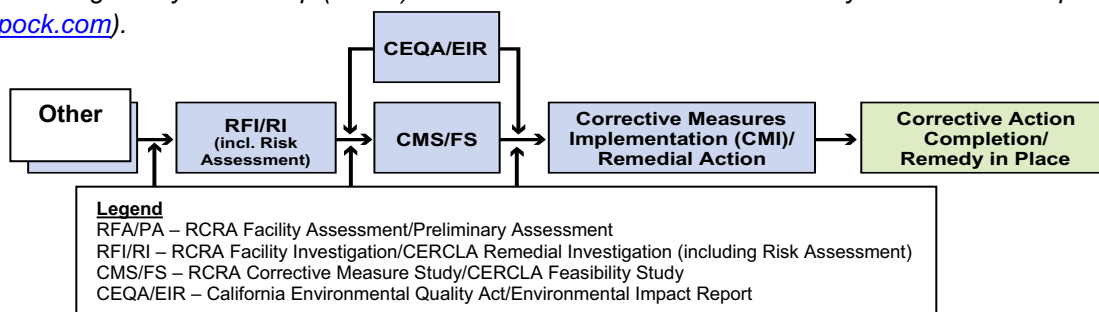


# Topock Project Executive Abstract

<p>Document Title:</p> <p>Topock IM No. 3 WDR Combined Fourth Quarter 2009 Monitoring, Jul-Dec 2009 Semiannual, and Jan-Dec 2009 Annual Operation and Maintenance Report</p> <p>Submitting Agency/ Authored by: RWQCB</p> <p>Final Document? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Date of Document: January 15, 2010</p> <p>Who Created this Document?: (i.e. PG&amp;E, DTSC, DOI, Other)</p> <p>PG&amp;E</p>
<p>Priority Status: <input type="checkbox"/> <b>HIGH</b> <input type="checkbox"/> <b>MED</b> <input checked="" type="checkbox"/> <b>LOW</b></p> <p>Is this time critical? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>Action Required:</p> <p><input checked="" type="checkbox"/> Information Only <input type="checkbox"/> Review &amp; Comment</p> <p>Return to: _____</p> <p>By Date: _____</p> <p><input type="checkbox"/> Other / Explain:</p>
<p>Type of Document:</p> <p><input type="checkbox"/> Draft <input checked="" type="checkbox"/> Report <input type="checkbox"/> Letter <input type="checkbox"/> Memo</p> <p><input type="checkbox"/> Other / Explain:</p>	<p>Is this a Regulatory Requirement?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no, why is the document needed?</p>
<p>What does this information pertain to?</p> <p><input type="checkbox"/> Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)</p> <p><input type="checkbox"/> RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)</p> <p><input type="checkbox"/> Corrective Measures Study (CMS)/Feasibility Study (FS)</p> <p><input type="checkbox"/> Corrective Measures Implementation (CMI)/Remedial Action</p> <p><input type="checkbox"/> California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)</p> <p><input checked="" type="checkbox"/> Interim Measures</p> <p><input type="checkbox"/> Other / Explain:</p>	<p>Is this a Regulatory Requirement?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no, why is the document needed?</p>
<p>What is the consequence of NOT doing this item? What is the consequence of DOING this item?</p> <p>Submittal of this report is a compliance requirement of RWQCB Waste Discharge Requirements/Order No. R7-2006-0060</p>	<p>Other Justification/s:</p> <p><input type="checkbox"/> Permit <input type="checkbox"/> Other / Explain:</p>
<p>Brief Summary of attached document:</p> <p>This report covers the Interim Measure No. 3 (IM No. 3) groundwater treatment system monitoring activities during the Fourth Quarter 2009 period. The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program. This report also covers the IM No. 3 operation and maintenance activities during the July - December 2009 semiannual and January – December annual periods.</p> <p>Written by: PG&amp;E</p>	
<p>Recommendations:</p> <p>This report is for your information only.</p>	
<p>How is this information related to the Final Remedy or Regulatory Requirements:</p> <p>The IM No. 3 WDR Fourth Quarter 2009 Monitoring, Jul-Dec 2009 Semiannual, and Jan-Dec 2009 Annual Operation and Maintenance Report is related to the Interim Measure, and is designed to monitor compliance with RWQCB Waste Discharge Requirements/Order No. R7-2006-0060.</p>	
<p>Other requirements of this information?</p> <p>None.</p>	

Related Reports and Documents:

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





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January 15, 2010

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

**Subject: Board Order R7-2006-0060**  
**PG&E Topock Compressor Station, Needles, California**  
**Interim Measure No. 3 Groundwater Treatment System Discharge to Injection Wells**  
***Combined Fourth Quarter 2009 Monitoring and Semiannual July-December 2009/  
Annual January-December 2009 Operation and Maintenance Report for Interim Measure  
No. 3 Groundwater Treatment System***

Dear Mr. Perdue:

Enclosed is the Combined Fourth Quarter 2009 Monitoring and Semiannual July-December 2009 / Annual January-December 2009 Operation and Maintenance Report for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Interim Measure (IM) No. 3 Groundwater Treatment System.

