Pacific Gas and Electric Company®

Yvonne J. Meeks
Site Remediation - Portfolio Manager
Environmental Affairs

6588 Ontario Road
San Luis Obispo, CA 93405
Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401

805.546.5243
Internal: 664.5243
Fax: 805.546.5232
E-Mail: YJM1@pge.com

November 30, 2005

Norman Shopay
Project Manager
California Department of Toxic Substances Control
Geology and Corrective Action Branch
700 Heinz Avenue
Berkeley, California 94710

Subject: Third Quarter 2005 Performance Monitoring Report
Interim Measures Performance Monitoring Program
PG&E Topock Compressor Station, Needles, California

Dear Mr. Shopay:

Enclosed is the *Performance Monitoring Report for October 2005 and Quarterly Performance Evaluation, August through October 2005* for PG&E's Interim Measures (IM) performance monitoring program for the Topock project. This report presents the October 2005 performance monitoring results for the IM hydraulic containment system and summarizes the operations and performance evaluation for the third quarter 2005 (August through October) reporting period.

The quarterly performance monitoring report is prepared and submitted in conformance with the IM reporting requirements described in Enclosure A of the Department of Toxic Substances Control's letter dated February 14, 2005.

Please contact me at (805) 546-5243 if you have any questions on the performance monitoring report.

Sincerely,

Paul Bertics
for Yvonne Meeks

Enclosure
cc: Kate Burger/DTSC

Performance Monitoring Report for October 2005 and Quarterly Performance Evaluation, August through October 2005

Interim Measures Performance 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

November 30, 2005

CH2MHILL
155 Grand Ave. Ste. 1000
Oakland, CA 94612

Performance Monitoring Report for October 2005
and
Quarterly Performance Evaluation, August through October 2005

Interim Measures Performance Monitoring Program
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This report was prepared under the supervision of a California Certified Engineering Geologist

Paul Bertucci, C.E.G. No. 1977
Project Hydrogeologist

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Contents

Tables

Figures

Acronyms and Abbreviations

cfs	cubic feet per second
Cr(T)	total chromium
Cr(VI)	hexavalent chromium
DTSC	Department of Toxic Substances Control
gpm	gallons per minute
IM	Interim Measure
IM-3	Interim Measure No. 3
µg/L	micrograms per liter (essentially equivalent to parts per billion [ppb])
PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
RCRA	Resource Conservation and Recovery Act
TDS	total dissolved solids
USBR	United States Bureau of Reclamation

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 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 No. 3 (IM-3). Currently, the IM-3 facilities include a groundwater extraction system (two operational wells), 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 extraction, conveyance, treatment, and injection facilities.

In a letter dated February 14, 2005, the California Department of Toxic Substances Control (DTSC) established the criteria for evaluating the performance of the IM. 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 concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment" (Enclosure A, DTSC 2005). The DTSC directive also defined the monitoring and reporting requirements for the IM. A draft *Performance Monitoring Plan for Interim Measures in the Floodplain Area* was submitted to DTSC on April 15 (CH2M HILL 2005a) (herein referred to as the Performance Monitoring Plan). The site monitoring, data evaluation, reporting, and response actions required under the February 2005 DTSC directive are collectively referred to as the IM Performance Monitoring Program (PMP) for the floodplain area.

This quarterly report has been prepared in compliance with DTSC's requirements and documents the monitoring activities and performance evaluation of the IM hydraulic containment system for the period from August 1 through October 31, 2005. The next monthly report for the November 2005 period will be submitted on December 15, 2005. The next quarterly performance report will be submitted on March 15, 2006 in conjunction with the first annual performance monitoring report.

1.1 Report Organization

In support of the IM performance evaluation, the quarterly report presents documentation for:

- Monthly performance monitoring results for October 2005 and status of the extraction and treatment system (Section 2.0).
- Evaluation of quarterly performance data including the extraction system, chromium distribution and trends in the floodplain area, hydraulic gradients and river levels during the period of August through October 2005 (Section 3.0).
- Conclusions (Section 4.0).

2.0 Performance Monitoring Report for October 2005

2.1 Introduction

Figure 2-1 shows the locations of wells used for the IM extraction, performance monitoring, and hydraulic gradient calculation. The wells are defined as:

- **Floodplain Wells**: MW-22, MW-27 cluster (3), MW-28 cluster (2), MW-29, MW-30 cluster (2), MW-32 cluster (2), MW-33 cluster (4), MW-34 cluster (3), MW-36 cluster (6), MW-39 cluster (6), MW-42 cluster (3), and MW-43 cluster (3).
- **Intermediate Wells**: MW-12, MW-19, MW-20 cluster (3), MW-21, MW-26, MW-31 cluster (2), MW-35 cluster (2), TW-2S, TW-2D.
- **Interior Wells**: MW-10, MW-25.

The two currently operational extraction wells, TW-2S and TW-2D, are located on the MW-20 bench (Figure 1-1). Two new extraction wells, PE-1 and TW-3D, have been installed at the direction of DTSC to provide additional extraction system capacity. In March 2005, extraction well PE-1 was installed on the floodplain approximately 450 feet east of extraction well TW-2D (Figure 1-1). In late October 2005, extraction well TW-3D was installed approximately 15 feet west of well TW-2D to serve as a supplemental extraction well for the IM system with a well completion similar to TW-2D. Construction of the conveyance piping and power supply to PE-1 on the floodplain will begin after Bureau of Land Management approval of the work, anticipated in December 2005. Construction of piping and power supply to TW-3D commenced in November and this well is scheduled to be brought into service in mid-December 2005.

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—designated upper, middle, and lower—are based on grouping the monitoring wells screened at common elevations and do not represent distinct hydrostratigraphic units or separate aquifer zones. 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. It should be noted, however, that these divisions do not correspond to any lithostratigraphic layers within the aquifer. The floodplain aquifer is considered to be hydraulically undivided.

2.2 Extraction System Operations

Pumping data for the period October 1 through October 31, 2005 are shown in Table 2-1. The October 2005 monthly average pumping rates from wells TW-2D and TW-2S were approximately 88.1 gallons per minute (gpm) and 2.3 gpm, respectively, for a combined monthly average extraction rate of 90.4 gpm. A total of 4,035,390 gallons of groundwater were extracted and treated by the IM-3 treatment plant during October 2005.

TABLE 2-1
Pumping Rate and Extracted Volume for IM System through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Extraction Well	October 2005 Period[a]		Quarterly Period[b]		Project To Date[c]
	Average Pumping Rate[d] (gpm)	Volume Pumped (gal)	Average Pumping Rate[d] (gpm)	Volume Pumped (gal)	Cumulative Volume Pumped (gal)
TW-2S	2.3	100,921	3.0	400,080	994,438
TW-2D	88.1	3,934,469	75.8	10,033,954	44,495,538
MW-20 wells	0	0	0	0	1,527,724
Total	90.4	4,035,390	78.8	10,434,034	47,017,700
			Total Volume Pumped (ac-ft)		144.3

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

[a] Pumping results during the monthly period are based on readings collected between September 30, 2005 at 12:00 a.m. and October 31, 2005 at 11:59 p.m. (31 days).
[b] Pumping results during the quarterly period are based on readings collected between August 1, 2005 at 12:00 a.m. and October 31, 2005 at 11:59 p.m. (92 days).
[c] Interim Measure groundwater extraction at the Topock site was initiated in March 2004.
[d] The "Average Pumping Rate" is the overall average during the reporting period, including system downtime based on flow meter totalizer readings. The TW-2S well was run for 1.4 days during October and averaged 50.2 gpm during this time. TW-2S was run for 6.4 days during the quarter and averaged 43.6 gpm during run time.

During October 2005, operation of the treatment system and discharge to injection well IW-2 (Figure 1-1) operated under the following conditions:

- **October 1 through 10**: Operated extraction well TW-2D at a target pump rate of 90 gpm.
- **October 10 through 11:** Operated extraction well TW-2S at a target pump rate of 45 gpm while the well pump in TW-2D was replaced due to an apparent pump motor failure.
- **October 11 through 31:** Operated extraction well TW-2D at a target pump rate of 90 gpm.

During October 2005, the operational run time for the IM groundwater extraction system (wells TW-2D and TW-2S combined) was 93 percent and the operational run time for well TW-2D was 89 percent. An operations log for the IM extraction system during October 2005, including downtime, is included in Appendix D.

The concentrate (i.e., brine) from the reverse osmosis system was manifested as a Resource Conservation and Recovery Act (RCRA) non-hazardous waste and transported to United States Filter Corporation in Los Angeles, California for additional treatment and disposal. The first container (approximately 18 cubic yards) of solids accumulated in the clarifier from the IM-3 plant was characterized and disposed as a non-RCRA hazardous waste at the Chemical Waste Management, Kettleman Hills Facility in October 2005.

Daily inspections included general facility inspections, flow measurements, site security, and desert tortoise monitoring. Daily logs with documentation of inspections are maintained onsite.

Table 2-2 summarizes the analytical results of groundwater samples collected from extraction well TW-2D during the October reporting period and prior months. 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.

2.3 Chromium Sampling Results

The groundwater monitoring wells in the floodplain area are sampled for hexavalent chromium [Cr(VI)], total chromium [Cr(T)], and field water quality parameters under quarterly, monthly, and biweekly schedules, in accordance with the approved groundwater sampling and analysis procedures (CH2M HILL 2005b) and DTSC directives. Table A-1 (Appendix A) presents the groundwater sampling results for Cr(VI), Cr(T), groundwater elevation, and selected field water quality parameters for monitoring wells in the floodplain area from May through October 2005. Table A-2 presents the groundwater sampling data for the other wells monitored in the PMP area during the reporting period.

Figure 2-2 presents a plan view of the October 2005 Cr(VI) results for wells in the upper, middle, and lower depth intervals of the Alluvial Aquifer. Figure 2-2 also shows the approximate locations of the 20 µg/L and 50 µg/L Cr(VI) contour lines in groundwater within each depth interval. The California drinking water standard for Cr(T) is 50 µg/L.

The Cr(VI) sampling results from the October 2005 sampling event are shown on Figure 2-3, a vertical cross section extending east-west across the floodplain. Figure 2-4 presents the October 2005 Cr(VI) results for additional floodplain monitoring wells on a cross section oriented parallel to the Colorado River (see Figure 2-1 for locations of the cross sections). For the October monthly performance evaluation, Cr(VI) concentration trend graphs and hydrographs for selected floodplain monitoring wells are presented in Appendix A.

2.4 Hydraulic Gradient Results

During the reporting period, water levels were recorded at intervals of 30 minutes with pressure transducers in 48 wells and two river monitoring stations (I-3 and RRB). The data loggers typically run continuously with only short interruptions for sampling or maintenance. During October 2005, the transducers in all gradient pair wells were replaced with simpler transducer models to prevent potential data gaps previously encountered with the multi-parameter data loggers. The location of the wells monitored are shown on Figure 2-1 and listed in Section 2.1.

The daily minimum, maximum, and average groundwater and river elevations have been calculated from the pressure transducer data for the October reporting period (October 1 to October 31, 2005) and are summarized in Appendix B, Table B-1. Reported groundwater elevations (or hydraulic heads) are adjusted for salinity and temperature differences between wells (i.e., adjusted to a common freshwater equivalent), as described in the Performance Monitoring Plan. Groundwater elevation hydrographs (for October 2005) for all wells with transducers are included in Appendix B. The Colorado River elevation (I-3 gage station) during October 2005 is also shown on the hydrographs.

The October 2005 groundwater gradient maps for the upper, middle, and lower depth intervals in the floodplain wells are shown on Figures 2-5, 2-6, and 2-7, respectively. The groundwater elevations for all depth intervals of the Alluvial Aquifer indicate strong landward hydraulic gradients along the floodplain. To the west of the pumping area, the hydraulic gradient in the upper depth interval is easterly and consistent with the regional gradient outside of the floodplain area. The landward gradients measured during October 2005 were steeper than previous months due to an increase in the TW-2D extraction rate (66 to 73 gpm in prior months) to approximately 88 gpm. The average monthly groundwater elevations are also presented and contoured in cross-section on Figure 2-8 (location of cross-section shown on Figure 2-1).

Table 2-3 summarizes the estimated and actual Davis Dam releases and river elevations since April 2004. The actual Davis Dam October 2005 release (11,201 cubic feet per second [cfs]) was slightly less than the United States Bureau of Reclamation (USBR) projected release for the October reporting period (12,300 cfs). The projected Colorado River elevation at I-3 (monthly average) is calculated using a multiple regression method that considers both the Davis Dam release and the Lake Havasu level.

Gradients between the northern well pair (MW-31-135/MW-33-150) central well pair (MW-20-130/MW-34-80) and southern well pair (MW-20-130/MW-42-65) were measured in October 2005. As shown in Table 2-4, the average gradients in these well pairs were landward at magnitudes that were 1.7 to greater than three times greater than the target value of 0.0010 feet/foot (0.0017, 0.0028, and 0.0033, respectively). These gradients were slightly greater than the average gradients measured in August and September 2005.

2.5 Status of Operation and Monitoring

Reporting of IM extraction and monitoring activities will continue as described in the Performance Monitoring Plan. The next monthly performance monitoring report for the November 2005 reporting period will be submitted on December 15, 2005.

Operation of extraction well TW-2D at its maximum pump capacity (currently between 90 and 96 gpm) will continue in November 2005. Extracted groundwater will be treated at the IM-3 treatment plant. Treated groundwater will be discharged into the injection wells in accordance with Waste Discharge Requirements Order No. R7-2004-0103. Brine generated as a byproduct of the treatment process will continue to be transported offsite to U.S. Filter Corporation in Los Angeles for treatment and disposal. No solids are anticipated to be shipped offsite during November 2005.

Current USBR projections show that the average Davis Dam release for November 2005 (10,900 cfs) will be slightly less than in October 2005 (11,201 cfs). Future adjustments in pump rates from TW-2D will be proposed based on expected river levels, observed groundwater gradients, potential system modifications, and other relevant factors.

3.0 Quarterly Performance Evaluation for August through October 2005

3.1 Extraction System Operations

Between August and October (third quarter) 2005, 10,434,034 gallons of groundwater were extracted. The average extraction rate for the IM system during the quarter, including system downtime and operation of TW-2D and TW-2S, was 78.8 gpm.

The average monthly pumping rates for the primary extraction well TW-2D were 65.8 gpm (August), 73.2 gpm (September), and 88.1 gpm (October) during the quarterly reporting period.

3.2 Cr(VI) Distribution and Trends in Floodplain Area

Figure 3-1 presents the average Cr(VI) results in plan view from August through October 2005 for floodplain wells in the upper, middle, and lower depth intervals of the Alluvial Aquifer. Average groundwater Cr(VI) concentration contours of 50 µg/L and 20 µg/L are depicted along with the number of sampling events that occurred at each well.

Figure 3-2 presents the floodplain cross section A, with average Cr(VI) concentrations from August through October 2005. Average groundwater Cr(VI) concentration contours are shown along with the number of sampling events that occurred at each well. The quarterly average Cr(VI) concentrations for the wells at the MW-39 and MW-36 clusters have declined relative to the concentrations measured during the May through July 2005 sampling (see Table A-1). The average Cr(VI) concentrations detected at well MW-34-100 during August through October sampling have increased relative to the previous quarter sampling.

Figure 3-3 presents average Cr(VI) concentrations from August through October 2005 sampling on the additional floodplain, north-south oriented cross section B. Average groundwater Cr(VI) concentration contours are shown along with the number of sampling events that occurred at each well. During the August -October 2005 reporting period, Cr(VI) was detected at concentrations ranging from 4.0 to 5.3 µg/L in the well MW-33-150 and 2.5 to 4.0 µg/L in well MW-33-210 (Table A-1). These concentrations are similar to the June and July 2005 sampling results.

Hexavalent chromium concentration trend graphs and hydrographs for floodplain wells that have consistently shown Cr(VI) concentrations above the analytical reporting limit are presented in Figures A-1 through A-11. Five out of 11 monitoring wells with Cr(VI) detections (MW-36-90, MW-36-100, MW-39-50, MW-39-60, and MW-39-100) are showing declining Cr(VI) concentrations during the past six months of monitoring. During the October 2005 sampling, Cr(VI) concentration at MW-39-50 dropped to non-detect. Cr(VI) concentrations have remained essentially stable May-October 2005 monitoring at wells MW-

33-90, MW-33-150, MW-33-210, MW-39-70, and MW-39-80. An increasing Cr(VI) concentration trend has been observed at well MW-34-100 since it was first sampled in February 2005.

3.3 Other Water Quality Data for Floodplain Wells

A field parameter meter and flow-through cell were used to measure water quality parameters that include temperature, pH, oxidation-reduction potential, dissolved oxygen, and specific conductance during well purging and groundwater sampling, as outlined in *Sampling and Analysis Field Procedures Manual, PG&E Topock Program* (CH2M HILL 2005b). The field water quality data measured from May through October 2005 are presented in Tables A-1 and A-2. Table A-1 also presents the groundwater elevations collected during the same time period. Due to the density differences in groundwater caused by salinity variations, the groundwater elevations measured in the wells have been adjusted, or normalized, to a freshwater standard.

Table C-1 (Appendix C) presents the results of the general chemistry and stable isotope analyses for select monitoring wells in the IM performance monitoring area and river locations during sampling events from March 2004 through October 2005. Figure 2-1 shows the locations of the monitoring wells sampled for the performance monitoring parameters. The wells were sampled for specific chemical parameters in order to monitor the performance and effects of IM pumping on groundwater chemistry in the floodplain area. Water samples were analyzed for total dissolved solids (TDS), chloride, sulfate, nitrate, bromide, calcium, potassium, magnesium, sodium, boron, alkalinity, deuterium, and oxygen 18. Stable isotope results for the October 2005 monitoring event are not available at this time since these analyses are being performed at a second subcontracted laboratory.

The majority of the 14 floodplain wells sampled for chemical performance monitoring parameters exhibit minor variations in concentrations over the period of March 2004 through October 2005. However, the concentrations of TDS, chloride, and sodium at wells MW-20-100, MW-20-130, MW-25, MW-28-25, MW-31-60, and MW-34-55 have shown decreases compared to initial concentrations measured in March 2004 (Table C-1). Over the performance monitoring period, wells MW-27-20, MW-32-20, MW-32-35, and MW-34-80 have shown increasing TDS, magnesium, and potassium concentrations. Nitrate concentrations are decreasing in monitoring wells MW-25, MW-30-50, and MW-31-60, and increasing in well MW-20-130 (Table C-1). Further assessment of the performance monitoring wells will be conducted as additional monitoring data are collected.

3.4 Hydraulic Gradients and River Levels during Quarterly Period

Average monthly groundwater and river elevations, contour maps of groundwater elevations, and hydraulic gradients between key monitoring wells are reported in each of the monthly performance monitoring reports. The groundwater contour maps for the upper, middle, and lower depth intervals for August, September, and October 2005 are also provided in this report as follows:

- August 2005: Appendix B, Figures B-2A through B-2C
- September 2005: Appendix B, Figures B-2D through B-2F
- October 2005: Figures 2-5 through 2-7 presented in Section 2.0 of this report

A review of the groundwater level contours on these figures shows that all floodplain wells with detectable chromium were within the capture zone of the pumping well(s) during each month of this reporting period, August through October 2005. That is, the inferred groundwater flow lines from the floodplain monitoring wells where Cr(VI) is detected greater then 20 µg/L are oriented towards the TW-2D/2S extraction wells.

Average quarterly groundwater elevations (August through October, inclusive) for the deep wells are presented and contoured in plan view on Figure 3-4. The average quarterly groundwater elevations are also presented and contoured in floodplain cross section A (Figure 3-5). The landward hydraulic gradients for the deep monitoring wells shown on Figure 3-4, during the quarterly reporting period, are consistent with the strong landward gradients observed in groundwater elevation maps for the deep aquifer interval submitted in the monthly performance monitoring reports.

Hydraulic gradients are calculated each month between the following well/gradient pairs:

- MW-31-135 and MW-33-150 (northern gradient pair)
- MW-20-130 and MW-34-80 (central gradient pair)
- MW-20-130 and MW-42-65 (southern gradient pair)

The average hydraulic gradients between key gradient well pairs in August, September, and October 2005 are summarized in Table 3-1. The mean landward hydraulic gradients were up to greater than 3 times the required minimum gradient of than 0.001 feet/foot for all gradient pairs during all periods monitored during this reporting period. Data from MW-34-80 were not available during the second half of August due to transducer failure, as noted in Table 3-1.

Figure 3-6 presents, in graphic form, the measured hydraulic gradients and pumping rates and river levels throughout the quarterly period. River levels were moderate and relatively steady throughout the reporting period, resulting in similarly high well pair gradients each month. Landward gradients measure during October increased slightly reflecting the increase in the TW-2D extraction rate.

3.5 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 USBR. Total releases from Davis Dam follow a predictable annual cycle, with largest monthly releases typically in early spring (April and May) and smallest monthly releases in winter (December and January). Superimposed on this annual cycle, 24-hour releases often fluctuate on a diurnal cycle. 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.

The corresponding river stage at the I-3 station fluctuates in a similar pattern. The monthly average stage at I-3 typically peaks in the early summer and reaches its low point in the winter. Following Davis Dam releases, river stage also fluctuates on a diurnal cycle, though greatly attenuated. The magnitude of the daily river stage fluctuations is less than the magnitude of the monthly average river stage fluctuations over a typical year.

Figure 3-7 shows river stage measured at I-3 superimposed on the projected I-3 river levels based on actual Davis Dam discharge and Lake Havasu levels. This graph shows that the formula used to calculate I-3 levels provides a very good estimate of the actual levels at I-3 over a wide range of river levels. The future projections shown on this graph are based on USBR long-range projections of Davis Dam release and Lake Havasu level. Current projections show the lowest water levels will occur in December. December average water level is projected to be more than 1.5 feet lower than November. Water levels are projected to rebound approximately 0.5 foot in January 2006. By February 2006, average water levels will have rebounded to near the current October/November levels. Because water demand is based on climatic factors, there is more uncertainty in these projections at longer times in the future.

4.0 Conclusions

The groundwater elevation and hydraulic gradient data for August, September, and October 2005 performance monitoring indicate that the minimum landward gradient target of 0.001 feet/foot was met during the quarterly reporting period. Even though a complete transducer dataset was not available for one of the wells in the central gradient pair (MW-34-80) during August, the groundwater elevation maps and hydraulic data from a comparable deeper well at this location indicate that the average minimum gradient was met for the central well pair during August. As summarized in Table 3-1, the landward gradients during August, September, and October were 1.5 to greater than 3 times the required minimum magnitude in all well pairs. The IM pumping was sufficient to meet the minimum gradient targets during each of the three months of the third quarter 2005.

The existing gradient well pairs are adequate to define the capture of the plume while pumping from extraction wells TW-2D and TW-2S. Although none of the designated well pairs are aligned directly with the hydraulic gradient, the only effect due to the slight misalignments would be an underestimate of the true gradient induced from pumping.

A total of 10,434,034 gallons of groundwater was extracted and treated from the IM system during the August through October (third quarter) 2005 reporting period. The average pumping rate for the IM extraction system, including downtime, during the quarterly reporting period was 78.8 gpm.

Hexavalent chromium continues to be detected in the deep floodplain monitoring well MW-34-100. The Cr(VI) concentrations in this well have shown a generally increasing trend since it was installed in February 2005 (Figure A-2). This increasing trend is in contrast to nearly all other floodplain wells, which show decreasing or stable trends. It should be noted that landward gradients have been present at MW-34-100 since it was installed. The increasing trend in chromium concentration at this well is therefore not an indication of chromium migration to the east. The hydraulic monitoring data and gradients measured this quarter indicate that the current IM pumping is inducing landward groundwater flow in the aquifer interval that is monitored at MW-34-100. The aquifer materials in the screened interval of MW-34-100 contain a higher fraction of fine silt and clay than the materials in other nearby wells MW-34-80 and MW-36-100. Groundwater moves slower in zones of finer-grained aquifer material. This may result in chromium concentrations in MW-34-100 being slower to respond to pumping than wells in other, more permeable zones of the aquifer.

Overall, the Cr(VI) concentrations in the floodplain are stable or decreasing. As noted in Section 3.2 and shown in Figures A-1 through A-11, five out of 11 floodplain monitoring wells with consistent Cr(VI) detections (MW-36-90, MW-36-100, MW-39-50, MW-39-60, and MW-39-100) are showing declining Cr(VI) concentrations during the past six months of monitoring. Concentrations of Cr(VI) have remained essentially stable at wells MW-33-90, MW-33-150, MW-33-210, MW-39-70, and MW-39-80. The exception to these trends is well MW-34-100 in which concentrations are generally increasing. It is anticipated that, with continued pumping from well TW-2D and the initiation of pumping from TW-3D and PE-1

(anticipated by January 2006), Cr(VI) concentrations in well MW-34-100 will change and could even increase in the short-term, but will ultimately show the same declining trends observed in the MW-39 and MW-36 well clusters.

Based on the hydraulic and chemical performance monitoring data and evaluation presented in this report, the IM performance standard has been met for the August through October (third quarter) 2005 reporting period. Performance monitoring of the IM hydraulic containment system will continue in accordance with the Performance Monitoring Plan and as directed by the DTSC.

5.0 References

California Department of Toxic Substances Control (DTSC). 2005. Letter to PG&E. "Criteria for Evaluating Performance Requirements of Interim Measure to Hydraulic Control of Chromium Plume in Floodplain". February 14.

CH2M HILL. 2005a. *Draft Performance Monitoring Plan for Interim Measures in the Floodplain Area. PG&E Topock Compressor Station, Needles, California.* April 15.

CH2M HILL. 2005b. *Topock Program Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Topock Compressor Station.* March 31.

Tables

TABLE 2-2
Analytical Results for Extraction Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Well ID	Sample Date	Unfiltered Total Chromium mg/L	Dissolved Total Chromium mg/L	Hexavalent Chromium mg/L	Total Dissolved Solids mg/L
TW-02D	05-May-05	---	5.49 ^	---	6470
TW-02D	15-Jun-05	---	4.86	4.57	6420
SC-100B	08-Aug-05	4.06	---	4.27	5980 J
SC-100B	11-Aug-05	4.83	---	4.21 J	6060
SC-100B	16-Aug-05	4.75	---	4.22	6170
SC-100B	18-Aug-05	3.96	---	3.88	5950
SC-100B	22-Aug-05	4.11	---	4.10	6000
SC-100B	25-Aug-05	3.74	---	4.27	6200
SC-100B	16-Sep-05	3.91	---	3.92	6090 J
SC-100B	21-Sep-05	4.15	---	3.99	6360
SC-100B	28-Sep-05	5.57	---	4.02	6250
SC-100B	05-Oct-05	3.79	---	3.96	6040
SC-100B	12-Oct-05	4.24	---	3.60	5950
SC-100B	19-Oct-05	3.68	---	3.79	6080
SC-100B	25-Oct-05	3.27	---	3.90	5880

Notes:

mg/L = concentration in milligrams per liter (mg/L)
FD = field duplicate sample
J = concentration or reporting limit estimated by laboratory or data validation.
(---) = data not collected.
^ = Groundwater samples from IM extraction wells are analyzed by certified laboratory for operational monitoring purpose. Analytical data is reviewed for quality control but does not undergo full data validation; results flagged ^.

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

The analytical results after August 1, 2005 were obtained from a sample point (SC-100B) on the influent conveyance system at the IM3 treatment system.

TABLE 2-3

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

Interim Measures Performance Monitoring

PG&E Topock Compressor Station

Month	Davis Dam Release			Colorado River Elevation at I-3		
	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft AMSL)	Actual (ft AMSL)	Difference (feet)
April 2004	17,400	17,354	-46	456.4	456.2	-0.2
May 2004	17,100	16,788	-312	456.3	456.3	-0.1
June 2004	15,800	16,869	1,069	455.8	456.6	0.7
July 2004	14,000	14,951	951	455.2	455.9	0.7
August 2004	12,100	12,000	-100	454.5	454.9	0.4
September 2004	11,200	10,979	-221	454.2	454.6	0.4
October 2004	8,600	7,538	-1,062	453.2	453.5	0.3
November 2004	9,500	8,075	-1,425	453.6	453.4	-0.2
December 2004	6,200	8,090	1,890	452.4	453.3	0.9
January 2005	8,800	4,900	-3,900	453.4	452.4	-1.0
February 2005	8,000	4,820	-3,180	453.1	452.6	-0.5
March 2005	15,600	7,110	-8,490	455.8	452.9	-2.9
April 2005	16,700	16,306	-394	455.9	456.0	0.1
May 2005	16,700	15,579	-1,121	456.2	456.1	-0.1
June 2005	14,600	15,223	623	455.8	456.1	0.3
July 2005	15,400	15,612	212	456.0	456.0	0.0
August 2005	11,700	11,544	-156	454.6	454.8	0.2
September 2005	12,400	12,335	-65	454.6	NA	NA
October 2005	12,300	11,201	-1,099	454.5	454.3	-0.2
November 2005	10,900	----	----	454.3	----	----

NOTES:

NA = I-3 transducer data unavailable for month of September due to damage by debris.

Projected Davis Dam Releases, updated monthly, are reported by the US Department of Interior, Bureau of Reclamation at http://www.usbr.gov/lc/region/g4000/24mo.pdf; listed projections for April 2004 through July 2004 are from April 2004, and the remainder were from the beginning of each respective month.

Colorado River levels at I-3 are predicted from a linear regression between historical dam releases and measured river levels at I-3 (updated monthly).

cfs = cubic feet per second; ft AMSL = feet above mean sea level

TABLE 2-4
Average Hydraulic Gradients Measured at Well Pairs, October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Well Pair	Mean Landward Hydraulic Gradient (feet/foot)	Measurement Dates 2005
Northern Gradient Pair		
MW-31-135 / MW-33-150	0.0017	October-1 through October-31
Central Gradient Pair		
MW-20-130 / MW-34-80	0.0028	October-1 through October-31
Southern Gradient Pair		
MW-20-130 / MW-42-65	0.0033	October-1 through October-31

Notes:

1) Refer to Figure 1-2 for location of well pairs

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

3) Data missing from MW-31-135/MW-33-150 well pair 10/3/05 through 10/4/05

4) Data missing from MW-20-130/MW-34-80 well pair 10/3/05 through 10/5/05

5) Data missing from MW-20-130/MW-42-65 well pair 10/3/05 through 10/4/05

TABLE 3-1

Average Hydraulic Gradients Measured at Well Pairs, August through October 2005

Interim Measures Performance Monitoring

PG&E Topock Compressor Station

Well Pair[1]	Reporting Period	Mean Landward Hydraulic Gradient[2] (feet/foot)	Measurement Interval 2005
Northern Gradient Pair			
MW-31-135 / MW-33-150	August	0.0013	August-1 through August-31
	September	0.0015	September-1 through September-30
	October	0.0017	October-1 through October 31
Central Gradient Pair			
MW-20-130 / MW-34-80	August	0.0025[4]	August-1 through August-15[3]
	September	0.0027	September-1 through September-30
	October	0.0028	October-1 through October 31
Southern Gradient Pair			
MW-20-130 / MW-42-65	August	0.0025	August-1 through August-31
	September	0.0027	September-1 through September-30
	October	0.0033	October-1 through October 31

Notes:

1. Refer to Figure 2-1 for location of well pairs
2. For IM pumping, the target landward gradient for the selected well pairs is 0.001 feet/foot
3. MW-34-80 transducer data unavailable from August 16-31, 2005 due to transducer failure
4. To verify the full-month average gradient at the central well pair, the average gradient was also calculated using transducer data from MW-20-130 and MW-34-100 (the deeper well in the MW-34 cluster). The average gradient between MW-20-130 and MW-34-100 from August 1 through August 31 was 0.0025 feet/foot.

5) Data missing from MW-31-135/MW-33-150 well pair 10/3/05 through 10/4/05

6) Data missing from MW-20-130/MW-34-80 well pair 10/3/05 through 10/5/05

7) Data missing from MW-20-130/MW-42-65 well pair 10/3/05 through 10/4/05

Figures

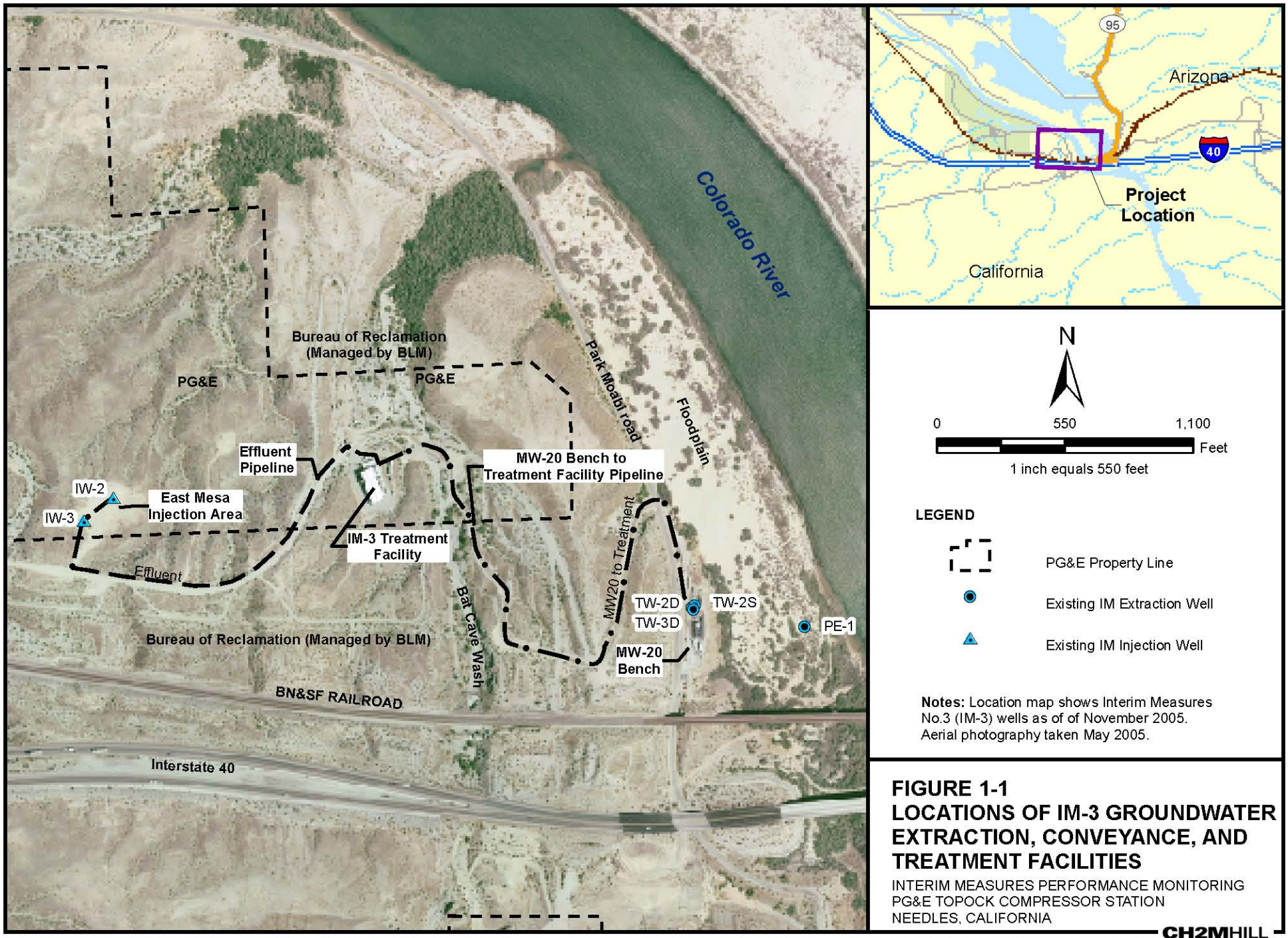

FIGURE 1-1
LOCATIONS OF IM-3 GROUNDWATER EXTRACTION, CONVEYANCE, AND TREATMENT FACILITIES

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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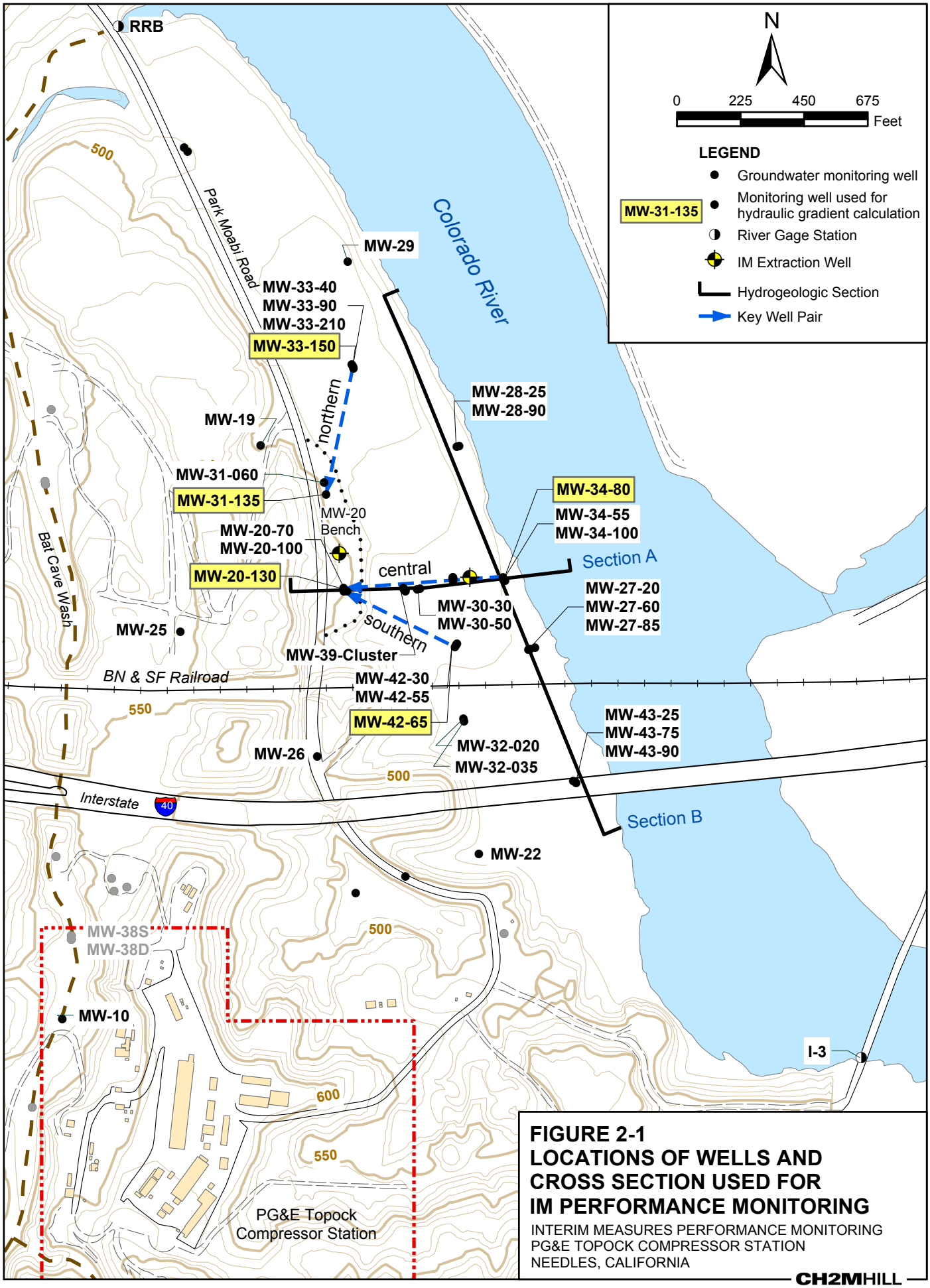

