Pacific Gas and Electric Company

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July 3, 2008

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

Mr. Robert Perdue
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, California 92260

Subject: Proposed Modifications to the Groundwater Monitoring Plan for Interim Measures No. 3 Injection Area Compliance Monitoring Program
PG&E Topock Compressor Station, Needles, California

Dear Mr. Yue and Mr. Perdue:

The Interim Measures (IM) No. 3 Injection Area Compliance Monitoring Program (Injection Area CMP), approved by the California Department of Toxic Substances Control (DTSC) and California Regional Water Quality Control Board, Colorado River Basin Region (Water Board) in June 2005, contained a sampling schedule that specifically addressed only the first two years of operation. The first two years of sampling were thought to provide sufficient observation well (OW) information to determine the effects of injection of treated groundwater on the local system, while also providing two years' worth of background information for the compliance wells (CW). (It was predicted that no effects would be observed in the compliance wells within this time period.) Information from 3rd Quarter 2005 through 3rd Quarter 2006 was summarized in the *2006 Performance Assessment Report for the Interim Measure No. 3 Injection Well Field*, dated December 15, 2006.

Based on the sampling conducted to date, Pacific Gas and Electric Company (PG&E) is requesting that, at this time, DTSC and the Water Board consider modifications to the Injection Area CMP. The Water Board Order No. R7-2006-0060 states that "Monitoring locations, sampling frequencies, and monitored constituents shall not be changed without notification to, and having the approval of the Regional Water Board's Executive Officer." (Attachment C, Section I.A.1). With these considerations, the body of monitoring data collected from September 2004 to January 2008 has been evaluated. This letter documents the proposed changes to the Injection Area CMP at PG&E's Topock Compressor Station and provides the rationale for specific modifications.

Current Setting

The Injection Area CMP monitoring well network consists of 17 wells at seven separate locations. Nine of the wells are labeled as observation wells and are clustered in groups of three at three separate ground locations, approximately 100 feet from the injection wells (IW). Eight of the wells are labeled as compliance wells and are clustered in groups of two at four separate ground locations, varying from approximately 300 to 700 feet from the injection wells. The observation well clusters constitute the inner network of monitoring wells surrounding the injection wells and were installed specifically to provide information on the changes in groundwater hydraulics or water quality without having to wait several years for treated water to arrive at the compliance points. By monitoring the changes close in, at the observation wells, adjustments could be made to the injection system in the initial operation period long before any effects would be observed in the more distant compliance monitoring wells. The travel time for the injected water to reach the observation wells was estimated in the Technical Memorandum "Selection of Locations for Compliance Monitoring Wells," dated November 9, 2004, to be approximately 2 to 4 months, and the estimated travel time for the injected water to reach the compliance wells was 3 to 5 years. The stated objectives of the Injection Area CMP are to:

- Monitor water levels to assess groundwater flow directions and the development of groundwater mounding near the injection wells.
- Monitor the rate at which injected groundwater migrates from the injection wells.
- Monitor water quality throughout the upper, middle, and lower aquifer zones to evaluate the degree of vertical migration and mixing of groundwater during groundwater injection.
- Detect any measurable aquifer plugging due to turbidity in the injected water, precipitation of minerals in the aquifer matrix, or cation exchange effects.
- Assess whether injection of treated water results in any mobilization of trace metals from aquifer sediments to groundwater as a result of changes in pH, oxidation-reduction potential, and major ion composition.

The first two objectives concern the use of water-level data collected under the program. Beginning with the 3rd quarter 2005, each quarterly report has presented potentiometric surface maps for the three alluvial aquifer depths over the quarterly report time period. These maps, provided as Figures 1 through 3, present the potentiometric surfaces developed from the 4th quarter 2007 water levels and are representative of how the potentiometric surface surrounding the injection wells has changed little since injection began approximately 3 years ago. The effects of injection in the injection well field are superimposed on the more regional Topock site flow system and, as expected, a groundwater mound can be seen around the injection wells. This mound is centered on the active injection well IW-3. The potentiometric surfaces in prior CMP reports mapped the growth of the groundwater mound over time and show that, after 30 months of injection, the mound has only increased in height by several tenths of a foot in elevation above the surrounding water-level elevations. While the mound is a visible feature on the potentiometric surface maps, it does not appear to significantly change in height relative to surrounding monitoring wells as injection continues.

The last three objectives concern the use of water quality data collected under the program. Eleven quarters of water quality monitoring data have been collected and reported between 3rd Quarter 2005 and 1st Quarter 2008. Quarterly and semiannual monitoring reports contain summary graphics of how the observation and compliance well water quality have changed over time. Figures 4 through 8 present this information from the 4th Quarter 2007 CMP Groundwater Monitoring Report . The 4th Quarter 2007 report is the basis for the following discussion as it contains the most recent complete set of observation and compliance monitoring well data. Preliminary review of 2nd Quarter 2008 data shows that, while 2nd Quarter 2008 report graphics are not yet available for inclusion in this letter, the results of sampling are consistent with those presented on the 4th Quarter 2007 figures.

As of the 4th Quarter 2007, all middle-zone and deep-zone observation wells show water quality similar to treated water. Water quality in these wells has stabilized and does not vary from quarter to quarter. The OW shallow-depth wells (OW-1S, OW-2S, and OW-5S) do not reflect treated water quality, but show little water quality variation over time and generally have no net trends over time. All observation well water quality hydrographs show the same overall pattern: water quality has stabilized and does not change significantly from quarter to quarter.

Compliance well water quality hydrographs, in general, show no trend in concentration, with only minor variation over time. Well CW-1D and CW-1M are exceptions to this and are most likely affected by treated injection water. In a similar fashion to the observation wells, once the compliance well is affected by treated injection water, its water quality stabilizes and does not change significantly over time. The overall response seen in the compliance well water quality hydrographs reflects a hydrogeologic system that is undergoing only gradual change during the approximate 30-month period of injection.

Eleven quarters of monitoring data, both water level and water quality, support that the objectives of the injection area CMP have been achieved. Analyses of these data show that the system is stable and functioning properly and that any significant change to water level or water quality is due to the predictable pattern of treated water moving radially from the injection well, replacing original aquifer water quality with the water quality of treated injection water, with no observed adverse effects. This conclusion is consistent with those made in the approved *2006 Performance Assessment Report for the Interim Measure No. 3 Injection Well Field*.

Proposed Modifications to the Monitoring Program

Based on the assessment of the monitoring data, four proposed modifications to the monitoring program are discussed below and are summarized in Table 1 and Table 2.

Sampling Frequency

As discussed above, the middle and deep observation wells have monitored change as the treated injection water front arrived and replaced the original water quality. However, shallow-zone observation well water quality has not changed since the start of injection. Replacement of the local groundwater by treated water was complete in the three deep zone observation wells by 4th Quarter 2005 and in the middle-zone observation wells by 3rd Quarter

2006. After these dates, water quality has varied little and is reflective of the treated injection water quality. Evidence of either metals mobilization or dissolution/precipitation reactions caused by mixing of treated water with local groundwater have not been observed. Therefore, while shallow-zone water quality may still change due to injection, changes to groundwater quality in the middle and deep zones no longer warrant the level of monitoring in the observation wells carried out in the first 2 years of injection.

Therefore, PG&E proposes to modify the sampling frequencies for water quality observation wells as follows (see Table 1):

- Sample all middle- and deep-zone observation wells annually, as opposed to quarterly.
- Sample all shallow zone observations wells semiannually, as opposed to quarterly.
- No change to the frequency of water quality sampling in the compliance monitoring wells is requested.

TABLE 1
Sampling Schedule and Analyses
Interim Measures No. 3. Revised Compliance Monitoring Program, PG&E Topock Compressor Station

	Approved Sampling Program				Proposed Sampling Program	
Monitoring Wells	**QTR 1**	**QTR 2**	**QTR 3**	**QTR 4**	**QTR 2**	**QTR 4**
Observation Wells						
OW-1S	L	F	L	F	L	L
OW-1M	L	F	L	F		L
OW-1D	L	F	L	F		L
OW-2S	L	F	L	F	L	L
OW-2M	L	F	L	F		L
OW-2D	L	F	L	F		L
OW-5S	L	F	L	F	L	L
OW-5M	L	F	L	F		L
OW-5D	L	F	L	F		L
Compliance Wells						
CW-1M		F		F	L	F
CW-1D		F		F	L	F
CW-2M		F		F	L	F
CW-2D		F		F	L	F
CW-3M		F		F	L	F
CW-3D		F		F	L	F
CW-4M		F		F	L	F
CW-4D		F		F	L	F

Notes:

Analytical suites are presented in Table 2.

F - Full Suite (unchanged in proposed sampling program).
L - Limited Suite (a revision is included in the proposed sampling program – see Table 2).

Water levels monitored at the observation wells showed a rapid response to the onset of injection, increasing by several tenths of a foot within the first two quarters. Water levels within the injection well field not only reflect injection, but also reflect atmospheric, river stage, and regional water level changes. However, the relative change between the observation wells over this time period (i.e., the height of the groundwater mound) is only several tenths of a foot. This minimal growth of an injection mound does not warrant continuous monitoring in all observation wells.

Therefore, PG&E proposes to modify the sampling frequencies for water levels in observation wells as follows:

- Monitor water levels at wells OW-1M, OW-1D, OW-2M and OW-2D by hand prior to sampling.
- Continue to monitor water levels at wells OW-1S, OW-2S, OW-5S, OW-5M, and OW-5D by pressure transducers.
- No change to the frequency of water-level monitoring in the compliance monitoring wells is requested.

It is proposed that the above changes in frequency be applied for 2 additional years beyond the original Injection Area CMP schedule (through July 2009). After that time, PG&E proposes, that monitoring of intermediate- and deep-screened observation wells be discontinued. Given that the observation well's water level and water quality are predictable and consistent, 4 years is a sufficient duration to verify that the observation wells have completed their objectives. Compliance wells will need to be monitored for the duration of the use of the injection well field.