This report is being submitted in compliance with the Waste Discharge Requirements (WDRs) issued September 20, 2006 by the California Regional Water Quality Control Board, Colorado River Basin Region (Water Board) under Order R7-2006-0060 and in compliance with the revised Monitoring and Reporting Program for Order R7-2006-0060, issued August 28, 2009. The WDRs apply to IM No. 3 Treatment System discharge by subsurface injection.

The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program.

If you have any questions regarding this report, please call me at (760) 326-5582.

Sincerely,

Curt Russell  
Topock Site Manager

Enclosures:

Combined Fourth Quarter 2009 Monitoring and Semiannual July-December 2009/ Annual  
January-December 2009 Operation and Maintenance Report for IM No. 3 Groundwater Treatment  
System

Robert Perdue  
January 15, 2010  
Page 2

cc: Cliff Raley, Water Board  
Tom Vandenberg, State Water Resources Control Board  
Aaron Yue, DTSC

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**Combined Fourth Quarter 2009 Monitoring  
and Semiannual July - December 2009 /  
Annual January - December 2009  
Operation and Maintenance Report  
for Interim Measure No. 3  
Groundwater Treatment System**

**Waste Discharge Requirements  
Board Order No. R7-2006-0060  
PG&E Topock Compressor Station  
Needles, California**

Prepared for  
**California Regional Water Quality Control Board  
Colorado River Basin Region**

On behalf of  
**Pacific Gas and Electric Company**

January 15, 2010

**CH2MHILL**  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612

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**Combined Fourth Quarter 2009 Monitoring and  
Semiannual July – December 2009 / Annual January – December 2009  
Operation and Maintenance Report  
for Interim Measure No. 3 Groundwater Treatment System  
Waste Discharge Requirements Order No. R7-2006-0060  
PG&E Topock Compressor Station  
Needles, California**

Prepared for  
Pacific Gas and Electric Company

January 15, 2010

This report was prepared under the supervision of a  
California Certified Professional Engineer



Dennis Fink, P.E.  
Project Engineer



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- A Semiannual Operations and Maintenance Log, July 1, 2009 through December 31, 2009
- B Daily Volumes of Groundwater Treated
- C Flowmeter Calibration Records
- D Fourth Quarter 2009 Laboratory Analytical Reports



# Acronyms and Abbreviations

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ATL	Advanced Technology Laboratories, Inc.
gpm	gallons per minute
IM	Interim Measure
MRP	Monitoring and Reporting Program
PG&E	Pacific Gas and Electric Company
ppb	parts per billion
RCRA	Resource Conservation and Recovery Act
RO	reverse osmosis
TPH	total petroleum hydrocarbons
Truesdail	Truesdail Laboratories, Inc.
TVSS	transient voltage surge suppressor
Water Board	California Regional Water Quality Control Board, Colorado River Basin Region
WDR	Waste Discharge Requirements



# 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 collectively are referred to as IM No. 3. Figure 1 provides a map of the project area. All figures are located at the end of this report.

California Regional Water Quality Control Board, Colorado River Basin Region (Water Board) Board Order No. R7-2006-0060 authorizes PG&E to inject treated groundwater into injection wells located on San Bernardino County Assessor's Parcel No. 650-151-06. Order No. R7-2006-0060 was issued September 20, 2006 and is the successor to Order No. R7-2004-0103. The revised Monitoring and Reporting Program (MRP) under the Order, issued August 28, 2009, requires quarterly monitoring reports to be submitted by the fifteenth day of the month following the end of the quarter.

**This report covers the IM No. 3 groundwater treatment system monitoring activities during the Fourth Quarter 2009; the operation and maintenance activities during the July 1, 2009 to December 31, 2009 semiannual period (Third and Fourth Quarters 2009); and (by reference; see Section 3.0) the operation and maintenance activities during the January 1, 2009 to June 30, 2009 semiannual period (First and Second Quarters 2009).** The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program.

## 2.0 Sampling Station Locations

---

Table 1 lists the locations of sampling stations. (Tables are located at the end of this report.) Sampling station locations are shown on the process and instrumentation diagrams provided at the end of this report; figures:

- TP-PR-10-10-04 – Raw Water Storage and Treated Water Storage Tanks;
- PR-10-03 and PR-10-04 – Reverse Osmosis System (diagrams 1 and 2 of 2);
- TP-PR-10-10-06 – Sludge Storage Tanks;
- TP-PR-10-10-03 – Extraction Wells; and
- TP-PR-10-10-11 – Injection Wells.

## 3.0 Description of Monitoring Activities

---

This report describes Fourth Quarter 2009 monitoring activities and the July 1, 2009 through December 31, 2009 (Third and Fourth Quarters) operation and maintenance activities related to the IM No. 3 groundwater treatment system. IM No. 3 monitoring activities from January 1, 2009 through September 30, 2009 (First, Second, and Third Quarter monitoring) were presented in the following monitoring reports:

- *IM No. 3 First Quarter 2009 Monitoring Report for Groundwater Treatment System Waste Discharge Requirements Order No. R7-2006-0060*, submitted to the Water Board April 15, 2009.
- *IM No. 3 Second Quarter 2009 Monitoring / Semiannual January 1- June 30, 2009 Operation and Maintenance Report for Groundwater Treatment System Waste Discharge Requirements Order No. R7-2006-0060*, submitted to the Water Board July 15, 2009.
- *IM No. 3 Third Quarter 2009 Monitoring Report for Groundwater Treatment System Waste Discharge Requirements Order No. R7-2006-0060*, submitted to the Water Board October 15, 2009.