FIGURE 2-1
LOCATIONS OF WELLS AND CROSS SECTION USED FOR IM PERFORMANCE MONITORING

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\PMP_WELLS_SECTIONS_8X11.MXD
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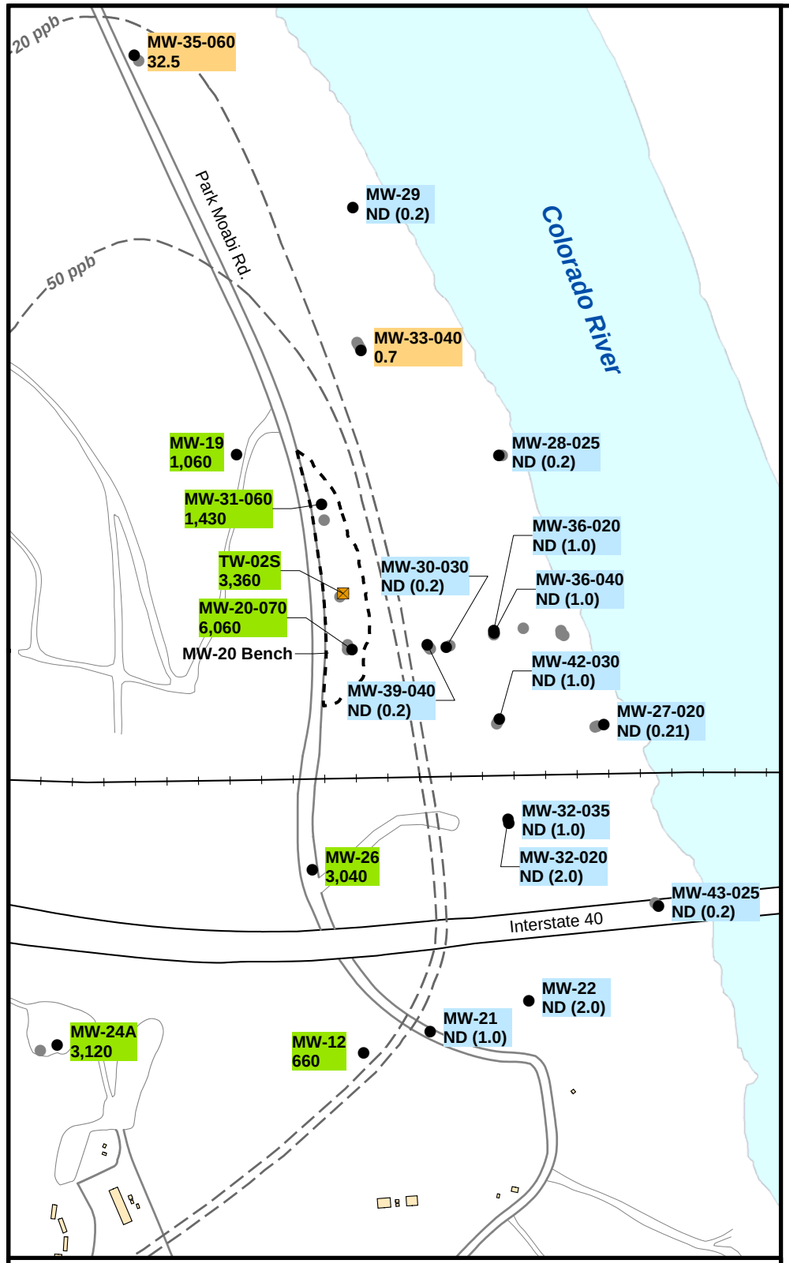
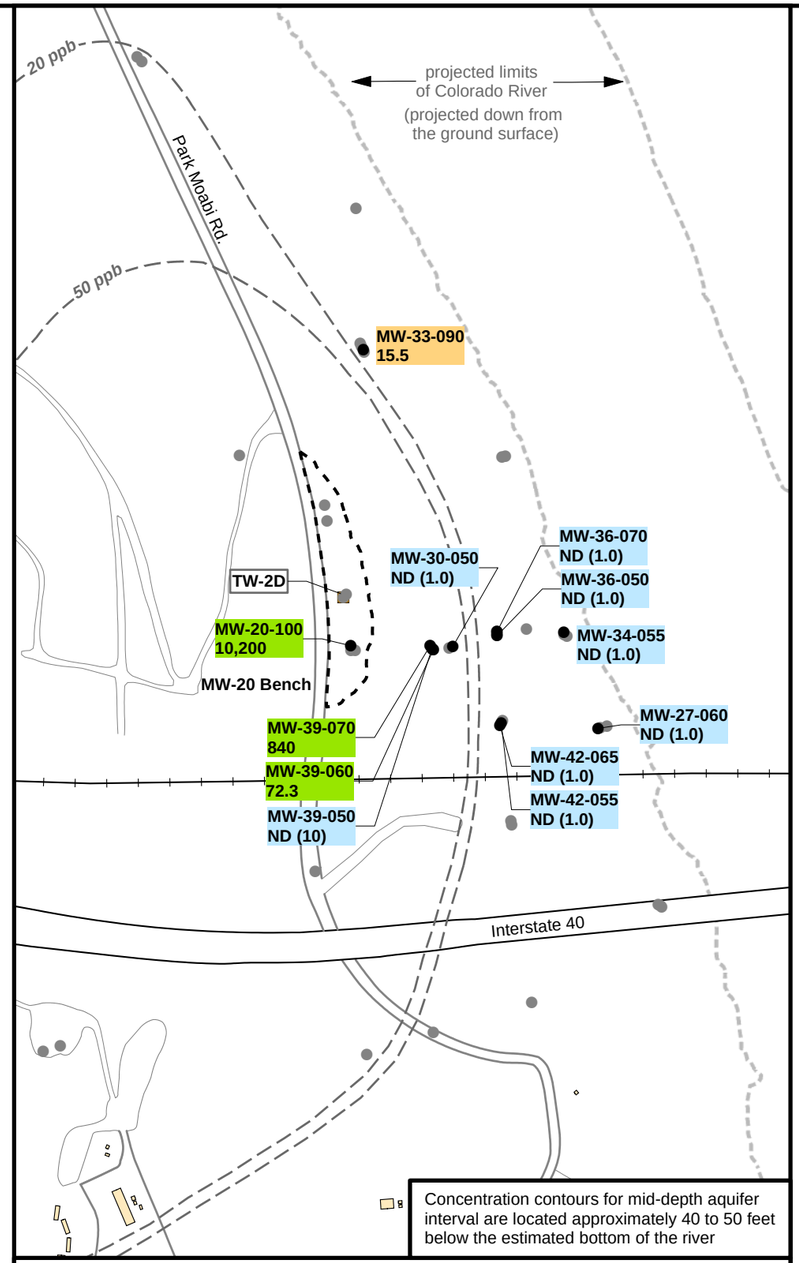
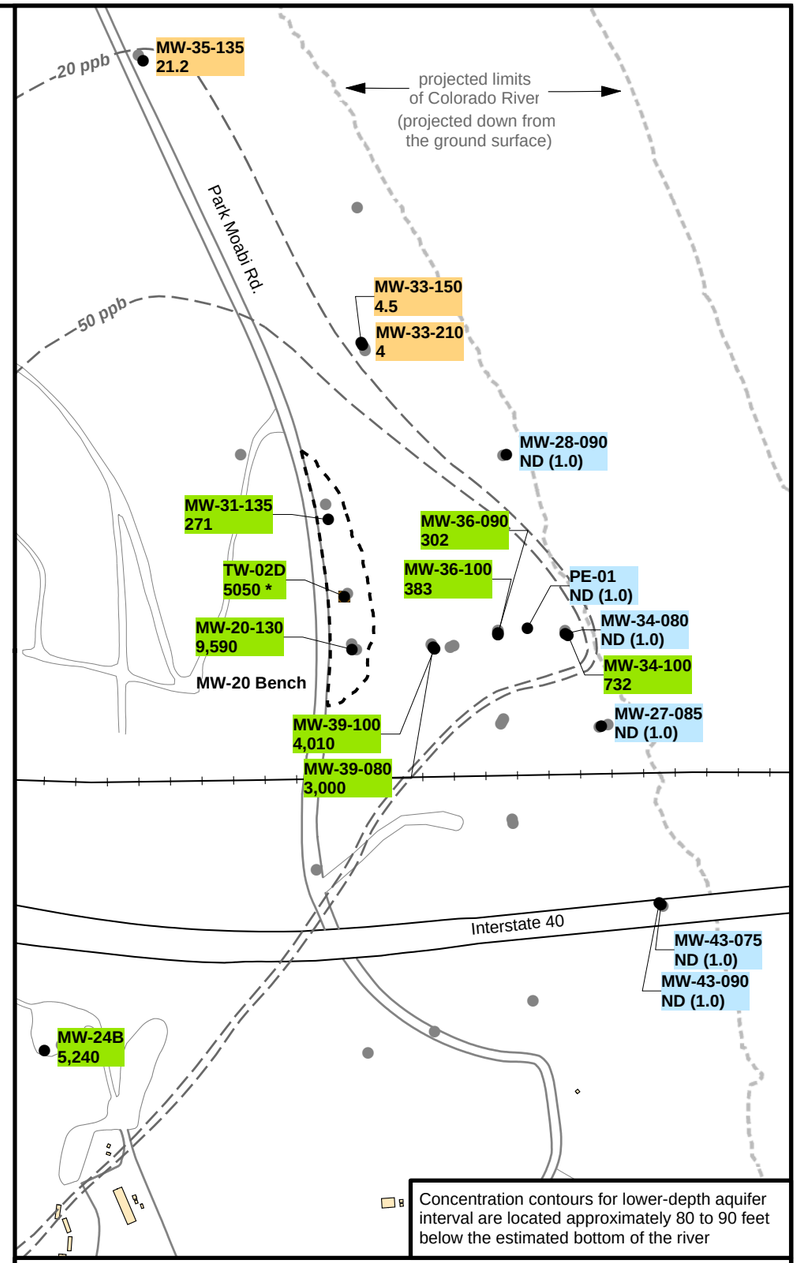


Shallow Wells (Upper Depth Interval)



Intermediate Wells (Middle Depth Interval)



Deep Wells (Lower Depth Interval)

ND (1) Not detected at listed reporting limit (ppb)

41 Less than 50 ppb

3,810 Greater than 50 ppb

— · 50 · — Inferred Cr(VI) concentration contour

Notes:
Results marked * are from the June 2005 sampling event. All other results are from the October 2005 quarterly sampling event.

Results plotted are from primary samples for monitoring event. See tables A-1 and A-2 for data and dates of sampling.

Hexavalent Chromium Concentrations in Groundwater
October 2005 Quarterly Sampling Event

Concentrations in micrograms per liter (µg/L)
equivalent to parts per billon (ppb)
ND = not detected at listed reporting limit.

N

0 400 800 Feet

1 inch equals 400 feet

FIGURE 2-2
CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER, OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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West

East
Section A

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

MW-20 Cluster

MW-39 Cluster

MW-30-30
MW-30-50

MW-36 Cluster

PE-1
proj: 20'

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

Colorado River

Elevation (feet above MSL)

520
500
480
460
440
420
400
380
360
340
320

6,060
10,200
9,590
132'
180'

ALLUVIAL AQUIFER

Upper Depth Interval
Middle Depth Interval
Lower Depth Interval

5,000
20
50
500

Approximate geologic contact between alluvial fan (west) and fluvial deposits (east)

ND (10)
72.3
840
3,000
4,010
118'

ND (0.2)
ND (0.2)
ND (1.0)
67'

ND (1.0)
ND (1.0)
ND (1.0)
ND (1.0)
302
383
108'

Upper Depth Interval
Middle Depth Interval
Lower Depth Interval
ND (1.0)
ND (1.0)
105'

ND (1.0)
ND (1.0)
500
732
115'
?

Miocene Conglomerate (Bedrock)

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

water level
well screen
3,420
boring depth (feet)
103

50
Inferred Hexavalent Chromium concentration contour

Hexavalent Chromium concentration in micrograms per liter (ug/L) equivalent to parts per billion (ppb)

ND (1) Not detected at listed reporting limit (ppb)

42 Less than 50 ppb

3,810 Greater than 50 ppb

Notes:
Results plotted are from primary samples for monitoring event; see Tables A-1 and A-2 for complete results for reporting period

FIGURE 2-3
CR(VI) CONCENTRATIONS
FLOODPLAIN CROSS-SECTION A
OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GINT\INPUT\GINT_WORK_FILE_TYPES\GDW\X-SECTIONS\PMR\3Q05QUARTERLY\OCT_AVG_SECA_DRAFT.GDW;

North

South
Section B

MW-33 wells
projected 200' onto line of section

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

Cross-Section Parallel to the Colorado River

BN & SF
Railroad

I-40
Bridge

MW-28-25
MW-28-90
projected: 40'

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

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

MW-43-25
MW-43-75
MW-43-90

water table (average 454' MSL)

Upper Depth Interval

Middle Depth Interval

Lower Depth Interval

ALLUVIAL AQUIFER

Oldest Alluvium (Toa)

0.7
15.5
4.5
4

ND (0.2)
ND (1.0)

ND (1.0)
ND (1.0)

ND (0.21)
ND (1.0)
ND (1.0)

ND (0.2)
ND (1.0)
ND (1.0)

20
50
500
732

Approximate geologic contact
between alluvial fan
and fluvial deposits

237'
148'
116'
107'
97'

Miocene Conglomerate (Bedrock)

Elevation (feet above MSL)

560 540 520 500 480 460 440 420 400 380 360 340 320 300 280 260 240

-200 0 200 400 600 800 1,000 1,200 1,400 1,600 1,800

Distance (feet)

water level

well screen

3,810

boring depth (feet) 103'

50
Inferred Hexavalent Chromium concentration contour

Hexavalent Chromium concentration in micrograms per liter (ug/L) equivalent to parts per billion (ppb)

ND (1)	Not detected at listed reporting limit (ppb)
42	Less than 50 ppb
3,810	Greater than 50 ppb

Notes:
Results plotted are from primary samples for monitoring event;
see Tables A-1 and A-2 for complete results for reporting period

FIGURE 2-4
CR(VI) CONCENTRATIONS
FLOODPLAIN CROSS-SECTION B
OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GINT\INPUT\GINT_WORK_FILE_TYPES\GDW\X-SECTIONS\PMR\3Q05QUARTERLY\OCT_AVG_SECB_DRAFT.GDW;

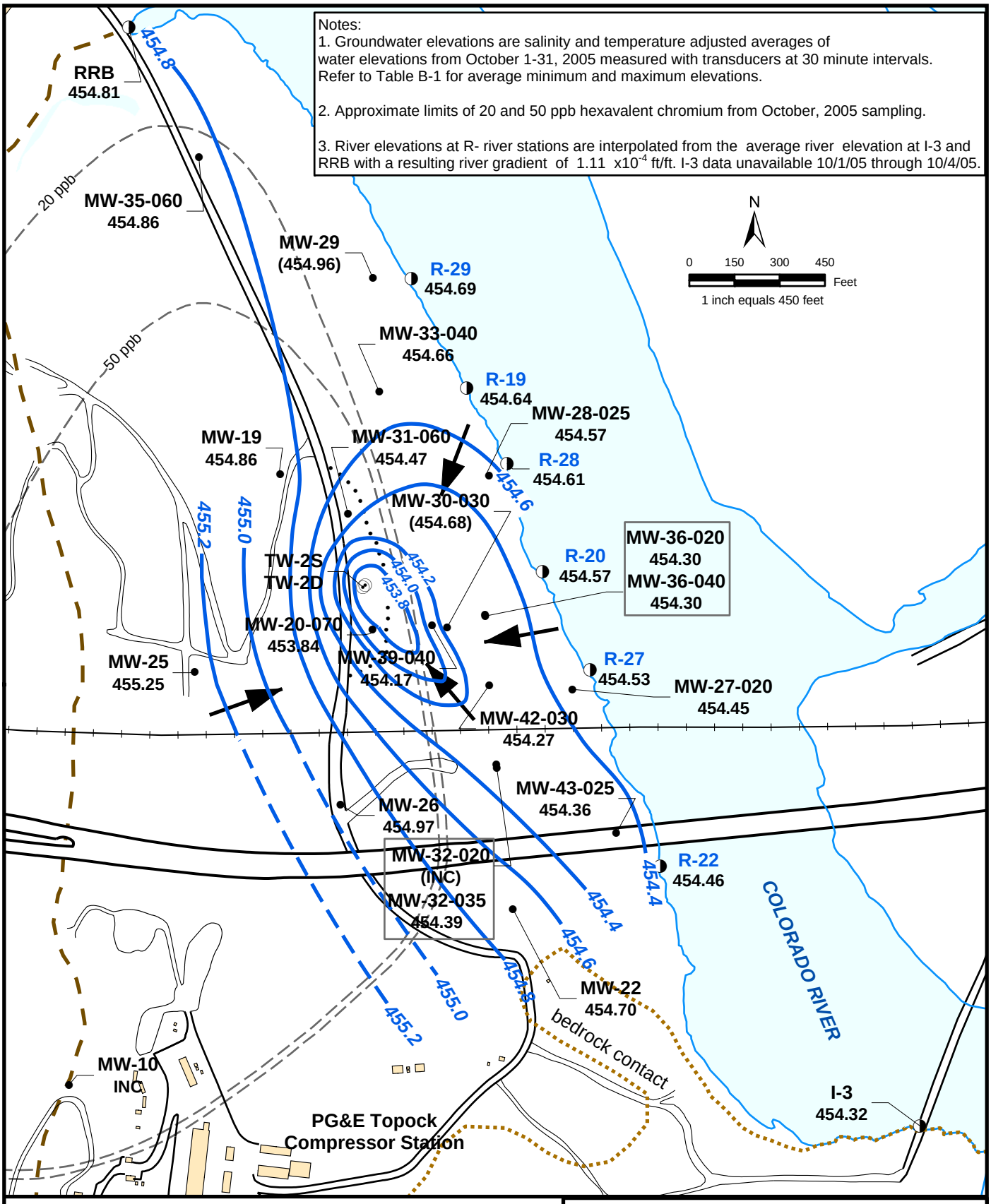

FIGURE 2-5
AVERAGE GROUNDWATER SHALLOW WELLS AND RIVER ELEVATIONS OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_UA_OCT1_31_05.MXD

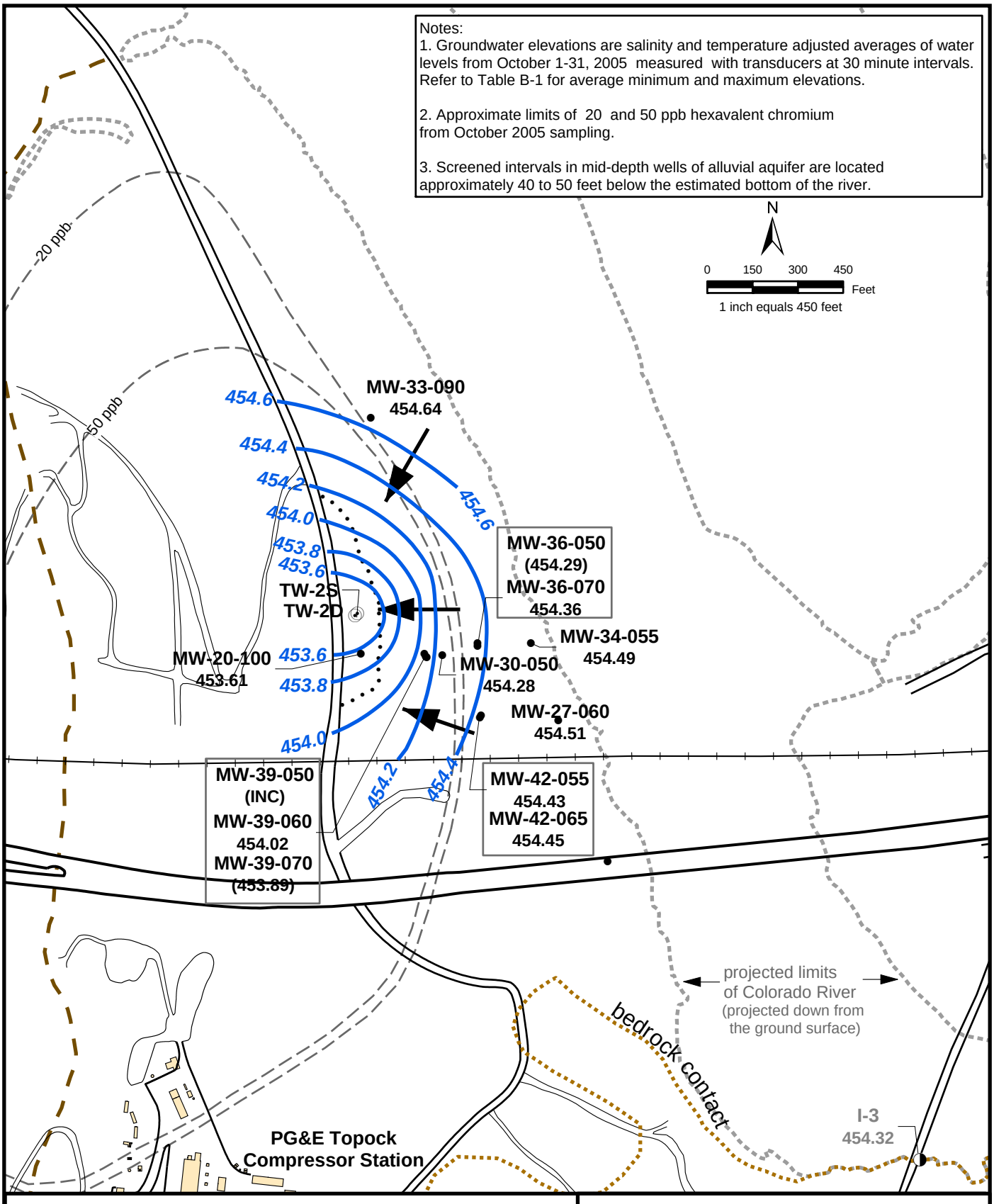

FIGURE 2-6
AVERAGE GROUNDWATER ELEVATIONS MID-DEPTH WELLS OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_MA_OCT1_31_05.MXD
IM_AVERAGE_GROUNDWATER_MA_OCT1_31_05.PDF

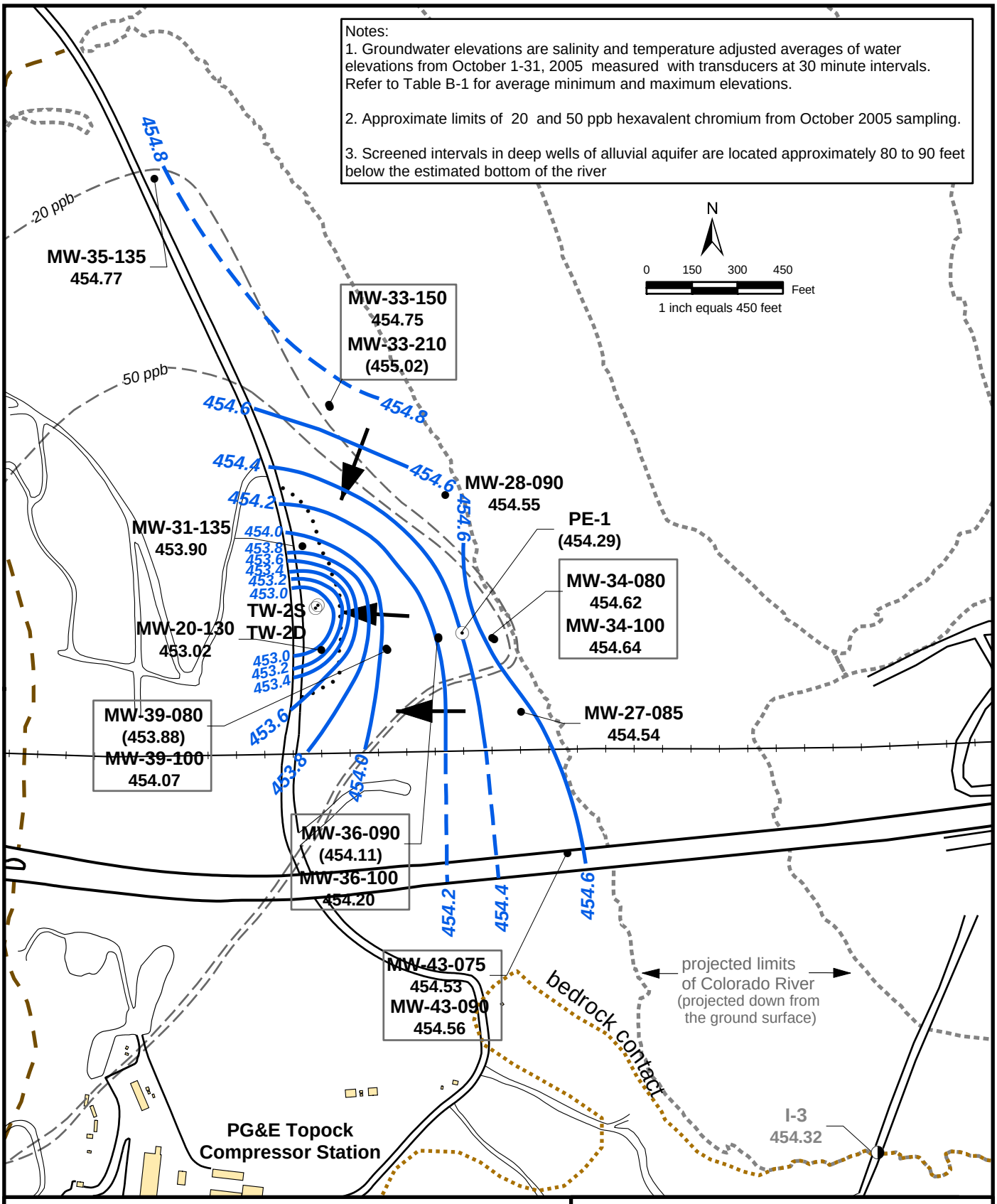

FIGURE 2-7
AVERAGE GROUNDWATER ELEVATIONS DEEP WELLS OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_LA_OCT1_31_05.MXD

West

East
Section A

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

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
proj: 20'

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

Colorado River

R-20
454.57

453.84
453.68 / 454.00

453.61
453.35 / 454.02

453.02
452.64 / 453.67

454.25
453.71 / 454.76

454.17
453.66 / 454.64

454.02
453.52 / 454.51

453.89
453.45 / 454.40

453.88
453.43 / 454.38

454.07
453.61 / 454.58

454.68
454.59 / 454.77

454.28
453.71 / 454.82

454.30
453.77 / 454.80

454.30
453.69 / 454.88

454.29
453.65 / 454.89

454.36
453.71 / 454.98

454.11
453.55 / 454.66

454.20
453.64 / 454.76

454.29
453.65 / 454.91

454.49
453.70 / 455.26

454.62
453.90 / 455.33

454.84
453.96 / 455.32

453.8
453.6
453.4
453.2
453.0
454.0
454.2
454.4
454.6
20
50
?

Alluvial Aquifer

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

Miocene Conglomerate (Bedrock)

Elevation (feet MSL)

Distance (feet)

Notes:
Results show average groundwater elevations for October 1-31, 2005 measured with transducers at 30 minute intervals.
Groundwater elevations adjusted for salinity and temperature.

*Wells MW-30-30, and MW-36-90, excluded from contouring.
MW-39-50 mean does not include 10/11/05 through 10/18/05 due to transducer battery failure.

River elevation (R-20) is the calculated monthly average river level based upon the river gradient between RRB and I-3.
Data subject to review.

Legend:

MW-30-50
Inferred water table
well screen
453.66
453.40/453.94
103 boring depth (feet)

20
Inferred hexavalent chromium contour (ppb) October 2005

Monthly average groundwater head (ft MSL)
Daily Minimum / Maximum average groundwater head (ft MSL)

453.5
Groundwater head contour

453.5
Inferred groundwater head contour

FIGURE 2-8
AVERAGE GROUNDWATER ELEVATIONS
FLOODPLAIN CROSS-SECTION A
OCTOBER, 2005
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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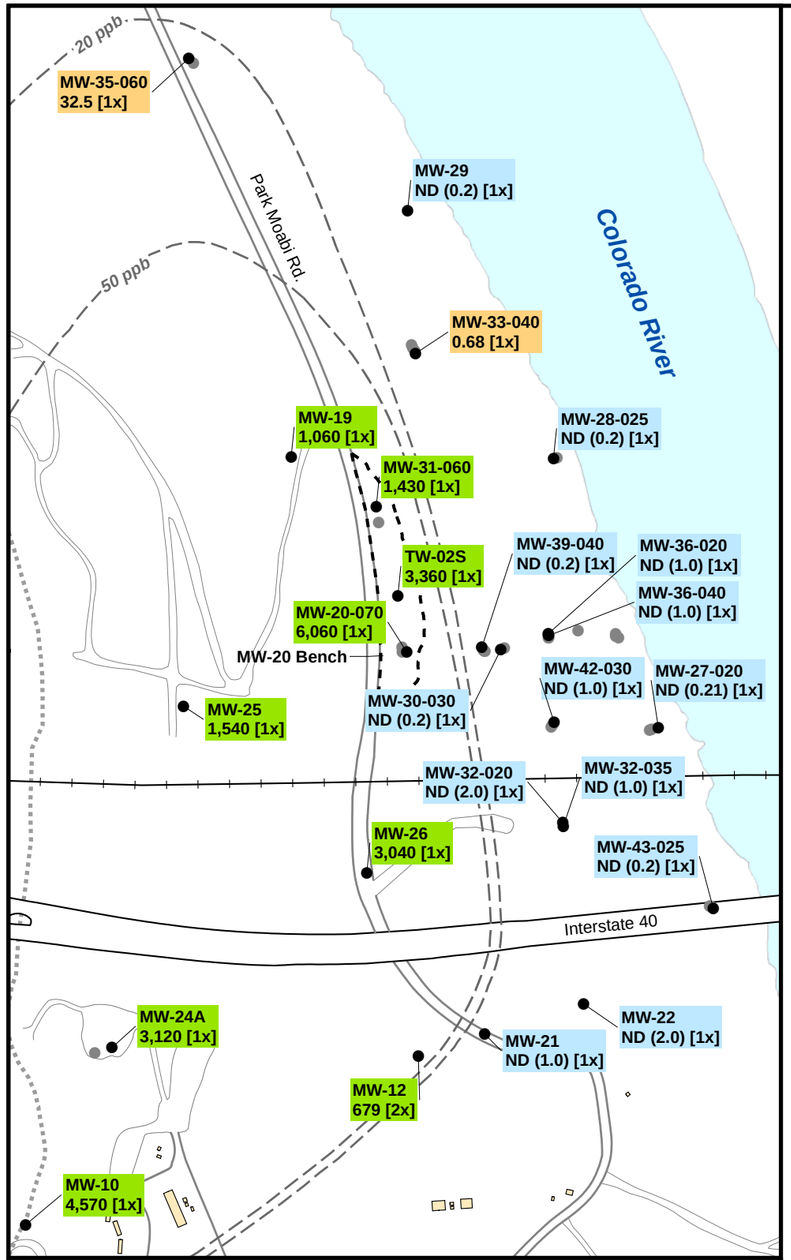
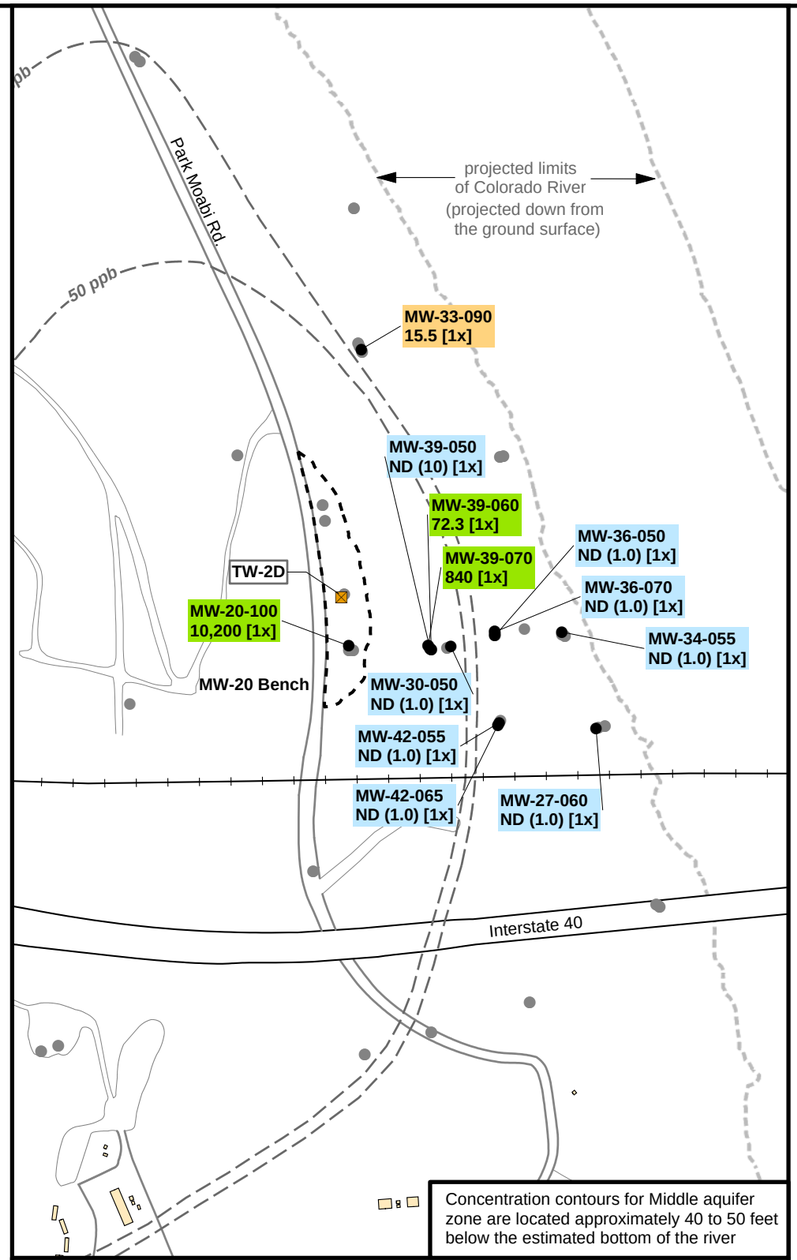
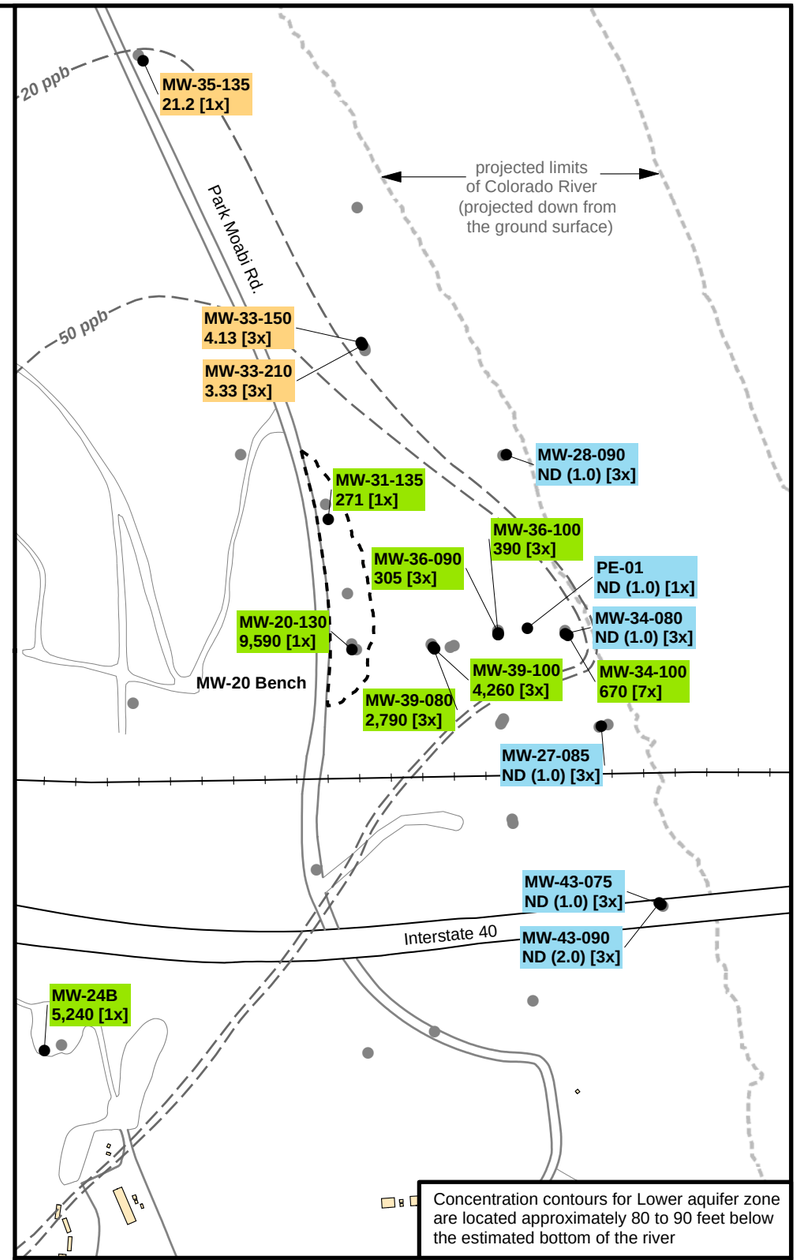


Shallow Wells (Upper Depth Interval)



Intermediate Wells (Middle Depth Interval)



Deep Wells (Lower Depth Interval)

ND (1) Not detected at listed reporting limit (ppb)

41 Less than 50 ppb

3,810 Greater than 50 ppb

— 50 — - Inferred Cr(VI) concentration contour

See Figure 3-2 for depths of Alluvial Aquifer zones.
Results plotted are averages from primary samples
for monitoring events during the reporting period;
see Tables A-1 and A-2 for complete results.