Analytes Suite

The current suite of 36 analytes was proposed to provide a baseline for pre-injection background water quality and to measure changes in water quality over time due to mixing and geochemical interaction of injected water in the aquifer. Three potential adverse consequences of geochemical interactions were initially contemplated during Injection Area CMP development, none of which has been found to occur at the injection site. These potential interactions included:

- Metals mobilization; increases in the local groundwater's oxidation reduction potential have not mobilized metals potentially bound up in the aquifer matrix material.
- Precipitation reactions; mixing reactions have not caused plugging of the aquifer.
- Increased total dissolved solids (TDS); differences in composition between the local groundwater and treated injection water have not caused dissolution or increases in the TDS load.

Changes to groundwater samples ionic chemistry caused by precipitation or dissolution reactions in the wells where the treated injection water front has arrived are not seen after

approximately 3 years. The water chemistry in the observation wells affected by injection has stabilized and is essentially the same as the treated injected water.

Water quality sample results from the Injection Area are currently reviewed quarterly in the Injection Area CMP Groundwater Monitoring Reports and have also been reviewed in the *2006 Performance Assessment Report for the Interim Measure No. 3 Injection Well Field* and the *2006 Request for Approval to Implement Limited Sampling Frequency for Selected Metals/General Minerals*. The conclusions of these reports show that, with the exception of the change in water quality associated with the replacement of local groundwater by treated injection water, groundwater sample results are consistent and predictable. The groundwater background quality is sufficiently characterized in the Injection Area. Because of this, we propose to modify the suite of analytes to focus on what is observed to occur when a well experiences the arrival of the treated injection water front and to remove analytes that were originally proposed to characterize the background quality of groundwater in the area.

For observation wells, analytes for each sampling event would include those that are indicative of treated injection water (TDS, fluoride, nitrate as nitrogen, sulfate, chloride, sodium, total chromium, hexavalent chromium, molybdenum) and groundwater quality objectives contingency trigger parameters (pH, TDS, total chromium, and hexavalent chromium). The field groundwater quality parameters of pH, specific conductance, and turbidity would still be measured to confirm purge stabilization before sample collection. The proposed analytes would be used for both of the semiannual events, second quarter and fourth quarter. Samples are listed in Table 2 as the proposed semiannual suite.

TABLE 2 – CHANGES PER OUR TELECON
Analytical Program
Interim Measures No. 3. Revised Compliance Monitoring Program, PG&E Topock Compressor Station

		Current Analytical Suite for Compliance Monitoring Plan		Proposed Analytical Suite for Compliance Monitoring Plan	
				Full Suite[a]	Limited Suite[b]
Constituents	**Units**	**Full Suite**	**Limited Suite**	**(unchanged)**	**(revised)**
TDS	mg/L	X	X	X	X
Turbidity	NTU	X	X	X	X
Specific Conductance	µmhos/cm	X	X	X	X
pH	pH units	X	X	X	X
Fluoride	mg/L	X	X	X	X
Ammonia (as N)	mg/L	X		X	
Nitrate/nitrite (as N)	mg/L	X	X	X	X
Sulfate	mg/L	X	X	X	X
Chloride	mg/L	X	X	X	X
Total Iron	mg/L	X		X	
Boron	mg/L	X	X	X	
Calcium	mg/L	X		X	
Magnesium	mg/L	X		X	

TABLE 2 – CHANGES PER OUR TELECON
Analytical Program
Interim Measures No. 3. Revised Compliance Monitoring Program, PG&E Topock Compressor Station

		Current Analytical Suite for Compliance Monitoring Plan		Proposed Analytical Suite for Compliance Monitoring Plan	
				Full Suite[a]	Limited Suite[b]
Constituents	**Units**	**Full Suite**	**Limited Suite**	**(unchanged)**	**(revised)**
Potassium	mg/L	X		X	
Sodium	mg/L	X		X	X
Alkalinity (as $CaCO_3$)	mg/L	X		X	
Aluminum	µg/L	X		X	
Antimony	µg/L	X		X	
Arsenic	µg/L	X		X	
Barium	µg/L	X		X	
Beryllium	µg/L	X		X	
Cadmium	µg/L	X		X	
Cobalt	µg/L	X		X	
Chromium, Total	µg/L	X	X	X	X
Chromium VI	µg/L	X	X	X	X
Copper	µg/L	X		X	
Lead	µg/L	X		X	
Manganese	µg/L	X		X	
Mercury	µg/L	X		X	
Molybdenum	µg/L	X		X	X
Nickel	µg/L	X		X	
Selenium	µg/L	X		X	
Silver	µg/L	X		X	
Thallium	µg/L	X		X	
Vanadium	µg/L	X		X	
Zinc	µg/L	X		X	

Footnotes

[a] Unchanged from current "Full Suite." Proposed for annual sampling of compliance wells.

[b] Modified from current "Limited Suite." Proposed for semiannual compliance well sampling and for semiannual and annual observation well sampling.

For compliance monitoring wells, fourth quarter samples would remain as the existing annual suite listed on Table 2. Second quarter compliance well samples would include those analytes that are indicative of treated injection water and contingency trigger parameters. The analytes for second quarter samples are listed in Table 2 as the proposed semiannual suite.

Reporting Frequency

PG&E proposes to modify the reporting frequency from quarterly to semiannual reporting to match the change in sampling frequency. A semiannual letter report summarizing the results of second quarter (semiannual sampling event) compliance parameter analyses would be submitted to the agencies annually on July 15. A comprehensive annual report containing a summary of both semiannual events would be submitted to the agencies annually on January 15. In addition to routine monitoring results reporting, PG&E is required to submit a biennial Performance Assessment Report on injection wellfield operations, including an evaluation of influence of treated water on aquifer water quality. PG&E proposes that the biennial Performance Assessment Report be combined with the annual report of coinciding years. This would make the next Performance Assessment Report, due on January 15, 2009, a part of the comprehensive annual report for the Injection Area CMP.

Revised pH Range in Contingency Plan

On March 12, 2007, the United states Environmental Protection Agency issued updated procedures for obtaining validated laboratory pH values, where holding times for pH were reduced from "as soon as possible" (generally interpreted as 24 to 48 hours) to 15 minutes. Given the distance of Topock from the nearest California-certified laboratory, it was no longer possible to produce valid results by analyzing for pH in the laboratory. While pH has never been considered a contaminant of concern at Topock, it was included in the contingency plan flowchart for groundwater quality changes associated with the IM No. 3 injection system. Rather than remove pH from the contingency plan, field pH has been proposed to replace laboratory pH for purposes of the contingency plan. Field pH has been routinely collected from monitoring wells beginning in September 2004, and a histogram of observed pH compared to observed laboratory pH shows that the two behave similarly, as shown in Figure 9). There are two notable differences between the behavior of the field and laboratory pH; the range of values is wider for field pH than for laboratory pH (6.49 to 8.96 vs. 7.26 to 8.89, respectively), and the peak occurrence is less pronounced for field pH than for laboratory pH (46 vs. 55 occurrences, respectively). Both of these differences can be related to the accuracy of the field measurement compared to the laboratory measurement. Laboratory measurements are made with laboratory-grade equipment under controlled conditions (temperature in particular), while field measurements are made with portable equipment under variable conditions. The United States Geological Survey, in their publication *National Field Manual for the Collection of Water Quality Data* (2006), specifies that field pH be measured to within 0.2 pH units, which contrasts to the standard laboratory pH reading of 0.01 pH units. Figure 10 presents a comparison between the offsite laboratory and field pH measurements for the 2004 through 2008 sampling time period, and the wider spread of measurement variation within the two separate data sets is readily apparent.

With these differences in mind, PG&E proposes that field pH be used in place of lab pH in the contingency plan if a new pH range is specified, and if the potential decrease in accuracy is captured in how the range is applied. To that end, PG&E proposes that the observed range of field pH (6.4 to 9.0) replace the previous pH range and, further, that a modifier of ±0.2 pH units

be applied to the endpoints of this range in the contingency plan. The proposed range for field pH would change to 6.2 to 9.2 pH units.

Figure 11, attached to this letter, is a revised contingency plan flowchart for groundwater quality changes associated with the Interim Measures No. 3 injection system at the PG&E Topock site. The contingency plan flowchart was originally submitted as part of the *Interim Measure No. 3 Injection Well Operations and Maintenance Plan Addendum,* dated June 3, 2005, and subsequently updated in PG&E's letter dated August 8, 2006.

The attached revised contingency plan flowchart replaces laboratory pH with field pH as a groundwater quality objective. Due to a change in the United States Environmental Protection Agency-approved analytical methods (effective April 11, 2007), which require pH measurements be taken within 15 minutes of sampling, laboratory pH measurements are no longer being collected under Monitoring and Reporting Program R7-2006-0010 for the CMP for IM No. 3. No changes are proposed to the evaluation of hexavalent chromium, total chromium, and TDS in the contingency plan.

Summary

PG&E requests approval of the recommendations for updating and modifying CMP activities as described above. The specific requests include:

- Change the frequency of water quality sampling for observation wells from quarterly to semiannually. After 4 years of sampling (following the 2nd Quarter 2009 sampling event), OW-1M, OW-1D, OW-2M, OW-2D, OW-5M, and OW-5D would be removed from the Injection Area CMP. OW-1S, OW-2S, and OW-5S would continue to be sampled for water quality on semiannually.
- Change the frequency of groundwater level monitoring for wells OW-1M, OW-1D, OW-2M, and OW-2D. The water levels in these wells will be monitored by hand prior to water quality sampling. All other wells would continue to be monitored for water level using pressure transducers.
- Revise the analytes for the limited suite of water quality parameters to add sodium and molybdenum and eliminate boron. This limited suite of analytes is proposed for all wells sampled during the 2nd Quarter sampling event and for observation wells sampled during the 4th Quarter sampling event. Compliance wells sampled during the 4th Quarter sampling event would continue to be sampled using the full suite of analytes.
- Change the frequency of reporting from quarterly to semiannually. Biennially, the annual report would be combined with the Performance Assessment Report.
- Change the contingency plan flowchart for groundwater quality changes associated with the IM No. 3 injection system to incorporate a revised pH range to match the observed values for field pH. The new range used to trigger contingency actions would be 6.2 to 9.2 pH units and would be based on field pH data.