The IM No. 3 operation and maintenance activities from January 1, 2009 through June 30, 2009 (First and Second Quarter 2009 operation and maintenance) were reported in the Second Quarter 2009 Monitoring/Semiannual Operation and Maintenance Report listed above; these operation and maintenance data are incorporated in the present report by reference. The present report therefore also serves as the annual January through December 2009 Operation and Maintenance Report for IM No. 3.

### 3.1 Groundwater Treatment System

The treatment system was initially operated between July 25 and July 28, 2005 for the Waste Discharge Requirement (WDR)-mandated startup phase. Discharge to the injection wells was initiated July 31, 2005 after successfully completing the startup phase in accordance with Order R7-2004-0103. Full-time operation of the treatment system commenced in August 2005.

Influent to the treatment facility, permitted by Order R7-2006-0060 (successor to Order R7-2004-0103), includes:

- Groundwater from extraction wells TW-2S, TW-2D, TW-3D, and PE-1.
- Purged groundwater and water generated from rinsing field equipment during monitoring events.
- Groundwater generated during well installation, well development, and aquifer testing.

Operation of the groundwater treatment system results in the following three effluent streams:

- **Treated Effluent:** Treated water that is discharged to the injection well(s).
- **Reverse Osmosis Concentrate (brine):** Treatment byproduct that is transported and disposed of offsite at a permitted facility.
- **Sludge:** Treatment byproduct that is transported offsite for disposal at a permitted facility, which occurs either when a sludge waste storage bin reaches capacity, or within 90 days of the start date for accumulation in the storage container, whichever occurs first.

## 3.2 Groundwater Treatment System Flow Rates for Fourth Quarter 2009

Downtime is defined as any periods when all extraction wells are not operating so that no groundwater is being extracted and piped into IM No. 3 as influent. Periods of planned and unplanned extraction system downtime (that together resulted in approximately 4.4 percent downtime during Fourth Quarter 2009) are summarized in the Semiannual Operations and Maintenance Log provided in Appendix A. The times shown are in Pacific Standard Time to be consistent with other data collected (e.g., water level data) at the site. Periods of planned and unplanned extraction system downtime during the months July 2009 – September 2009 are reported in the *Third Quarter 2009 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System Waste Discharge Requirements Order No. R7-2006-0060, PG&E Topock Compressor Station, Needles, CA*, published October 15, 2009.

Data regarding daily volumes of groundwater treated and discharged are provided in Appendix B. The IM No. 3 groundwater treatment system flowmeter calibration records are included in Appendix C.

### 3.2.1 Treatment System Influent

During the Fourth Quarter 2009, extraction wells TW-3D and PE-1 operated at a target pumping rate of 135 gallons per minute, excluding periods of planned and unplanned downtime. Extraction well TW-2D ran for a short period on October 1, 2009, for sampling activities, during the Fourth Quarter 2009. Extraction well TW-2S was not pumped during Fourth Quarter 2009. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 98.5 percent during October 2009.
- 98.4 percent during November 2009.
- 94.6 percent during December 2009.

The Fourth Quarter 2009 treatment system monthly average flow rates (influent, effluent, and reverse osmosis [RO] concentrate) are presented in Table 2. The system influent flow rate was measured by flow meters at groundwater extraction wells TW-2S, TW-2D, TW-3D, and PE-1 (Figure TP-PR-10-10-03).

The IM No. 3 facility treated approximately 17,241,485 gallons of extracted groundwater during Fourth Quarter 2009.

In addition to extracted groundwater, during Fourth Quarter 2009 the IM No. 3 facility treated 5,975 gallons of water generated from the groundwater monitoring program and 74,750 gallons of injection well development water.

### 3.2.2 Effluent Streams

The treatment system effluent flow rate was measured by flow meters in the piping leading to injection wells IW-2 and IW-3 (Figure TP-PR-10-10-11) and in the piping running from the treated water tank T-700 to the injection wells (Figure TP-PR-10-10-04). The IM No. 3 facility injected 16,870,124 gallons of treatment system effluent during Fourth Quarter 2009. The monthly average flow rate to injection wells is shown in Table 2.

The reverse osmosis concentrate flow rate was measured by a flow meter at the piping carrying water from RO concentrate tank T-701 to the truck load-out station (Figure TP-PR-10-10-08). The IM No. 3 facility generated 287,660 gallons of RO concentrate during Fourth Quarter 2009. The monthly average RO concentrate flow rate is shown in Table 2.

The sludge flow rate is measured by the size and weight of containers shipped offsite. One sludge container was shipped offsite from the IM No. 3 facility during Fourth Quarter 2009. The shipment dates and approximate weights are provided in Section 5.3.