Average Hexavalent Chromium [Cr (VI)] Concentrations
August-October 2005 Sampling Events
Concentrations in micrograms per liter (µg/L)
equivalent to parts per billon (ppb).
Brackets indicate number of sampling events
during the quarterly reporting period.

N

0 400 800 Feet

1 inch equals 400 feet

FIGURE 3-1
AVERAGE CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER, AUGUST-OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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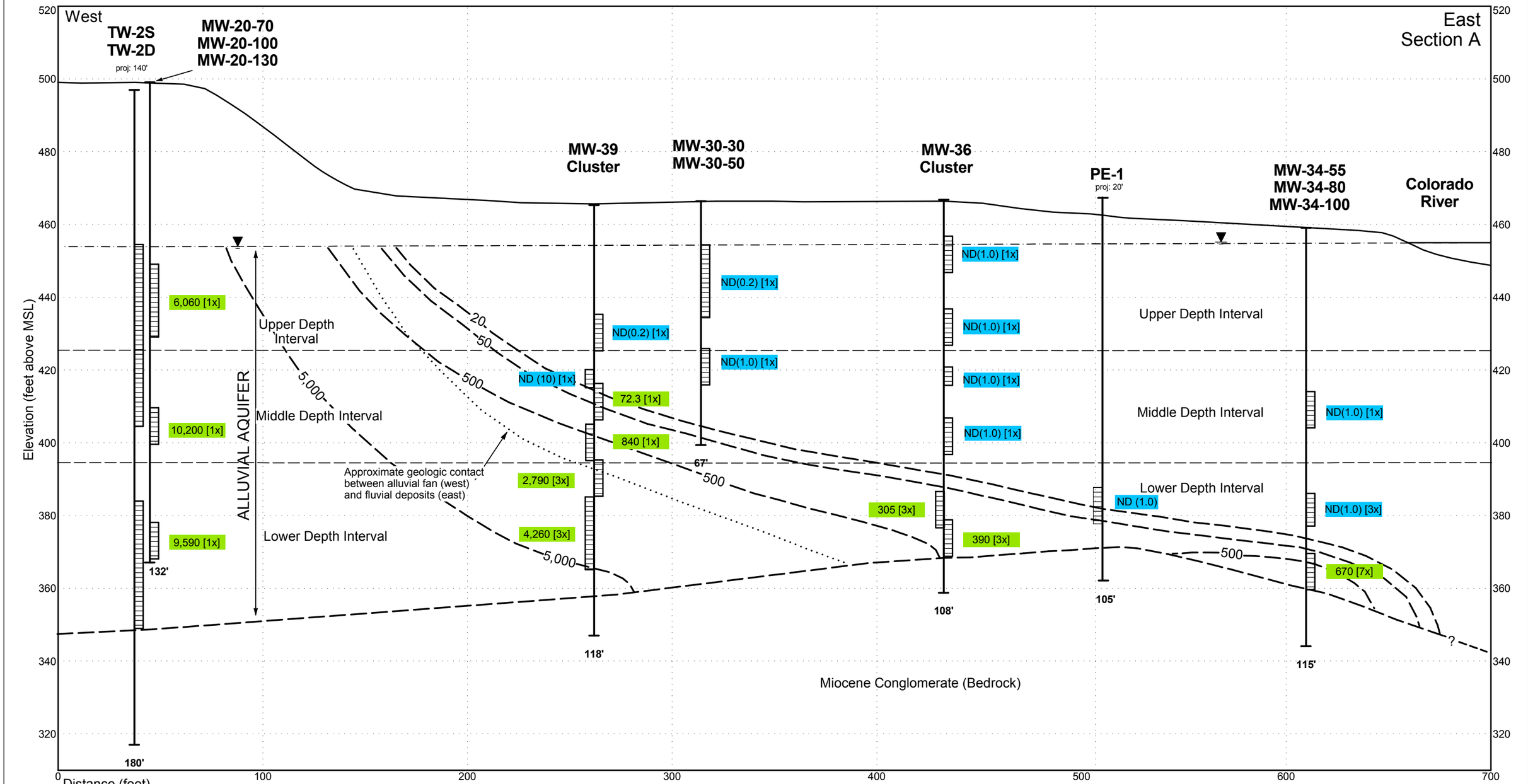

water level

well screen

boring depth (feet) 103

10.1 [7x]

Quarterly Average Cr(VI) concentration in micrograms per liter (ug/L), equivalent to parts per billion (ppb). Brackets indicate number of sampling events during the quarterly reporting period.

50 Inferred Cr(VI) Contour

Hexavalent Chromium [Cr(VI)] Concentrations, Averaged for August-October 2005 Sampling Events

ND(5)	Not detected at listed reporting limit (ppb)
10.1	Less than 50 ppb
1,257	Greater than 50 ppb

Note: Results plotted are averages from primary samples for monitoring events during the reporting period; see Tables A-1 and A-2 for complete results

FIGURE 3-2
AVERAGE CR(VI) CONCENTRATIONS
FLOODPLAIN CROSS-SECTION A
AUGUST-OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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North

South
Section B

Cross-Section Parallel to the Colorado River

MW-33 wells
projected 200' onto line of section

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

MW-28-25
MW-28-90
projected: 40'

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

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

BN & SF
Railroad

I-40
Bridge

MW-43-25
MW-43-75
MW-43-90

water table (average 454' MSL)

Upper Depth Interval

Middle Depth Interval

Lower Depth Interval

ALLUVIAL AQUIFER

Oldest Alluvium (Toa)

0.68 [1x]
15.5 [1x]
4.13 [3x]
3.33 [3x]

ND (0.2) [1x]
ND (1.0) [3x]

ND (1.0) [1x]
ND (1.0) [3x]

ND (0.21) [1x]
ND (1.0) [1x]
ND (1.0) [3x]

ND (0.2) [1x]
ND (1.0) [3x]
ND (2.0) [3x]

20
50
500
670 [7x]

Approximate geologic contact
between alluvial fan
and fluvial deposits

237'
148'
116'
107'
97'

Miocene Conglomerate (Bedrock)

Elevation (feet above MSL)

560 540 520 500 480 460 440 420 400 380 360 340 320 300 280 260 240

-200 0 200 400 600 800 1,000 1,200 1,400 1,600 1,800

Distance (feet)

water level
well screen
boring depth (feet) 103

10.1 [7x]

Quarterly Average Cr(VI) concentration in micrograms per liter (ug/L), equivalent to parts per billion (ppb). Brackets indicate number of sampling events during the quarterly reporting period.

50 Inferred Cr(VI) Contour

Hexavalent Chromium [Cr(VI)] Concentrations, Averaged for August-October 2005 Sampling Events

ND(5)	Not detected at listed reporting limit (ppb)
10.1	Less than 50 ppb
1,257	Greater than 50 ppb

Note: Results plotted are averages from primary samples for monitoring events during the reporting period; see Tables A-1 and A-2 for complete results

FIGURE 3-3
CR(VI) CONCENTRATIONS
FLOODPLAIN CROSS-SECTION B
AUGUST - OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GINT\INPUT\GINT_WORK_FILE_TYPES\GDW\X-SECTIONS\PMR\3Q05QUARTERLY\3Q_QUARTERLY_AVG_SECB_DRAFT.GDW;

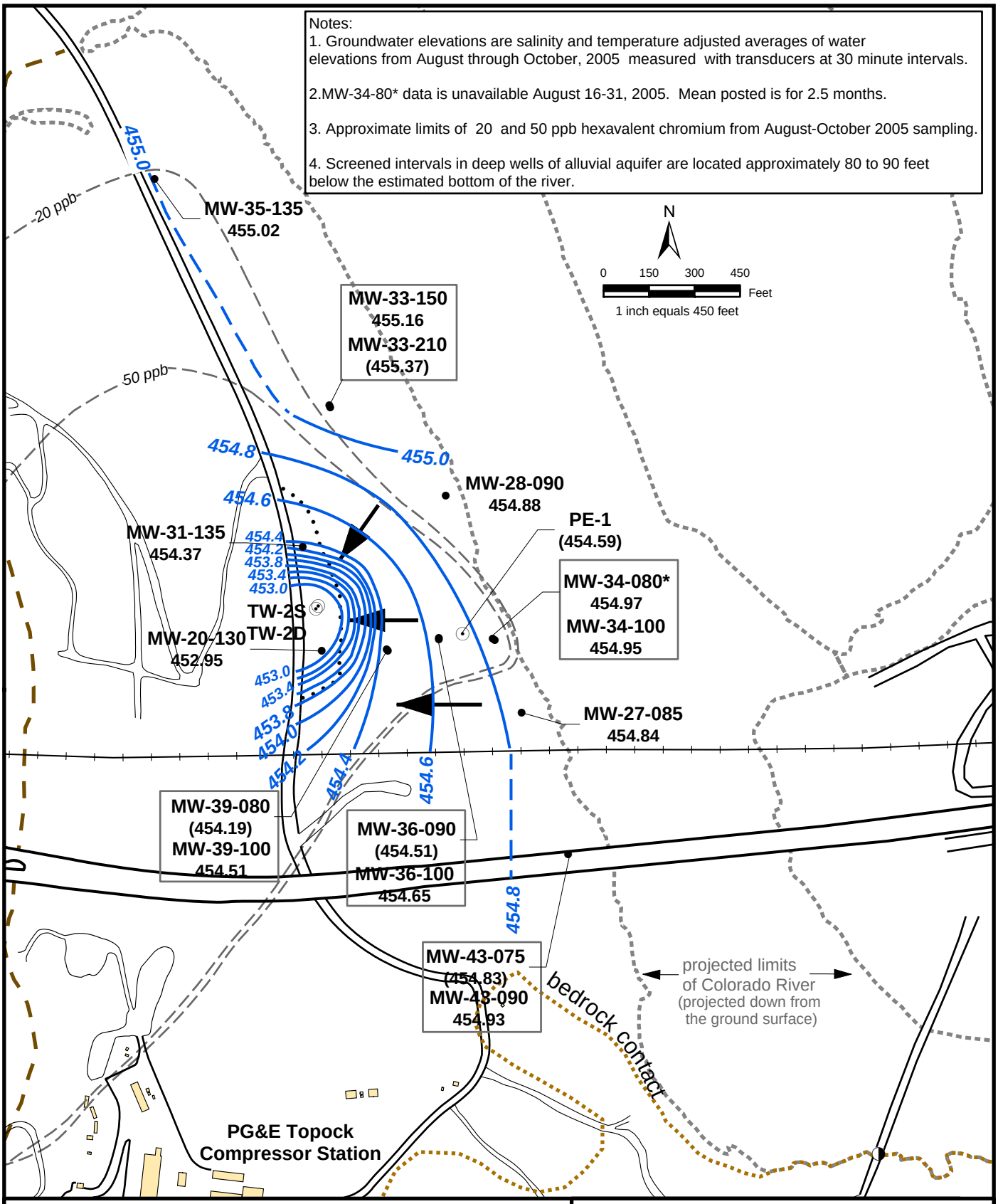

FIGURE 3-4
AVERAGE GROUNDWATER ELEVATIONS DEEP WELLS AUGUST-OCTOBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_LA_Aug-Oct_05.MXD

West

East
Section A

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

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*
proj: 20'

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

Colorado River

R-20
454.85

454.23
454.06 / 454.39

453.96
453.69 / 454.33

452.95
452.55 / 453.52

454.56
453.99 / 455.08

454.55
454.00 / 455.06

454.40
453.87 / 454.89

454.21
453.74 / 454.69

454.19
453.72 / 454.68

454.51
454.03 / 455.00

455.03
454.91 / 455.14

454.59
454.00 / 455.15

454.63
454.08 / 455.13

454.62
453.98 / 455.22

454.63
453.96 / 455.25

454.73
454.04 / 455.37

454.51
453.82 / 455.08

454.65
453.06 / 455.21

454.59
453.91 / 455.23

454.80
453.96 / 455.59

454.97
454.17 / 455.72

454.95
454.22 / 455.66

454.2
454.0
453.8
453.6
453.4
453.2
453.0
454.4
454.6
454.8
20
50
?

Alluvial Aquifer

Miocene Conglomerate (Bedrock)

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

Elevation (feet MSL)

Distance (feet)

Notes:
Results show average groundwater elevations for August 1 through October 31, 2005 measured with transducers at 30 minute intervals.
Groundwater elevations adjusted for salinity and temperature.

Wells MW-30-30, MW-36-90, and PE-1 excluded from contouring. MW-39-50 mean does not include 10/11/05 through 10/18/05. MW-34-80* mean does not include 8/16/05 through 8/31/05 due to transducer failure.

River elevation (R-20) is the calculated monthly average river level based upon the river gradient between RRB and I-3.
Data subject to review.

Legend:

MW-30-50
Inferred water table
well screen
453.66
453.40/453.94
103 boring depth (feet)

20
Inferred hexavalent chromium contour (ppb)
August-October 2005

453.5
Groundwater head contour

453.5
Inferred groundwater head contour

Quarterly average groundwater head (ft MSL)
Quartlerly Minimum / Maximum average groundwater head (ft MSL)

FIGURE 3-5
AVERAGE GROUNDWATER ELEVATIONS
FLOODPLAIN CROSS-SECTION A
AUGUST-OCTOBER 2005
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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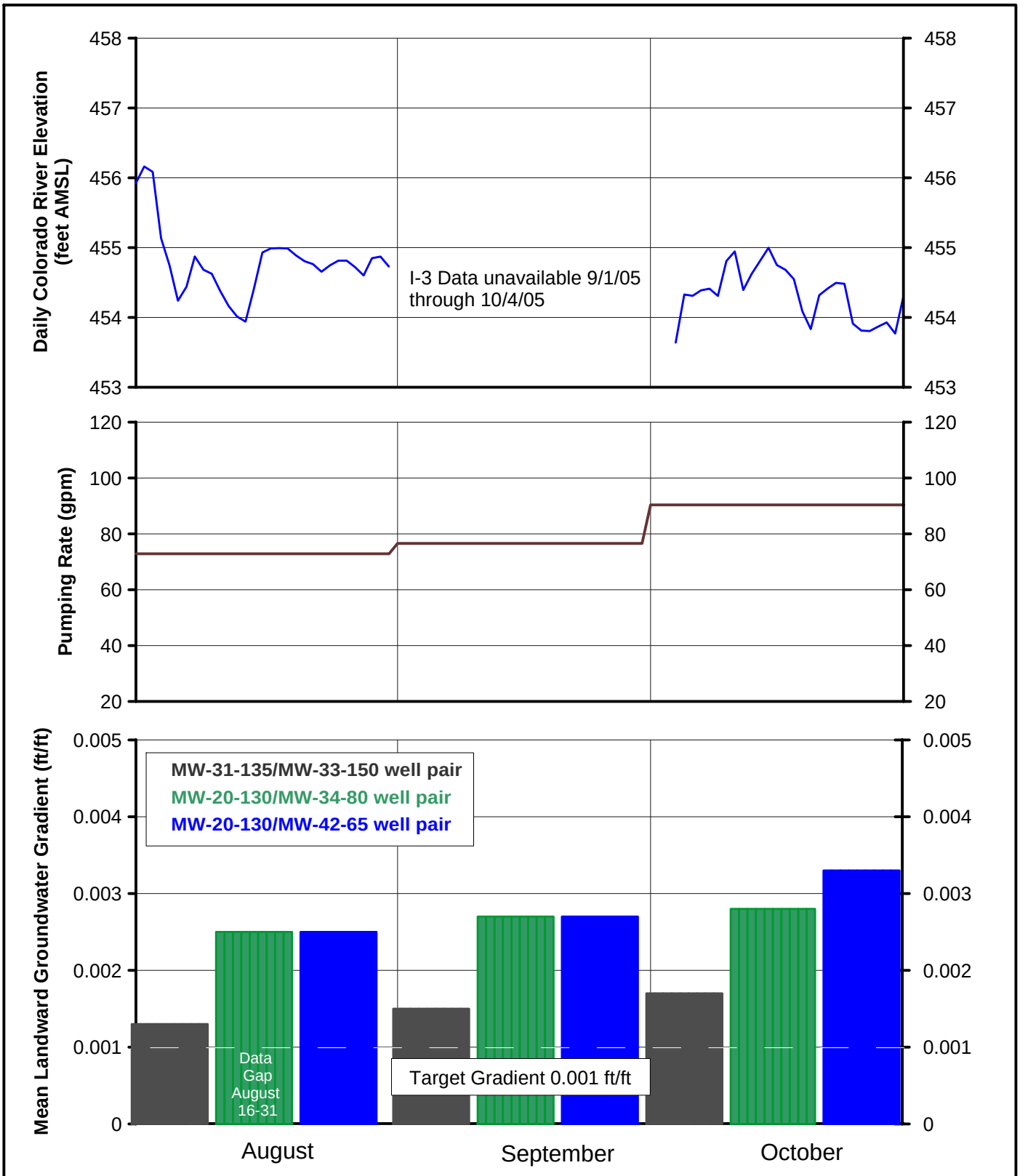

Notes:

1) For IM pumping, the target landward gradient for well pairs is 0.001 feet/foot.
2) Refer to Table 2-1 and Sections 2.2 and 3.1 for discussion of pumping data. Pumping rate plotted is the the combined rate of TW-2S and TW-2D.
3) Refer to Table 3-1, Sections 2-4, and 3.4 for discussion of transducer data and gradients.

FIGURE 3-6
COMPARISON OF RIVER ELEVATION, PUMPING RATE, AND MEASURED HYDRAULIC GRADIENTS, AUGUST THROUGH OCTOBER 2005
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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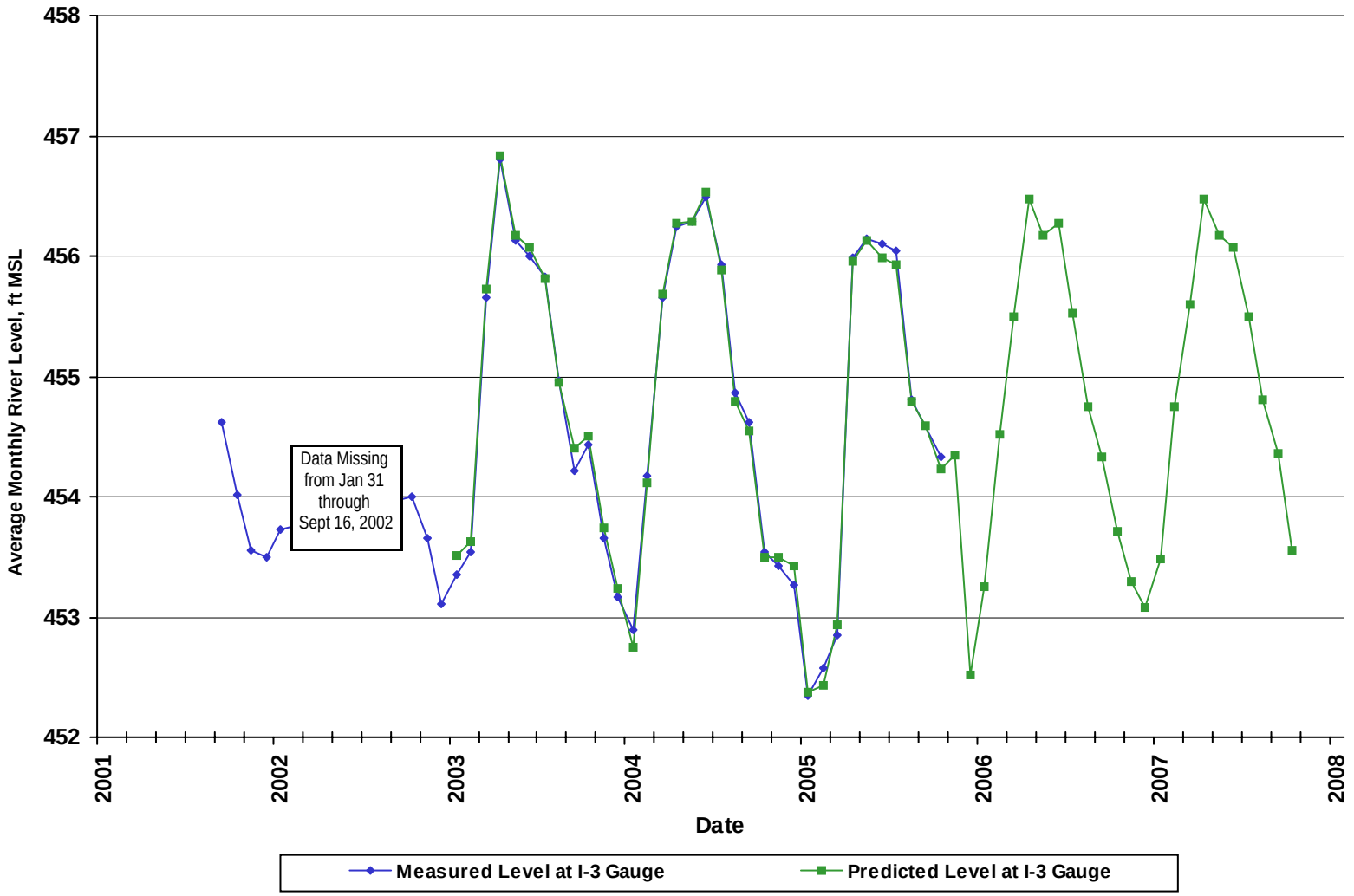

Projected river level is calculated based on monthly averages of Davis Dam release and stage in Lake Havasu.
Data through 10/31/05.

FIGURE 3-7
PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION
INTERIM MEASURES PERFORMANCE MONITORING
PG&E COMPRESSOR STATION
NEEDLES, CALIFORNIA

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Appendix A
Chromium Sampling Results for Monitoring Wells in Floodplain Area

TABLE A-1
Groundwater Sampling Results for Floodplain Monitoring Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Shallow Wells								
MW-27-020	04-May-05	ND (0.2)	ND (1.0)	-176	0.4	1,280	456.1	455.7
	18-Jul-05	ND (0.2)	ND (1.0) FF	-190	1.1	1,040	456.4	456.3
	05-Oct-05	ND (0.21)	ND (1.0) FF	-158	1.8	1,170	454.7	454.4
MW-28-025	03-May-05	ND (0.2)	ND (1.0)	-59	0.4	1,280	456.4	456.2
	15-Jun-05	ND (0.2)	ND (1.0)	-54	2.7	1,460	456.2	455.8
	13-Jul-05	ND (0.2)	ND (1.0) FF	19	4.9	1,690	456.6	456.4
	06-Oct-05	ND (0.2)	ND (1.0) FF	-35	2.0	1,300	454.9	454.6
MW-29	05-May-05	ND (0.2)	ND (1.0)	-142	0.1	4,840	455.9	456.1
	15-Jun-05	ND (0.2)	ND (1.0)	-108	3.1	6,580	456.1	456.0
	04-Oct-05	ND (0.2)	ND (1.0) FF	-110	3.2	5,240	455.1	452.9
MW-30-030	09-May-05	ND (2.0)	ND (1.0)	-131	0.3	47,700	455.4	455.2
	07-Oct-05	ND (0.2)	ND (1.0) FF	-146	2.5	45,000	453.7	454.2
MW-32-020	09-May-05	ND (1.0)	ND (1.0)	-121	0.2	20,600	455.4	454.9
	17-Jun-05	ND (1.0)	ND (1.0)	-188	2.4	15,500	455.6	455.2
	04-Oct-05	ND (2.0)	ND (1.0) J FF	-115	2.3	36,000	454.4	452.9
MW-32-035	09-May-05	ND (1.0)	ND (1.0)	-164	0.2	13,600	455.5	455.0
	17-Jun-05	ND (1.0)	ND (1.0)	-202	2.3	12,800	455.7	455.3
	04-Oct-05	ND (1.0)	ND (1.0) FF	-159	2.1	11,600	454.4	452.9
MW-33-040	05-May-05	ND (0.2)	ND (1.0)	-90	0.6	5,760	455.8	455.6
	17-Jun-05	ND (0.2)	ND (1.0)	-94	5.4	5,460	456.0	456.0
	07-Oct-05	0.68	ND (1.0) FF	---	---	---	454.9	454.1
MW-36-020	03-May-05	ND (1.0)	ND (1.0)	-180	3.5	10,200	456.0	456.2
	03-Oct-05	ND (1.0)	ND (1.0) FF	-165	3.0	13,000	454.3	M
MW-36-040	05-May-05	ND (1.0)	ND (1.0)	-180	2.7	10,300	455.5	455.4
	03-Oct-05	ND (1.0)	ND (1.0) FF	-162	3.8	10,800	454.6	M
MW-39-040	05-May-05	ND (0.2)	ND (1.0)	-179	1.8	6,070	455.7	456.1
	16-Jun-05	ND (0.2)	ND (1.0)	-202	2.1	9,600	456.0	455.5
	04-Oct-05	ND (0.2)	ND (1.0) FF	-203	2.9	5,640	454.5	452.9
MW-42-030	07-Oct-05	ND (1.0)	ND (1.0) FF	-139	2.9	16,700	454.6	454.7
MW-43-025	20-Jun-05	ND (0.2)	ND (1.0)	-174	1.9	1,800	456.3	455.8
	04-Oct-05	ND (0.2)	ND (1.0) FF	-159	2.0	1,220	454.6	452.9
Middle-Depth Wells								
MW-27-060	04-May-05	ND (1.0)	ND (1.0)	-114	0.4	14,400	456.2	455.9
	18-Jul-05	ND (1.0)	1.80 FF	-125	2.6	13,500	456.8	456.6
	05-Oct-05	ND (1.0)	ND (1.0) FF	-97	3.2	13,200	454.9	454.6
MW-30-050	09-May-05	ND (1.0)	ND (1.0)	-100	0.3	14,200	455.4	455.4
	09-May-05 FD	ND (1.0)	ND (1.0)	FD	FD	FD	FD	FD
	07-Oct-05	ND (1.0)	ND (1.0) FF	-236	2.8	12,300	454.5	454.3
MW-33-090	05-May-05	17.4	16.8	-244	0.3	8,250	455.7	455.3
	18-May-05	15.5	16.3	-141	1.6	17,200	455.8	454.9
	01-Jun-05	17.8	14.0	-53	0.4	12,000	456.3	456.1

Refer to table footnotes for data qualifier explanation.

TABLE A-1
Groundwater Sampling Results for Floodplain Monitoring Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Middle-Depth Wells								
MW-33-090	01-Jun-05 FD	16.0	12.7	FD	FD	FD	FD	FD
	16-Jun-05	15.0	14.2	-209	2.1	9,500	455.9	455.2
	16-Jun-05 FD	15.7 J	13.4	FD	FD	FD	FD	FD
	20-Jul-05	16.1	17.3 FF	-23	0.6	8,440	456.5	456.0
	20-Jul-05 FD	16.5	17.3 FF	FD	FD	FD	FD	FD
	06-Oct-05	15.5	13.0 FF	-33	1.9	9,210	454.7	454.0
MW-34-055	05-May-05	ND (1.0)	ND (1.0)	-99	0.1	8,860	455.5	455.0
	15-Jul-05	ND (1.0)	ND (1.3) FF	-77	3.6	9,180	457.1	456.9
	05-Oct-05	ND (1.0)	ND (1.0) FF	-93	1.7	8,610	454.2	453.5
MW-36-050	05-May-05	ND (1.0)	ND (1.0)	-137	2.1	9,330	455.5	455.2
	03-Oct-05	ND (1.0)	ND (1.0) FF	-133	2.9	7,500	454.6	M
MW-36-070	03-May-05	ND (1.0)	ND (1.0)	-103	0.0	12,300	455.9	455.8
	03-Oct-05	ND (1.0)	ND (1.0) FF	-112	2.5	7,680	454.5	M
MW-39-050	03-May-05	206	204	56	0.0	14,300	454.2	455.1
	16-Jun-05	66.2	55.4	-44	2.0	15,200	456.0	454.8
	04-Oct-05	ND (10)	4.70 FF	-78	2.6	13,600	454.2	452.9
MW-39-060	05-May-05	450	455	43	2.0	14,600	455.4	455.8
	05-May-05 FD	460	509	FD	FD	FD	FD	FD
	16-Jun-05	213	198	19	1.9	17,600	456.1	454.9
	04-Oct-05	72.3	79.6 J FF	---	2.2	14,100	454.0	452.9
MW-39-070	05-May-05	1320	1270	98	1.9	12,500	455.2	456.3
	16-Jun-05	799	576	22	1.8	16,000	456.1	455.2
	04-Oct-05	840	754 FF	31	2.7	13,800	454.0	452.9
MW-42-055	07-Oct-05	ND (1.0)	ND (1.0) FF	-126	5.6	18,100	454.8	454.7
MW-42-065	07-Oct-05	ND (1.0)	ND (1.0) FF	-121	2.8	17,300	454.9	455.0
Deep Wells								
MW-27-085	04-May-05	ND (1.0)	ND (1.0)	-128	0.4	18,500	456.5	456.2
	19-May-05	ND (1.0)	ND (1.0)	-131	1.0	19,600	456.5	456.2
	02-Jun-05	ND (1.0)	ND (1.0)	-100	0.9	19,500	456.2	455.5
	19-Jul-05	ND (1.0)	3.00 FF	-106	0.9	19,100	457.0	457.3
	16-Aug-05	ND (1.0)	ND (2.6) FF	-156	1.3	13,700	455.5	455.8
	08-Sep-05	ND (1.0)	ND (1.0) FF	-158	1.7	20,500	455.3	M
	05-Oct-05	ND (1.0)	ND (1.0) FF	-82	2.1	18,100	454.8	454.5
MW-28-090	03-May-05	ND (1.0)	ND (1.0)	-208	0.4	10,600	456.1	455.6
	19-May-05	ND (1.0)	ND (1.0)	-147	0.8	9,110	456.4	456.5
	02-Jun-05	ND (1.0)	ND (1.0)	-141	1.0	---	456.2	456.0
	15-Jun-05	ND (1.0)	ND (1.0)	-205	2.5	9,410	455.8	455.4
	01-Jul-05	ND (1.0)	ND (1.0)	-174	1.8	12,700	456.4	456.1
	13-Jul-05	ND (1.0)	ND (1.0) FF	-142	4.3	8,850	456.3	456.0
	18-Aug-05	ND (1.0)	1.10 FF	-178	1.1	9,740	455.9	455.9
	09-Sep-05	ND (1.0)	ND (1.0) FF	-190	1.7	8,190	455.6	M
	06-Oct-05	ND (1.0)	ND (1.0) FF	-138	2.0	9,070	454.9	454.7

Refer to table footnotes for data qualifier explanation.

TABLE A-1
Groundwater Sampling Results for Floodplain Monitoring Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells								
MW-33-150	17-Jun-05	3.10 J	6.40	-172	3.0	18,300	456.3	456.0
	20-Jul-05	5.20	5.60 FF	-59	0.7	16,100	456.5	456.6
	17-Aug-05	4.00	6.10 FF	-72	1.3	17,000	455.6	455.3
	09-Sep-05	3.90	2.80 FF	-108	1.7	17,000	455.7	M
	06-Oct-05	4.50	3.90 FF	-41	2.0	15,800	454.6	453.5
	06-Oct-05 FD	5.30	4.90 FF	FD	FD	FD	FD	FD
MW-33-210	16-Jun-05	5.10 J	1.70 J	-216	2.0	22,400	456.2	454.9
	20-Jul-05	5.60	6.70 FF	-40	0.8	19,200	456.7	456.9
	17-Aug-05	2.50	8.00 FF	-88	1.2	19,900	456.0	455.5
	06-Sep-05	3.50	2.90 FF	-109	1.7	22,600	455.7	M
	06-Oct-05	4.00	4.20 FF	-30	1.8	18,800	454.8	453.8
MW-34-080	04-May-05	ND (1.0)	ND (1.0)	-241	0.3	15,900	455.9	455.0
	18-May-05	ND (1.0)	ND (1.0)	-138	1.3	16,000	456.3	455.7
	01-Jun-05	ND (1.0)	ND (1.0)	-117	0.4	17,800	456.2	455.4
	30-Jun-05	ND (1.0)	ND (1.0)	-61	1.6	18,300	456.0	454.6
	14-Jul-05	ND (1.0)	2.00 FF	-104	1.2	17,900	456.9	455.9
	15-Aug-05	ND (1.0)	2.40 FF	-137	1.5	14,600	455.4	454.7
	07-Sep-05	ND (1.0)	ND (1.0) FF	-148	1.5	17,100	455.9	M
	05-Oct-05	ND (1.0)	ND (1.0) FF	-58	2.2	13,800	454.4	453.1
MW-34-100	04-May-05	491	530	-98	0.6	18,700	455.7	454.8
	10-May-05	513	492	21	3.0	15,800	456.8	456.7
	10-May-05 FD	501	552	FD	FD	FD	FD	FD
	18-May-05	524	564	50	3.0	19,000	456.4	456.1
	25-May-05	559	478	-93	1.2	18,700	456.6	456.1
	01-Jun-05	527	609	-59	0.4	20,000	456.0	455.1
	08-Jun-05	552	583	-15	2.3	20,300	456.7	456.3
	21-Jun-05	560	477	-26	1.9	20,500	456.3	455.4
	21-Jun-05 FD	578	480	FD	FD	FD	FD	FD
	07-Jul-05	583	639	-88	3.8	18,800	456.5	455.7
	14-Jul-05	617	701 FF	-26	1.9	20,200	456.9	456.6
	27-Jul-05	597	504 FF	-2	1.1	17,800	456.1	456.5
	10-Aug-05	574	589 FF	-83	1.4	19,700	455.7	455.5
	10-Aug-05 FD	571	597 FF	FD	FD	FD	FD	FD
	15-Aug-05	633	660 FF	-17	1.2	16,600	455.3	455.0
	31-Aug-05	649	693 FF	-42	1.9	16,900	455.7	455.4
	31-Aug-05 FD	658	604 FF	FD	FD	FD	FD	FD
	07-Sep-05	673	868 FF	-60	1.5	19,500	455.5	M
	20-Sep-05	675	891 FF	-28	2.0	14,000	455.9	M
	05-Oct-05	732	732 FF	-13	1.9	15,900	454.6	453.8
	05-Oct-05 FD	708	703 FF	FD	FD	FD	FD	FD
	25-Oct-05	752	628 FF	-29	1.4	20,100	454.2	453.7
	25-Oct-05 FD	752	650 FF	FD	FD	FD	FD	FD
MW-36-090	03-May-05	705	623	55	0.0	17,600	455.5	455.5

Refer to table footnotes for data qualifier explanation.