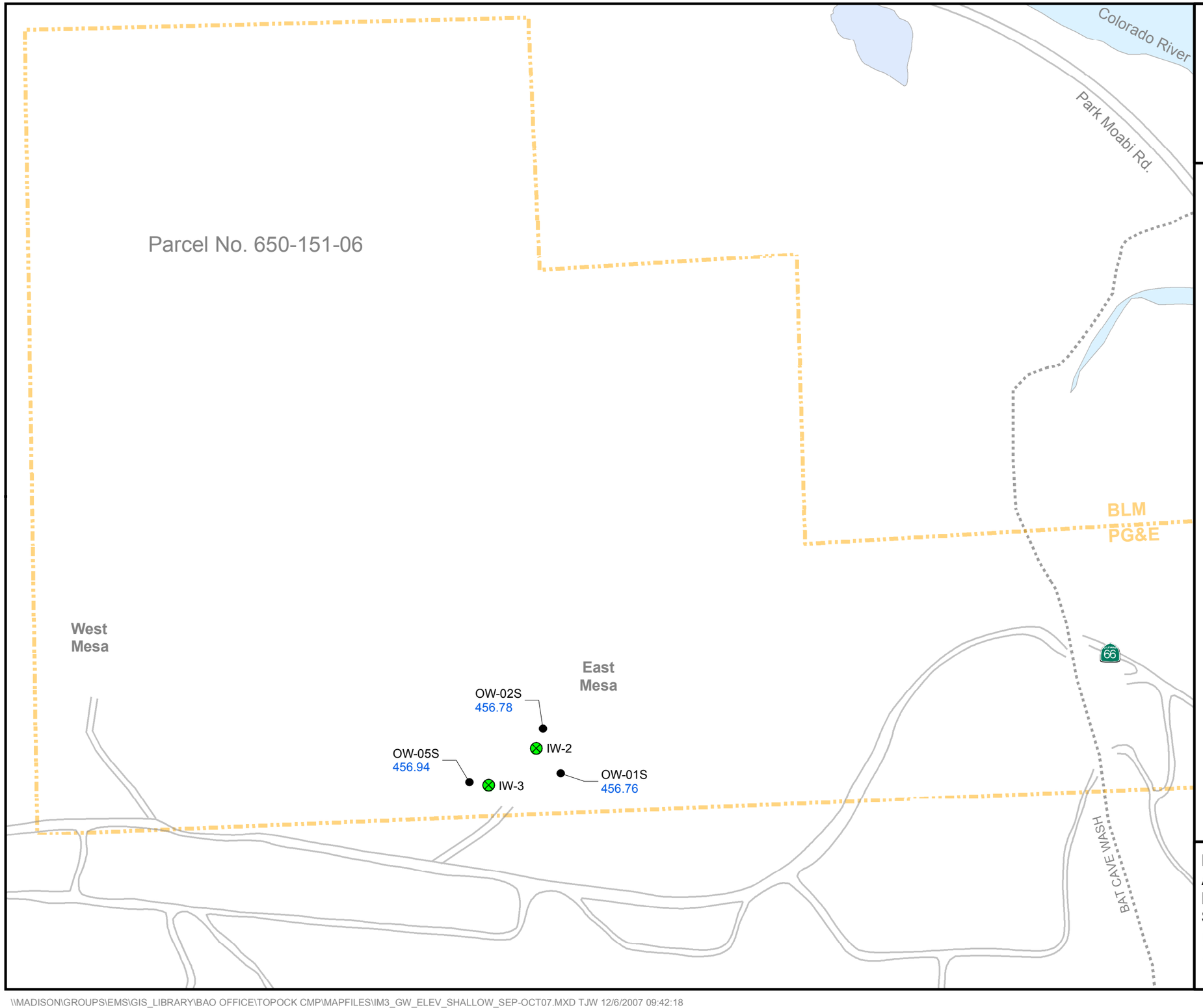
The next scheduled round of sampling is for 3rd Quarter 2008, which is a quarterly sampling event. Please contact Kevin Sullivan or me if you have questions or require additional information to support your decision.

Sincerely,

Yvonne Meeks
Topock Project Manager

Enclosure:
Figures 1 thru 11

cc: Chris Guerre/DTSC
Karen Baker/DTSC
Kevin Sullivan/PG&E
Tom Vandenberg/Water Board
Cliff Raley/Water Board
Abdi Haile, Water Board



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1 inch equals 250 feet

California State Plane NAD83 Zone 5 US Feet

LEGEND

- Groundwater Monitoring, Compliance, and Observation Well
- IM-3 Injection Well

Groundwater Elevations for Shallow Wells in IM-3 Injection Area

OW-02S 456.78 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Notes:
Data posted and contoured from monthly average heads measured with transducers at 30 minute intervals.

FIGURE 1
AVERAGE GROUNDWATER ELEVATIONS FOR SHALLOW WELLS SEPTEMBER 15 TO OCTOBER 15, 2007

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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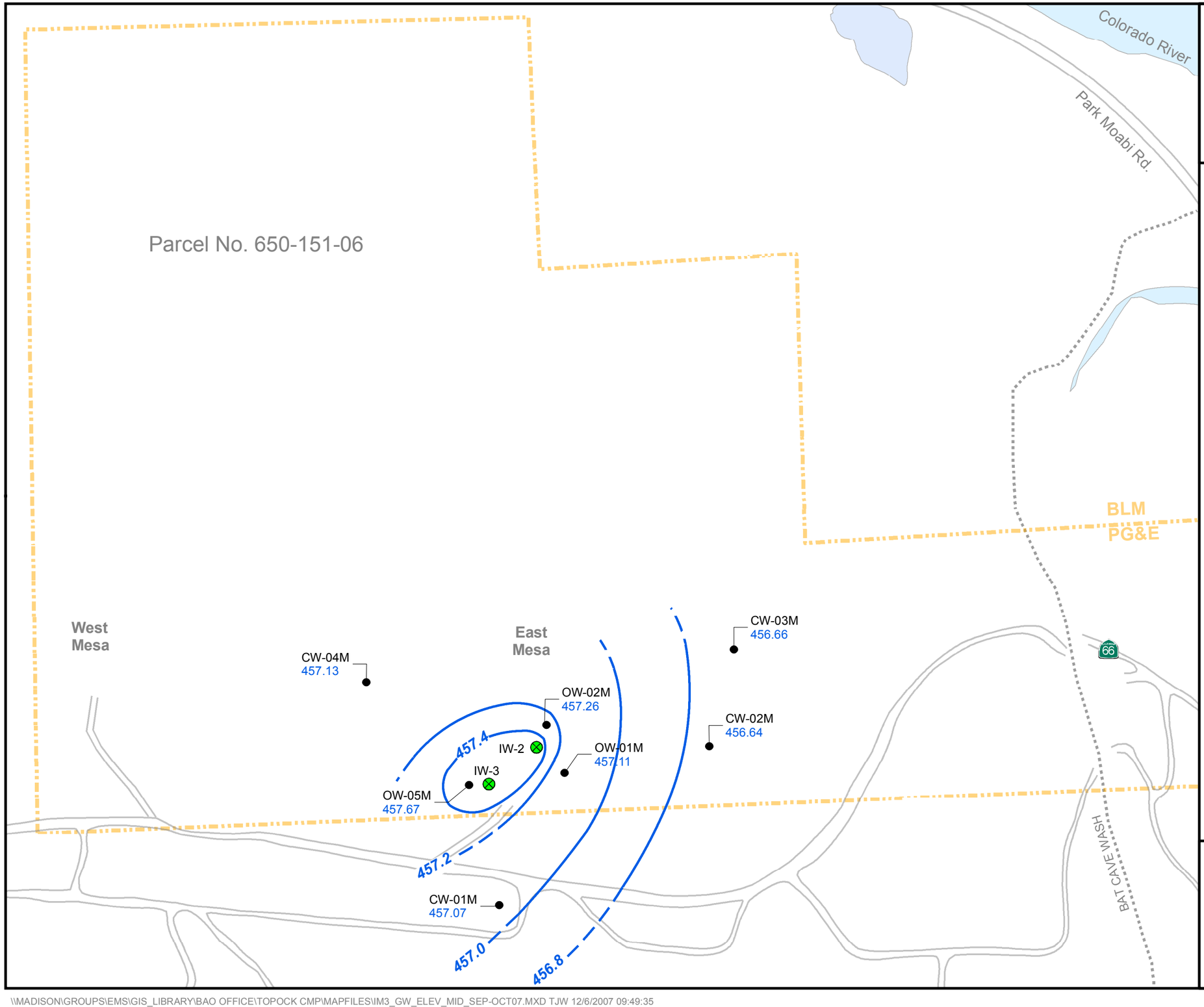

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1 inch equals 250 feet

California State Plane NAD83 Zone 5 US Feet

LEGEND

- Groundwater Monitoring, Compliance, and Observation Well
- IM-3 Injection Well

Groundwater Elevations for Mid-depth Wells in IM-3 Injection Area

- OW-02M 457.26 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)
- Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Notes:
Data posted and contoured from monthly average heads measured with transducers at 30 minute intervals.