## 3.3 Sampling and Analytical Procedures

With the exception of samples for pH and total petroleum hydrocarbons – diesel (TPH-diesel) analyses, all samples collected at the designated sampling locations were placed directly into containers provided by Truesdail Laboratories, Inc. (Truesdail). Analysis of samples for TPH-diesel was conducted by Advanced Technology Laboratories, Inc. (ATL). Sample containers were labeled and packaged according to standard sampling procedures.

The samples were stored in a sealed container chilled with ice and transported to the laboratories via courier under chain-of-custody documentation. The laboratories confirmed the samples were received in chilled condition upon arrival.

Samples analysis for pH was conducted by field method pursuant to the Water Board letter dated October 16, 2007 (subject: Clarification of Monitoring and Reporting Program Requirements) authorizing pH measurements to be conducted in the field. The field method pH samples were collected at the designated sampling locations and field tested within 15 minutes of sampling.

As required by the MRP, the analytical method selected for total chromium has a method detection limit of 1 part per billion (ppb), and the analytical method selected for hexavalent chromium has a method detection limit of 0.2 ppb.

Truesdail and ATL are certified by the California Department of Health Services under the State of California's Environmental Laboratory Accreditation Program. California-certified laboratory analyses were performed in accordance with the latest edition of the *Guidelines Establishing Test Procedures for Analysis of Pollutants* (40 Code of Federal Regulations Part 136), promulgated by the United States Environmental Protection Agency.

Influent, effluent, reverse osmosis concentrate, and sludge sampling was conducted in accordance with the revised MRP, issued August 28, 2009. See Table 3 for sample collection dates and frequencies.

Groundwater quality is being monitored in observation and compliance wells according to Order R7-2006-0060 and the procedures and schedules approved in the *Groundwater Compliance Monitoring Plan for Interim Measures No. 3 Injection Area* submitted to the Water Board on June 17, 2005. Quarterly groundwater monitoring analytical results for the injection area (wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D) are reported in a separate document, in conjunction with groundwater level maps of the same monitoring wells.



## 4.0 Analytical Results

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The analytical results and laboratory reports for the IM No. 3 groundwater treatment system monitoring program between January 1, 2009 and September 30, 2009 were included in the First Quarter, Second Quarter, and Third Quarter Monitoring Reports submitted to the Water Board (see Section 3.0 for a complete listing of reports).

Laboratory reports for samples collected in Fourth Quarter 2009 were prepared by certified analytical laboratories, and are presented in Appendix D. The Fourth Quarter 2009 analytical results are presented in Tables 4, 5, 6, and 7:

- Influent analytical results are presented in Table 4.
- Effluent analytical results are presented in Table 5. There were no exceedances of effluent limitations during the reporting period.
- Reverse osmosis concentrate analytical results are presented in Table 6.
- Sludge analytical results are presented in Table 7.

The sludge is required to have an aquatic bioassay test annually. The aquatic bioassay test results were conducted on a September 2009 sample and were presented in the Third Quarter Monitoring Report submitted to the Water Board October 15, 2009.

Table 8 identifies the following information for each analysis:

- Sample location
- Sample identification number
- Sampler name
- Sample date
- Sample time
- Laboratory performing analysis
- Analysis method
- Analysis date
- Laboratory technician

Additional effluent sampling analytical results are presented in Table 9. These additional samples were collected and analyzed for total petroleum hydrocarbons (TPH) as a result of the September extended treatment system shutdown due primarily to synthetic oil fouling of the treatment stream reported in the Third Quarter Monitoring Report submitted to the Water Board October 15, 2009.

## 5.0 Semiannual Operation and Maintenance

Pursuant to the WDR's Operations and Maintenance Section 1:

*The discharger shall inspect and document any operation/maintenance problems by inspecting each unit process. In addition, calibration of flow meters and equipment shall be performed in a timely manner and documented. Operation and Maintenance reports shall be submitted to the Regional Water Board Office twice annually.*

This section includes the Semiannual Operation and Maintenance Report for the IM No. 3 groundwater treatment system for the period July 1, 2009 through December 31, 2009. The IM No. 3 operation and maintenance activities for January 1, 2009 through June 30, 2009 were reported in the Second Quarter 2009 Monitoring and Semiannual January 1- June 30, 2009 Operation and Maintenance Report, submitted July 15, 2009.

All operations and maintenance records are maintained at the facility, including site inspection forms, process monitoring records, hazardous waste generator records (i.e., waste manifests), and self-monitoring reports. These records will be maintained onsite for a period of at least 5 years. Operational programmable logic controller data (flow rates, system alarms, process monitoring data, etc.) are maintained electronically via data historian software. Operations and maintenance records are also archived using maintenance software. The subsections below summarize the operations and maintenance activities during this semiannual reporting period.

### 5.1 Flowmeter Calibration Records

The IM No. 3 groundwater treatment system flowmeter calibration records are included in Appendix C. Flowmeter calibrations are performed in a timely manner consistent with the use, flow, material, and manufacturer recommendations. The following flowmeters are used at the plant to measure groundwater flow.

