 (Lower-4) = below 250' MSL.
See Figure E-1 for graphical presentation of well screen elevations

Ground surface elevations and all well and screen depths and elevations rounded to whole-foot values.

TABLE D-2
Chemical Sampling Program for IM Extraction and Monitoring Wells
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Current Chromium Sampling Frequency[a]	Hexavalent Chromium and Total Chromium	Water Quality Field Parameters[b]	IM Chemical Performance Parameters Sampling Frequency[c]
Shallow Wells				
MW-12	Quarterly	X	X	
MW-19	Annually	X	X	
MW-20-70	Semiannually	X	X	Annually
MW-22	Semiannually	X	X	
MW-24A	Semiannually	X	X	
MW-25	Annually	X	X	Annually
MW-26	Semiannually	X	X	Biennially
MW-27-20	Annually	X	X	
MW-28-25	Annually	X	X	
MW-29	Semiannually	X	X	
MW-31-60	Annually	X	X	Annually
MW-32-20	Semiannually	X	X	
MW-32-35	Annually	X	X	Annually
MW-33-40	Quarterly	X	X	
MW-35-60	Semiannually	X	X	
MW-36-20	Biennially	X	X	
MW-39-40	Biennially	X	X	
MW-42-30	Biennially	X	X	
MW-43-25	Annually	X	X	
MW-47-55	Quarterly	X	X	
TW-2S	Annually	X	X	
Mid-depth wells				
MW-20-100	Semiannually	X	X	Annually
MW-27-60	Annually	X	X	
MW-30-50	Not Sampled	X	X	
MW-33-90	Quarterly	X	X	
MW-34-55	Annually	X	X	Annually
MW-36-50	Biennially	X	X	
MW-36-70	Annually	X	X	
MW-39-50	Annually	X	X	
MW-39-60	Annually	X	X	
MW-39-70	Annually	X	X	
MW-42-55	Quarterly	X	X	
MW-42-65	Quarterly	X	X	
MW-44-70	Quarterly	X	X	
MW-50-95	Quarterly	X	X	
MW-51	Semiannually	X	X	
MW-52S	Quarterly	X	X	
Deep wells				
MW-20-130	Semiannually	X	X	Annually
MW-24B	Semiannually	X	X	

TABLE D-2
Chemical Sampling Program for IM Extraction and Monitoring Wells
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Current Chromium Sampling Frequency[a]	Hexavalent Chromium and Total Chromium	Water Quality Field Parameters[b]	IM Chemical Performance Parameters Sampling Frequency[c]
MW-27-85	Quarterly	X	X	
MW-28-90	Quarterly	X	X	
MW-33-150	Quarterly	X	X	
MW-33-210	Quarterly	X	X	
MW-34-80	Monthly	X	X	Annually
MW-34-100	Monthly	X	X	Annually
MW-35-135	Annually	X	X	
MW-36-90	Semiannually	X	X	
MW-36-100	Semiannually	X	X	
MW-39-80	Semiannually	X	X	
MW-43-75	Annually	X	X	
MW-43-90	Annually	X	X	
MW-44-115	Monthly	X	X	
MW-44-125	Monthly	X	X	
MW-46-175	Monthly	X	X	
MW-46-205	Quarterly	X	X	
MW-47-115	Quarterly	X	X	
MW-49-135	Semiannually	X	X	
MW-49-275	Semiannually	X	X	
MW-49-365	Semiannually	X	X	
MW-50-200	Quarterly	X	X	
MW-52D	Quarterly	X	X	
MW-52M	Quarterly	X	X	
MW-53D	Quarterly	X	X	
MW-53M	Quarterly	X	X	
PE-1	Monthly	X	X	
TW-2D	Annually	X	X	
TW-3D	Monthly	X	X	
River R-28	Quarterly	X	X	Annually

Notes:

[a] Sampling frequencies listed are current as of February 2010, and reflect updated sampling frequencies approved by DTSC (2007b).

[b] Water quality field parameters include: ORP, specific conductance, pH, and temperature.