FIGURE 2
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR MID-DEPTH WELLS SEPTEMBER 15 TO OCTOBER 15, 2007

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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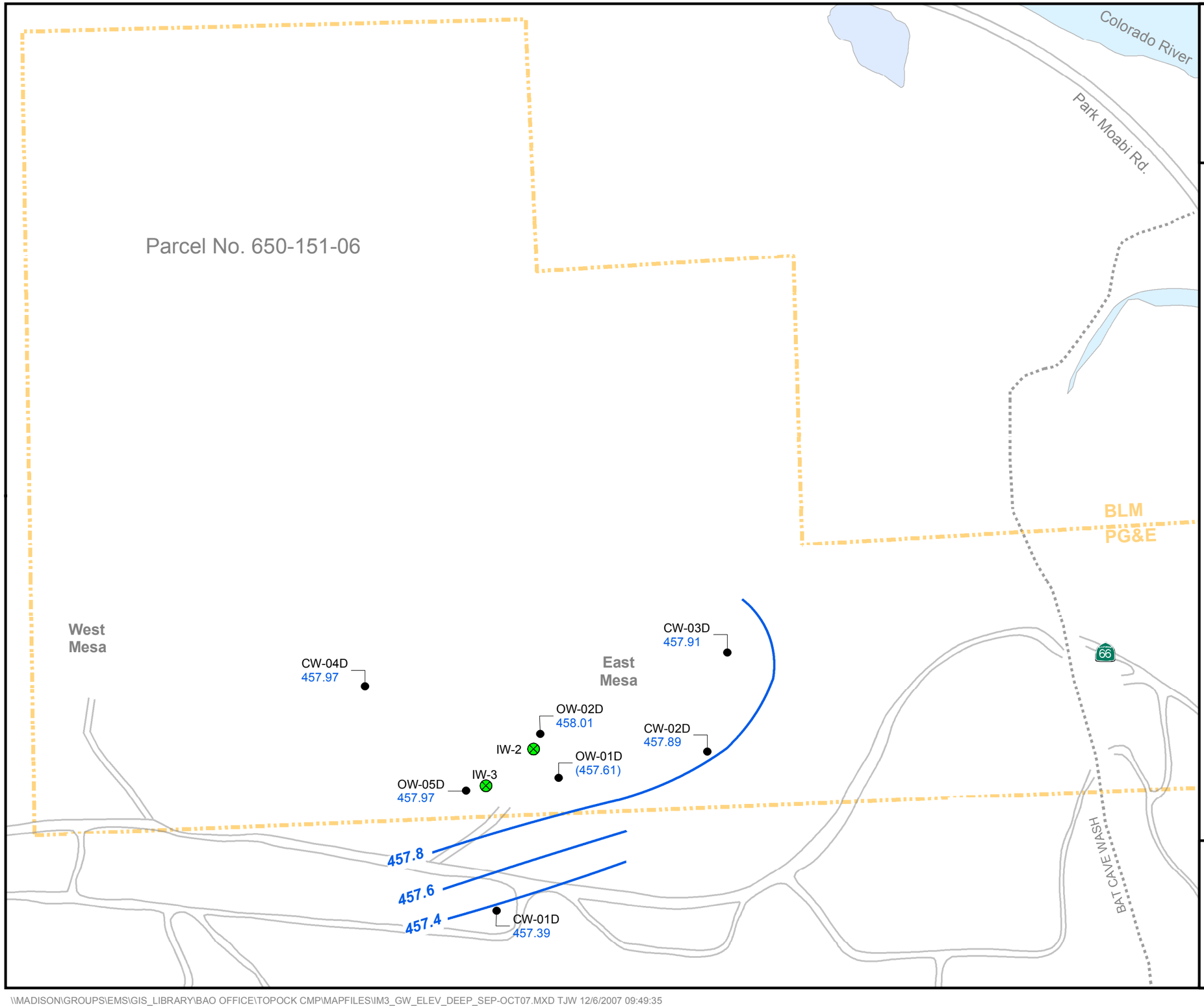

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1 inch equals 250 feet

California State Plane NAD83 Zone 5 US Feet

LEGEND

- Groundwater Monitoring, Compliance and Observation Well
- IM-3 Injection Well

Groundwater Elevations for Deep Wells in IM-3 Injection Area

- OW-05D 457.97 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)
- Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Notes:
Data posted and contoured from monthly average heads measured with tranducers at 30 minute intervals. (OW-1D) excluded from contouring

FIGURE 3
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR DEEP WELLS SEPTEMBER 15 TO OCTOBER 15, 2007

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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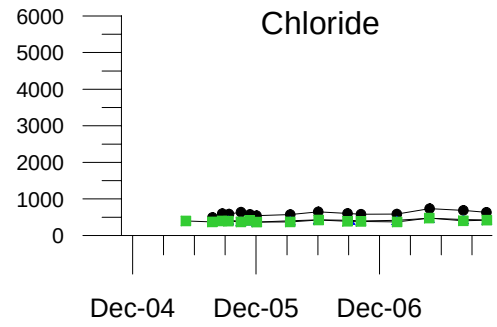
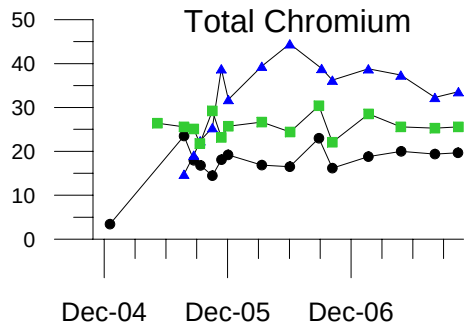
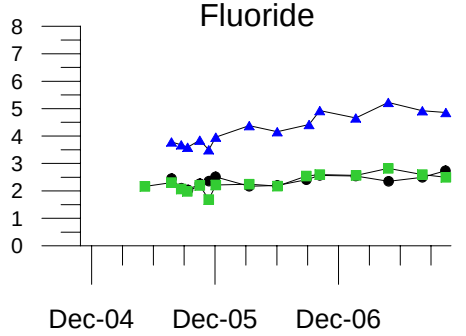
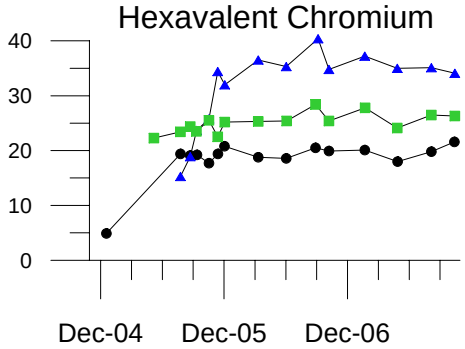
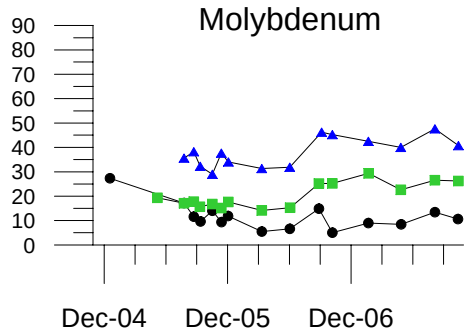
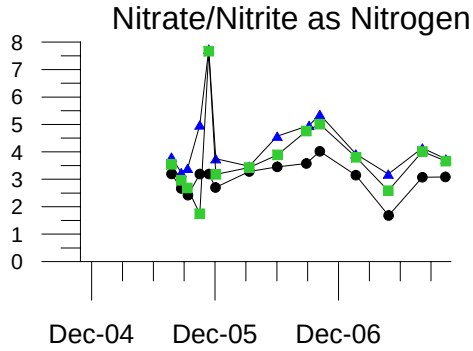


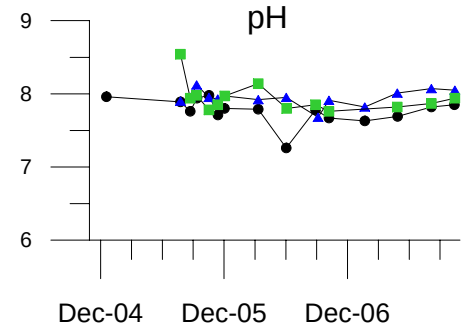


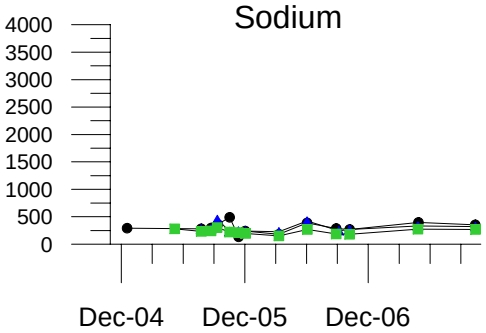


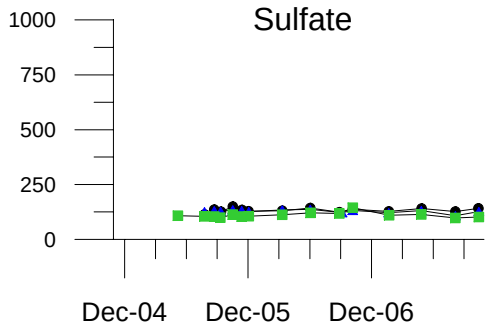


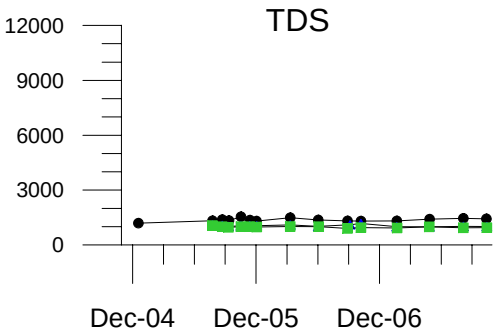


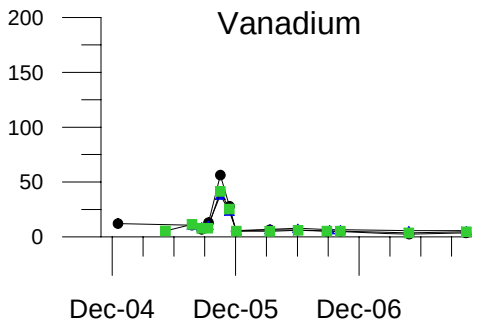


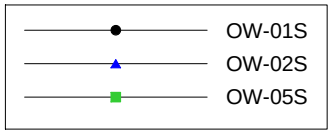








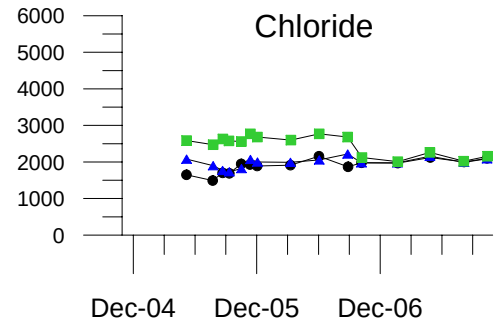


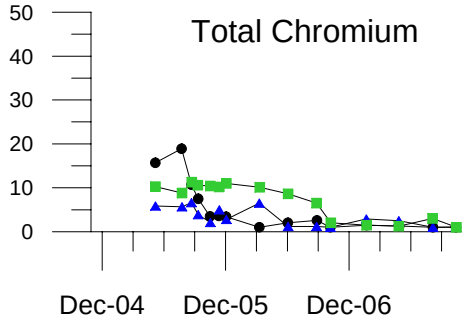


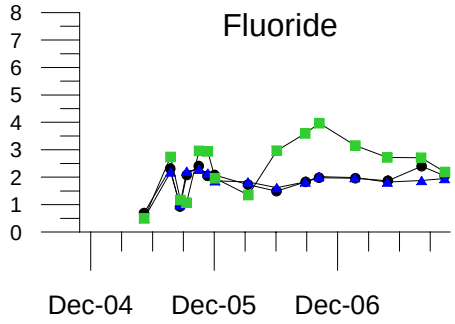
Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