TABLE A-1
Groundwater Sampling Results for Floodplain Monitoring Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells								
MW-36-090	25-Jul-05	344	343 FF	129	1.1	18,400	455.8	455.7
	17-Aug-05	346	336 FF	152	1.3	16,600	455.3	455.7
	08-Sep-05	267	301 FF	49	1.6	17,500	455.3	M
	03-Oct-05	302	286 FF	174	3.4	12,700	460.7	M
MW-36-100	03-May-05	705	679	4	0.4	18,700	455.4	455.1
	18-May-05	617	796 J	12	1.5	34,800	455.3	454.7
	18-May-05 FD	620	624 J	FD	FD	FD	FD	FD
	02-Jun-05	518	441	23	2.5	18,800	456.0	455.8
	19-Jul-05	398	635 FF	17	1.0	17,700	456.4	456.6
	15-Aug-05	391	410 FF	-15	1.6	16,800	455.2	454.6
	15-Aug-05 FD	390	392 FF	FD	FD	FD	FD	FD
	08-Sep-05	396 J	380 FF	21	1.7	18,300	455.4	M
	08-Sep-05 FD	397	454 FF	FD	FD	FD	FD	FD
	05-Oct-05	383	370 FF	4	2.8	16,500	454.7	454.2
MW-39-080	03-May-05	3430	3510	106	0.4	14,900	454.8	455.0
	16-Jun-05	2220	1930	52	2.0	16,800	456.2	454.6
	25-Jul-05	2060	1990 FF	169	1.2	17,400	455.6	456.1
	17-Aug-05	2370	2460 FF	164	1.3	15,600	454.9	455.8
	06-Sep-05	2990	4880 FF	149	2.0	17,700	454.8	M
	04-Oct-05	3000	2770 FF	76	2.7	15,900	454.0	452.9
MW-39-100	09-May-05	7980	8490	159	1.8	20,400	455.5	455.7
	09-May-05 FD	7720	8250	FD	FD	FD	FD	FD
	17-Jun-05	6980	6030	14	2.8	19,200	455.0	455.6
	19-Jul-05	5500	5490 FF	80	1.3	18,400	456.2	457.0
	19-Jul-05 FD	5450	5450 FF	FD	FD	FD	FD	FD
	17-Aug-05	4230	4050 FF	170	1.5	18,600	455.3	455.9
	06-Sep-05	4540	6480 FF	134	2.2	21,000	455.1	M
	04-Oct-05	4010	3950 FF	73	2.3	15,900	453.7	452.9
MW-43-075	20-Jun-05	ND (1.0)	ND (1.0)	-165	1.8	18,100	456.8	456.0
	26-Jul-05	ND (1.0)	ND (1.0) FF	-160	1.1	15,600	456.0	455.5
	16-Aug-05	ND (1.0)	5.40 FF	-168	1.3	13,800	455.6	455.5
	08-Sep-05	ND (1.0)	ND (1.0) FF	-176	1.7	16,400	455.0	M
	04-Oct-05	ND (1.0)	ND (1.0) J FF	-126	2.3	12,900	454.8	452.9
MW-43-090	20-Jun-05	ND (1.0)	ND (1.0)	-140	1.8	26,200	457.3	456.4
	20-Jun-05 FD	ND (1.0)	ND (1.0)	FD	FD	FD	FD	FD
	26-Jul-05	ND (2.0)	ND (1.6) FF	-129	2.1	23,800	456.9	456.0
	16-Aug-05	ND (2.0)	ND (5.2) FF	-136	1.3	19,400	455.7	455.3
	08-Sep-05	ND (1.0)	ND (1.0) FF	-152	1.7	23,100	455.3	M
	04-Oct-05	ND (1.0)	ND (1.0) FF	-78	4.8	18,400	454.9	452.9

Refer to table footnotes for data qualifier explanation.

TABLE A-1
Groundwater Sampling Results for Floodplain Monitoring Wells, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

NOTES:

ND = not detected at listed reporting limit (RL)
FD = field duplicate
J = concentration or RL estimated by laboratory or data validation
T = data from the downhole transducers to fill groundwater elevation data gaps at some locations
MSL = mean sea level
(---) = data not collected, available, or field instrumentation malfunctioned
µg/L= micrograms per liter
mV = oxidation-reduction potential (ORP)
µS/cm = microSiemens per centimeter
M = I-3 Transducer damaged

FF = Beginning in July 2005, samples analyzed for total chromium by EPA Method 6010B or 6020 were filtered and preserved in the field after sample collection, as per DTSC's June 28, 2005 letter.

The RLs for certain hexavalent chromium results from Method 7199 analyses have been elevated above the standard RL of 0.2 µg/L due to required sample dilution to accommodate matrix interferences.

Groundwater and river elevations in feet above mean sea level (MSL) rounded to 0.1 foot. River elevations from presssure transducer record at I-3.

TABLE A-2
Groundwater Sampling Results for Other Monitoring Wells in PMP Area, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Well ID	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters		
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm
Shallow Wells						
MW-12	13-Jun-05	852	835	60.0	6.97	4060
	16-Sep-05	698	618 FF	-37	6.58	3290
	04-Oct-05	660	644 FF	55.0	6.13	3040
	04-Oct-05 FD	670	613 FF	FD	FD	FD
MW-19	14-Jun-05	1150	1140	65.0	6.80	2170
	04-Oct-05	1060	996 FF	30.0	6.87	2150
MW-20-070	15-Jun-05	6680	6450	152	6.85	3160
	15-Jun-05 FD	7000	7080	FD	FD	FD
	11-Oct-05	6060	5930 FF	151	6.90	3330
MW-21	14-Jun-05	ND (1.0)	ND (1.0)	81.0	6.80	12000
	04-Oct-05	---	---	-149	2.42	11400
	05-Oct-05	ND (1.0) J	ND (1.0) J FF	---	---	---
MW-22	17-Jun-05	ND (1.0)	ND (1.0)	-57	3.23	33700
	04-Oct-05	ND (2.0)	ND (1.0) J FF	-86	2.51	35500
MW-24A	16-Jun-05	3280	2640	52.0	2.70	3470
	03-Oct-05	3120	2930 FF	157	3.26	3040
	03-Oct-05 FD	3040	2630 FF	FD	FD	FD
MW-26	13-Jun-05	3370	3140	119	9.16	3820
	04-Oct-05	3040	2990 FF	45.0	8.79	3380
MW-31-060	13-Jun-05	1790	1810	122	8.00	3060
	06-Oct-05	1430	1470 FF	54.0	6.36	2990
MW-35-060	13-Jun-05	33.6	34.1	-8.0	2.47	---
	07-Oct-05	32.5	28.0 FF	-1.0	1.90	7560
	07-Oct-05 FD	35.1 J	32.0 FF	FD	FD	FD
TW-02S	07-Oct-05	3360	3340 FF	204	8.57	3320
Middle-Depth Wells						
MW-20-100	15-Jun-05	9600	10100	136	3.44	3870
	11-Oct-05	10200	9430 FF	157	1.54	4140
Deep Wells						
MW-20-130	15-Jun-05	10800	10300	145	4.66	10600
	07-Oct-05	9590	10700 FF	53.0	2.46	12300
MW-24B	16-Jun-05	5640	5660	-4.0	2.20	13100
	03-Oct-05	5240	4930 FF	153	3.19	14000
MW-31-135	13-Jun-05	318	344	42.0	4.46	14600
	13-Jun-05 FD	318	338	FD	FD	FD
	06-Oct-05	271	251 FF	-4.0	2.02	10100
MW-35-135	13-Jun-05	17.6	17.6	-138	1.75	15000
	07-Oct-05	21.2	17.8 FF	-55	1.29	10800
PE-01	03-Oct-05	ND (1.0)	ND (1.0) FF	-202	0.77	11600

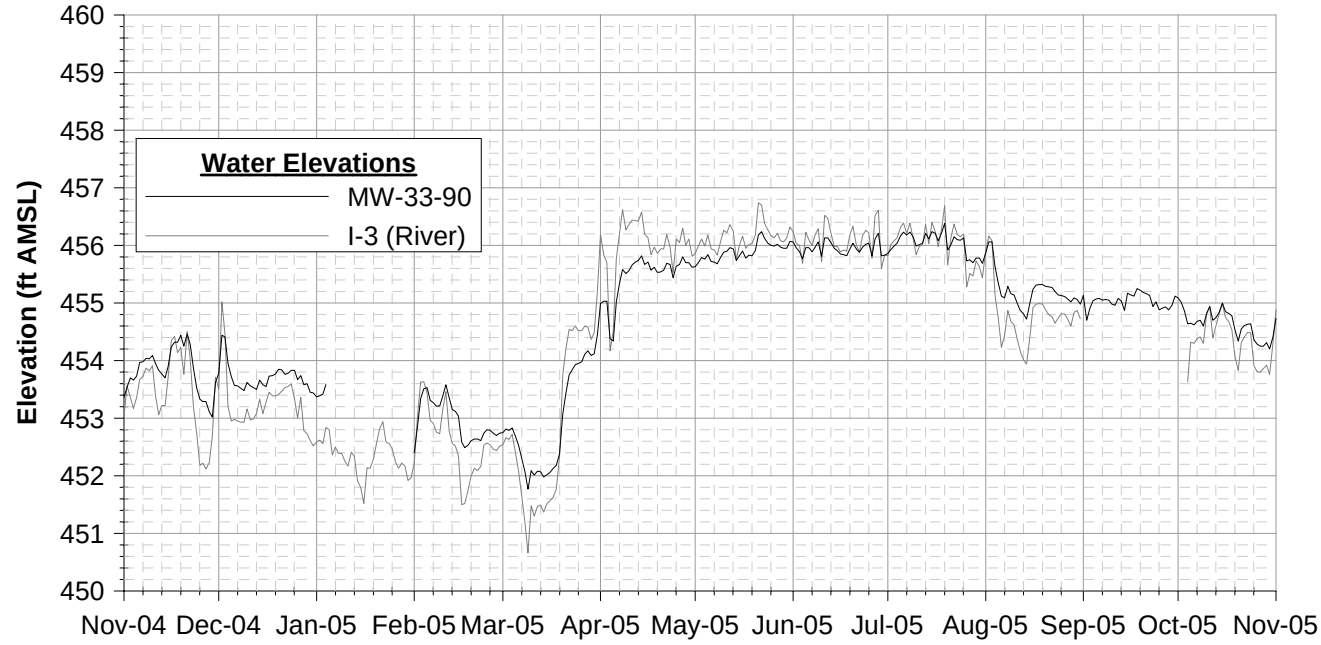
TABLE A-2
Groundwater Sampling Results for Other Monitoring Wells in PMP Area, May 2005 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

NOTES:

Analytical results are validated.
ND = not detected at listed reporting limit (RL)
FD = field duplicate
J = concentration or RL estimated by laboratory or data validation
(---) = data not collected, available, or field instrumentation malfunctioned
µg/L= micrograms per liter
mg/L = milligrams per liter
mV = oxidation-reduction potential (ORP)
µS/cm = microSiemens per centimeter

PMP = Interim Measure Performance Monitoring Program

FF = Beginning in July 2005, samples analyzed for total chromium by EPA Method 6010B or 6020 were filtered and preserved in the field after sample collection, as per DTSC's June 28, 2005 letter.



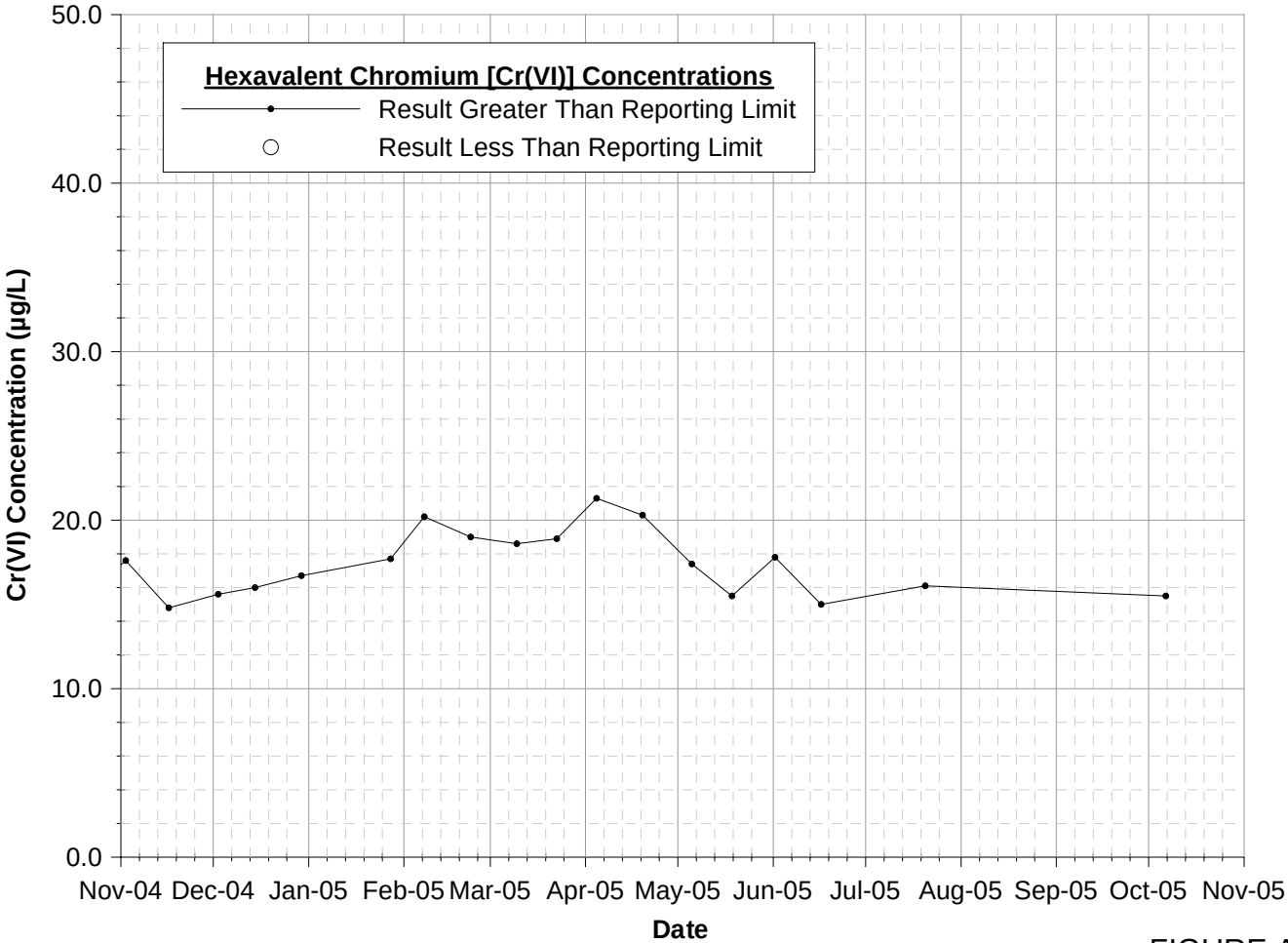


FIGURE A-1
MW-33-90 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/06/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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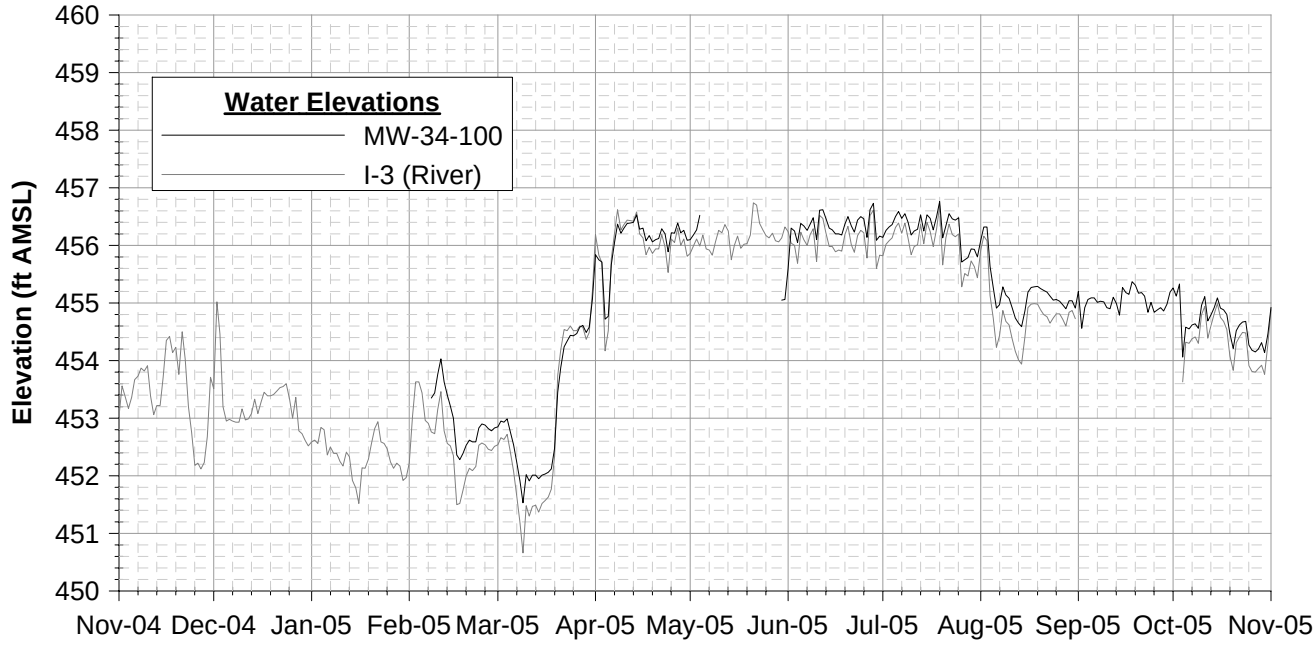

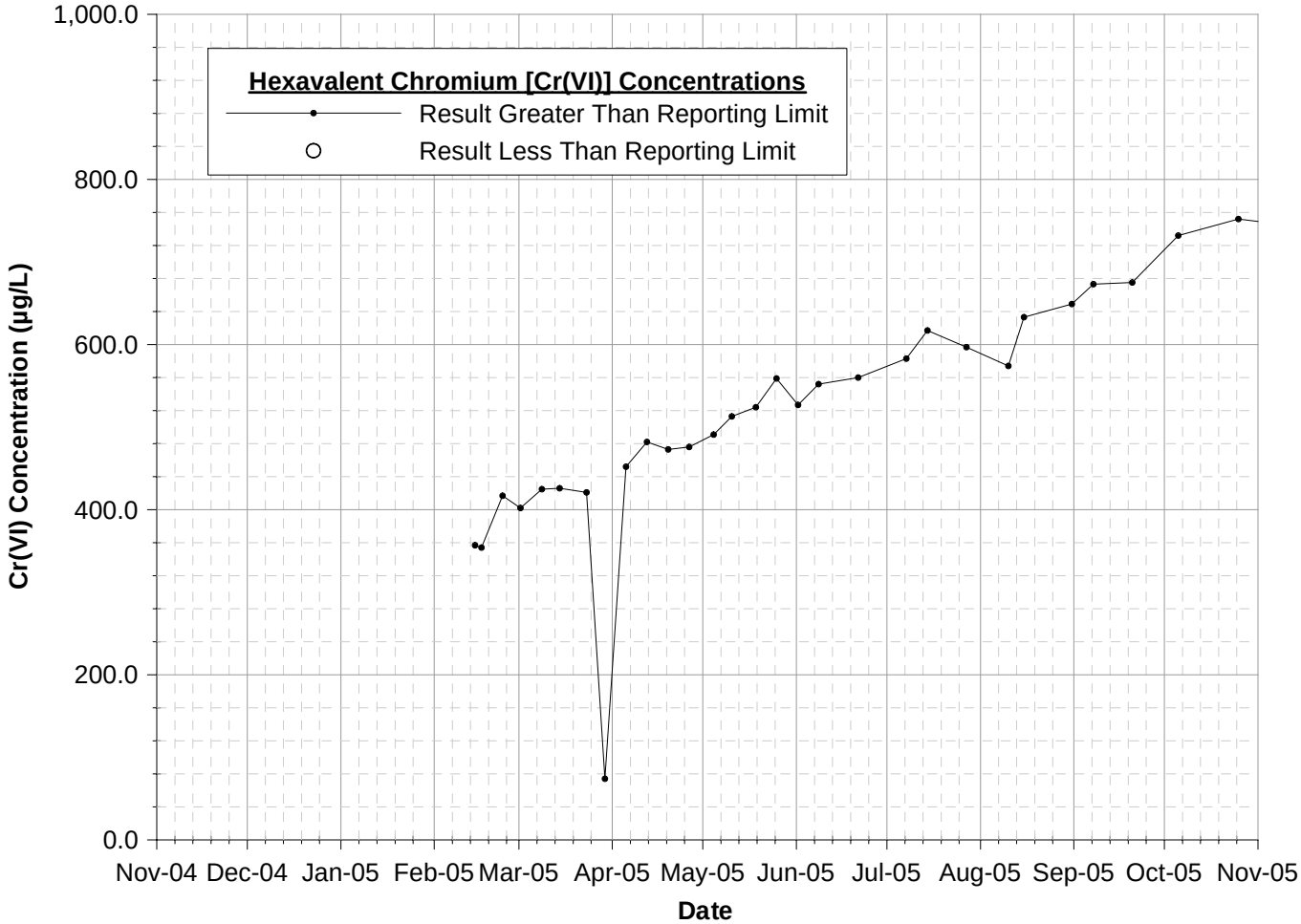

FIGURE A-2
MW-34-100 CR(VI) CONCENTRATION & HYDROGRAPH - THROUGH 10/25/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. No groundwater elevation data available during May 2005 due to transducer malfunction.
3. Data subject to review.
4. Results plotted are from primary samples; see Table A-1 for complete results.
5. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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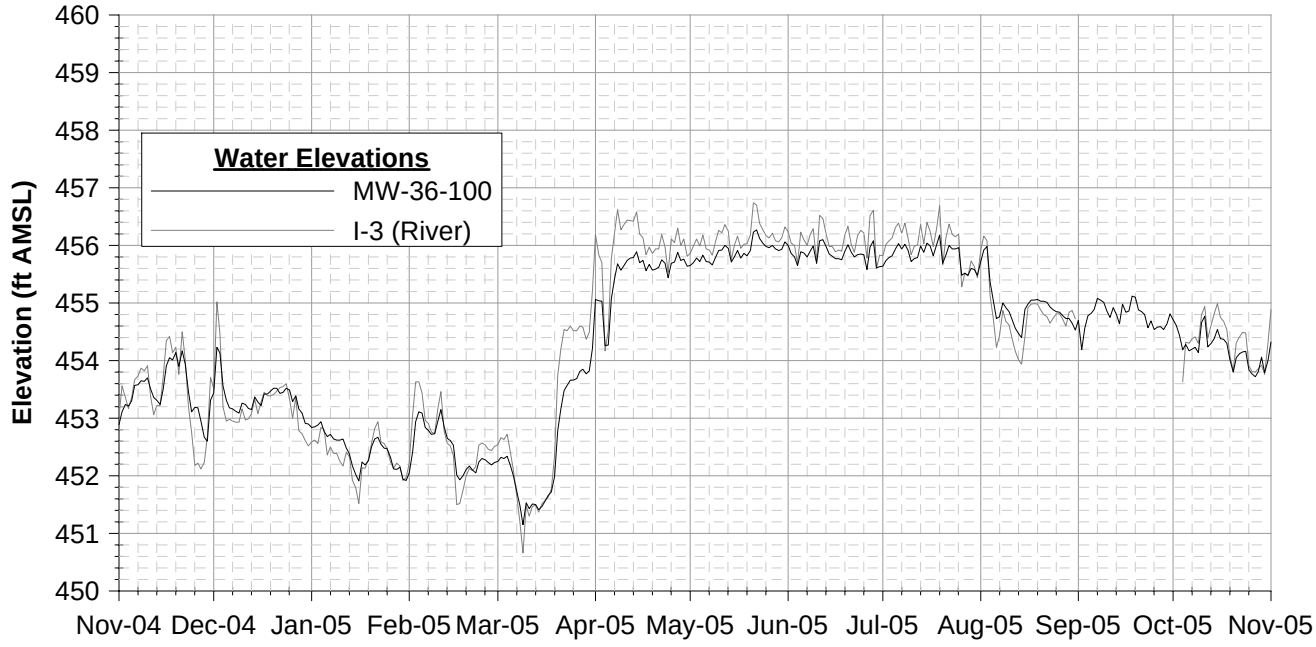

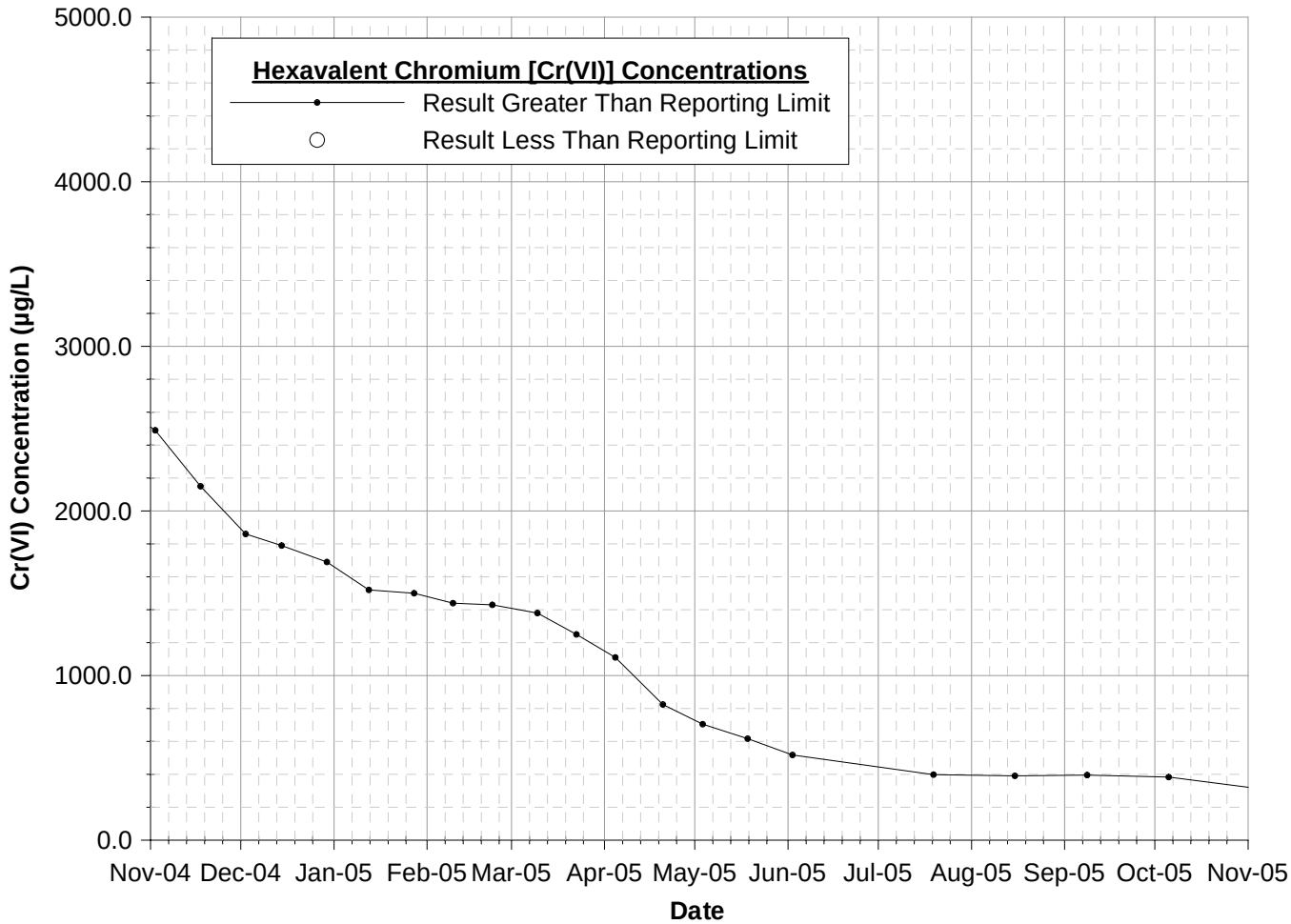

FIGURE A-3
MW-36-100 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/05/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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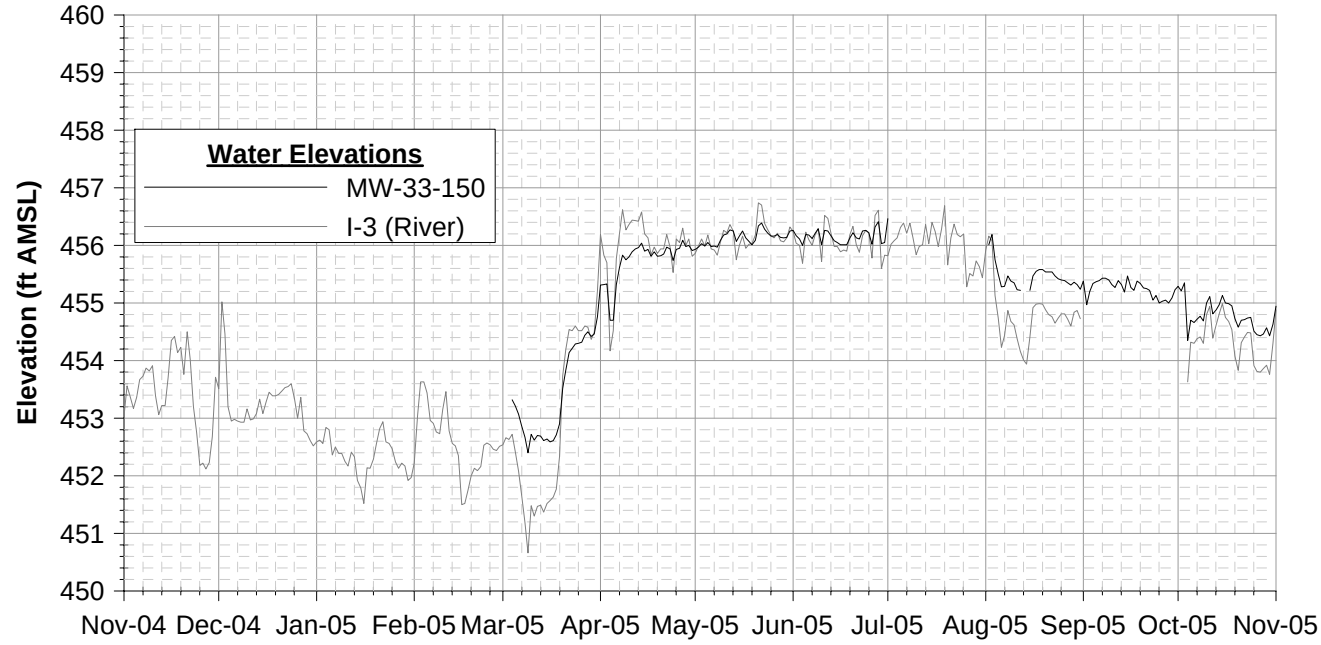

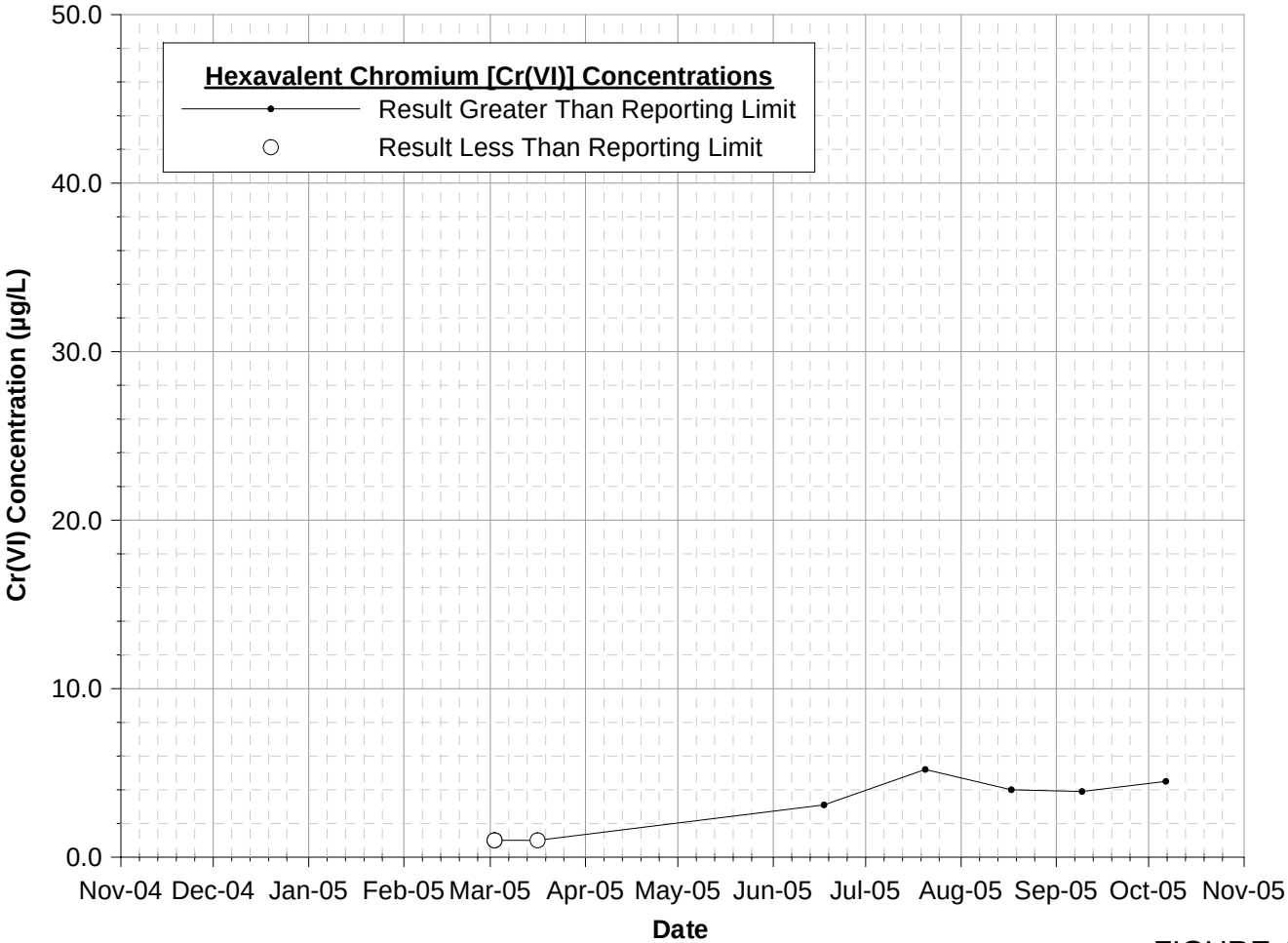

FIGURE A-4
MW-33-150 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/06/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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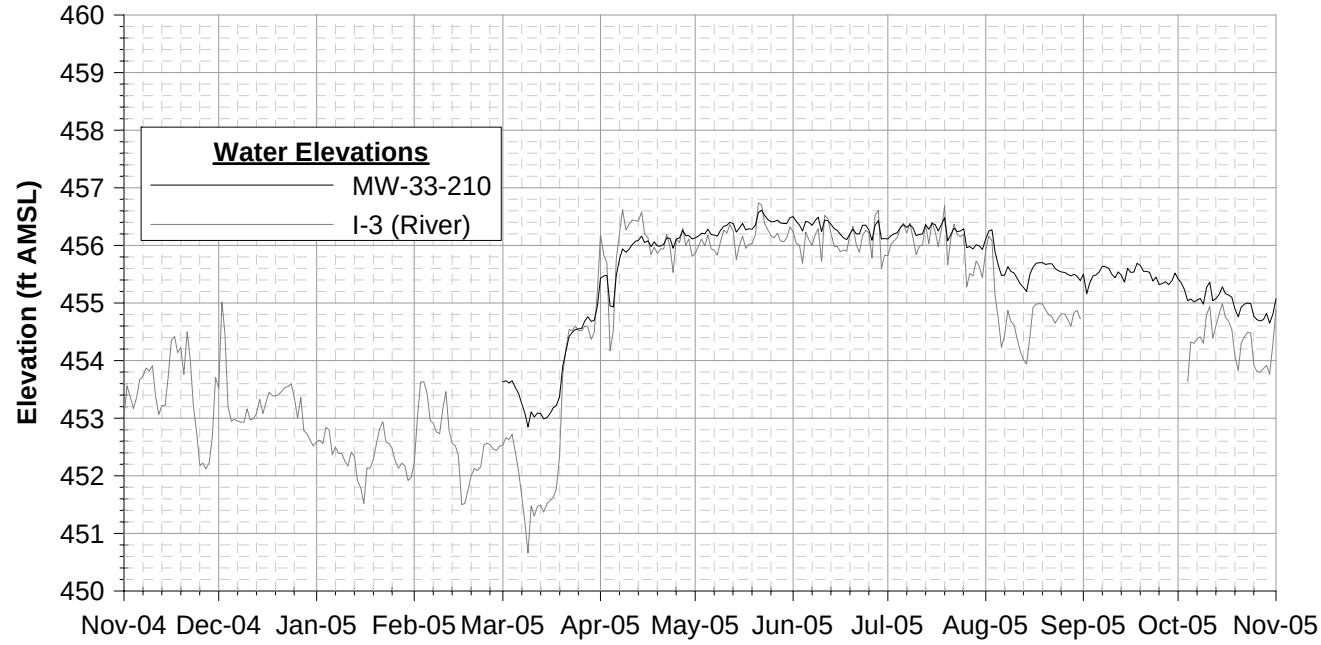