Location	Flowmeter Location ID	Current Flowmeter Serial No.	Date of Most Recent Re-Calibrated Meter Installation	Previous Flowmeter Serial No.
Extraction well PE-1	FIT-103	7700F216000	February 25, 2009	6C036F16000
Extraction well TW-3D	FIT-102	6C037016000	January 25, 2009	6A022116000
Extraction well TW-2D <sup>a</sup>	FIT-101	6A021F16000	July 28, 2005	---
Extraction well TW-2S <sup>b</sup>	FIT-100	6A022016000	July 28, 2005	---
Injection well IW-02	FIT-1202	6C037316000	February 26, 2009	6A022116000
Injection well IW-03	FIT-1203	6C036F16000	February 25, 2009	6C037216000
Combined IW-02 and IW-03	FIT-700	7700C616000	February 13, 2009	7700F316000
Reverse osmosis concentrate	FIT-701	6C037116000	February 25, 2009	6C022216000

**Notes:**

<sup>a</sup> TW-2D is a backup extraction well only operated for brief testing and sampling periods since January 2006.

<sup>b</sup> TW-2S is a backup extraction well only operated for brief testing and sampling periods since October 2005.

## 5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between July 1, 2009 and December 31, 2009 are provided in Appendix B. The daily volumes of groundwater treated from January 1, 2009 through June 30, 2009 were reported in the Second Quarter 2009 Monitoring and Semiannual January 1- June 30, 2009 Operation and Maintenance Report, submitted July 15, 2009.

Approximately 31,114,954 gallons of groundwater were extracted and treated between July 1, 2009 and December 31, 2009. Treatment of this water at the IM No. 3 facility is being performed in accordance with the conditions of Order No. R7-2006-0060.

Additionally, approximately 14,835 gallons of well purge water (generated during well development, monitoring well sampling, and/or aquifer testing) and 106,850 gallons of injection well re-development water were treated at the IM No. 3 facility during the July 1, 2009 through December 31, 2009 semiannual period.

A total of approximately 30,316,825 gallons of treated groundwater was injected back into the Alluvial Aquifer between July 1, 2009 and December 31, 2009.

## 5.3 Residual Solids Generated (Sludge)

During the July 1, 2009 through December 31, 2009 reporting period, nine containers of sludge were shipped offsite for disposal. The containers of sludge shipped offsite for disposal from January 1, 2009 through June 30, 2009 were reported in the Second Quarter 2009 Monitoring and Semiannual January 1- June 30, 2009 Operation and Maintenance Report, submitted July 15, 2009. The sludge was shipped to Chemical Waste Management at Kettleman Hills for disposal. A listing of each shipment during the July 1, 2009 through December 31, 2009 reporting period is provided below.

<b>Date Sludge Bin Removed from Site</b>	<b>Approximate Quantity from Waste Manifests (cubic yards)</b>	<b>Approximate Wet Weight (lbs)</b>	<b>Type of Shipment</b>
8/4/2009	8	11,940	non-RCRA hazardous waste
9/12/2009	8	14,000	non-RCRA hazardous waste
9/18/2009	8	14,820	non-RCRA hazardous waste
9/29/2009	8	10,989	non-RCRA hazardous waste
11/24/2009	8	13,440	non-RCRA hazardous waste

**Notes:**

The approximate wet weight is provided by the disposal facility based on full container weight less the empty container weight.

RCRA = Resource Conservation and Recovery Act.

## 5.4 Reverse Osmosis Concentrate Generated

Data regarding daily volumes of reverse osmosis concentrate generated are provided in Appendix B, as measured by flowmeter FIT-701 (Figures PR-10-03 and PR-10-04). From July 1, 2009 through December 31, 2009, approximately 610,085 gallons of RO concentrate were transported to Liquid Environmental Solutions in Phoenix, Arizona for disposal. The daily volumes of RO concentrate generated from January 1, 2009 through June 30, 2009 were reported in the Semiannual January 1- June 30, 2009 Operation and Maintenance Report, submitted July 15, 2009.

## 5.5 Summary of WDR Compliance

No WDR violations were identified during the July 1, 2009 through December 31, 2009 semiannual reporting period, nor during the January 1, 2009 through June 30, 2009 semiannual reporting period.

## 5.6 Operation and Maintenance – Required Shutdowns

Records of routine maintenance are kept onsite. The summary of operation or maintenance issues that required the groundwater extraction system to be shut down during the January 1, 2009 through June 30, 2009 period was reported in the Second Quarter 2009 Monitoring and Semiannual January 1- June 30, 2009 Operation and Maintenance Report, submitted July 15, 2009.

Appendix A contains a summary of the operation or maintenance issues that required the groundwater extraction system to be shut down during the July 1, 2009 through December 31, 2009 semiannual reporting period.

Activities during the Third Quarter 2009 included two extended shutdowns. No extended shutdowns of the IM No. 3 extraction system occurred during the Fourth Quarter 2009. The first extended shutdown was in July, due primarily to planned maintenance to replace the aging RO system. The second extended shutdown was in September due primarily to equipment failure that resulted in synthetic oil fouling of the treatment stream.