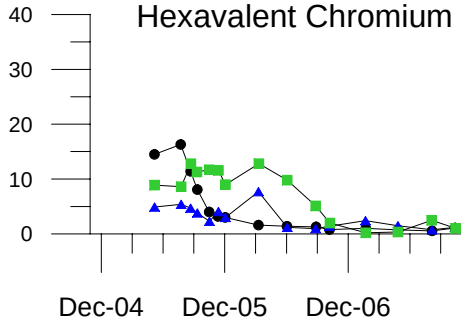
FIGURE 4
OW-01S, OW-02S, OW-05S
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

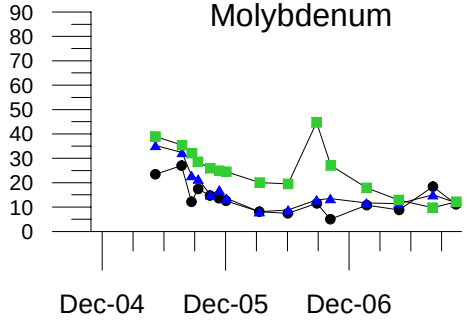
CH2MHILL

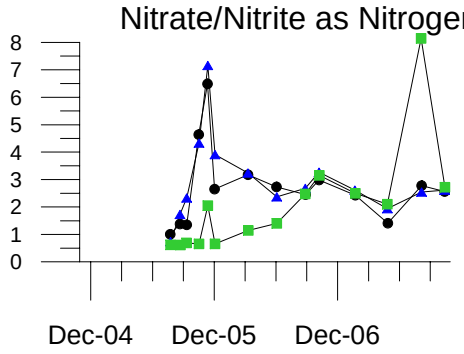


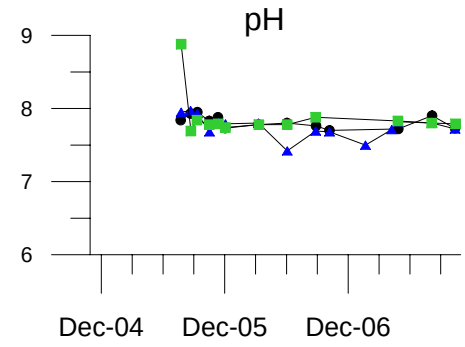


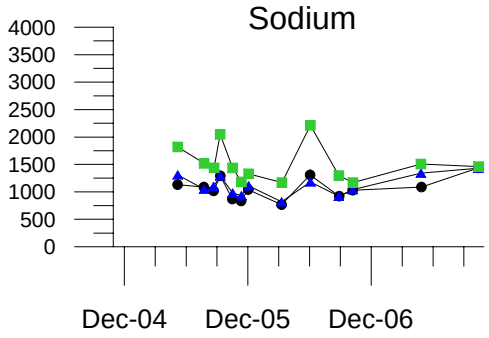


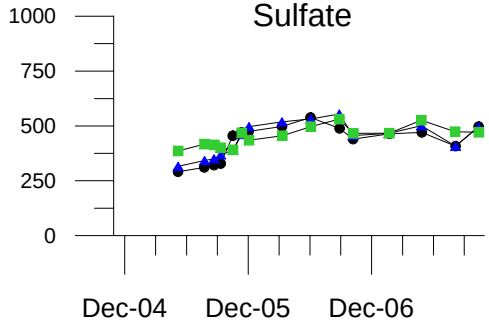


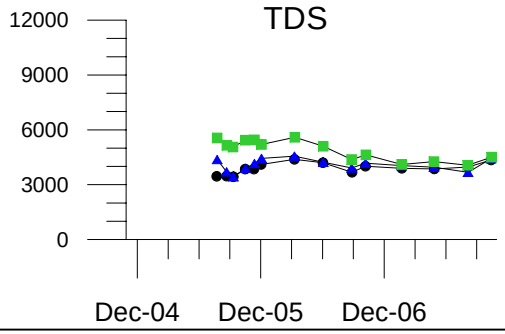


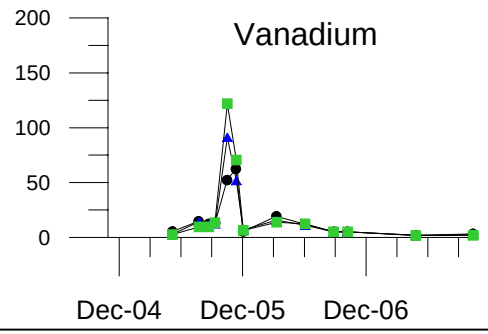


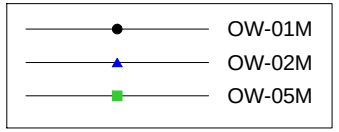








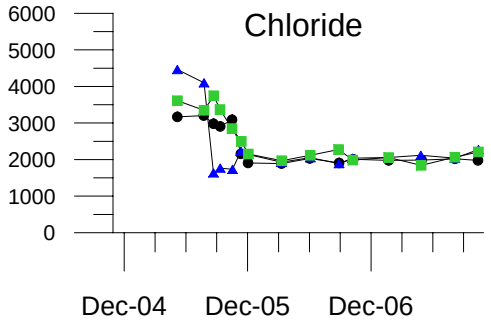


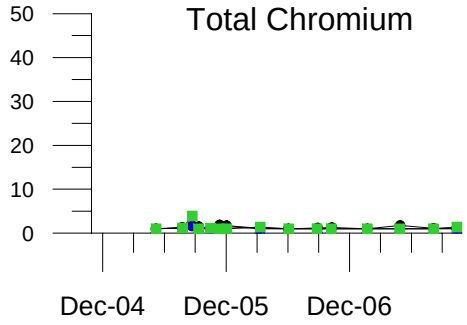


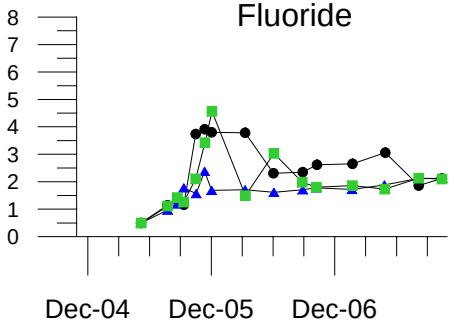
Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

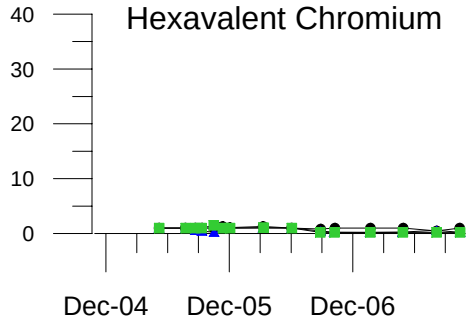
FIGURE 5
OW-01M, OW-02M, OW-05M
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