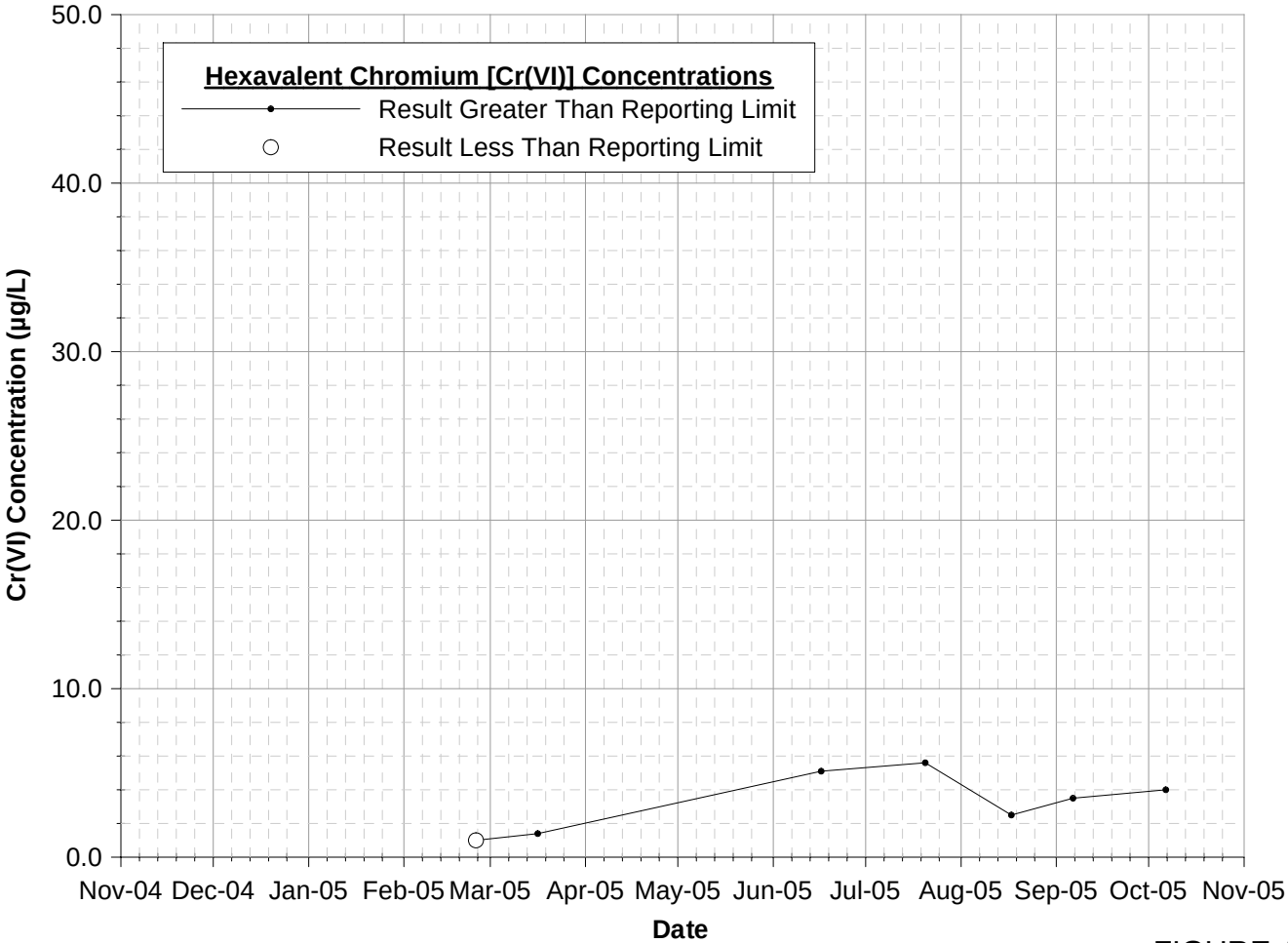

FIGURE A-5
MW-33-210 CR(VI) CONCENTRATION & HYDROGRAPH - THROUGH 10/06/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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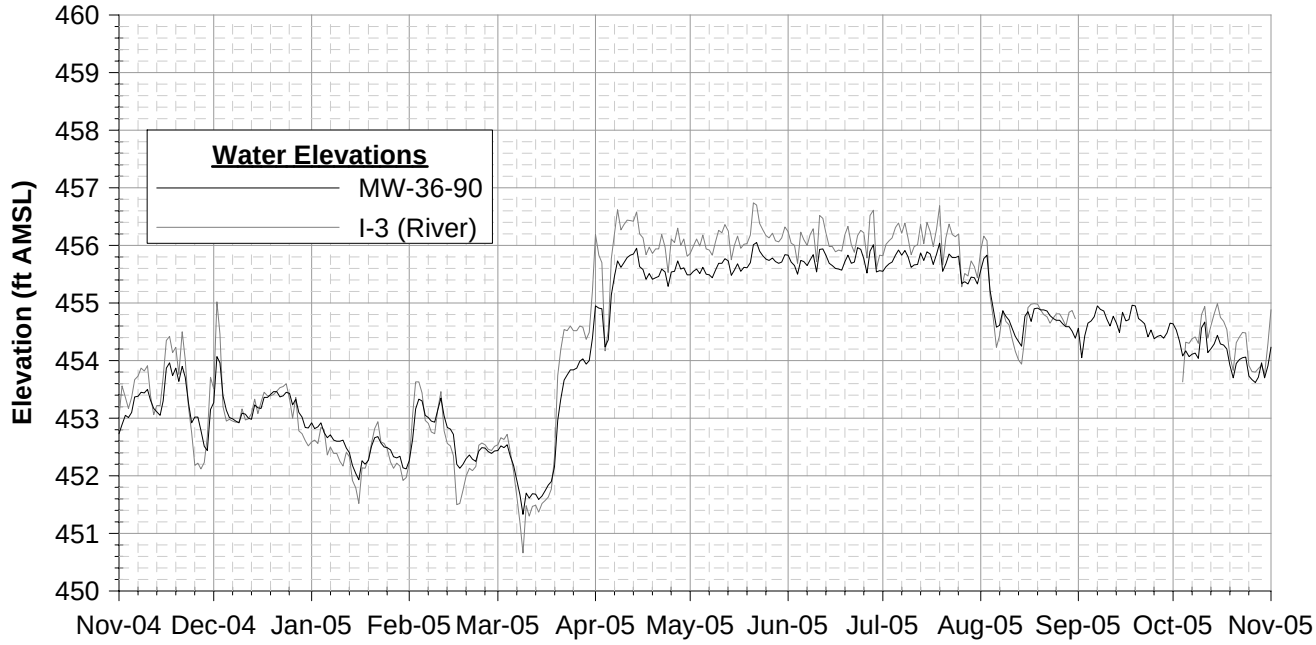

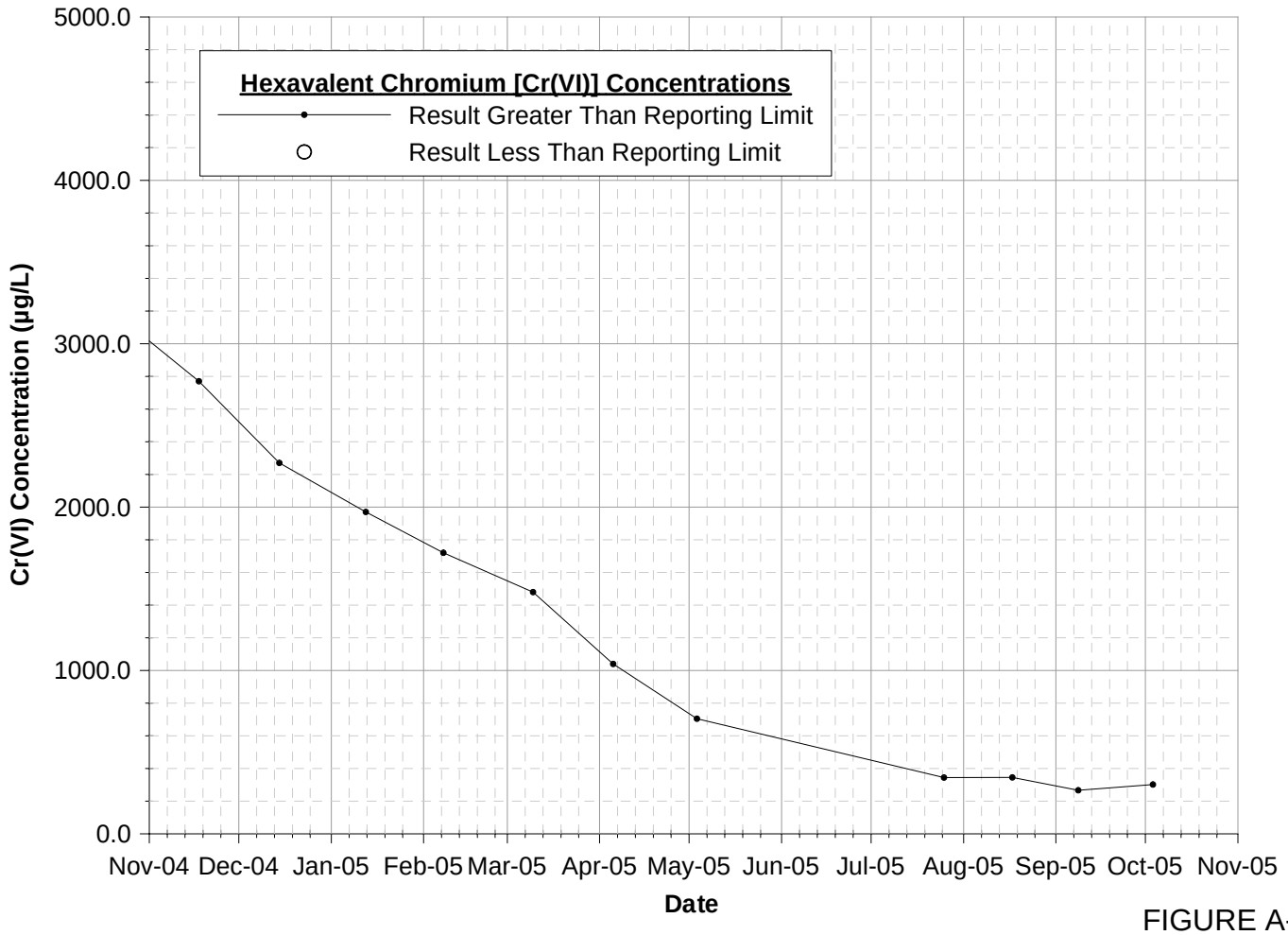

FIGURE A-6
MW-36-90 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/03/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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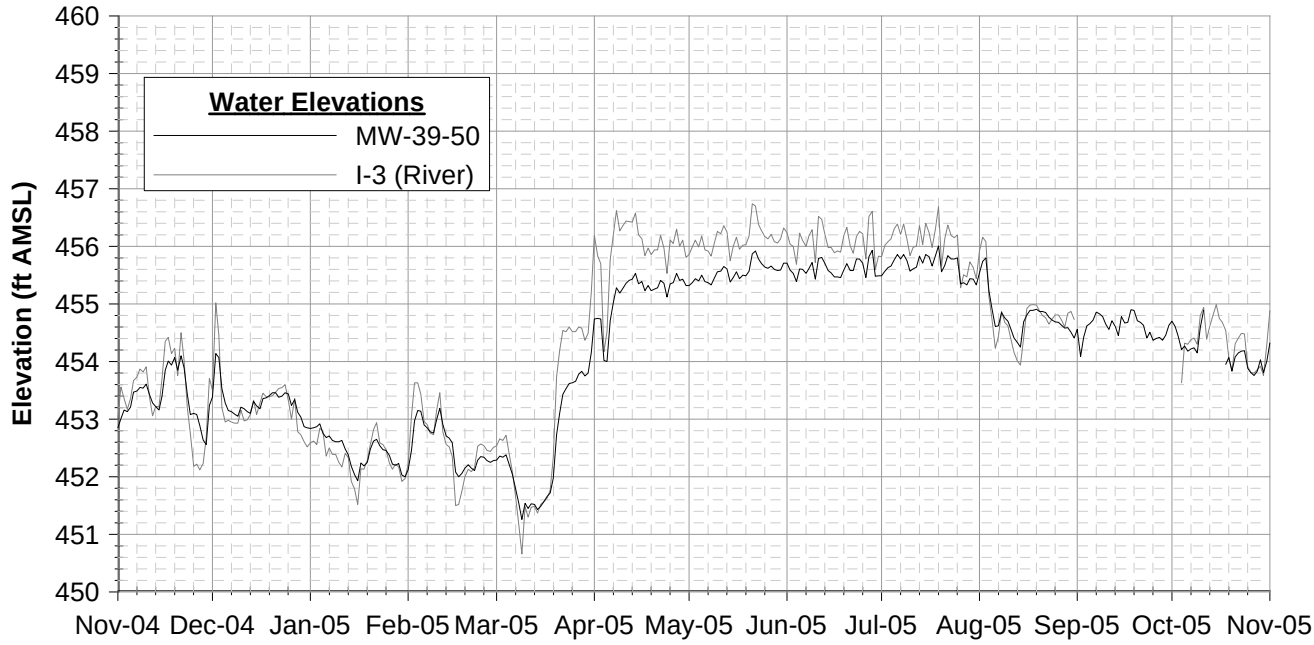

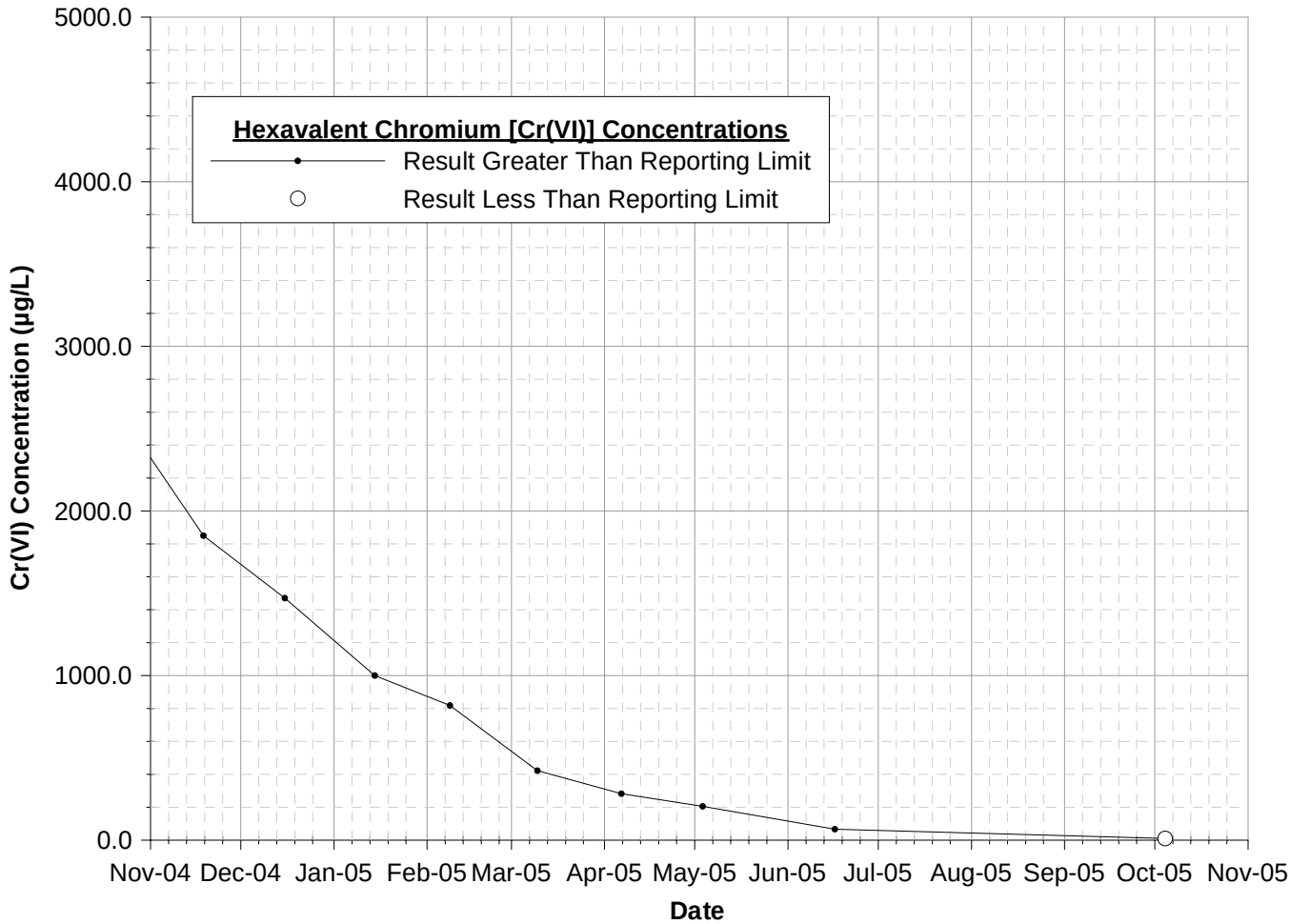

FIGURE A-7
MW-39-50 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/04/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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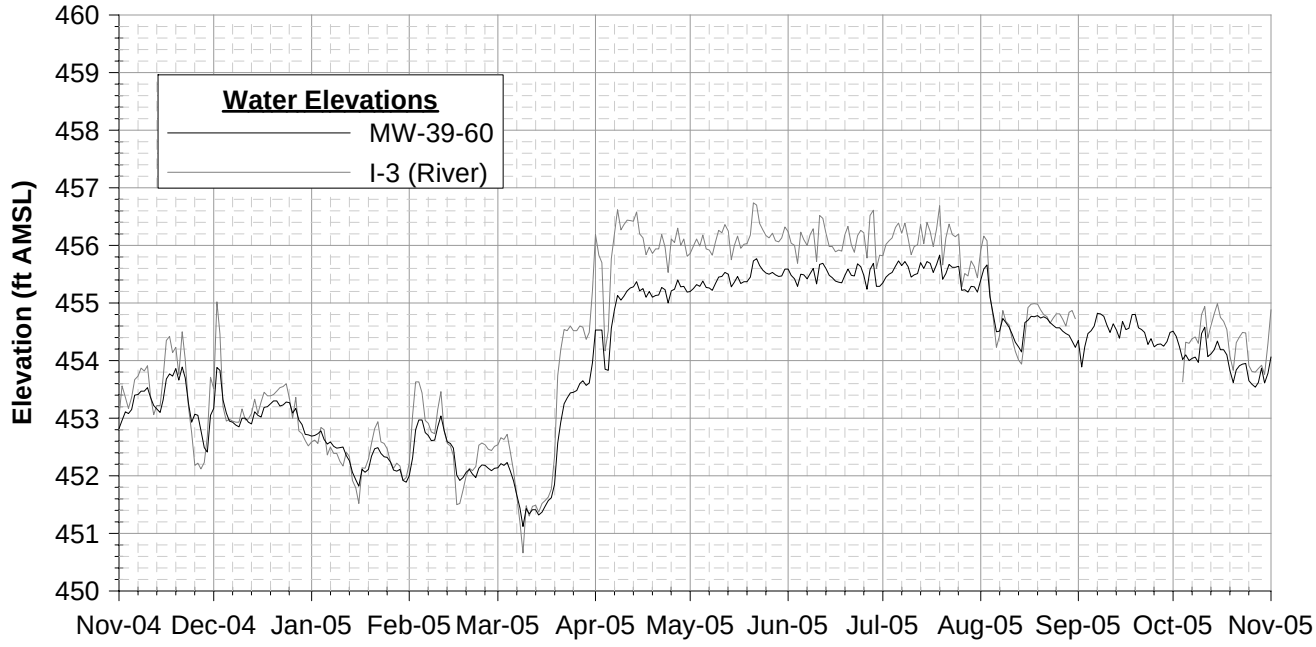

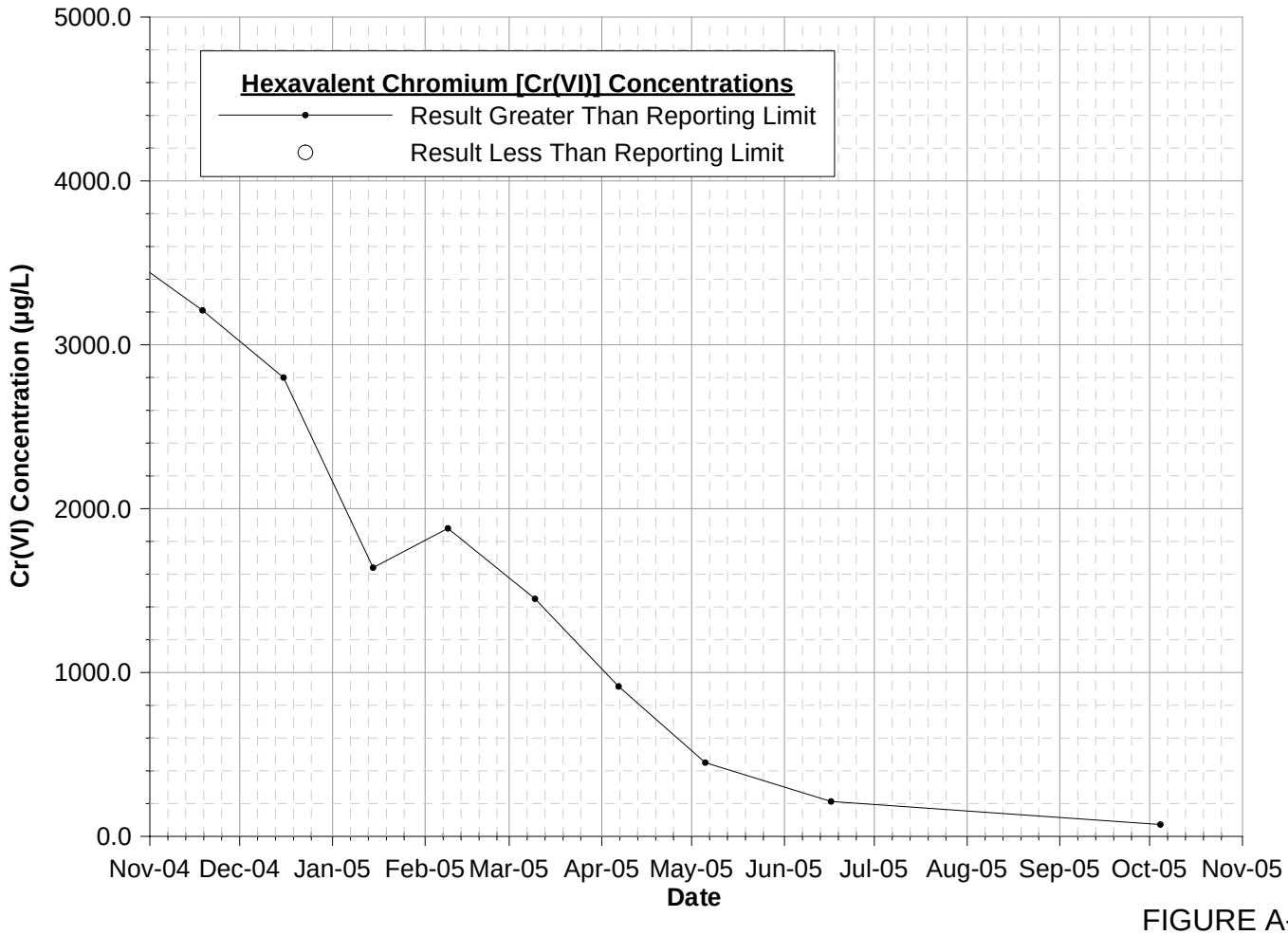

FIGURE A-8
MW-39-60 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/04/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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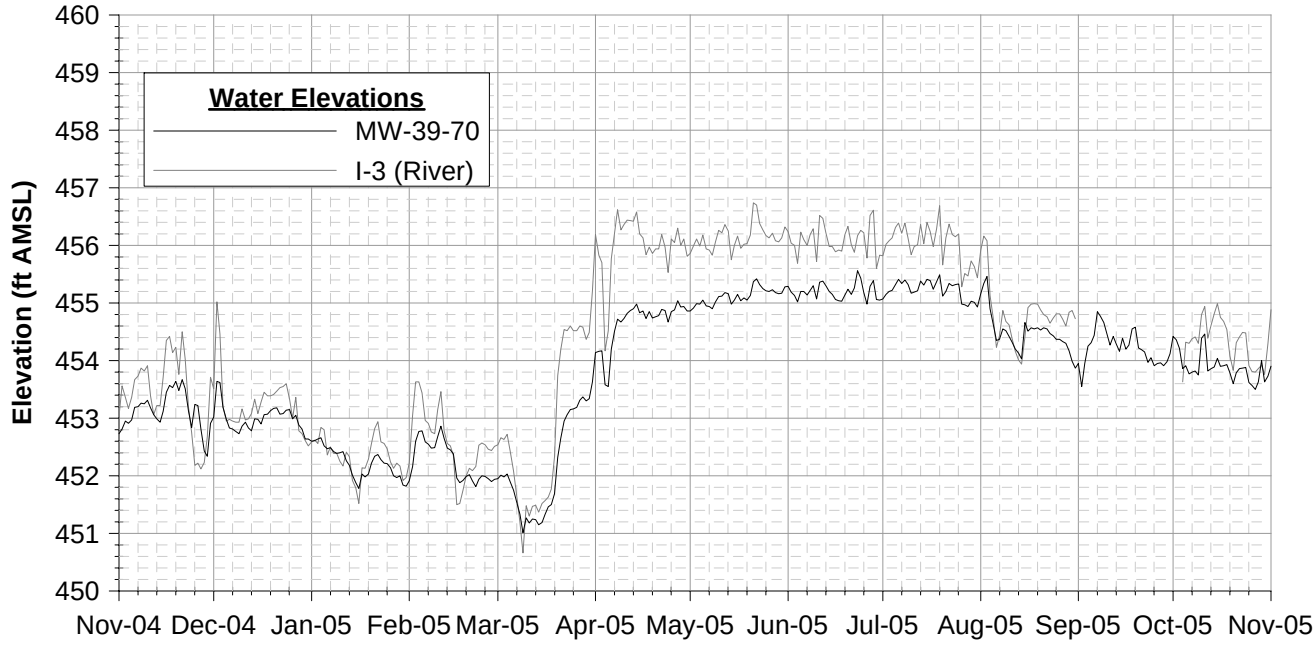

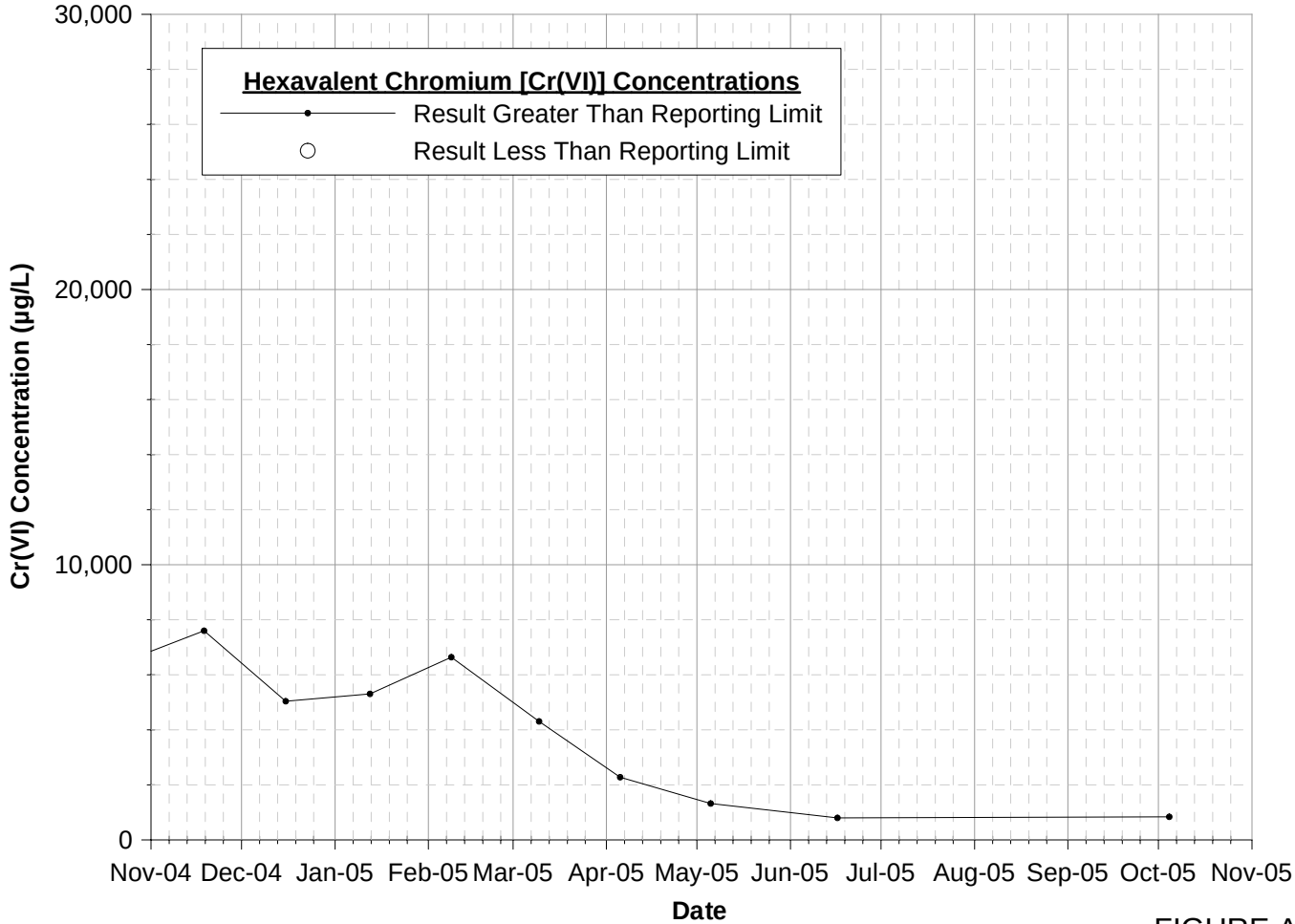

FIGURE A-9
MW-39-70 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/04/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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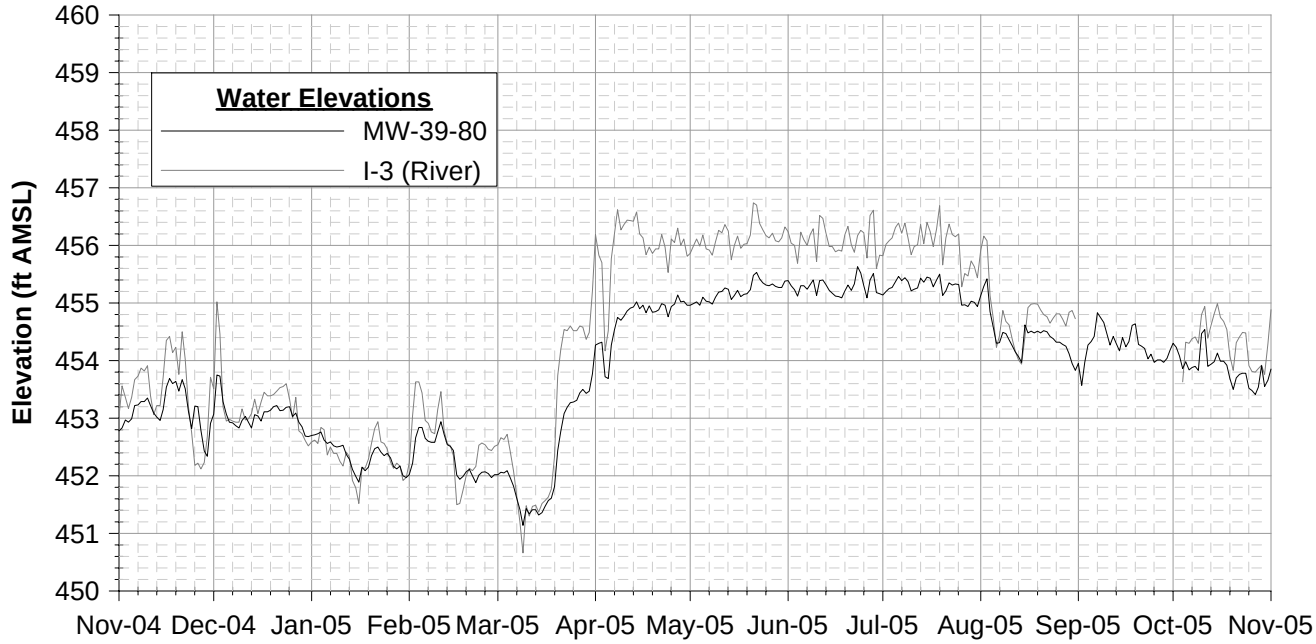

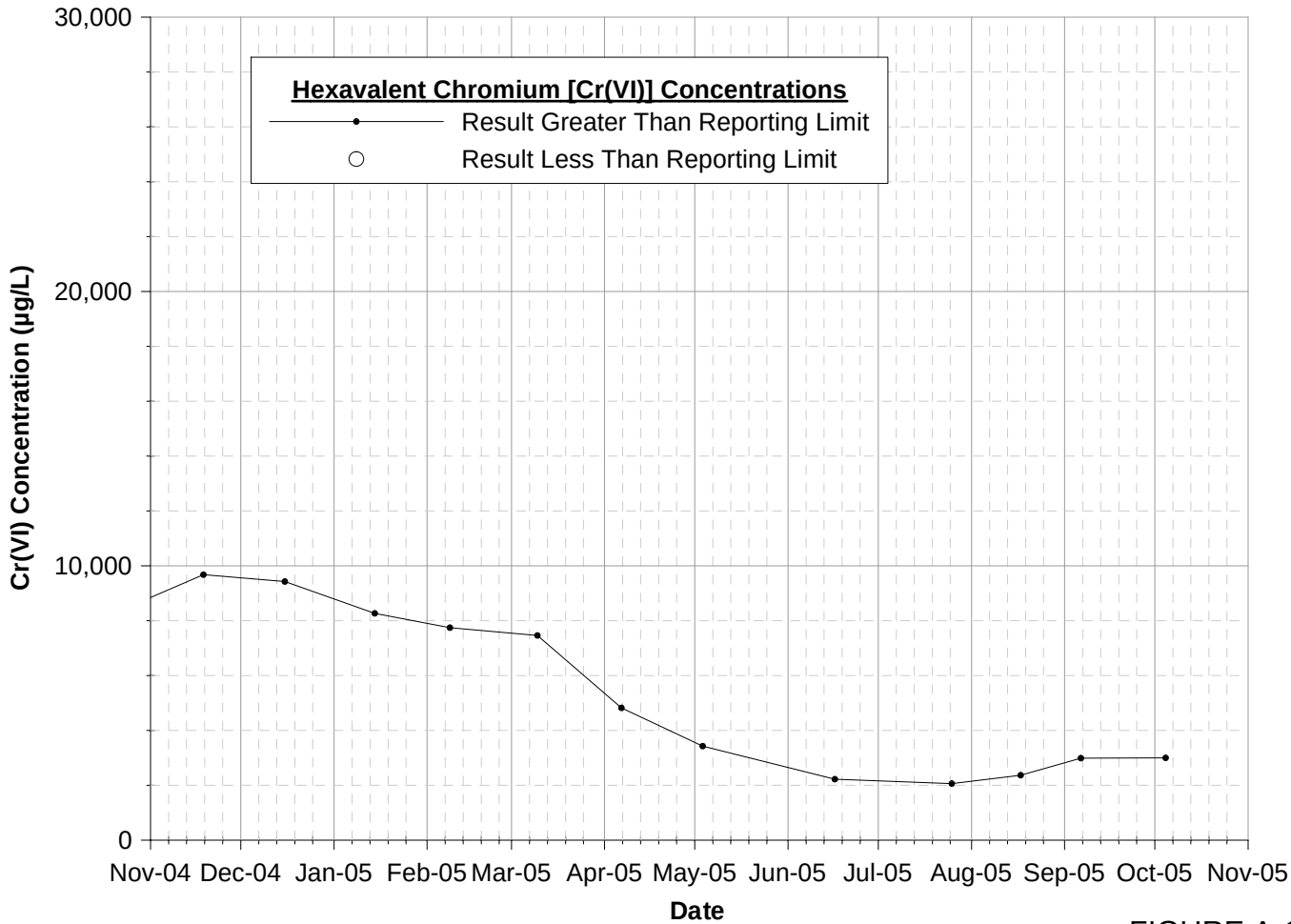

FIGURE A-10
MW-39-80 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/04/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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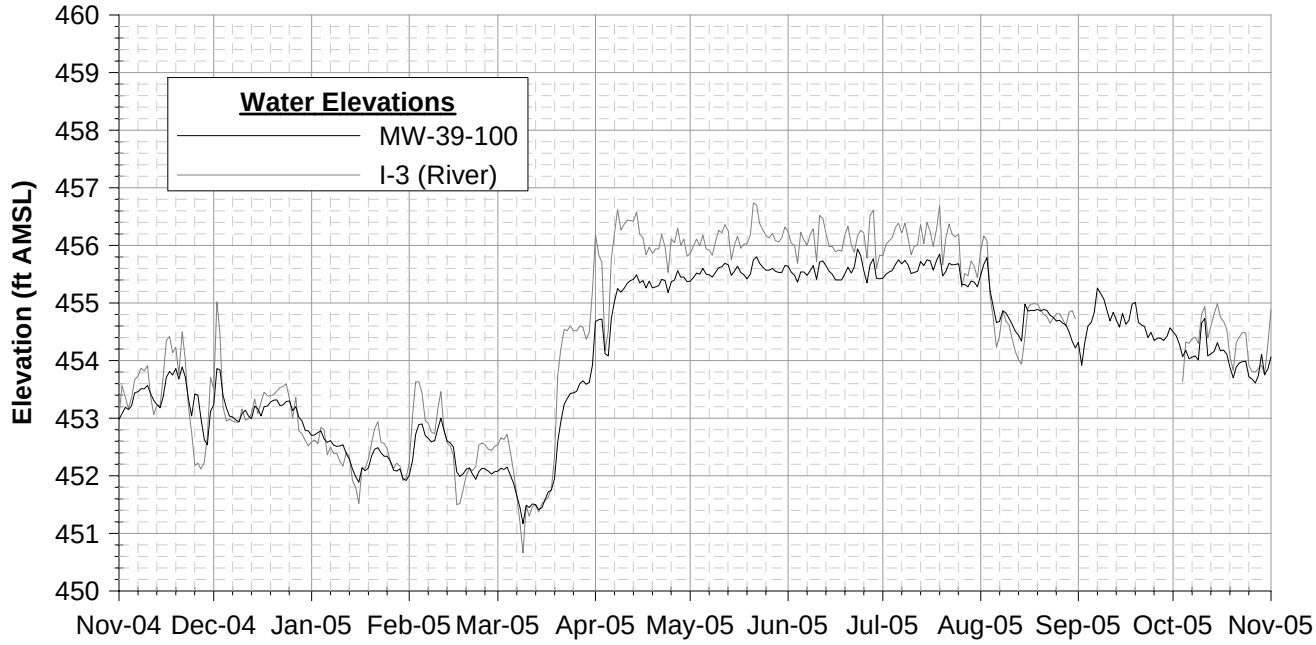