### July Extended Shutdown

The IM No. 3 extraction system was shut down for 267.9 hours during July 2009, for both planned and unplanned events. The causes of the extraction system downtime included:

- Planned maintenance to replace the aging RO system with a new, modern RO system;
- Unplanned maintenance to troubleshoot the new RO system during testing; and
- Unplanned maintenance to repair the microfilter level system.

The RO unit start-up testing was completed July 27, 2009, and the IM No. 3 plant was returned to continuous treatment service.

### **September Extended Shutdown**

The IM No. 3 facility shut down on September 9, 2009 due to equipment failure that resulted in synthetic oil fouling of the treatment stream in tank T301A from the tank mixer gearbox. Immediately upon discovery of the fouling, IM No. 3 operators shut down the extraction and injection well systems, and began cleanup and recovery actions. PG&E notified the Water Board about the incident on September 9, 2009. PG&E also had follow-up conversations with the Water Board on September 11, 14, and 16 to discuss the status of the clean-up and recovery actions. On September 16, 2009 the Water Board concurred with PG&E's recommendation to resume the injection of treated water from the IM No. 3 treatment plant into the injection wells.

The following recovery actions were implemented to address the synthetic oil fouling:

- At approximately 11:00 a.m. on September 9, 2009, injection was stopped upon discovering the oil fouling within the IM No. 3 treatment system. Injection of treated water was halted and the plant put into recirculation mode.
- At approximately 11:00 p.m. on September 9, 2009, the plant recirculation was shut down, which allowed free oil to float to the top of tanks.
- Starting at approximately 7:00 a.m. on September 10, 2009, a vacuum truck was mobilized to IM No. 3 to remove oil contamination. Removal of water in the top layer of tanks and injection pipe flushing were completed from September 10-15, 2009. The clarifier was drained and pressure-washed. The RO prefilters were inspected, and no significant fouling or petroleum odor was observed on the RO pre-filters.
- On September 14, 2009 three air-lift backwash cycles of injection well 3 (IW-3) were completed to help remove traces of oil that may have been pumped to the injection well by removing water from the injection well and the aquifer surrounding the well.
- On the afternoon of September 14, 2009 plant operation was restarted in recirculation mode.
- Injection was restarted on the afternoon of September 16, 2009 after receiving Water Board concurrence.

## **5.7 Treatment Plant Modifications**

No major IM No. 3 treatment plant modifications that affected the quality or quantity of treated effluent were performed during the January 1, 2009 through December 31, 2009 annual period. However, PG&E made the following modification while maintaining the quality and quantity of treated effluent:

- Replace the aging RO system with a new, modern RO system.

## 6.0 Conclusions

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There were no exceedances of effluent limitations during the reporting period.

In addition, no incidents of non-compliance were identified during the reporting period. No events that caused an immediate or potential threat to human health or the environment, and no new releases of hazardous waste or hazardous waste constituents, or new solid waste management units, were identified during the reporting period.

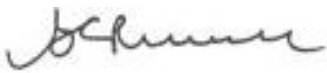
## 7.0 Certification

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On August 12, 2005, PG&E submitted a signature delegation letter to the Water Board, delegating PG&E signature authority to Mr. Curt Russell and Ms. Yvonne Meeks for correspondence regarding Board Order R7-2004-0103. Order R7-2006-0060 is the successor to Order R7-2004-0103; an additional signature authority delegation is not required, as confirmed in an email from Jose Cortez dated December 12, 2006.

Certification Statement:

I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Signature:  \_\_\_\_\_

Name: \_\_\_\_\_ Curt Russell

Company: \_\_\_\_\_ Pacific Gas and Electric Company

Title: \_\_\_\_\_ Topock Site Manager

Date: \_\_\_\_\_ January 15, 2010

## Tables

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**TABLE 1**  
 Sampling Station Descriptions  
*Fourth Quarter 2009 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

Sampling Station	Sample ID <sup>a</sup>	Location
Sampling Station A: Groundwater Treatment System Influent	SC-100B-WDR-###	Sample collected from tap on pipe into T-100 (see Figure TP-PR-10-10-04).
Sampling Station B: Groundwater Treatment System Effluent	SC-700B-WDR-###	Sample collected from tap on pipe downstream from T-700 (see Figure TP-PR-10-10-04).
Sampling Station D: Groundwater Treatment System Reverse Osmosis Concentrate	SC-701-WDR-###	Sample collected from tap on pipe into T-701 (see Figure TP-PR-10-10-08).
Sampling Station E: Groundwater Treatment System Sludge	SC-SLUDGE-WDR-###	Sample collected from sludge accumulated in the phase separator used this quarter (see Figure TP-PR-10-10-06).

**Note:**

### = Sequential sample identification number at each sample station.

<sup>a</sup> The sample event number is included at the end of the sample ID (e.g., SC-100B-WDR-015).

**TABLE 2**

## Flow Monitoring Results

*Fourth Quarter 2009 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

Parameter	System Influent <sup>a,b</sup> (gpm)	System Effluent <sup>b,c</sup> (gpm)	Reverse Osmosis Concentrate <sup>b</sup> (gpm)
October 2009 Average Monthly Flowrate	133.3	131.1	1.9
November 2009 Average Monthly Flowrate	133.4	130.5	2.2
December 2009 Average Monthly Flowrate	123.8	120.5	2.5

**Notes:**

gpm: gallons per minute.