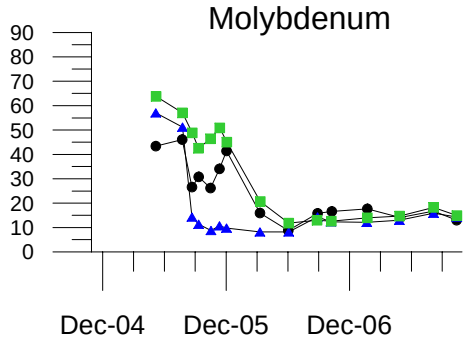
CH2MHILL

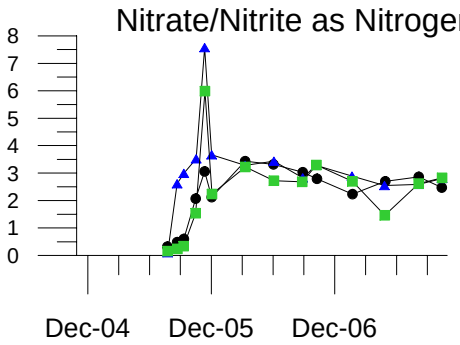


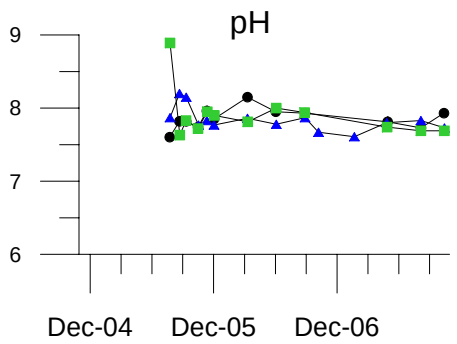


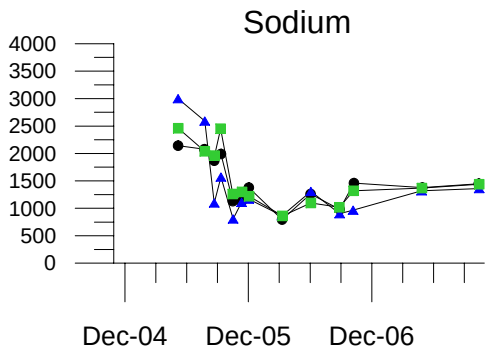


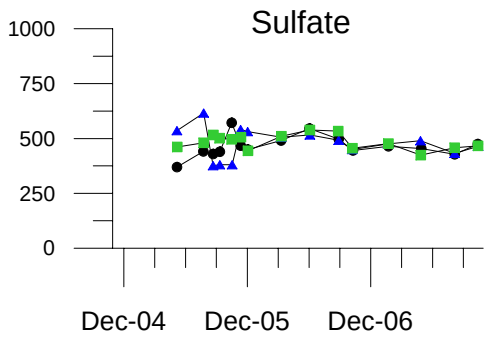


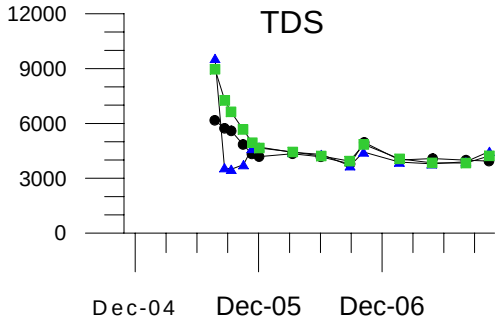


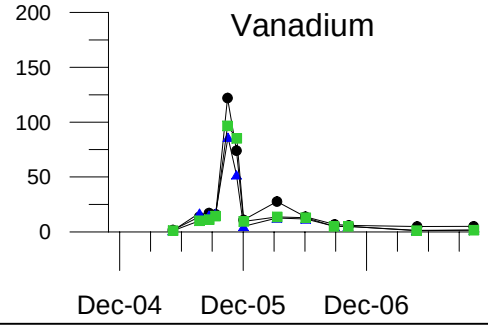


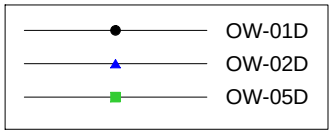








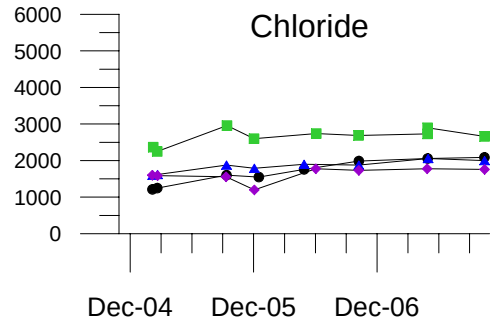


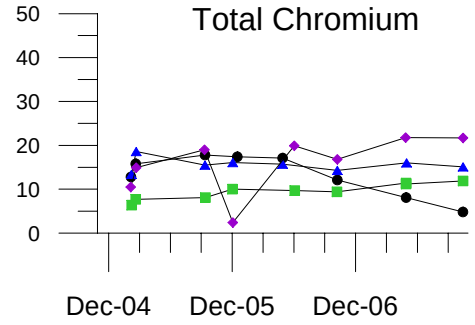


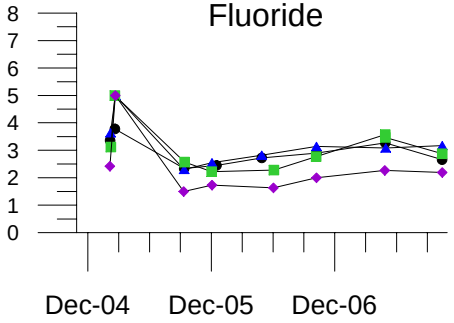
Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

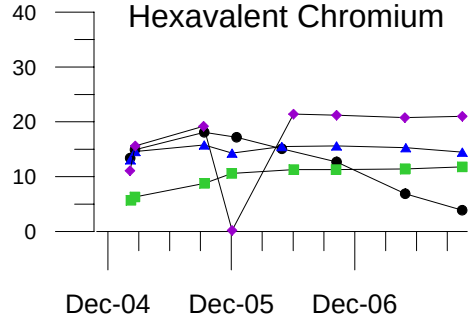
FIGURE 6
OW-01D, OW-02D, OW-05D
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

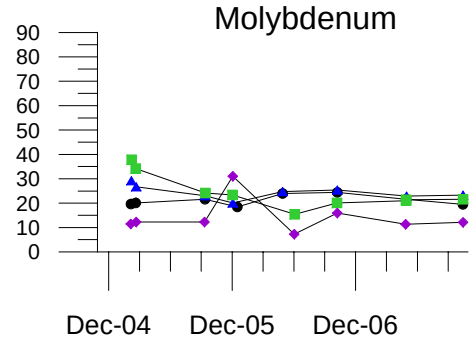
CH2MHILL

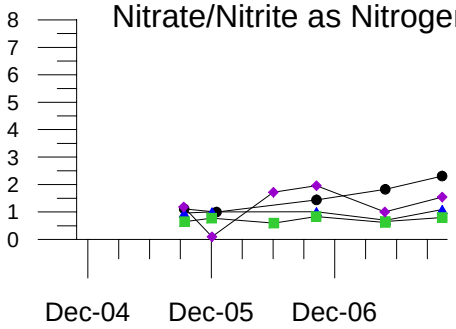


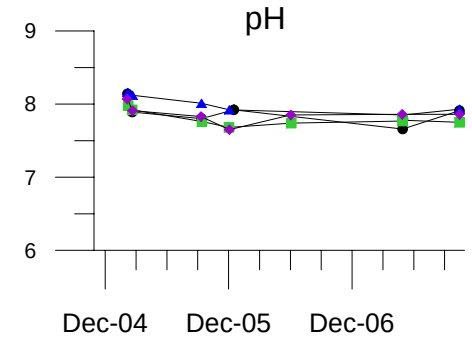


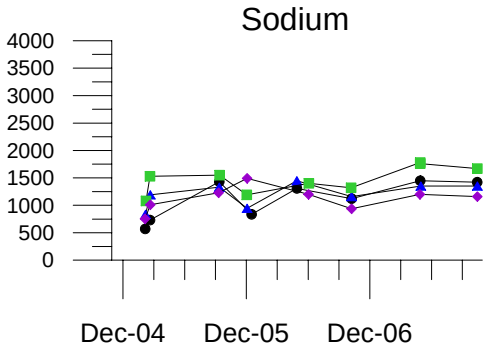


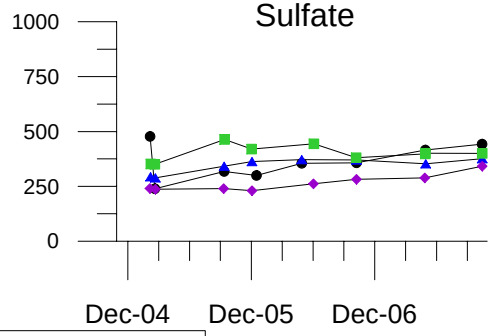


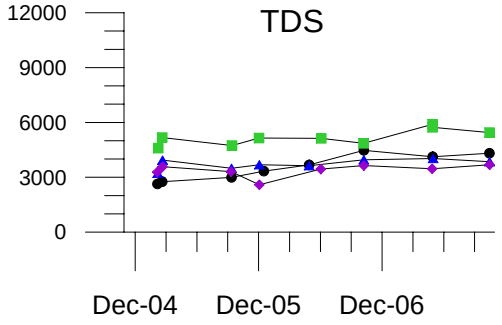


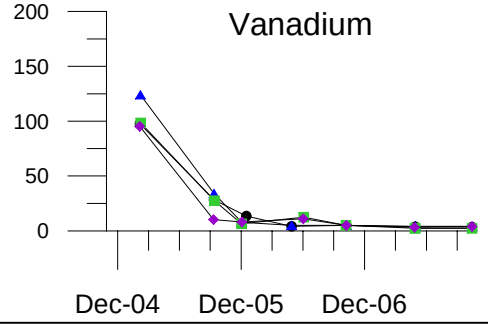


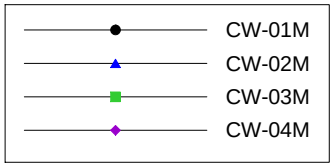








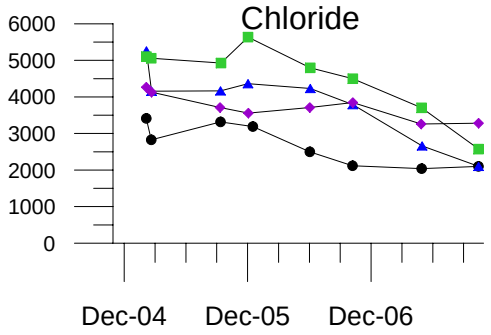


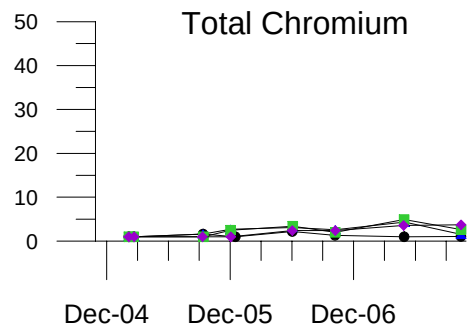


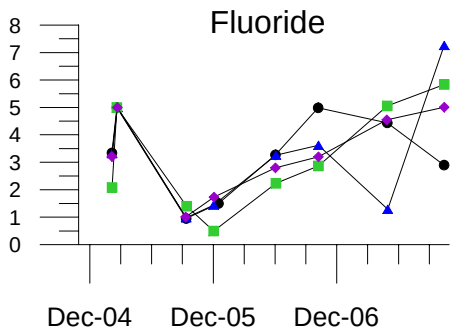
Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