[c] Updated July 2008. Chemical performance parameters include: TDS, chloride, sulfate, nitrate, bromide, calcium, potassium, magnesium, sodium, boron, alkalinity, deuterium, and oxygen-18.

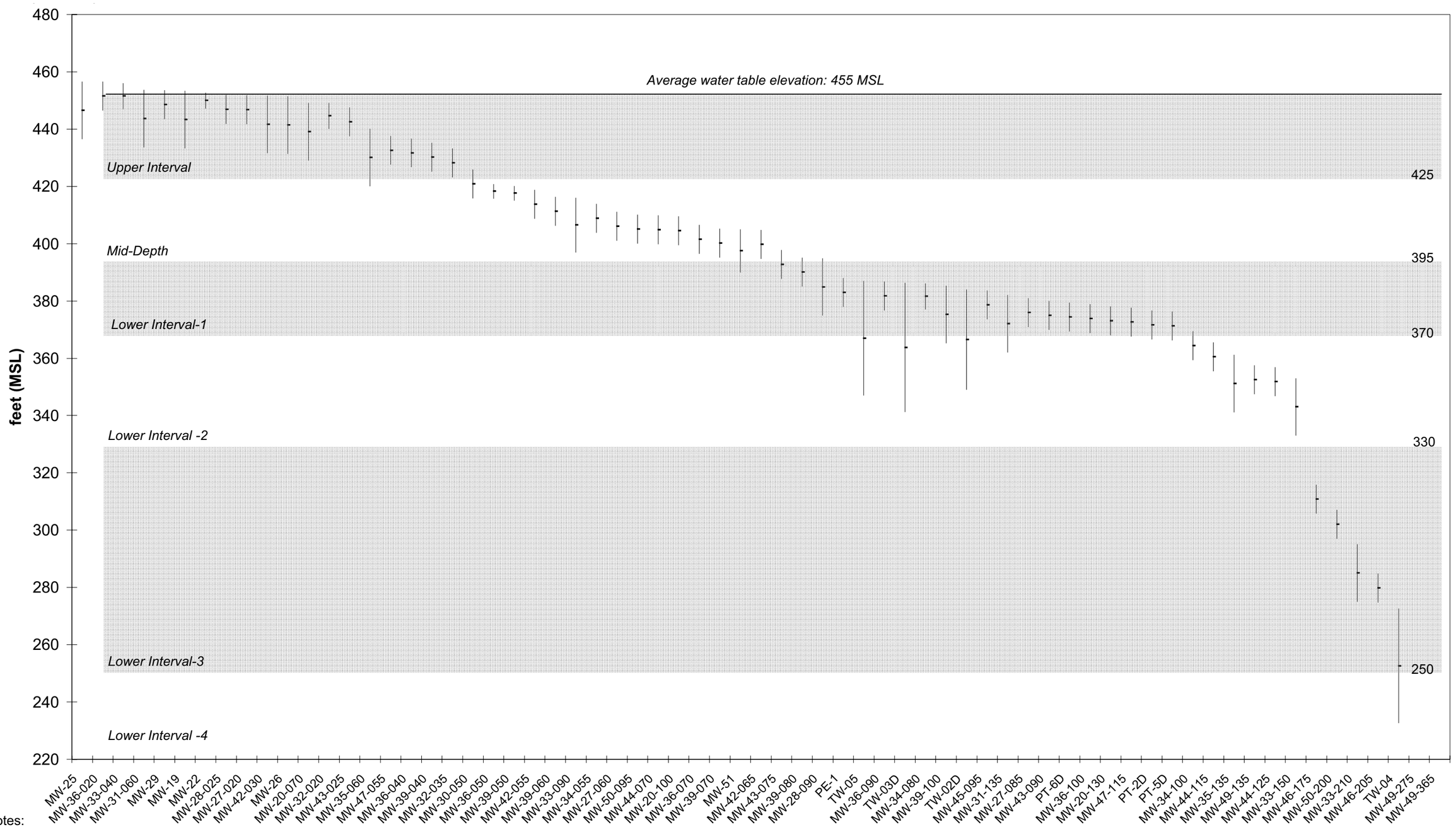
Additional notes:

Active extraction wells TW-3D and PE-1 are sampled for Cr(VI), Cr(T), and TDS monthly for IM operations.