July, August, and September 2009 Average Monthly Flowrates were presented in the IM No. 3 Third Quarter 2009 Monitoring Report

<sup>a</sup> Extraction wells TW-3D and PE-1 were operated during the Fourth Quarter 2009 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2D was operated for a short period of time on October 1, 2009 for groundwater sampling. Extraction well TW-2S was not operated during Fourth Quarter 2009.

<sup>b</sup> The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Fourth Quarter 2009 is approximately 0.49 percent.

<sup>c</sup> Effluent was discharged into injection well IW-02 and IW-03 during the Fourth Quarter 2009. During October 2009, effluent was discharged to injection well IW-02. Effluent was not discharged to IW-03 until the well was rehabilitated in November 2009.

**TABLE 3**  
Sample Collection Dates  
*Fourth Quarter 2009 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

Parameter	Sample Collection Dates	Results
Influent <sup>a</sup>	October 7, 2009	See Table 4
	November 4, 2009	
	December 2, 2009	
Effluent <sup>b</sup>	October 7, 2009	See Table 5
	October 13, 2009	
	October 20, 2009	
	October 28, 2009	
	November 4, 2009	
	November 10, 2009	
	November 17, 2009	
	November ,24 2009	
	December 2, 2009	
	December 9, 2009	
	December 15, 2009	
	December 22, 2009	
	December 29, 2009	
Reverse Osmosis Concentrate <sup>c</sup>	December 9, 2009	See Table 6
Sludge <sup>d</sup>	December 2, 2009	See Table 7

**Notes:**

<sup>a</sup> Influent sampling is required monthly.

<sup>b</sup> Effluent sampling is required weekly.

<sup>c</sup> Reverse Osmosis Concentrate sampling is required quarterly.

<sup>d</sup> One composite sludge sample is required quarterly. Sludge bioassay analysis is required annually, and was conducted on the Third Quarter 2009 sludge composite sample and reported (pass at 95 percent survival rate) in the IM No. 3 Third Quarter 2009 Monitoring Report.

TABLE 4  
Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)  
Influent Monitoring Results <sup>a</sup>  
Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Required Sampling Frequency		Monthly																								
<div>Sample ID</div>	<div>Date</div>	<div>Analytes Units <sup>b</sup> MDL</div>	TDS	Turbidity	Specific Conductance	Field <sup>c</sup> pH	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate (as N)	Nitrite (as N)	Sulfate	Iron	Zinc	
			mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	µg/L	µg/L
			7.00	0.0070	0.0220	---	0.0750	2.00	2.36	0.0050	0.495	0.140	0.210	0.0020	0.520	0.0600	0.0750	0.0600	0.725	0.205	0.0950	0.00020	2.00	3.00	1.50	
SC-100B-WDR-225	10/7/2009		5020	ND (0.100)	7900	7.5	965	1160	ND (50.0)	ND (0.500)	ND (10.0)	2.92	22.5	1.09	ND (5.00)	2.83	ND (10.0)	ND (10.0)	17.3	ND (10.0)	3.60	ND (0.0050)	580	30.0	ND (25.0)	
RL			250	0.100	2.00	---	1.00	21.0	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	25.0	20.0	25.0	
SC-100B-WDR-229	11/4/2009		5570	0.105	7880	7.5	1040	1100	ND (50.0)	ND (0.500)	ND (10.0)	3.81	25.7	1.08	ND (5.00)	2.64	ND (10.0)	ND (10.0)	27.1	ND (10.0)	3.07	ND (0.0050)	562	ND (20.0)	ND (10.0)	
RL			250	0.100	2.00	---	1.00	21.0	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	50.0	20.0	10.0	
SC-100B-WDR-233	12/2/2009		4730	ND (0.100)	7960	7.2	1020	1100	ND (50.0)	ND (0.500)	ND (10.0)	4.12	25.9	1.03	ND (5.00)	2.72	ND (10.0)	ND (10.0)	18.2	ND (10.0)	3.20	ND (0.0050)	574	ND (20.0)	ND (10.0)	
RL			250	0.100	2.00	---	1.00	21.0	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	50.0	20.0	10.0	

NOTES:

(---) = not required by the WDR Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
MDL = method detection limit  
mg/L = milligrams per liter  
N = nitrogen  
ND = parameter not detected at the listed value  
NTU = nephelometric turbidity units  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

<sup>a</sup> Sampling Location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&ID TP-PR-10-10-04).  
<sup>b</sup> Units reported in this table are those units required in the WDRs.  
<sup>c</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 5  
Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)  
Effluent Monitoring Results<sup>a</sup>  
Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