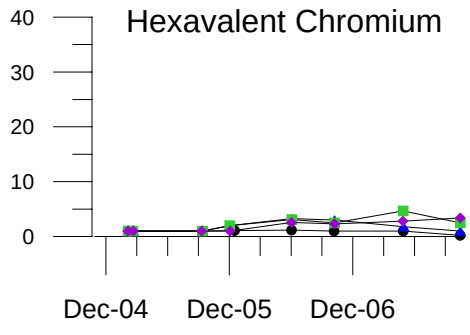
FIGURE 7
CW-01M, CW-02M, CW-03M, CW-04M
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

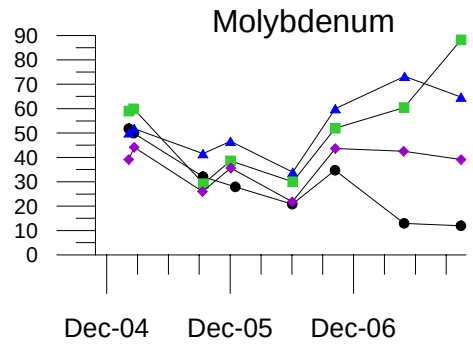
CH2MHILL

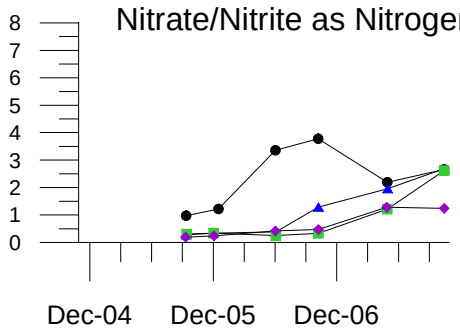


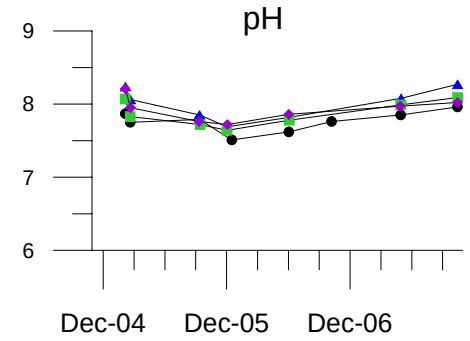


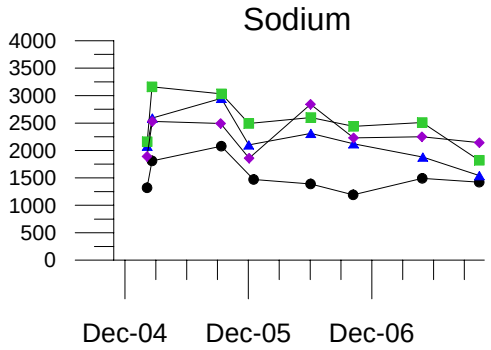


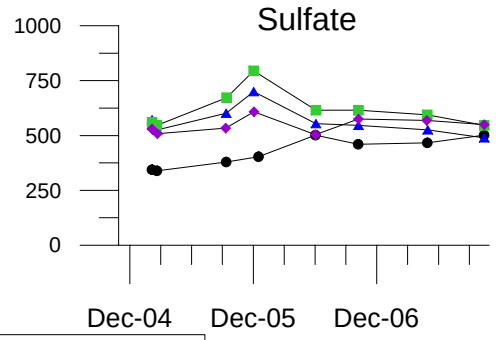


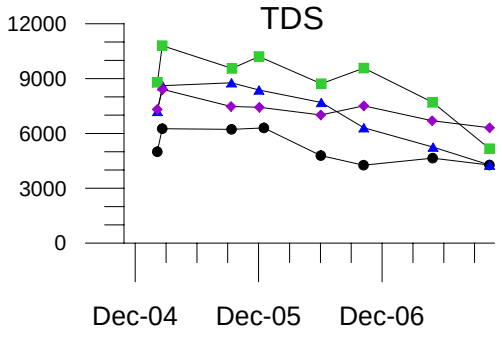


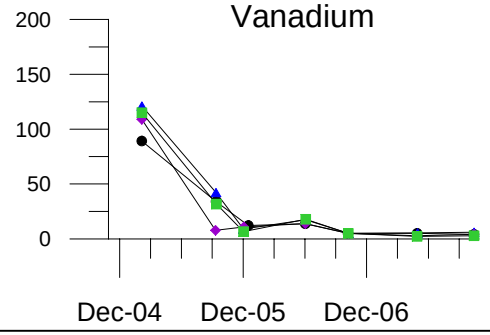


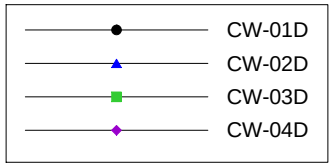








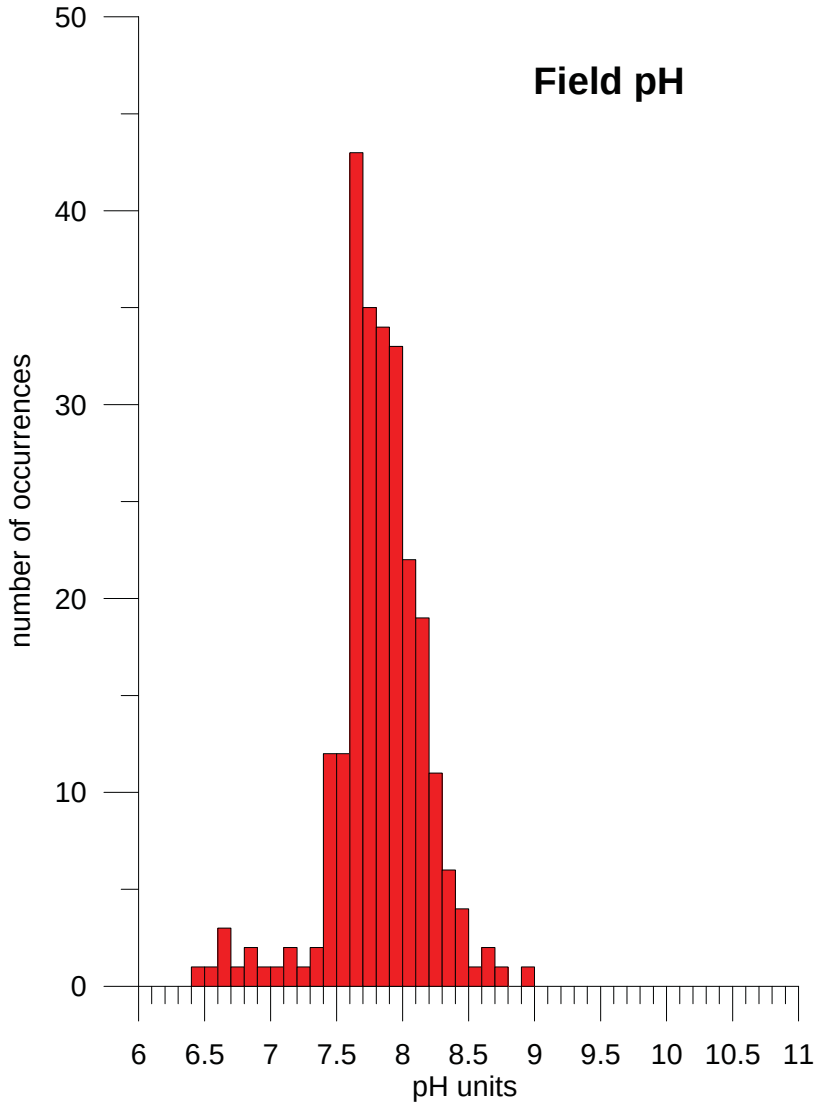




Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

FIGURE 8
CW-01D, CW-02D, CW-03D, CW-04D
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



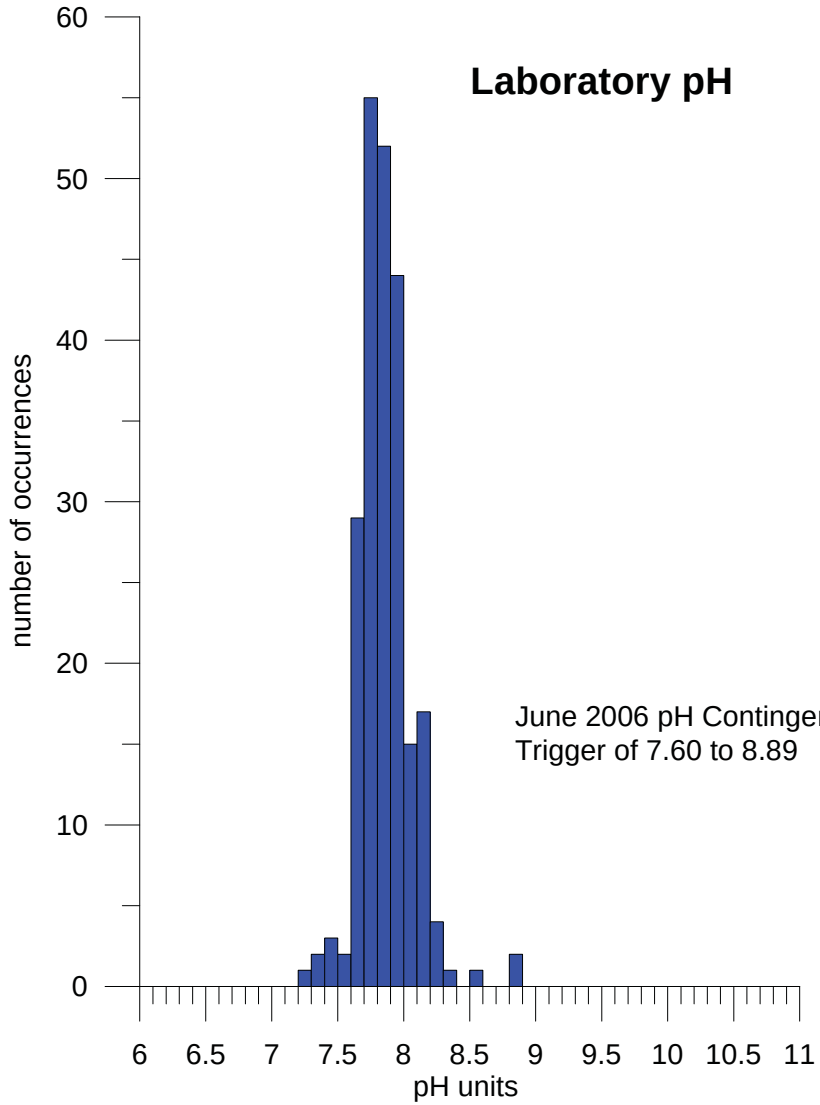


FIGURE 9
FIELD pH AND LABORATORY pH
(OW AND CW WELLS)
SEPTEMBER 2004 THRU JANUARY 2008
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