River sampling location R-28 is sampled quarterly and twice during low river season, November Through January totalling 5 yearly samples.

This table indicates sampling included in the scheduled chemical performance monitoring program only.

Figure D-1
Well Screen Elevations for Groundwater Monitoring Wells and Extraction Wells in the PMP Area
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and
Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California



Notes:
MSL = Mean Sea Level
Well screen elevations in feet above mean sea level (MSL)
Wells MW-49-275 and MW-49-365 are screened below 220 ft MSL
FigD-1_WellScreenElevPlot.xls, All Wells Chart

Appendix E
Extended Scope Analytical Results for Interim Measures 2009 Reporting Period

TABLE E-1
Arsenic Results, September 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Sample Date		Dissolved Arsenic (µg/L)
Bedrock Wells			
MW-58-115	16-Dec-09		18.0 J
MW-58-205	16-Dec-09		41.0 J
MW-62-110	16-Dec-09		32.0 J
MW-62-190	16-Dec-09		40.0 J
MW-64-150	16-Dec-09		26.0 J
MW-64-205	16-Dec-09		26.0 J
MW-64-260	16-Dec-09		33.0 J
Fluvial Wells			
MW-22	29-Sep-09		28.0
	10-Dec-09		ND (10)
MW-27-60	08-Dec-09		8.30
MW-27-85	08-Dec-09		14.0
MW-28-25	24-Sep-09		2.40
MW-28-90	24-Sep-09		7.60
	09-Dec-09		7.70
MW-29	24-Sep-09		19.0
MW-30-30	24-Sep-09		19.0
MW-30-50	24-Sep-09		9.20
MW-32-20	22-Sep-09		65.0
MW-32-35	22-Sep-09		53.0
MW-33-40	24-Sep-09		19.0
	09-Dec-09		20.0
MW-34-55	30-Sep-09		2.80
MW-34-80	30-Sep-09		7.30
	09-Dec-09		7.30
MW-34-100	30-Sep-09		14.0
	30-Sep-09	FD	15.0
	09-Dec-09		16.0
	09-Dec-09	FD	16.0
MW-36-20	23-Sep-09		3.30
MW-36-40	30-Sep-09		7.70
MW-36-50	30-Sep-09		4.20
MW-36-70	22-Sep-09		10.0
MW-36-90	23-Sep-09		16.0
MW-36-100	23-Sep-09		14.0
MW-39-40	01-Oct-09		15.0
MW-39-50	01-Oct-09		7.80
MW-42-30	23-Sep-09		6.50
MW-42-55	23-Sep-09		19.0
	08-Dec-09		22.0
MW-42-65	23-Sep-09		14.0
	08-Dec-09		14.0

TABLE E-1
Arsenic Results, September 2009 through January 2010
Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Well ID	Sample Date	Dissolved Arsenic (µg/L)
MW-43-25	01-Oct-09	20.0
MW-43-75	01-Oct-09	17.0
MW-43-90	01-Oct-09	25.0
MW-44-70	21-Sep-09	4.20
	07-Dec-09	4.20
MW-45-095a	29-Sep-09	10.0
MW-52D	29-Sep-09	23.0
	10-Dec-09	27.0
MW-52M	29-Sep-09	17.0
	10-Dec-09	21.0
MW-52S	29-Sep-09	9.70
	10-Dec-09	12.0
MW-53D	29-Sep-09	23.0
	10-Dec-09	32.0
MW-53M	29-Sep-09	18.0
	10-Dec-09	25.0

NOTES:

µg/L = micrograms per liter.
FD = field duplicate.
J = concentration or RL estimated by laboratory or data validation.