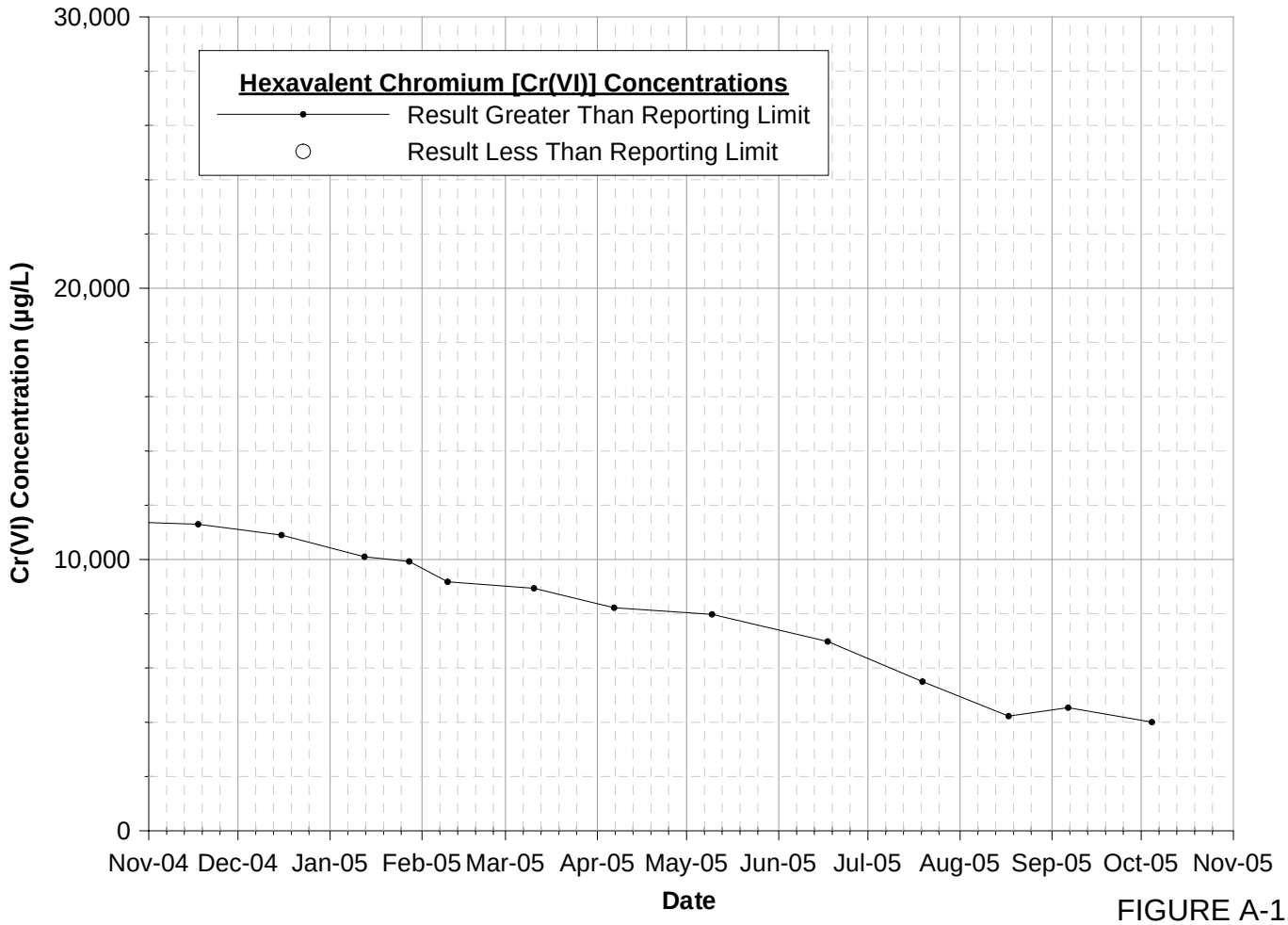

FIGURE A-11
MW-39-100 CR(VI) CONCENTRATION &
HYDROGRAPH - THROUGH 10/04/05
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Notes
1. Chromium results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Data subject to review.
3. Results plotted are from primary samples; see Table A-1 for complete results.
4. I-3 data unavailable 9/1/05 through 10/4/05 due to river damage.

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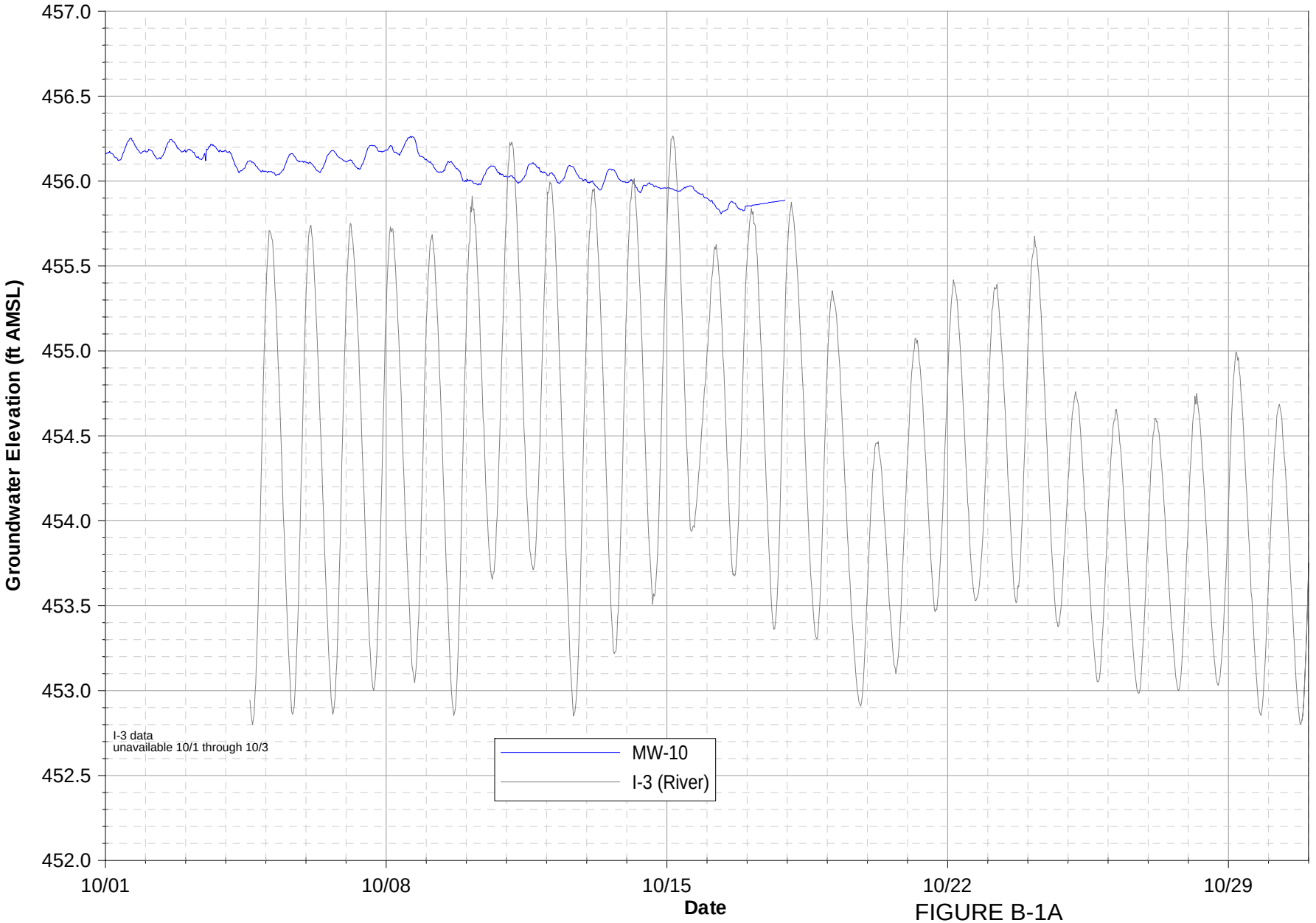
Appendix B
Hydrographs and Hydraulic Gradient Maps for Reporting Period

TABLE B-1
Monthly Average, Minimum, and Maximum Groundwater Elevations, October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Well	Average (ft AMSL)	Minimum (ft AMSL)	Maximum (ft AMSL)	Aquifer Depth
I-3	454.32	453.20	455.45	River Station
RRB	454.81	453.61	456.01	River Station
MW-10	INC	INC	INC	Upper
MW-19	454.86	454.73	454.95	Upper
MW-20-070	453.84	453.68	454.00	Upper
MW-20-100	453.61	453.35	454.02	Upper
MW-20-130	453.02	452.64	453.67	Upper
MW-22	454.70	454.62	454.75	Upper
MW-25	455.25	455.21	455.29	Upper
MW-26	454.97	454.84	455.10	Upper
MW-27-020	454.45	454.13	454.74	Upper
MW-27-060	454.51	453.86	455.13	Upper
MW-27-085	454.54	453.90	455.16	Upper
MW-28-025	454.57	454.03	455.07	Upper
MW-28-090	454.55	453.76	455.31	Upper
MW-29	454.96	454.91	454.99	Upper
MW-30-030	454.68	454.59	454.77	Upper
MW-30-050	454.28	453.71	454.82	Upper
MW-31-060	454.47	454.30	454.61	Upper
MW-31-135	453.90	453.58	454.30	Upper
MW-32-020	INC	INC	INC	Upper
MW-32-035	454.39	454.04	454.71	Upper
MW-33-040	454.66	454.27	455.02	Middle
MW-33-090	454.64	454.21	455.06	Middle
MW-33-150	454.79	454.38	455.20	Middle
MW-33-210	455.02	454.67	455.38	Middle
MW-34-055	454.49	453.70	455.26	Middle
MW-34-080	454.62	453.90	455.33	Middle
MW-34-100	454.64	453.96	455.31	Middle
MW-35-060	454.86	454.52	455.17	Middle
MW-35-135	454.77	454.55	454.98	Middle
MW-36-020	454.30	453.77	454.80	Middle
MW-36-040	454.30	453.69	454.88	Middle
MW-36-050	454.29	453.65	454.89	Middle
MW-36-070	454.36	453.71	454.98	Lower
MW-36-090	454.11	453.55	454.66	Lower
MW-36-100	454.20	453.64	454.76	Lower
MW-39-040	454.25	453.71	454.76	Lower
MW-39-050	454.17	453.66	454.64	Lower
MW-39-060	454.02	453.52	454.51	Lower
MW-39-070	453.89	453.45	454.40	Lower
MW-39-080	453.88	453.43	454.38	Lower
MW-39-100	454.07	453.61	454.58	Lower
MW-42-030	454.27	453.86	454.65	Lower
MW-42-055	454.43	453.99	454.83	Lower
MW-42-065	454.45	454.03	454.84	Lower
MW-43-025	454.36	453.73	454.97	Lower
MW-43-075	454.53	453.85	455.18	Lower
MW-43-090	454.56	453.89	455.22	Lower
PE-01	454.29	453.65	454.91	Lower

Notes: INC = Incomplete for reporting period

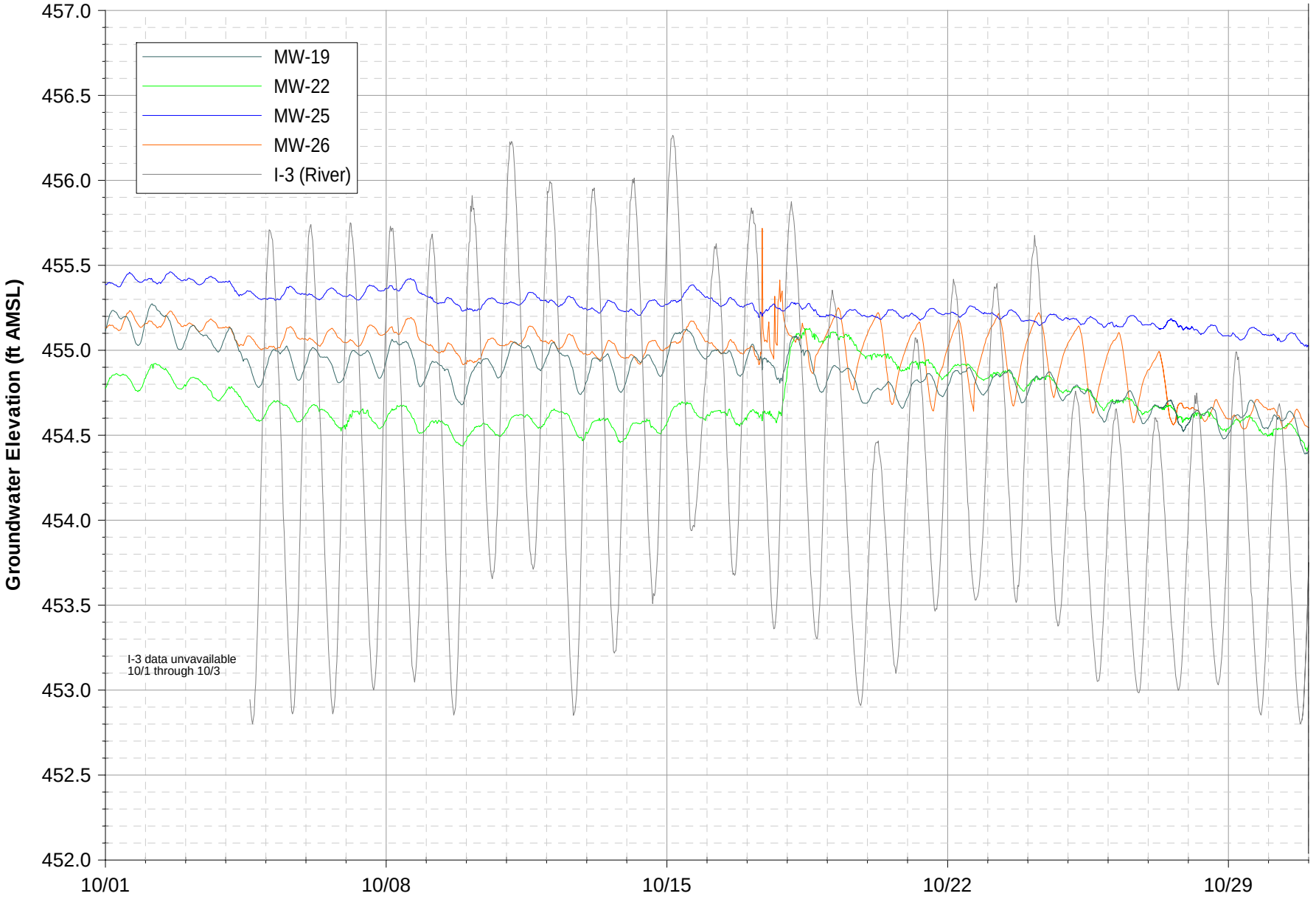
Averages for: I-3, MW-31-60, MW-34-80, MW-34-100, MW-31-135, MW-33-150, MW-42-65 are missing 1-3 days of data while MW-39-50 is missing 7 days of data over the reporting period. MW-34-80 data missing 8/16/06 through 8/31/05.



Note: Data subject to review. MW-10 data unavailable from 10/18/05 through 10/31/05

FIGURE B-1A
MW-10 HYDROGRAPH
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



Note: Data subject to review.

FIGURE B-1B

MW-19, MW-22, MW-25, AND MW-26 HYDROGRAPHS

INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

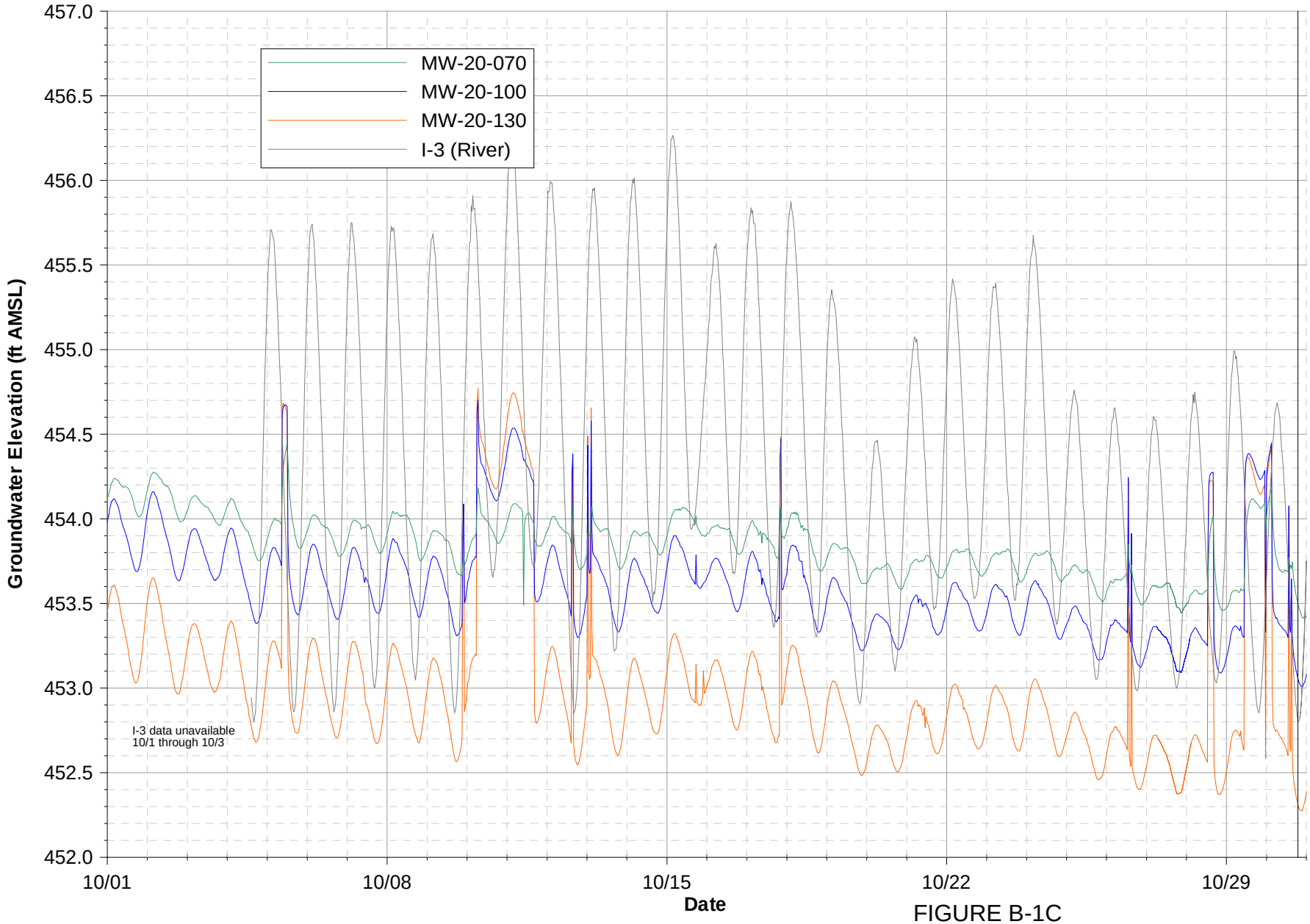
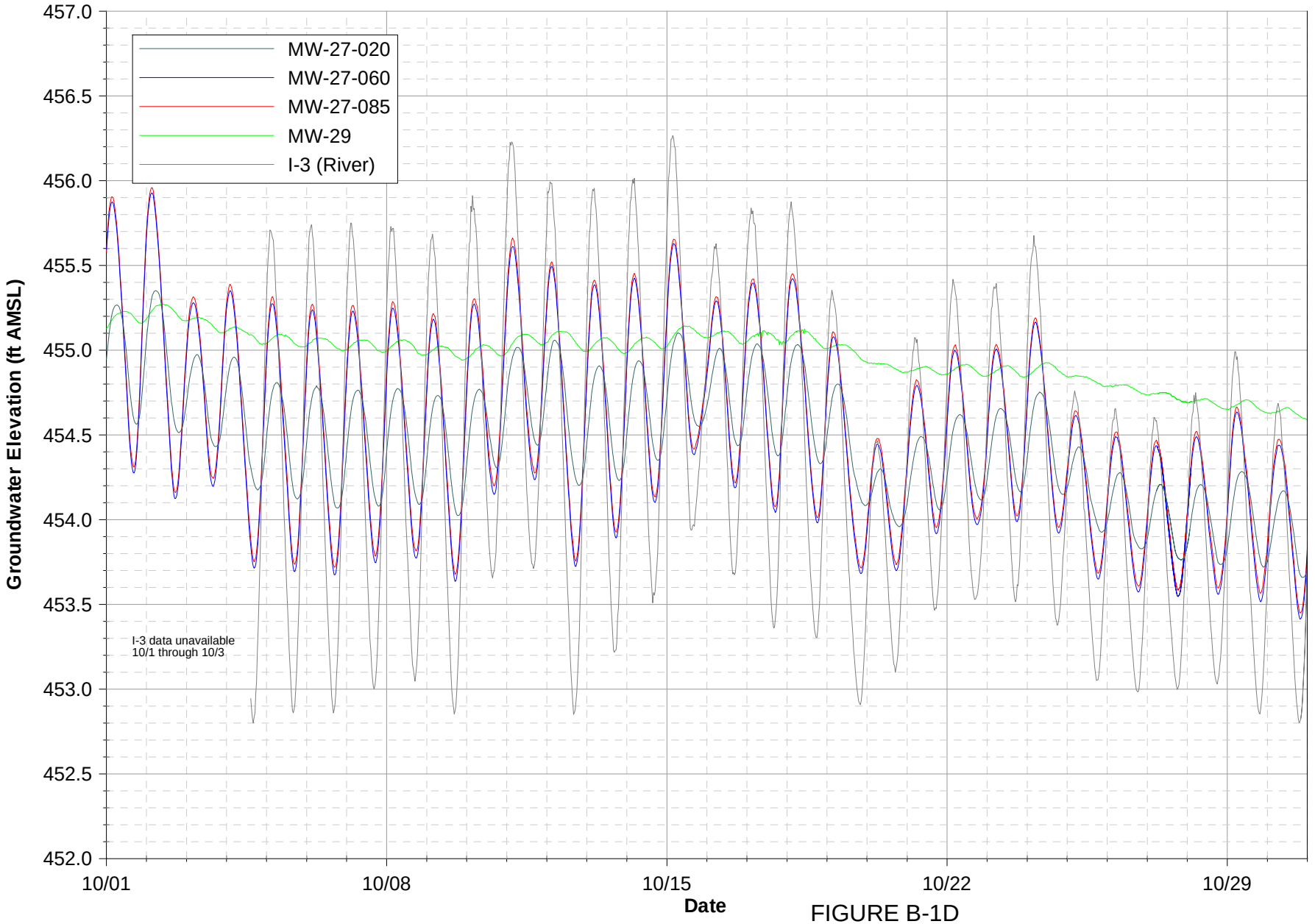


FIGURE B-1C
MW-20 CLUSTER HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.

CH2MHILL



Note: Data subject to review..

FIGURE B-1D
MW-27 CLUSTER AND MW-29 HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

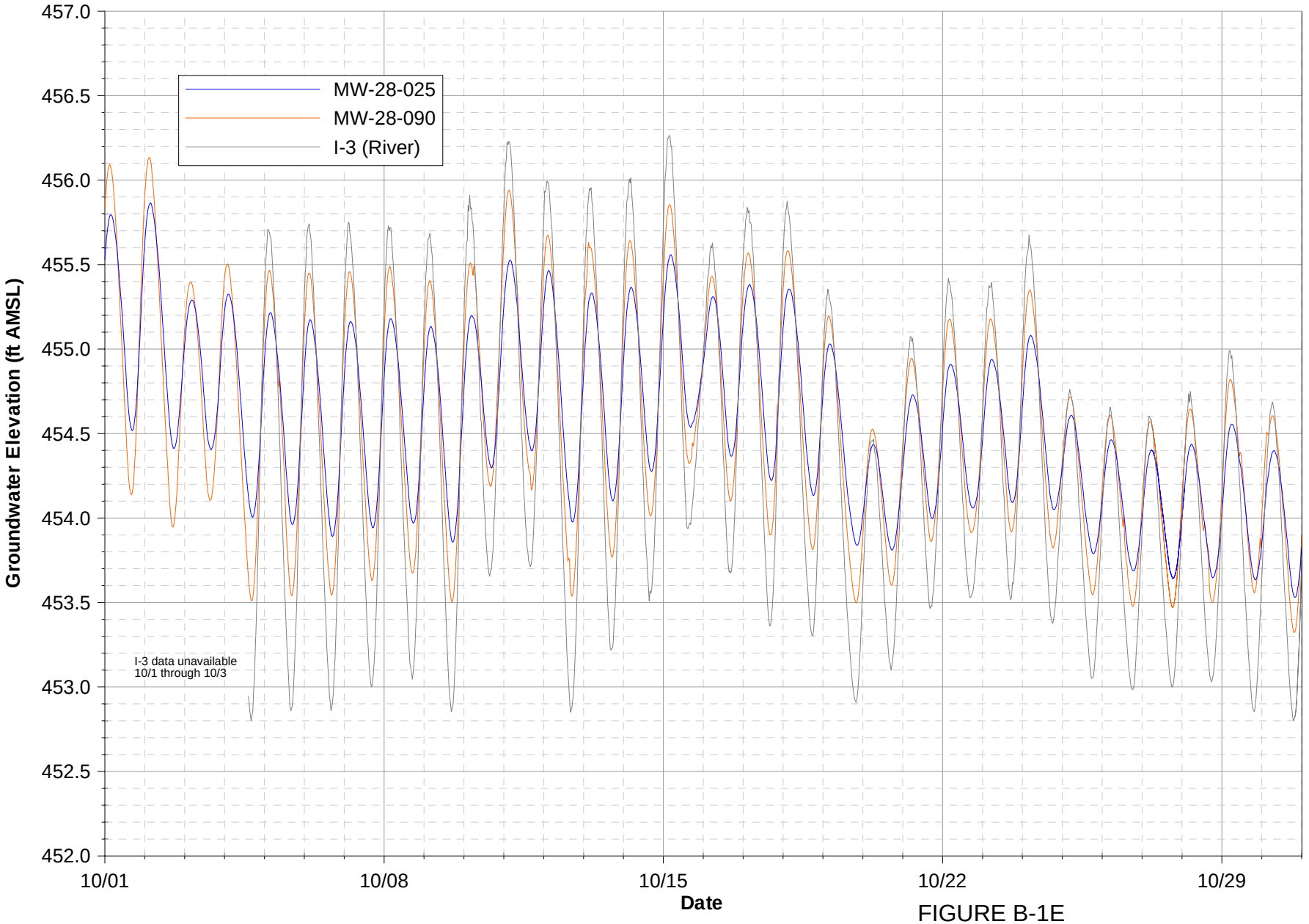
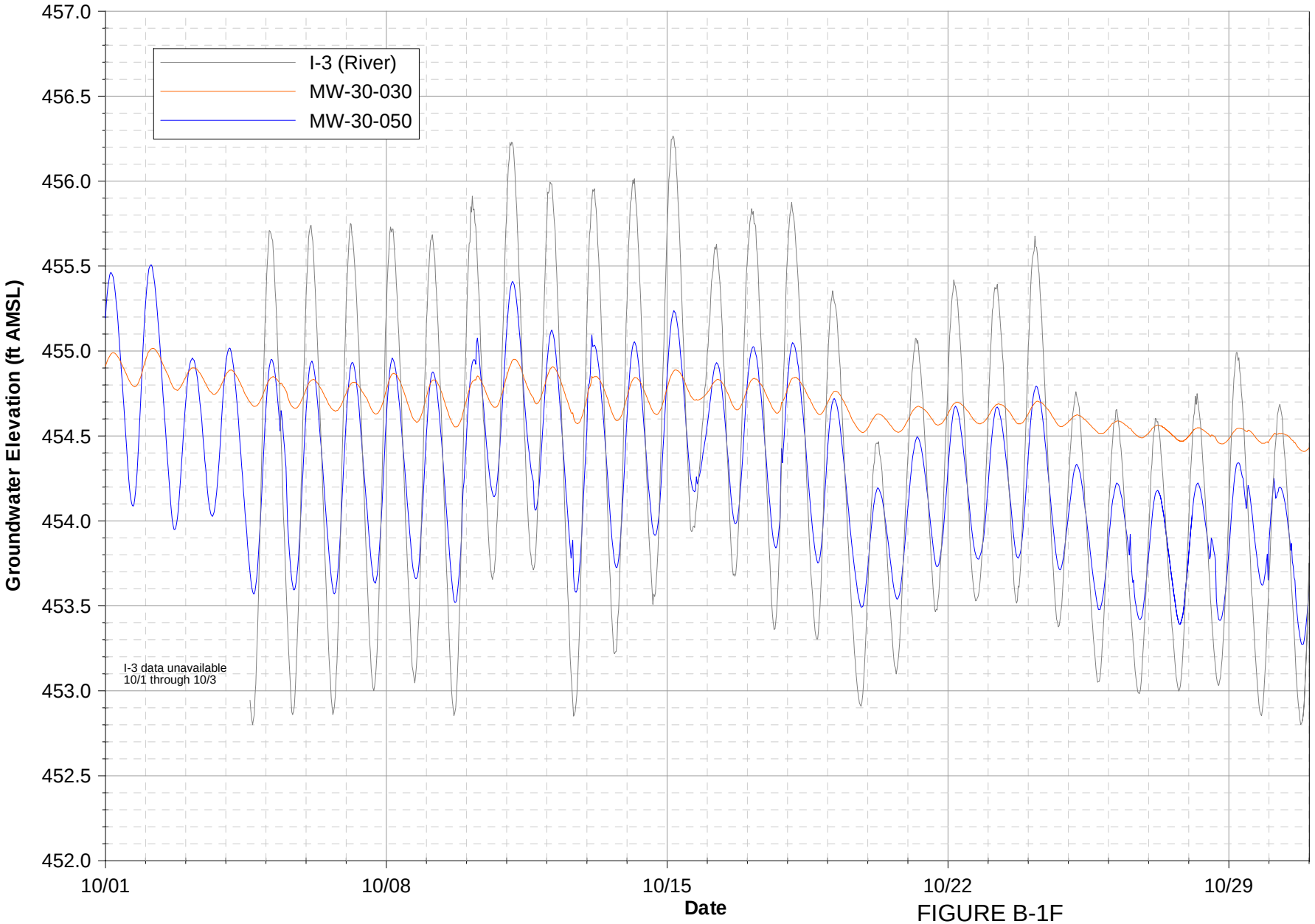


FIGURE B-1E
MW-28 WELL HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.

CH2MHILL



Note: Data subject to review.