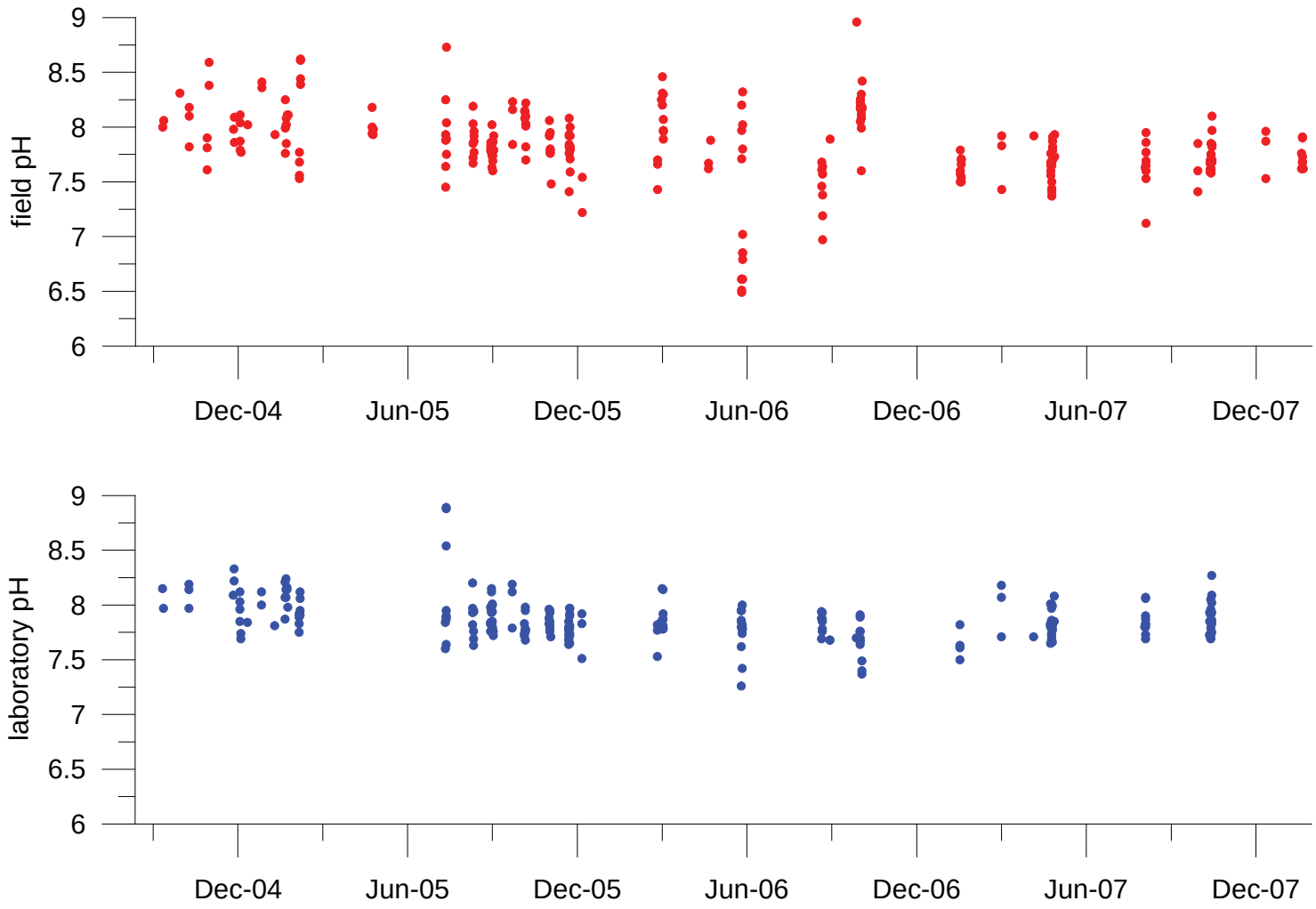
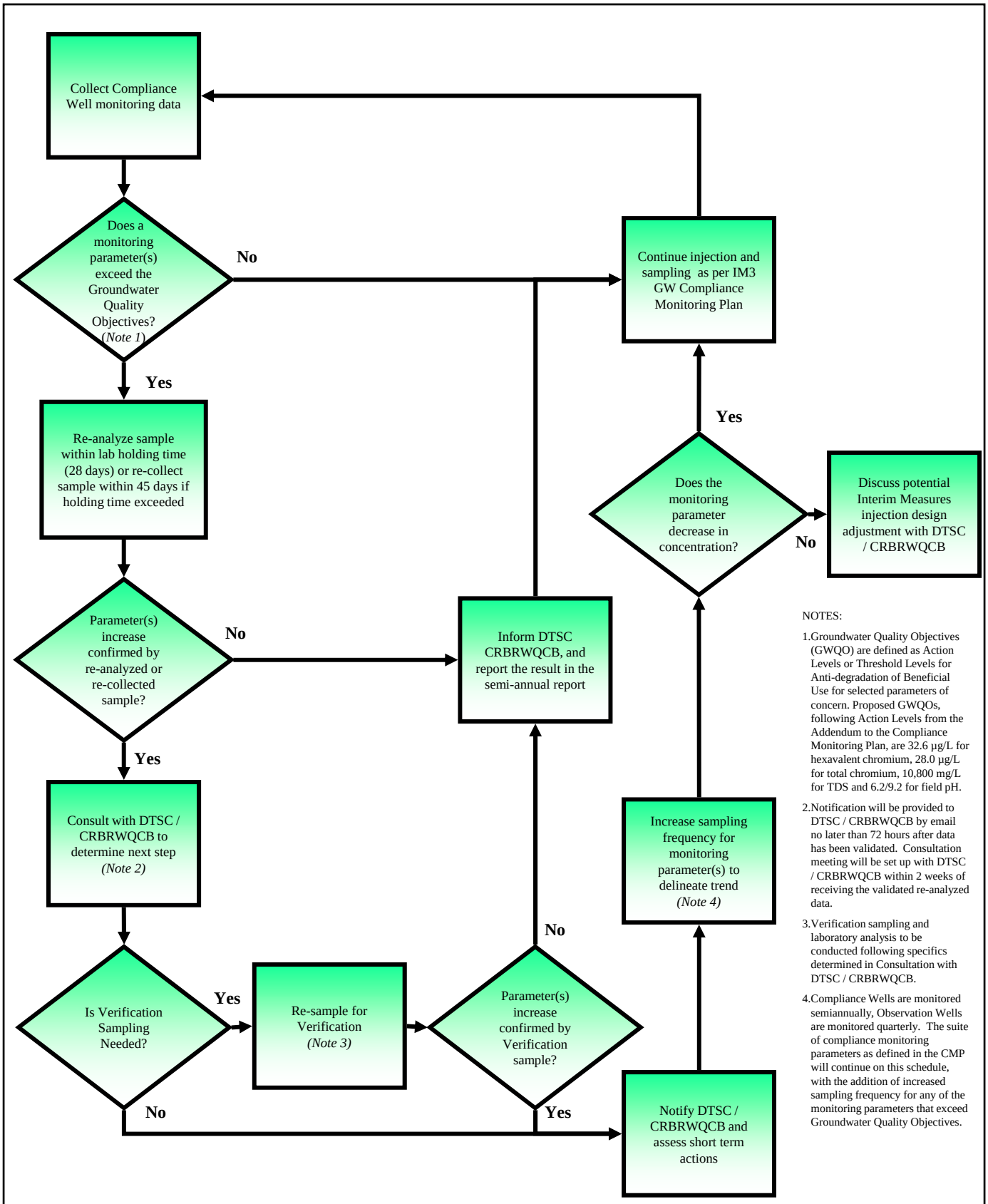


FIGURE 10
pH VS. SAMPLE DATE
(OW AND CW WELLS)
SEPTEMBER 2004 THRU JANUARY 2008
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



NOTES:

1. Groundwater Quality Objectives (GWQO) are defined as Action Levels or Threshold Levels for Anti-degradation of Beneficial Use for selected parameters of concern. Proposed GWQOs, following Action Levels from the Addendum to the Compliance Monitoring Plan, are 32.6 µg/L for hexavalent chromium, 28.0 µg/L for total chromium, 10,800 mg/L for TDS and 6.2/9.2 for field pH.
2. Notification will be provided to DTSC / CRBRWQCB by email no later than 72 hours after data has been validated. Consultation meeting will be set up with DTSC / CRBRWQCB within 2 weeks of receiving the validated re-analyzed data.
3. Verification sampling and laboratory analysis to be conducted following specifics determined in Consultation with DTSC / CRBRWQCB.
4. Compliance Wells are monitored semiannually, Observation Wells are monitored quarterly. The suite of compliance monitoring parameters as defined in the CMP will continue on this schedule, with the addition of increased sampling frequency for any of the monitoring parameters that exceed Groundwater Quality Objectives.

FIGURE 11
CONTINGENCY PLANNING FOR IM No. 3 GROUNDWATER INJECTION, MAY 2008

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