TABLE E-2
Summary of Groundwater Dioxins and Furans Analytical Results, May 2009
Second Quarter 2009 IM Performance Monitoring and Site-Wide
Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station

			Dioxin/Furans (pg/L)																
Location	**Date**	**Sample Type**	**1,2,3,4,6,7,8 -HpCDD**	**1,2,3,4,6,7,8 -HpCDF**	**1,2,3,4,7,8,9 -HpCDF**	**1,2,3,4,7,8- HxCDD**	**1,2,3,4,7,8- HxCDF**	**1,2,3,6,7,8- HxCDD**	**1,2,3,6,7,8- HxCDF**	**1,2,3,7,8,9- HxCDD**	**1,2,3,7,8,9- HxCDF**	**1,2,3,7,8- PeCDD**	**1,2,3,7,8- PeCDF**	**2,3,4,6,7,8- HxCDF**	**2,3,4,7,8- PeCDF**	**2,3,7,8- TCDD**	**2,3,7,8- TCDF**	**OCDD**	**OCDF**
MW-9	05/04/09	N	ND (2.4)	ND (3.3)	ND (1.2)	ND (0.94)	ND (0.61)	ND (1)	ND (0.56)	ND (2.1)	ND (3.2)	ND (3.1)	ND (0.51)	ND (0.65)	ND (2.5)	ND (0.51)	ND (0.48)	ND (1.6)	ND (1.2)
MW-10	05/04/09	N	ND (1.7)	ND (1.1)	ND (1.7)	ND (1.6)	ND (2.9)	ND (1.6)	ND (3)	ND (1.6)	ND (0.88)	ND (2)	ND (0.52)	ND (2.3)	ND (0.53)	ND (0.61)	ND (0.45)	ND (20)	ND (1.2)
MW-12	05/05/09	N	ND (6.8)	ND (1.2)	ND (1.8)	ND (1.5)	ND (0.5)	ND (1.5)	ND (3.3)	ND (1.6)	ND (0.7)	ND (3.2)	ND (4.5)	ND (2.8)	ND (1.1)	ND (0.8)	ND (1.6)	ND (22)	ND (1.4)
MW-12	05/05/09	FD	ND (3.1)	ND (1)	ND (1.5)	ND (1)	ND (0.64)	ND (1)	ND (0.4)	ND (1.1)	ND (0.59)	ND (1.9)	ND (0.39)	ND (1)	ND (0.4)	ND (1.4)	ND (0.54)	ND (13)	ND (3.7)

Notes:

ND	not detected at the listed reporting limit
pg/L	picograms per liter
N	primary sample
FD	field duplicate

TABLE E-3
Summary of Groundwater Organics Analytical Results, June 2009
Fourth Quarter 2009 and Annual Interim Measures Performance
Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Analyte	Method	Units	MW-09 6/09/09	MW-09 6/09/2009 (FD)	MW-10 6/09/2009	MW-12 6/10/2009
Polyaromatic Hydrocarbons						
1-Methyl naphthalene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
2-Methyl naphthalene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Acena phthylene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Acenaphthene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Anthracene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo (a) anthracene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo (a) pyrene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo (b) fluoranthene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo (ghi) perylene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo (k) fluoranthene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chrysene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Dibenzo (a,h) anthracene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Fluoranthene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Fluorene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Indeno (1,2,3-cd) pyrene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Naphthalene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Phenanthrene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Pyrene	8270SIM	µg/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Polychlorinated Biphenyls						
Aroclor 1016	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Aroclor 1221	8082	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Aroclor 1232	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Aroclor 1242	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Aroclor 1248	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Aroclor 1254	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Aroclor 1260	8082	µg/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Pesticides						
4,4-DDD	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
4,4-DDE	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
4,4-DDT	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Aldrin	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
alpha-BHC	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
alpha-Chlordane	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
beta-BHC	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
delta-BHC	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
Dieldrin	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

TABLE E-3
Summary of Groundwater Organics Analytical Results, June 2009
Second Quarter 2009 IM Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station