FIGURE B-1F
MW-30 WELL HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

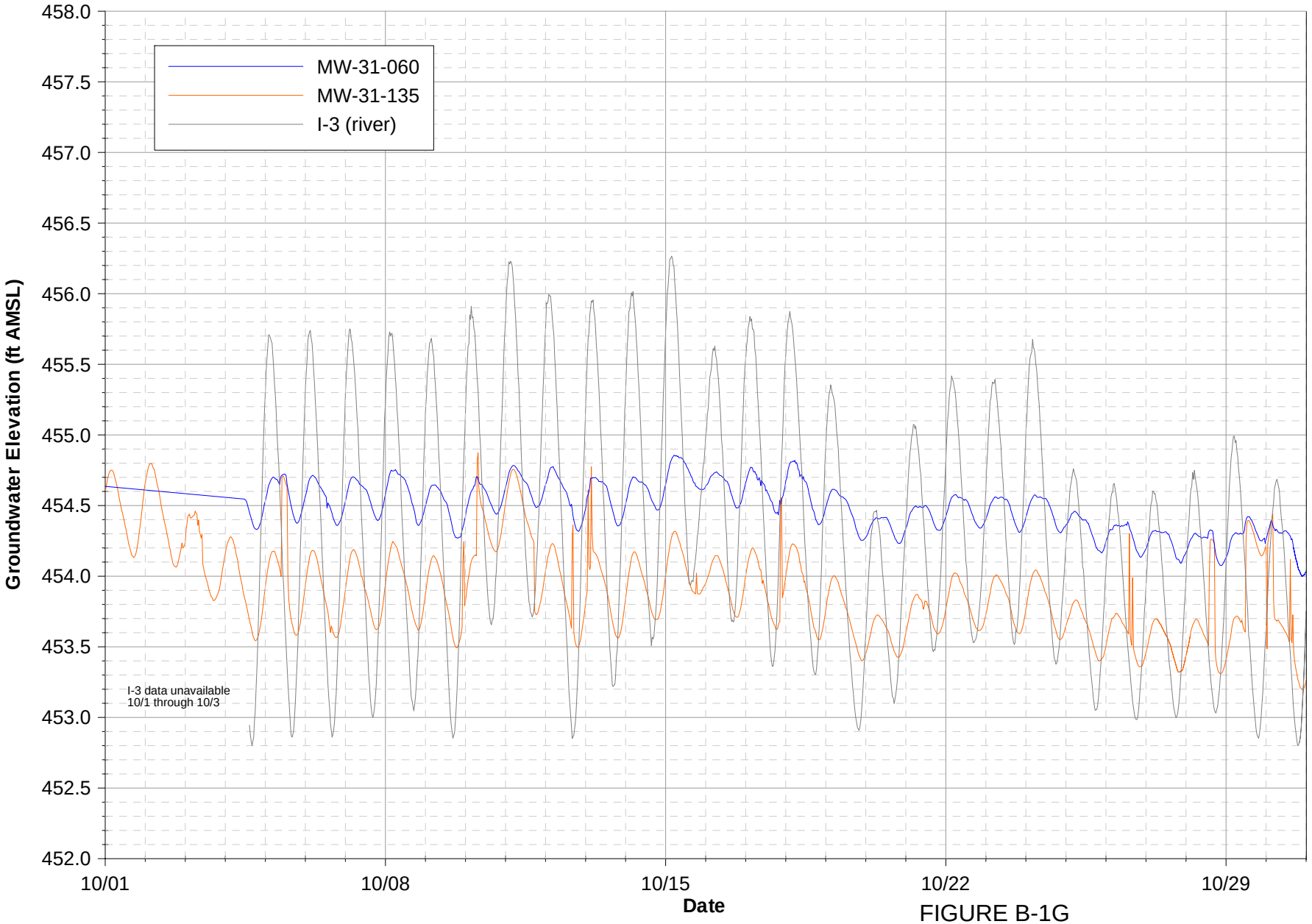


FIGURE B-1G
MW-31 WELL HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review. MW-31-60 unavailable from 10/1/05 through 10/3/05

CH2MHILL

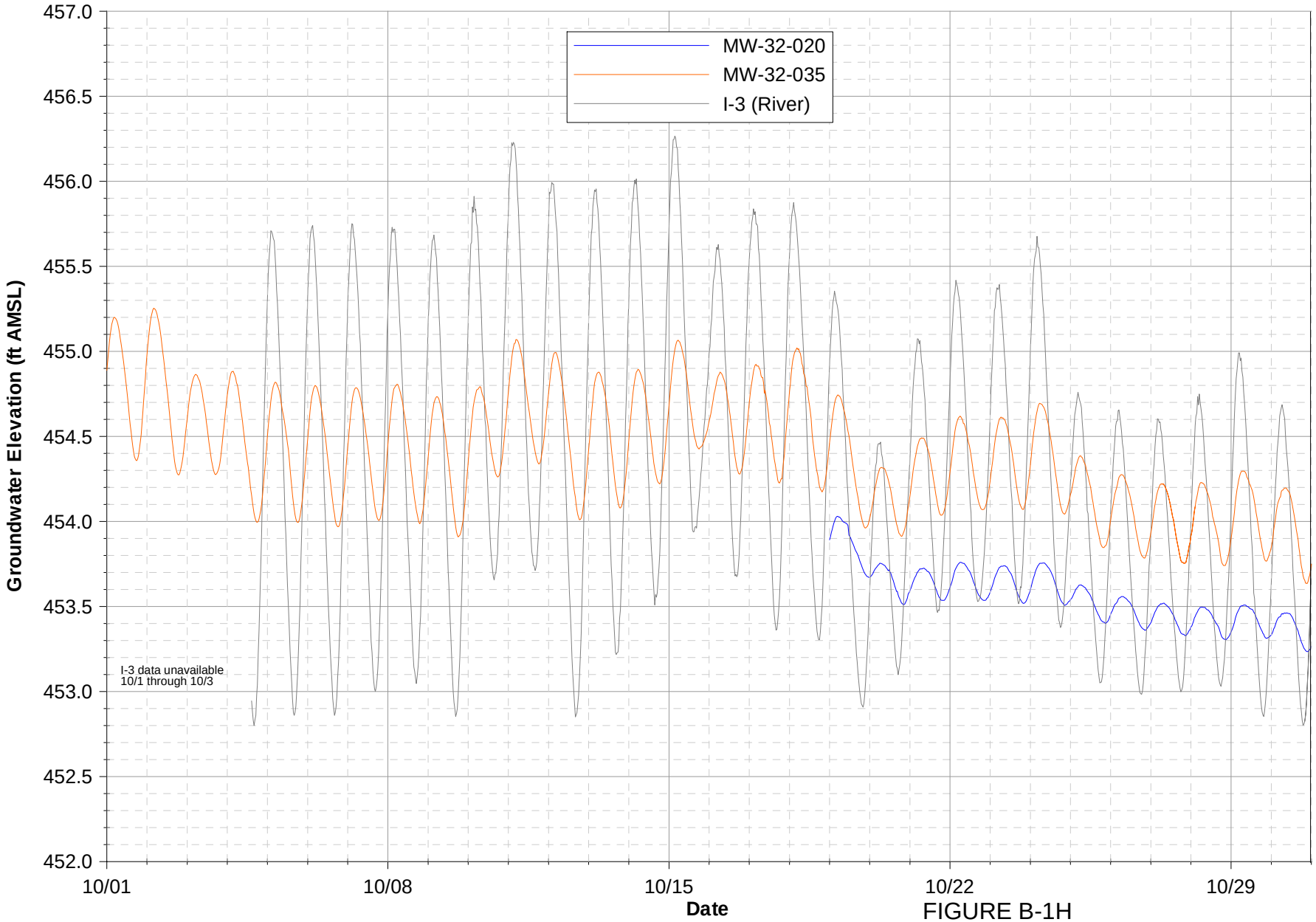


FIGURE B-1H
MW-32 WELL HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review. MW-32-20 data unavailable from 10/1/05 through 10/18/05

CH2MHILL

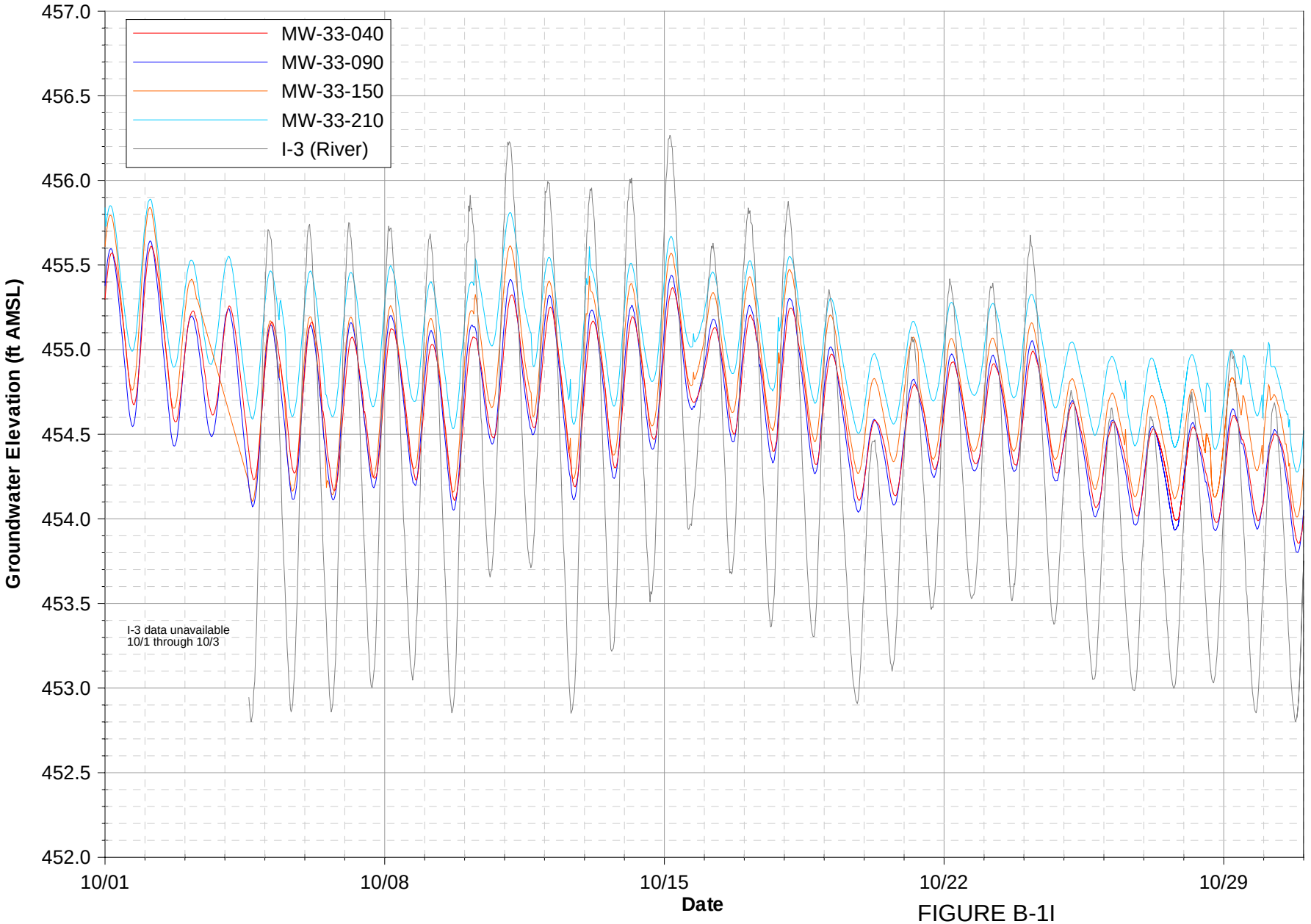


FIGURE B-1I
MW-33 CLUSTER HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review. MW-33-150 data unavailable 10/2/05 through 10/4/05.

CH2MHILL

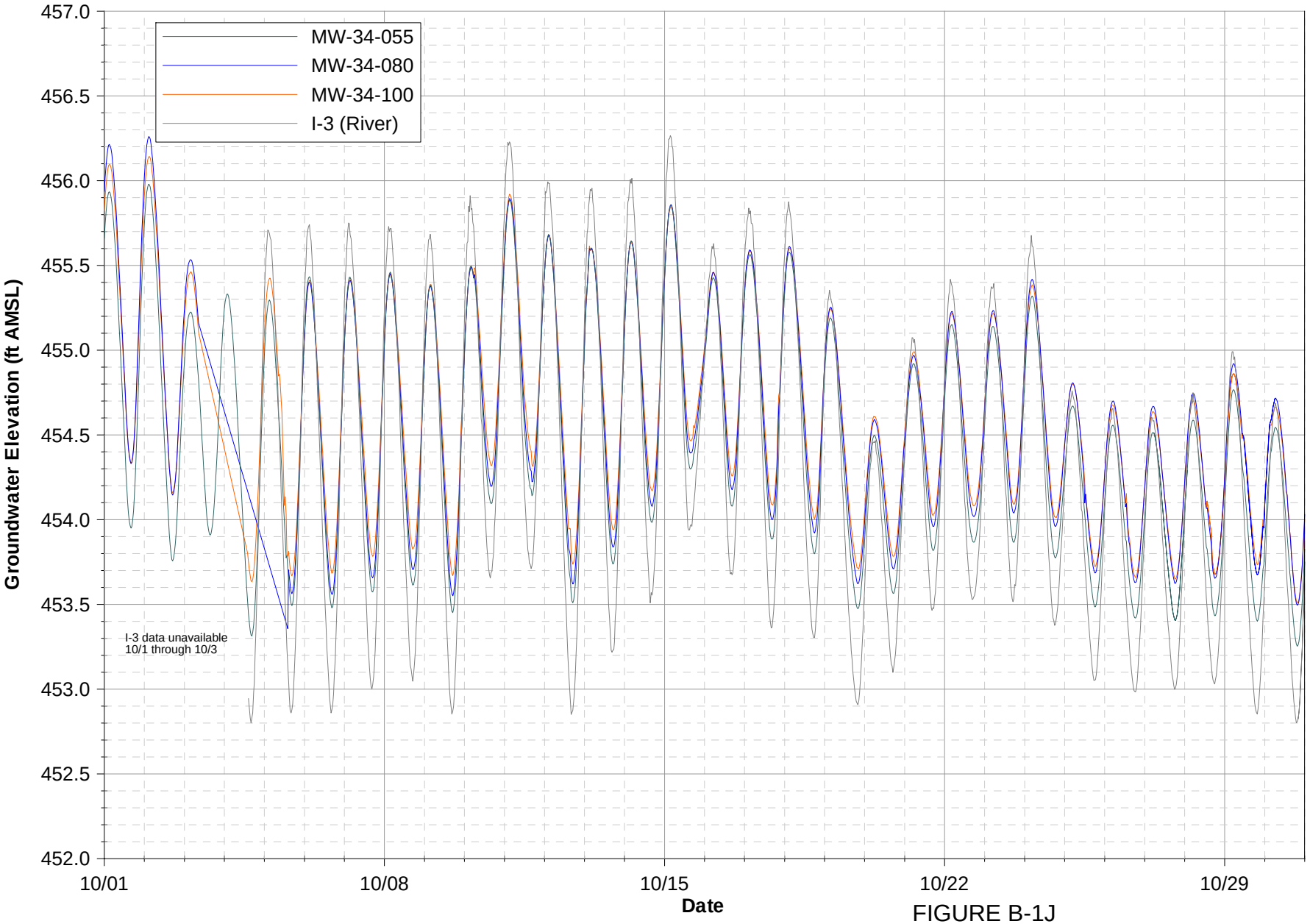


FIGURE B-1J
MW-34 CLUSTER HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.
MW-34-80 and MW-34-100 data unavailable from 10/2/05 through 10/5/05 and 10/4/05 each respectively..

CH2MHILL

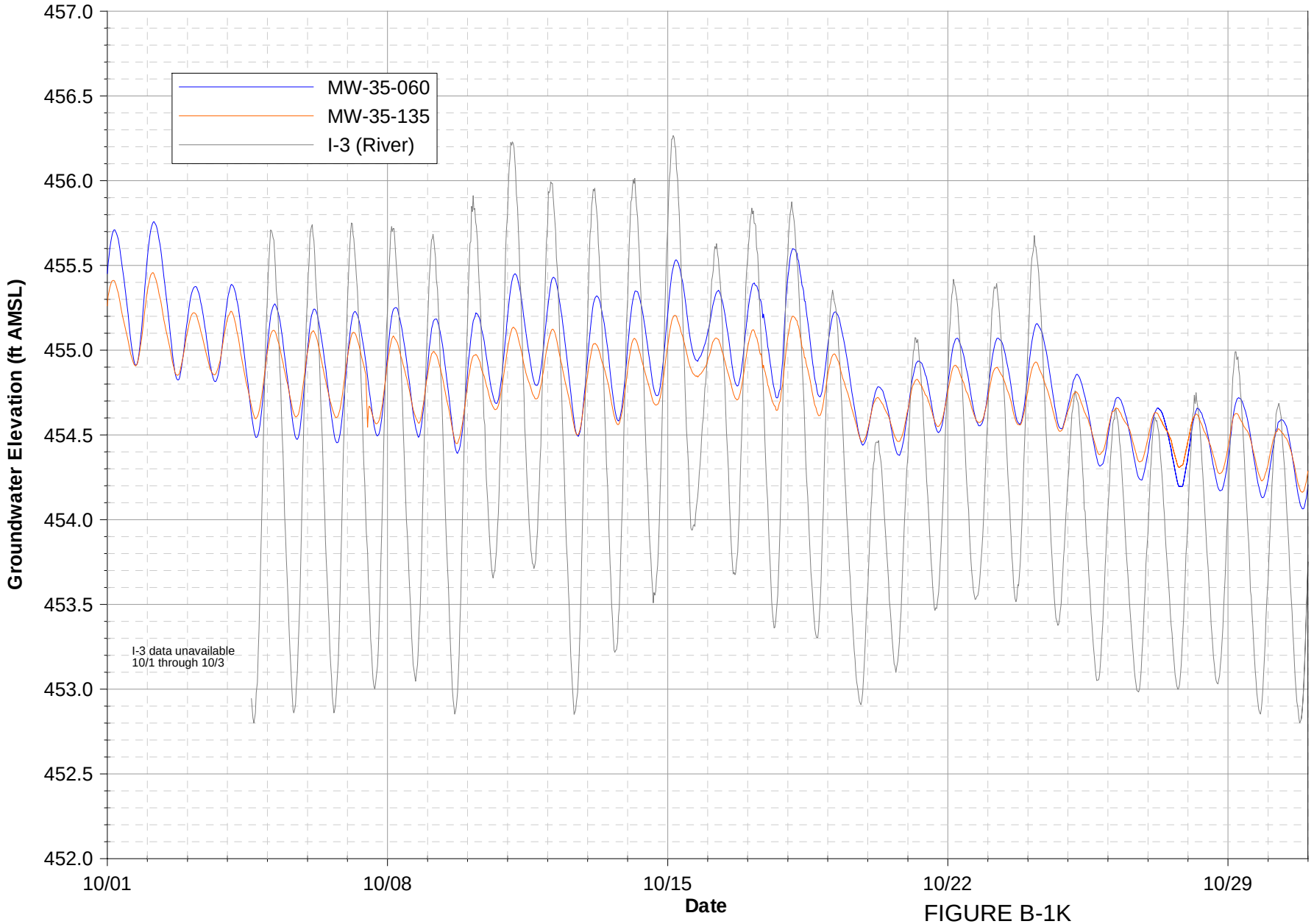


FIGURE B-1K
MW-35 WELL HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.

CH2MHILL

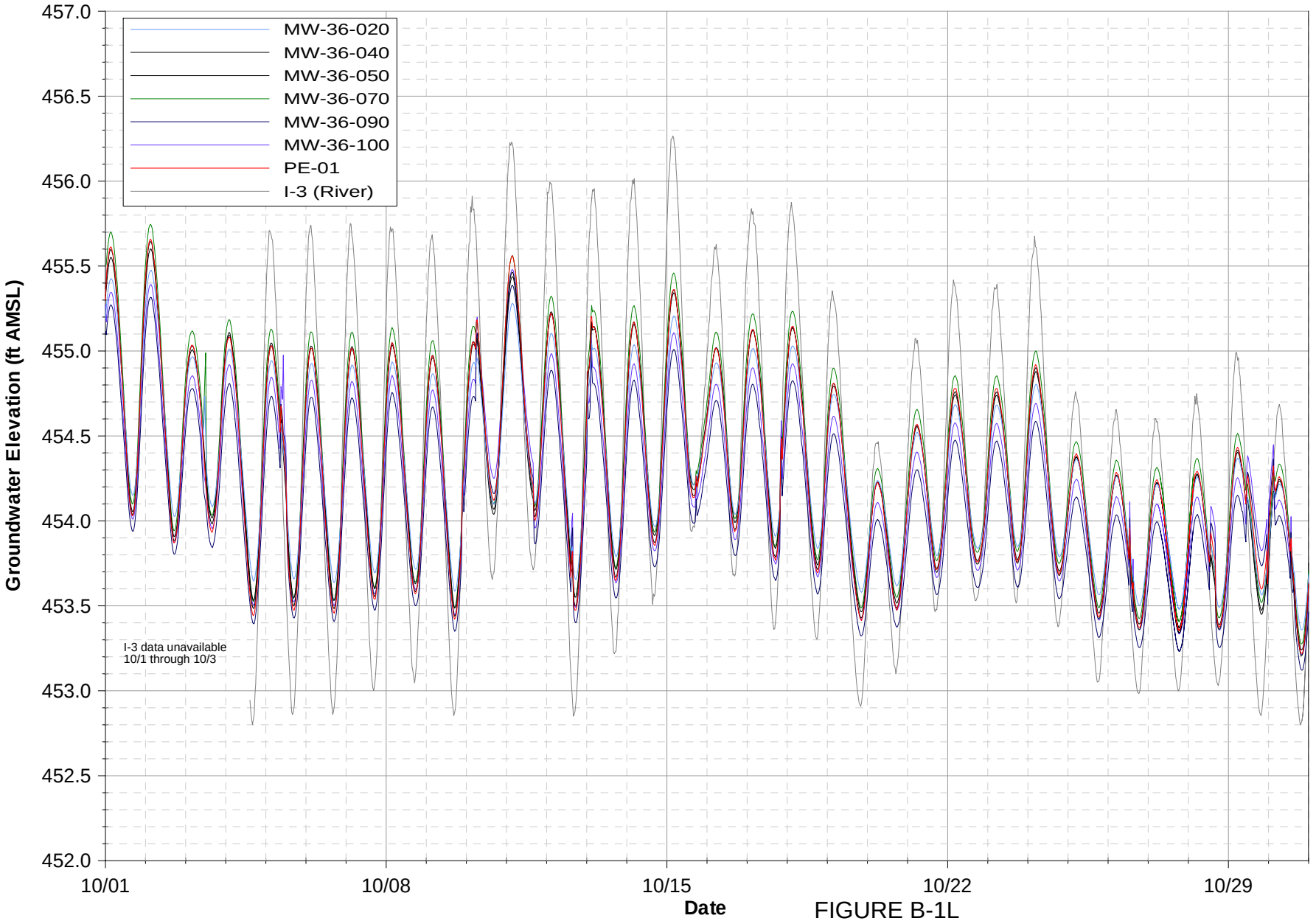


FIGURE B-1L
MW-36 CLUSTER AND PE-01 HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.

CH2MHILL

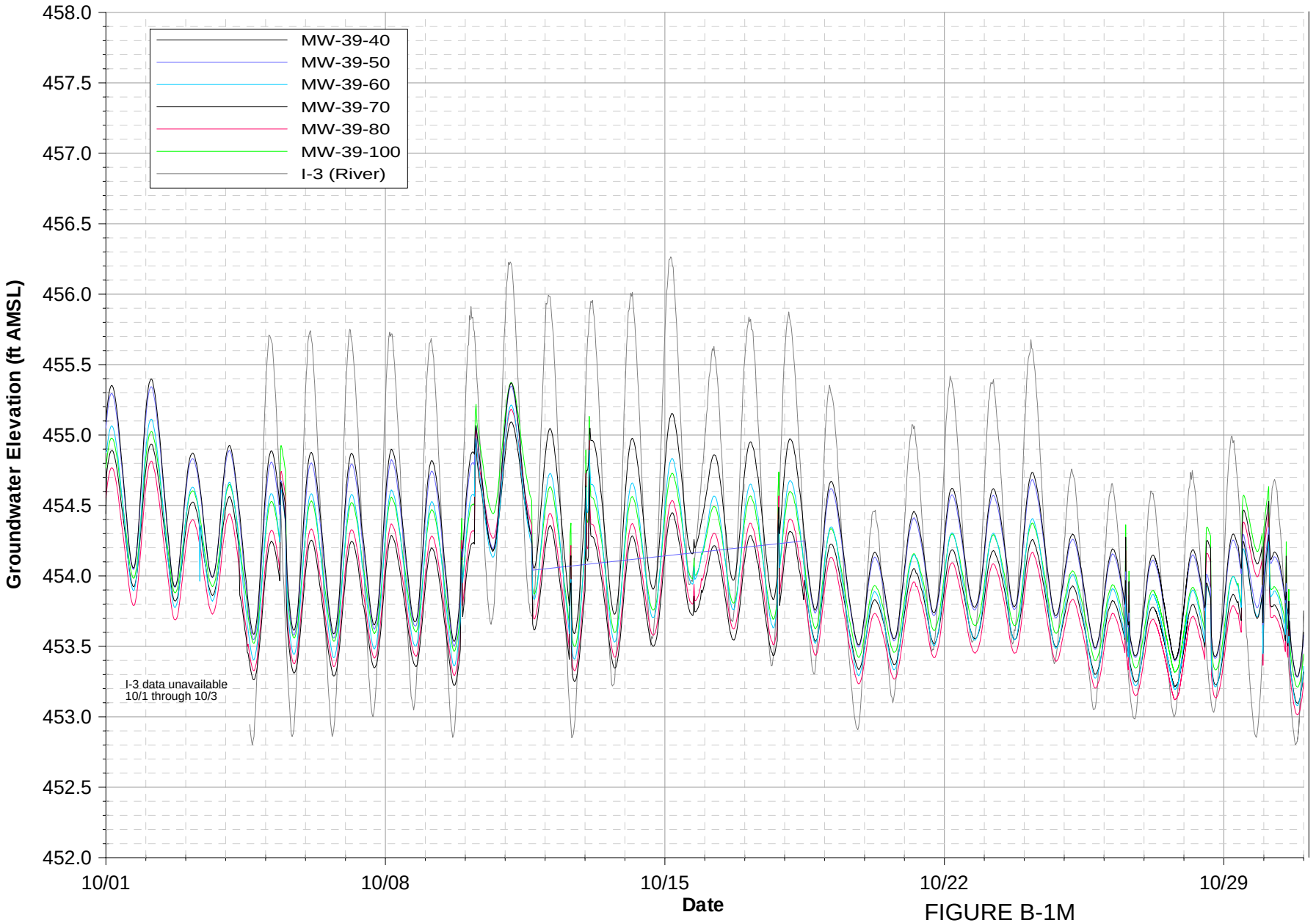


FIGURE B-1M
MW-39 CLUSTER HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.
MW-39-50 data unavailable from 10/11/05 through 10/18/05.

CH2MHILL

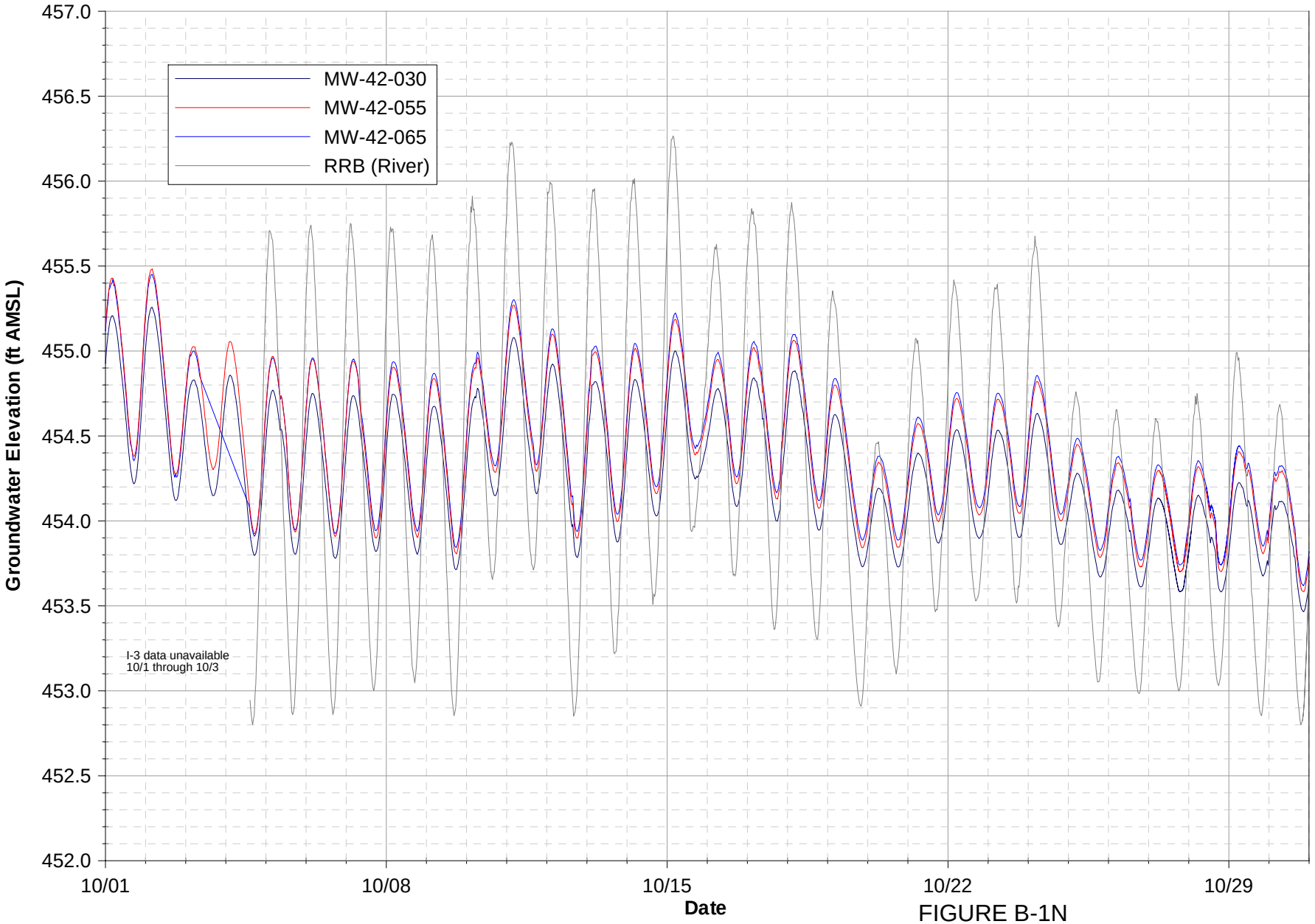
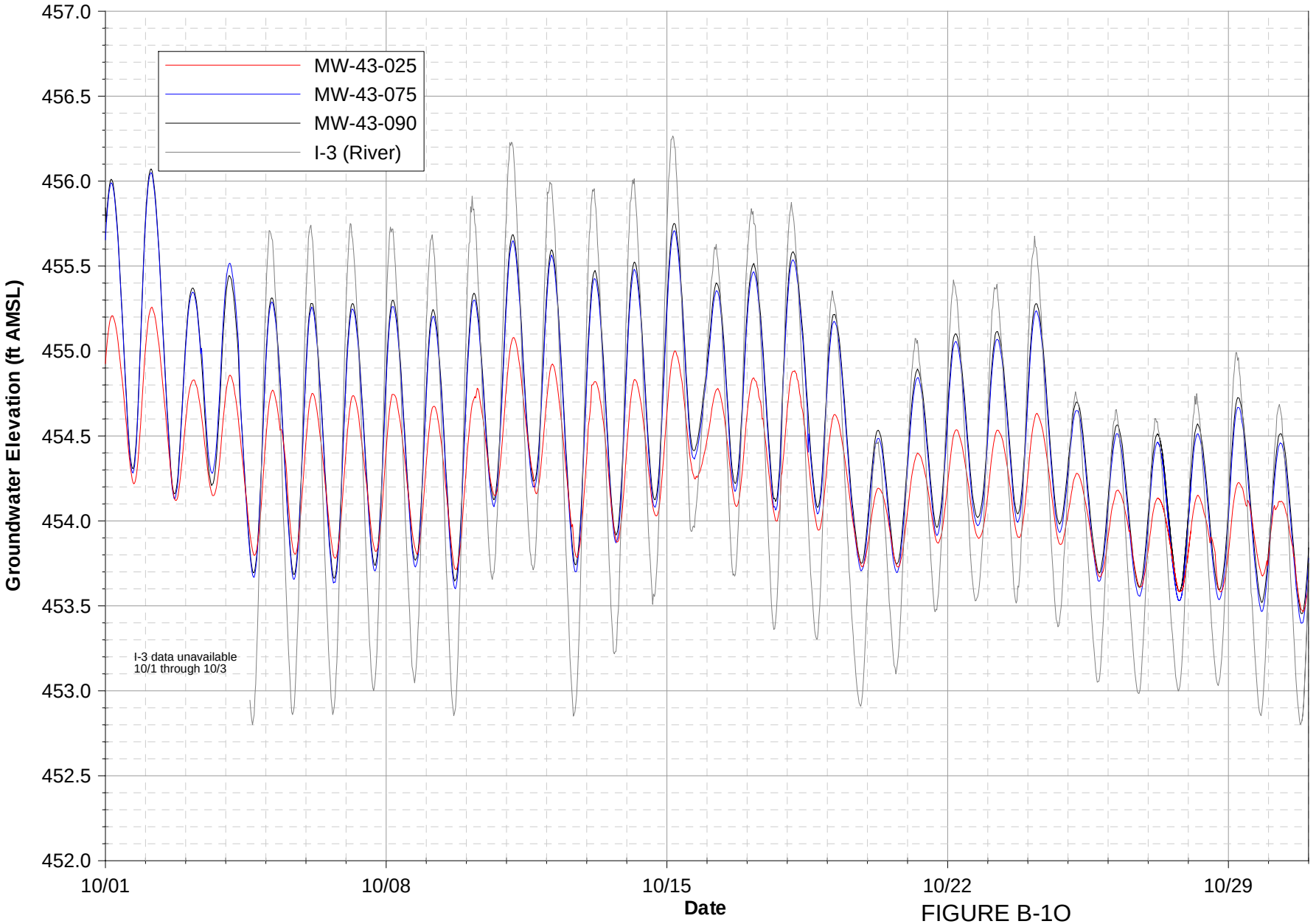


FIGURE B-1N
MW-42 CLUSTER HYDROGRAPHS
INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Note: Data subject to review.
MW-42-65 data unavailable from 10/2/04 through 10/4/05.

CH2MHILL



Note: Data subject to review.

FIGURE B-1O

MW-43 CLUSTER HYDROGRAPHS

INTERIM MEASURES PERFORMANCE MONITORING
PG & E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

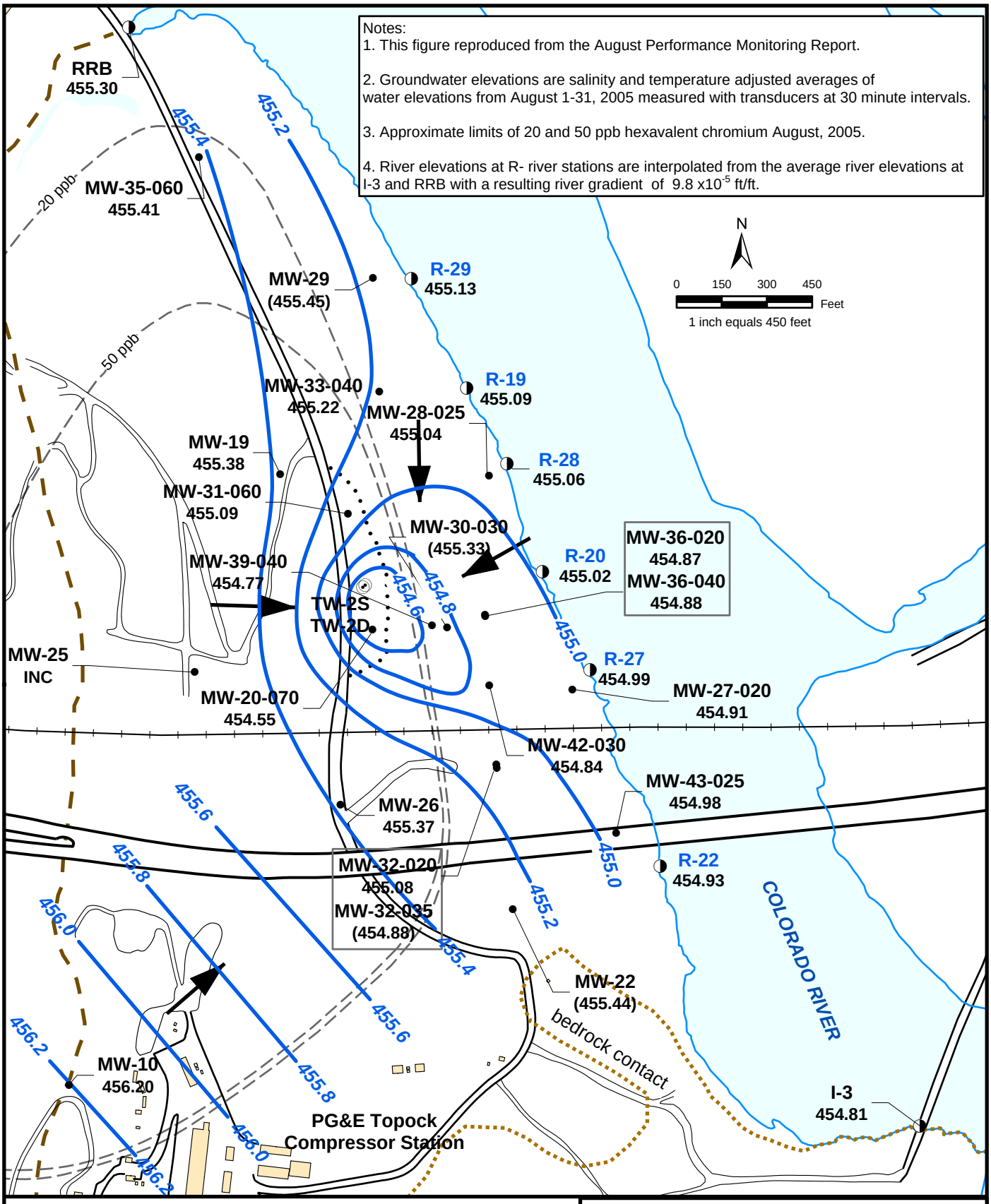


FIGURE B-2A
AVERAGE GROUNDWATER SHALLOW WELLS AND RIVER ELEVATIONS, AUGUST 2005
INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_UA_AUGUST1_31_05.MXD

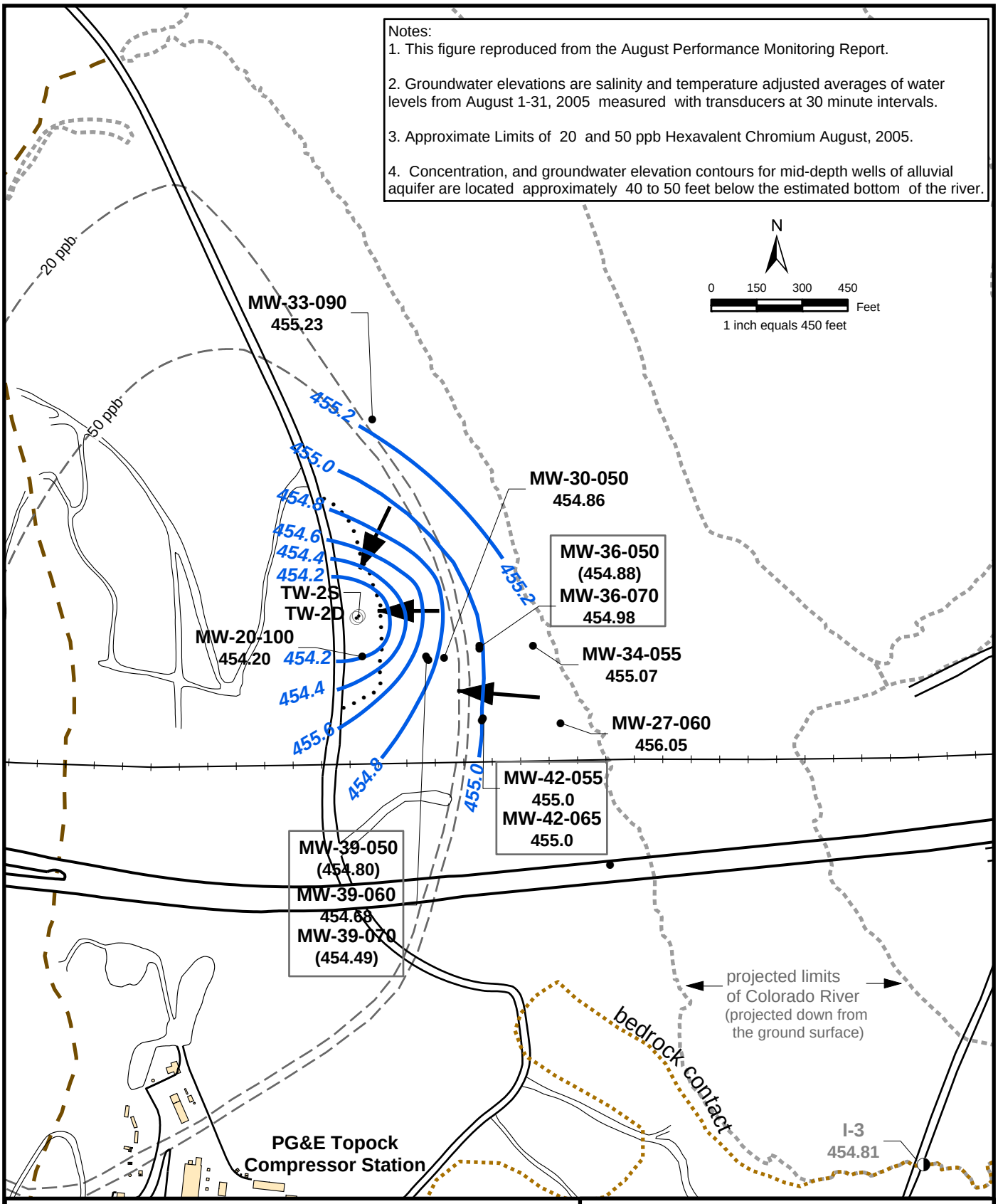


FIGURE B-2B
AVERAGE GROUNDWATER ELEVATIONS MID-DEPTH WELLS AUGUST 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_MA_AUGUST1_31_05.MXD
IM_AVERAGE_GROUNDWATER_MA_AUGUST1_31_05.PDF