Analyte	Method	Units	MW-09 6/09/09	MW-09 6/09/2009 (FD)	MW-10 6/09/2009	MW-12 6/10/2009
Pesticides						
Endo sulfan I	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
Endo sulfan II	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Endosulfan sulfate	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Endrin	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Endrin aldehyde	8081A	µg/L	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
gamma-BHC	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
gamma-Chlordane	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
Heptachlor	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
Heptachlor Epoxide	8081A	µg/L	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
Methoxy chlor	8081A	µg/L	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
Toxaphene	8081A	µg/L	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichlorobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
1,3-Dichlorobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
1,4-Dichlorobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,4,5-Trichlorophenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,4,6-Trichlorophenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dichlorophenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dimethylphenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,4-Dinitrophenol	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
2,4-Dinitrotoluene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2,6-Dinitrotoluene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2-Chloro naphthalene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2-Chlorophenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2-Methyl naphthalene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2-Methylphenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
2-Nitroaniline	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
2-Nitrophenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
3,3-Dichlorobenzidene	8270C	µg/L	ND (20)	ND (20)	ND (20)	ND (20)
3-Nitroaniline	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
4,6-Dinitro-2-methylphenol	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
4-Bromophenyl phenyl ether	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
4-Chloro-3-methylphenol	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
4-Chloroaniline	8270C	µg/L	ND (20)	ND (20)	ND (20)	ND (20)
4-Chlorophenyl phenyl ether	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)

TABLE E-3
Summary of Groundwater Organics Analytical Results, June 2009
Second Quarter 2009 IM Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station

Analyte	Method	Units	MW-09 6/09/09	MW-09 6/09/2009 (FD)	MW-10 6/09/2009	MW-12 6/10/2009
Semivolatile Organic Compounds						
4-Methylphenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
4-Nitroaniline	8270C	µg/L	ND (20)	ND (20)	ND (20)	ND (20)
4-Nitrophenol	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
Acena phthylene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Acenaphthene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Anthracene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzo (a) anthracene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzo (a) pyrene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzo (b) fluoranthene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzo (ghi) perylene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzo (k) fluoranthene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Benzoic acid	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
Benzyl alcohol	8270C	µg/L	ND (20)	ND (20)	ND (20)	ND (20)
Bis (2-chloroethoxy) methane	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Bis (2-chloroethyl) ether	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Bis (2-chloroisopropyl) ether	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Bis (2-ethylhexyl) phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Butyl benzyl phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Chrysene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Dibenzo (a,h) anthracene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Dibenzofuran	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Diethyl phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Dimethyl phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Di-N-butyl phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Di-N-octyl phthalate	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Fluoranthene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Fluorene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Hexachlorobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Hexachlorobutadiene	8270C	µg/L	ND (20)	ND (20)	ND (20)	ND (20)
Hexachloroethane	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Indeno (1,2,3-cd) pyrene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Isophorone	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Naphthalene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Nitrobenzene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
N-Nitroso-di-n-propylamine	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
N-nitrosodiphenylamine	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)

TABLE E-3
Summary of Groundwater Organics Analytical Results, June 2009
Second Quarter 2009 IM Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station

Analyte	Method	Units	MW-09 6/09/09	MW-09 6/09/2009 (FD)	MW-10 6/09/2009	MW-12 6/10/2009
Semivolatile Organic Compounds						
Pentachloro phenol	8270C	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
Phenanthrene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Phenol	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Pyrene	8270C	µg/L	ND (10)	ND (10)	ND (10)	ND (10)
Total Petroleum Hydrocarbons						
TPH as diesel	8015M	µg/L	ND (50)	ND (50)	ND (50)	ND (50)
TPH as motor oil	8015M	µg/L	ND (50)	ND (50)	ND (50)	ND (50)

NOTES:

ND = not detected at listed reporting limit.
ug/L = micrograms per liter.
FD = field duplicates.

Appendix F
Analytical Data Level 1 Packages, January 2009 through January 2010
(Provided on CD with hard copy submittal)