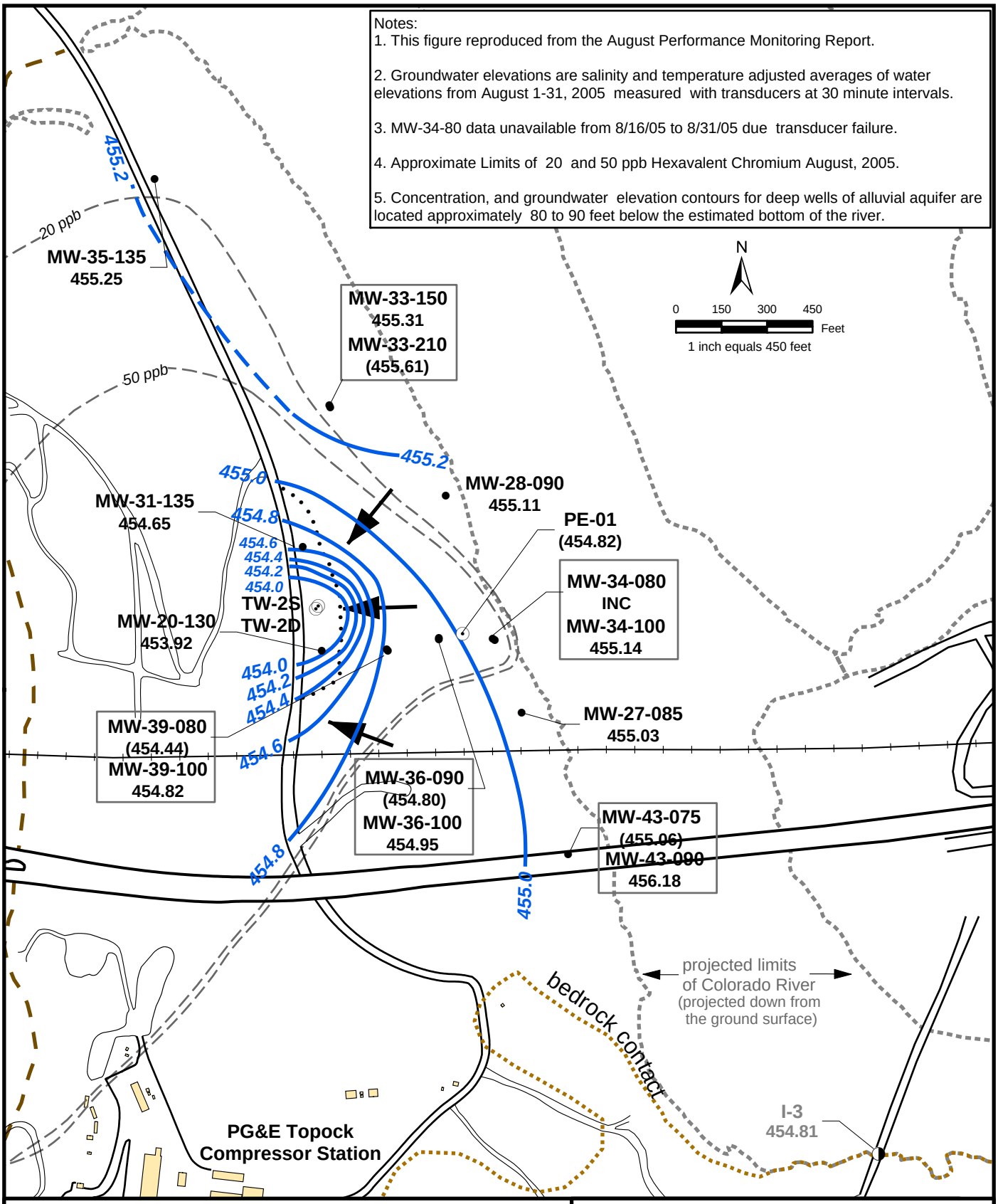


FIGURE B-2C
AVERAGE GROUNDWATER ELEVATIONS DEEP WELLS AUGUST, 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_LA_AUGUST1_31_05.MXD
IM_AVERAGE_GROUNDWATER_LA_AUGUST1_31_05.PDF

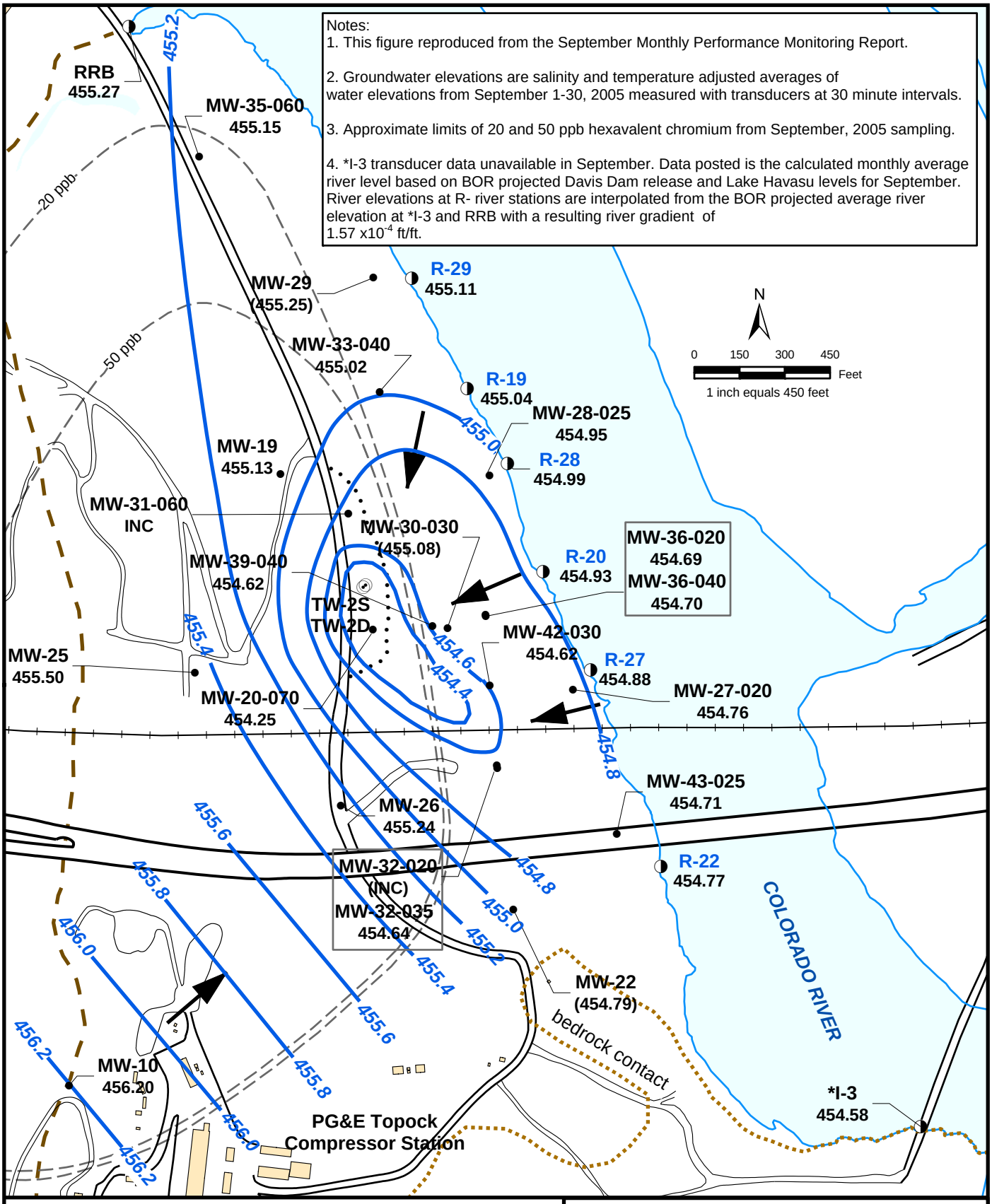


FIGURE B-2D
AVERAGE GROUNDWATER SHALLOW WELLS AND RIVER ELEVATIONS SEPTEMBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_UA_SEPT1_30_05.MXD

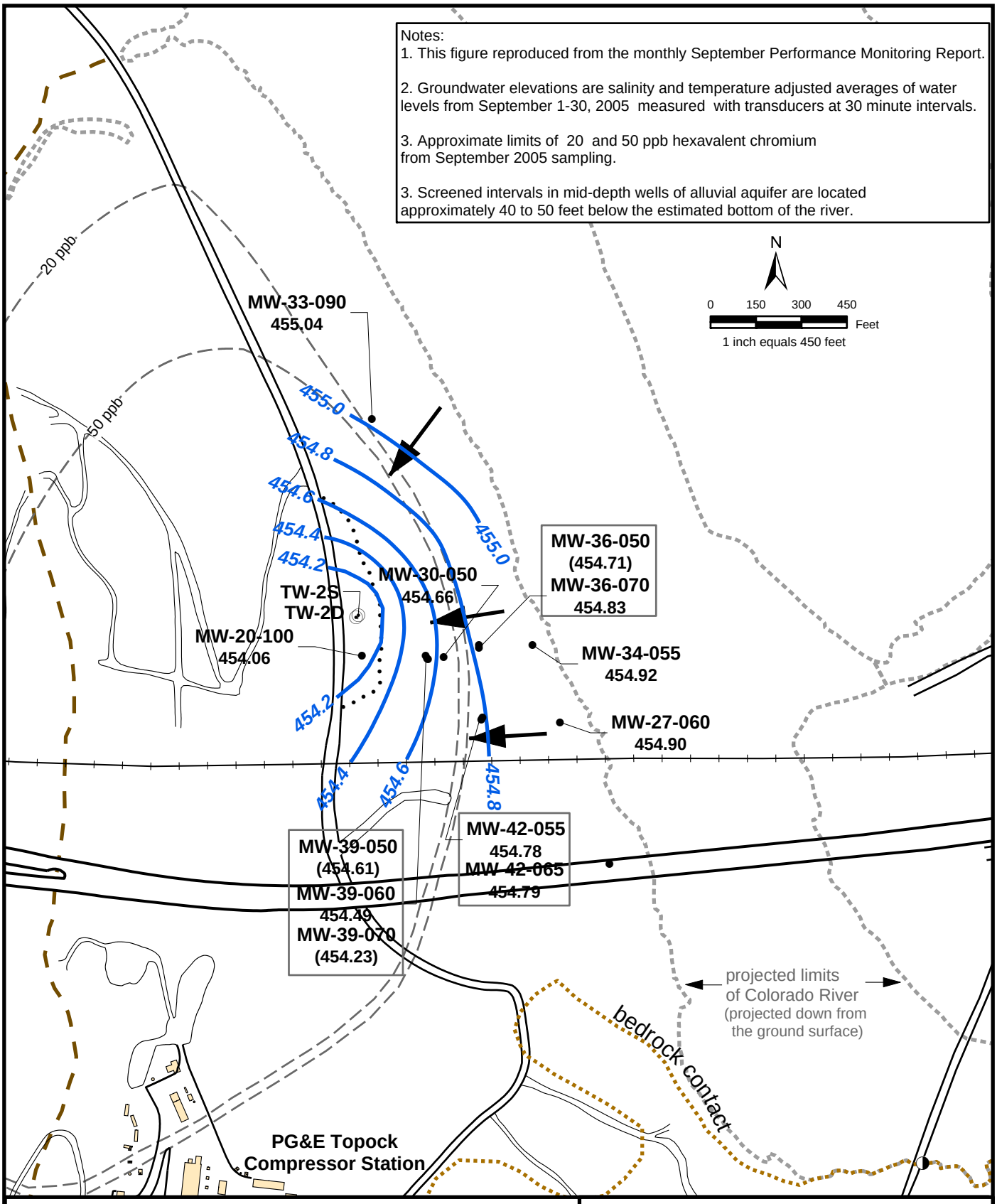


FIGURE B-2E
AVERAGE GROUNDWATER ELEVATIONS MID-DEPTH WELLS SEPTEMBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_MA_SEPT1_30_05.MXD
IM_AVERAGE_GROUNDWATER_MA_SEPT1_30_05.PDF

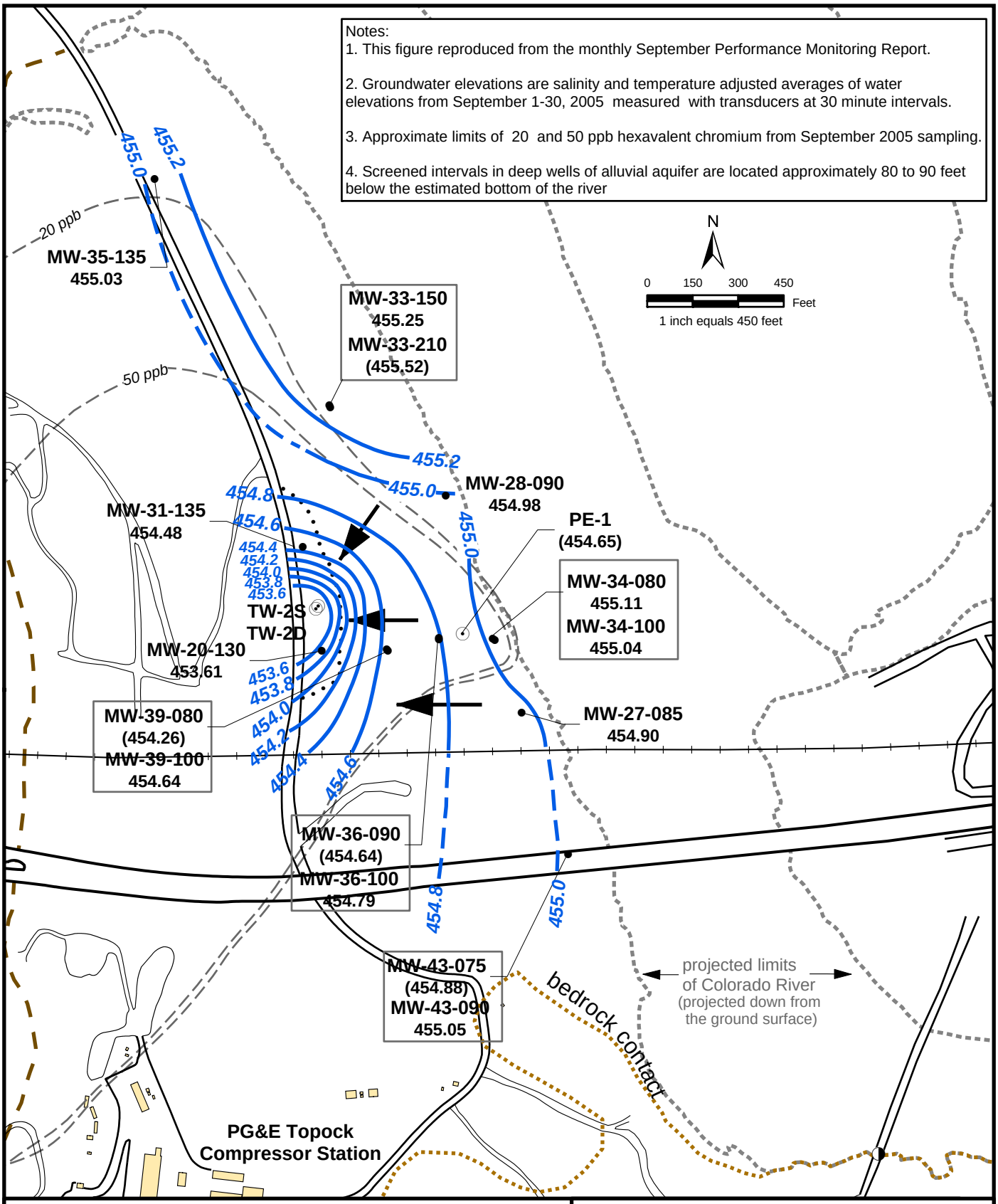


FIGURE B-2F
AVERAGE GROUNDWATER ELEVATIONS DEEP WELLS SEPTEMBER 2005

INTERIM MEASURES PERFORMANCE MONITORING
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\GW\IM_AVERAGE_GROUNDWATER_LA_SEPT1_30_05.MXD

Appendix C
Chemical Performance Monitoring Analytical Results

TABLE C-1
Chemical Performance Monitoring Results, March 2004 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
Monitoring Wells														
MW-20-70	03-Mar-04	2300	-6.5	-39.0	890	440	9.7	0.6	230	52	11	480	0.3	75
	03-Mar-04 FD	2300	-6.5	-53.0	890	440	9.7	0.6	220	51	11	460	0.3	72
	11-May-04	2100	-5.5	-53.0	800	450	10	ND (0.5)	210	48	9.7	490	0.4	76
	24-Sep-04	2200	-6.5	-57.0	824	402	9.7	ND (1)	180	58.5	12	430	0.2	74
	16-Dec-04	2080	-7.3	-60.0	753	374	9.68	0.604	177 J	52.5	9.05	410	0.497	70
	10-Mar-05	1940	-7.1	-59.0	740	378	9.98	ND (1)	198	55.4	9.89	431	0.412	81.7
	15-Jun-05	1980	-7	-60.0	749	388	9.79	ND (1)	189	55.4	10.5	433	0.414	73.8
	15-Jun-05 FD	2050	-8.3	-57.0	760	392	9.81	ND (1)	204	60.7	11.4	468	0.445	71.3
	11-Oct-05	1950	---	---	737	359	9.48	0.641	198	49.9	14.6	323	0.402	69.9
MW-20-100	03-Mar-04	3400	-4.2	-38.0	1300	740	9.6	0.7	170	20	11	1100	1	82
	11-May-04	3600	-2.7	-37.0	1300	700	9.6	0.5	150	18	10	1100	1	81
	24-Sep-04	3000	-4.8	-44.0	1180	621	8.85	ND (1)	140	23	13	860	0.8	100
	16-Dec-04	2840	-5	-47.0	1050	562	8.5	0.654	152	23.4	16.6	772	0.971	90
	10-Mar-05	2490	-5.2	-49.0	466	511	9.98	ND (1)	133	19.8	8.98	712	0.859	84.2
	15-Jun-05	2500	-4.7	-46.0	921	506	9.02	ND (1)	137	21.3	9.06	592	0.713	84
	11-Oct-05	2400	---	---	887	484	8.87	0.731	170	23.7	15.2	500	0.718	82.3
MW-20-130	03-Mar-04	11000	-6.6	-60.0	6200	960	6.2	ND (2.5)	400	19	35	3500	1.7	45
	11-May-04	8300	-5	-49.0	3300	1000	9.8	ND (0.5)	280	14	26	2500	1.7	62
	24-Sep-04	7800	-4.4	-45.0	7240	2280	9.8	ND (4)	240	15	33	2400	1.9	66
	27-Jan-05	7350	-5.7	-48.0	3790	1140	10.4	3.16	313	16.1	43.5	2260	2.03	66
	09-Mar-05	5520	-5.8	-56.0	3120	1080	10.9	ND (1)	219	12.1	24.7	2250	1.9	68.9
	09-Mar-05 FD	6200	-5.4	-51.0	3080	1080	10.9	ND (1)	231	12.8	25.4	2390	1.99	68.9
	15-Jun-05	7790	-5	-48.0	3410	1230	11.1	ND (1)	352	23.2	31.3	2980	2.75	68.7
	07-Oct-05	7330	---	---	3010	1210	10.9	1.04 J	349	13.9	38.4	2070	2.41	72.4
MW-25	03-Mar-04	970	-7.7	-56.0	300	220	4.2	ND (0.5)	92	18	7.8	230	0.4	140
	14-May-04	1000	-8.9	-59.0	310	210	4.2	ND (0.5)	89	19	8	230	0.4	130
	09-Jun-04	---	---	---	---	---	---	---	108	17.1	---	---	0.376	---
	22-Sep-04	1000	-7.6	-58.0	296	196	3.93	0.42	81	16.6	7.4	230	ND (0.2)	140
	09-Mar-05	877	-8.4	-62.0	247	169	3.64	ND (0.5)	77.6	16.1	6.24	211	0.441	158
	14-Jun-05	942	-8.6	-61.0	289	183	3.89	ND (0.5)	93.5	20	8.91	253	0.464	137

TABLE C-1
Chemical Performance Monitoring Results, March 2004 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
Monitoring Wells														
MW-25	14-Jun-05 FD	980	-7.2	-59.0	294	185	3.94	ND (0.5)	100	20.9	9.06	268	0.475	137
	04-Oct-05	950	---	---	252	171	3.77	ND (0.5)	83.3	14.9	9.93	164	0.362	141
	04-Oct-05 FD	910	---	---	251	171	3.75	ND (0.5)	94.6	15.3	10.2	185	0.371	146
MW-26	03-Mar-04	1900	-6.7	-54.0	770	400	4.6	ND (0.5)	170	40	12	470	0.5	110
	14-May-04	9300 R	-8.4	-60.0	850	480	5.1	ND (0.5)	190	50	14	490	0.6	110
	22-Sep-04	2300	-6.7	-59.0	821	472	5.65	ND (1)	170	46	13	390	0.4	98
	16-Dec-04	2130	-8.6	-64.0	835	388	5	0.578	176	45.7	17.8	466	0.662	100
	08-Mar-05	1840	-8.8	-70.0	756	370	4.48	ND (0.5)	166	41.6	10.7	439	0.557	98.7
	08-Mar-05 FD	1800	-8.7	-70.0	708	338	4.45	ND (0.5)	166	40.9	11.4	438	0.559	96.1
	13-Jun-05	2130	-8.2	-65.0	847	371	4.9	ND (0.5)	178	44.6	14	511	0.663	103
	04-Oct-05	2120	---	---	779	372	4.88	0.601	166	40.4	19.8	352	0.526	109
MW-27-20	03-Mar-04	640	-11.7	-100.0	74	200	ND (0.4)	ND (0.5)	79	26	4	84	ND (0.2)	180
	12-May-04	570	-11.3	-98.0	72	200	ND (0.4)	ND (0.5)	77	25	3.7	87	ND (0.2)	170
	21-Sep-04	670	-12.3	-92.0	77.2	212	ND (0.2)	ND (0.2)	76	26	5	82	ND (0.2)	160
	15-Dec-04	692	-11.9	-101.0	87.2	236	ND (0.5)	ND (0.5)	91.5	32.6	4.61	88.4	ND (0.2)	169
	08-Mar-05	1250	-12	-102.0	190	432	ND (0.5)	ND (0.5)	137	56.6	4.89	195	ND (0.2)	215
	18-Jul-05	---	-11.9	-98.0	81.9	228	ND (0.5)	ND (0.5)	96.1	30.1	4.27	94.8	ND (0.2)	160
	05-Oct-05	742	---	---	91.1	252	ND (0.5)	ND (0.5)	88.6	31.4	5.48	81	ND (0.2)	175
MW-28-25	04-Mar-04	1000	-11.3	-95.0	220	290	ND (0.4)	ND (0.5)	120	33	3.8	210	0.2	260
	11-May-04	800	-11.3	-95.0	110	270	ND (0.4)	ND (0.5)	110	29	3.9	120	ND (0.2)	240
	07-Jun-04	890	-12.5	-100.0	150	220	ND (0.4)	---	---	---	---	---	---	---
	20-Sep-04	850 J	-11.7	-89.0	99.1	286	ND (0.4)	ND (0.2)	110	30	4.6	120	ND (0.2)	210
	14-Dec-04	810	-12	-99.0	110	310	ND (0.5)	ND (0.5)	122	35.7	4.78	103	ND (0.2) J	202
	10-Mar-05	880	-12.2	-95.0	112	302	ND (0.5)	ND (0.5)	129	36.3	3.5	122	ND (0.2)	204
	15-Jun-05	974	-11.6	-91.0	108	359	ND (0.5)	ND (0.5)	133	38.9	6.54	117	ND (0.2)	221
	06-Oct-05	884	---	---	99.8	300	ND (0.5)	ND (0.5)	123	37	6.61	88.7	ND (0.2)	197
MW-30-30	04-Mar-04	36000	-9	-76.0	19000	4100	ND (4)	5.2	1000	1000	50	9600	3.6	570
	12-May-04	30000	-7.8	-71.0	14000	3000	ND (4)	ND (50)	1300	800	47	8300	2.8	610
	23-Sep-04	42000	-9.5	-73.0	22000	4500	ND (200)	ND (100)	900	890	76	11000	4.1	570
	15-Dec-04	45500	-9.5	-79.0	19900	4730	ND (5)	8.14	1300	1400	118	6110	7.84	458

TABLE C-1
Chemical Performance Monitoring Results, March 2004 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
Monitoring Wells														
MW-30-30	10-Mar-05	38800	-9.8	-79.0	16000	4270	ND (5)	7.91	1590	1600	95.4	13600	4.97	421
	07-Oct-05	36400	---	---	17600	4000	ND (0.5)	ND (10)	1020	842	93.6	7650	5.2	521
MW-30-50	05-Mar-04	6100	-6.4	-58.0	3000	750	1.2	ND (5)	280	120	16	1600	0.9	280
	05-Mar-04 FD	5900	-6.6	-56.0	2900	730	1.2	ND (5)	290	120	15	1600	0.9	280
	14-May-04	6300	-7.7	-54.0	2700	800	3.5	ND (5)	270	100	15	1700	1.2	180
	14-May-04 FD	6500	-7.5	-54.0	2600	800	3.5	ND (5)	270	110	16	1700	1.1	180
	23-Sep-04	6600	-7.3	-58.0	3330	742	1.58	ND (10)	290	100	18	1800	0.9	240
	23-Sep-04 FD	6800	-6.7	-58.0	3220	694	1.64	ND (10)	310	110	19	1900	0.9	240
	15-Dec-04	6750	-7.9	-63.0	3040	716	ND (0.5)	1.14	378	117	36.5	1720	1.39	249
	15-Dec-04 FD	6690	-7.8	-64.0	2920	725	ND (0.5)	1.13	372	114	37.8	1700	1.43	249
	10-Mar-05	6470 J	-8.3	-68.0	4660	672	ND (0.5)	1.03	335	107	16.5	2040	1.15	324
	07-Oct-05	6860	---	---	3060	857	ND (0.5)	0.899 J	438	101	37	1780	1.27	252
MW-31-60	03-Mar-04	1700	-8.1	-60.0	750	280	6.2	ND (0.5)	160	22	7.9	420	0.4	72
	14-May-04	1900	-9	-59.0	750	260	5.5	ND (0.5)	150	22	7.5	420	0.4	74
	22-Sep-04	1700	-8	-61.0	691	236	5.45	0.46	130	19	7.9	430	ND (0.2)	79
	16-Dec-04	1640	-8.7	-64.0	691	246	5.36	ND (0.5)	118	18.5	9.67	421	0.44	80
	09-Mar-05	1540	-8.6	-63.0	649	210	4.94	ND (0.5)	108	17.3	5.97	424	0.401	76.6
	13-Jun-05	1660	-8.2	-65.0	745	207	4.12	ND (0.5)	121	18.9	6.57	403	0.388	70
	06-Oct-05	1660	---	---	691	206	4.01	ND (0.5)	109	16.5	9.75	308	0.462	77.3
MW-32-20	04-Mar-04	6200	-8	-64.0	2900	540	ND (0.4)	ND (5)	520	180	13	1500	1.1	570
	12-May-04	5000	-7.1	-70.0	2100	130	ND (0.4)	ND (5)	510	180	16	1100	0.8	600
	20-Sep-04	21000 J	-7.3	-63.0	10200	3800	ND (0.4)	ND (100)	1100	420	45	4900	3	920
	14-Dec-04	16100	-8.2	-66.0	8890	1990	ND (5)	ND (5)	1140	400	46.8	3500	4.22 J	784
	09-Mar-05	12500	-7.2	-65.0	6930	1660	ND (0.5)	3.51	838	302	36.9	4000	2.76	123
	17-Jun-05	10200	-9	-67.0	4810	690	ND (0.5)	ND (2.5)	566	231	23.3	2620	1.75	676
	04-Oct-05	28800	---	---	14200	2420	ND (5)	6.19	1380 J	613 J	91.1 J	5400 J	4.75 J	733
MW-32-35	04-Mar-04	4200	-8	-65.0	1900	470	ND (0.4)	ND (5)	340	99	13	1100	1	310
	12-May-04	4500	-6.9	-64.0	1900	460	ND (0.4)	ND (5)	330	94	12	1100	0.9	320
	21-Sep-04	4500	-8.7	-63.0	2150	422	ND (0.2)	ND (10)	320	89	14	990	0.9	310
	15-Dec-04	4120	-8.5	-67.0	1760	524	ND (0.5)	0.89	351	96.3	24.7 J	954	1.28	276

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Chemical Performance Monitoring Results, March 2004 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
Monitoring Wells														
MW-32-35	09-Mar-05	3560	-8.2	-68.0	1770	465	ND (0.5)	0.845	312	85.5	13	944	1.07	260
	17-Jun-05	7550	-9.5	-72.0	3520	787	ND (0.5)	ND (2.5)	506	120	14.8	2110	1.18	223
	04-Oct-05	8340	---	---	3840	765	ND (0.5)	ND (5)	567	134	29.3	1530	1.26	208
MW-34-55	04-Mar-04	6700	-9.6	-77.0	3200	850	ND (0.4)	ND (5)	360	97	13	2000	1.2	270
	13-May-04	5700	-10.3	-77.0	2700	770	ND (0.4)	ND (5)	310	77	15	1900	1	270
	08-Jun-04	---	---	---	---	---	---	---	246	68.3	---	---	1.18	---
	22-Sep-04	5800	-11	-82.0	2700	732	ND (0.2)	ND (10)	260	85.2	17	1800	0.9	250
	15-Dec-04	5860	-10.9	-83.0	2390	743	ND (0.5)	0.743	288	69.9	33	1540	1.34	234
	10-Mar-05	6230	-10.8	-82.0	2620	739	ND (0.5)	0.654	366	71.3	29.1	1900	1.19	240
	15-Jul-05	---	-10.3	-84.0	2250	607	ND (0.5)	ND (0.5)	247	52	16.5	1420	1.02	242
	05-Oct-05	5150	---	---	2170	619	ND (0.5)	ND (0.5)	272	59.1	25.8	1230	1.2	232
MW-34-80	05-Mar-04	8800	-8.9	-75.0	4700	1000	ND (0.4)	ND (5)	280	24	25	2600	1.7	180
	13-May-04	8800	-10.2	-77.0	3900	1000	ND (4)	ND (5)	390	54	27	2800	1.4	270
	13-May-04 FD	9100	-10.2	-76.0	4000	1000	ND (4)	ND (5)	390	53	27	2700	1.5	280
	08-Jun-04	---	---	---	---	---	---	---	396	56.6	---	---	1.72	---
	23-Sep-04	8900	-9.9	-79.0	4050	997	ND (10)	ND (10)	410	76	32	2800	1.4	290
	23-Sep-04 FD	9900	-9.6	-78.0	4170	998	ND (10)	ND (10)	410	84.3	35	2800	1.5	290
	13-Dec-04	---	---	---	---	---	---	---	455	55	40.4	2220	1.63	---
	08-Mar-05	6940	-10.4	-83.0	4180	1040	ND (0.5)	1.01	439	68.1	28	2750	1.65	304
	15-Mar-05	8980	---	---	3920	ND (5)	ND (1)	---	445	65.7	29.7	2990	---	288
	30-Jun-05	7840	-8.4	-82.0	3910	979	ND (0.5)	ND (0.5)	497	76.5	27.7	2670	1.66	302
	05-Oct-05	10200	---	---	3880	1060	ND (0.5)	ND (0.5)	429	72.5	47.4	1660	1.57	302
Surface Water Stations														
R-27	03-Mar-04	630	-11.4	-86.0	87	250	ND (0.4)	ND (0.5)	77	28	4.4	94	ND (0.2)	140
	12-May-04	590	-11.4	-96.0	84	240	ND (0.4)	ND (0.5)	74	27	4.8	96	ND (0.2)	140
	22-Sep-04	680	-12.1	-98.0	88.4	237	0.38	ND (0.2)	77	29	4.8	99	ND (0.2)	130
	13-Dec-04	632	-11.4	-95.0	84.4	235	ND (0.5) R	ND (0.5)	79.6	31.4	4.95	86.5	ND (0.2) J	125
	07-Mar-05	669	-12.3	-102.0	92.7	244	ND (0.5)	ND (0.5)	82.8	31.3	4.72	108	ND (0.2)	136
	14-Jun-05	686	-11.4	-92.0	90.9	266	ND (0.5)	ND (0.5)	81.9	29.8	6.04	98.9	ND (0.2)	127
	05-Oct-05	678	---	---	85.1	255	ND (0.5)	ND (0.5)	101	36.2	6.56	91.2	ND (0.2)	130

TABLE C-1
Chemical Performance Monitoring Results, March 2004 through October 2005
Interim Measures Performance Monitoring
PG&E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
Surface Water Stations														
R-28	03-Mar-04	670	-11.3	-90.0	87	250	0.5	ND (0.5)	78	28	4.4	93	ND (0.2)	140
	12-May-04	580	-11.5	-98.0	84	240	ND (0.4)	ND (0.5)	72	26	4.2	92	ND (0.2)	140
	22-Sep-04	680	-12.1	-99.0	104	240	0.38	ND (0.2)	79	30	4.9	99	ND (0.2)	130
	13-Dec-04	652	-11.1	-95.0	84.8	236	ND (0.5) R	ND (0.5)	79.9	31.5	4.93	86	ND (0.2) J	133
	08-Mar-05	651	-12.5	-102.0	90.4	231	ND (12.5)	ND (0.5)	83.7	31.4	5.02	107	ND (0.2)	132
	14-Jun-05	680	-11.6	-95.0	91.2	268	ND (0.5)	ND (0.5)	78.5	28.5	5.08	94.5	ND (0.2)	127
	05-Oct-05	672	---	---	85.5	255	ND (0.5)	ND (0.5)	85.7	30.4	6.3	77	ND (0.2)	122

NOTES:

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

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 reported as carbonate (CaCO3). Nitrate reported as Nitrogen (N).

Monitoring wells MW-30-30 and MW-30-50 were not sampled during the June 2005 monitoring event due to floodplain inaccessibility.

Stable isotope data for the October 2005 monitoring event not available due to laboratory issues.

Appendix D
Extraction System Operations Log for October 2005

Appendix D

Extraction System Operations Log for October 2005
PG&E Topock Interim Measures Performance Monitoring Program

During October 2005, the operational run time for the IM groundwater extraction system (wells TW-2D and TW-2S combined) was 93 percent and the operational run time for well TW-2D was 89 percent.

An operations log for the IM extraction system, including downtimes, during October 2005 is summarized below.

- **October 1 through 10**: Operated extraction well TW-2D at a target pump rate of 90 gpm.
- **October 5:** Extraction well TW-2D and IM No. 3 treatment system were shut down to install an air line connection for the microfilter system. Extraction well downtime was 4 hours 48 minutes.
- **October 9:** Extraction well TW-2D and IM No. 3 treatment system were shut down for 12 minutes due to a low-flow alarm on a sodium hydroxide feed pump.
- **October 10 through 11:** Operated extraction well TW-2S at a target pump rate of 45 gpm while the well pump in TW-2D was replaced due to an apparent pump motor failure.
- **October 10:** Extraction well TW-2D pump failed at 6:40 a.m. and extraction well TW-2S was brought online at 7:30 a.m. The pump in extraction well TW-2D was replaced on October 11 and resumed full-time operation at 5:06 p.m. Extraction well system downtime was approximately 50 minutes on October 10 to switch operation from well TW-2D to TW-2S.
- **October 11 through 31:** Operated extraction well TW-2D at a target pump rate of 90 gpm.
- **October 12:** Extraction well TW-2D and IM No. 3 treatment system were shut down due to a microfilter pressure transducer malfunction. Extraction well downtime was 41 minutes.
- **October 13:** Extraction well TW-2D was shut down for 49 minutes due to high water level in the raw water receiving tank (T-100).
- **October 17:** Extraction well TW-2D and IM No. 3 treatment system were shut down due to alarm in the leak detection system. The leak detection points in the pipeline were inspected and no liquid was observed. The leak detection system control panel was shipped to the manufacturer for repair due to apparent lightning damage. Extraction well downtime was 1 hour. The onsite operators physically inspected the leak detection points along the pipeline for the remainder of the month while the control panel was repaired. No liquid was observed in the secondary containment pipe during any inspection. The control panel is scheduled to be re-installed during early-November 2005.

- **October 26:** Extraction well TW-2D and the IM No. 3 treatment system were shut down for 26 minutes to switch from generator power to City of Needles power. Between September 26 and October 26, 2005, the facility operated on generator power until the transient voltage surge suppression could be replaced.
- **October 26, 28, and 30:** Extraction well TW-2D and the IM No. 3 treatment system were shut down to conduct chemical cleaning (i.e., clean in place) of the microfilter membranes. Extraction well TW-2D was shut down for a total of 18 hours 9 minutes while cleaning activities were conducted.
- **October 31:** Extraction well TW-2D and the IM No. 3 treatment system were shut down due to encountering in-line pH meter readings outside of the operating target range. One pH meter was re-calibrated and returned to service, and one pH meter was replaced with a spare. Extraction well TW-2D downtime was 2 hours 30 minutes.