WDRs Effluent Limits <sup>b</sup>	Ave. Monthly Max Daily	NA	NA	NA	6.5-8.4	25	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		NA	NA	NA	6.5-8.4	50	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Required Sampling Frequency		Weekly						Monthly																		
<div><div></div><div>Analytes Units<sup>c</sup> MDL<sup>d</sup></div><div>Sample IDDate</div></div>		TDS	Turbidity	Specific Conductance	Field pH <sup>e</sup>	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate (as N)	Nitrite (as N)	Sulfate	Iron	Zinc		
		mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	µg/L	µg/L	
		3.50	0.0070	0.0220	---	0.0750	0.0200	2.36	0.0050	0.495	0.140	0.210	0.0020	0.520	0.0600	0.0750	0.0600	0.725	0.205	0.0950	0.00020	1.00	3.00	1.50		
SC-700B-WDR-225 10/7/2009		4310	ND (0.100)	6730	7.60	ND (1.00)	ND (0.200)	ND (50.0)	ND (0.500)	ND (10.0)	ND (1.00)	14.7	1.00	ND (5.00)	2.39	ND (10.0)	57.3	15.5	ND (10.0)	2.72	ND (0.0050)	500	ND (20.0)	ND (25.0)		
RL		250	0.100	2.00	---	1.00	0.200	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	25.0	20.0	25.0		
SC-700B-WDR-226 10/13/2009		4510	ND (0.100)	7940	7.40	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-227 10/20/2009		4970	ND (0.100)	7580	7.60	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-228 10/28/2009		4640	ND (0.100)	7640	7.50	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-229 11/4/2009		4900	0.142	7340	7.50	ND (1.00)	ND (0.200)	ND (50.0)	ND (0.500)	ND (10.0)	ND (1.00)	16.5	1.04	ND (5.00)	2.38	ND (10.0)	52.1	17.8	ND (10.0)	2.86	ND (0.0050)	514	ND (20.0)	ND (10.0)		
RL		250	0.100	2.00	---	1.00	0.200	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	25.0	20.0	10.0		
SC-700B-WDR-230 11/10/2009		4370	ND (0.100)	7460	7.50	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-231 11/17/2009		4430	ND (0.100)	7230	7.30	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-232 11/24/2009		4460	ND (0.100)	7370	7.40	1.21	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-233 12/2/2009		4490	ND (0.100)	7370	7.00	ND (1.00)	ND (0.200)	ND (50.0)	ND (0.500)	ND (10.0)	ND (1.00)	17.1	0.972	ND (5.00)	2.40	ND (10.0)	50.6	14.2	ND (10.0)	3.12	ND (0.0050)	521	ND (20.0)	ND (10.0)		
RL		250	0.100	2.00	---	1.00	0.200	50.0	0.500	10.0	1.00	10.0	0.200	5.00	0.500	10.0	10.0	10.0	10.0	1.00	0.0050	12.5	20.0	10.0		
SC-700B-WDR-234 12/9/2009		4570	ND (0.100)	7160	7.40	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-235 12/15/2009		4290	0.121	6920	6.80	1.28	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		125	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-236 12/22/2009		4030	0.245	7060	7.10	1.90	ND (1.05)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	1.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
SC-700B-WDR-237 12/29/2009		4480	0.124	7190	6.90	ND (1.00)	ND (0.200)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
RL		250	0.100	2.00	---	1.00	0.200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		

**TABLE 5**  
Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)  
Effluent Monitoring Results <sup>a</sup>  
*Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System*

**NOTES:**

(---) = not required by the WDR Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
MDL = method detection limit  
mg/L = milligrams per liter  
N = nitrogen  
NA = not applicable  
ND = parameter not detected at the listed value  
NTU = nephelometric turbidity units  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

- <sup>a</sup> Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection wells (see attached P&ID TP-PR-10-10-04).
- <sup>b</sup> In addition to the listed effluent limits, the WDRs state that the effluent shall not contain heavy metals, chemicals, pesticides or other constituents in concentrations toxic to human health.
- <sup>c</sup> Units reported in this table are those units required in the WDRs.
- <sup>d</sup> MDL listed is the target MDL by analysis method; however, the MDL may change for each sample analysis due to the dilution required by the matrix to meet the method QC requirements. The target MDL for each method/analyte combination is calculated annually.
- <sup>e</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 6  
Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)  
Reverse Osmosis Concentrate Monitoring Results <sup>a</sup>  
Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Required Sampling Frequency		Quarterly																					
<div>Sample ID</div> <div>Date</div>	<div>Analytes Units <sup>b</sup></div> <div>MDL</div>	TDS	Specific Conductance	Field <sup>c</sup> pH	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		mg/L	µmhos/cm	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		35.0	0.0220	---	0.00015	0.00050	0.00099	0.00014	0.00042	0.000036	0.00012	0.00015	0.00052	0.0600	0.00015	0.0015	0.00025	0.00041	0.00049	0.00038	0.00017	0.00012	0.0015
SC-701-WDR-234	12/9/2009	39600	46800	7.4	0.00354	ND (0.0052)	ND (0.0100)	0.00134	0.152	ND (0.0010)	ND (0.0030)	0.00741	0.00800	21.4	ND (0.0100)	0.184	ND (0.0020)	0.0356	0.0314	ND (0.0050)	ND (0.0020)	ND (0.0050)	0.0530
RL		1250	2.00	---	0.0020	0.0052	0.0100	0.0010	0.0100	0.0010	0.0030	0.0050	0.0050	0.500	0.0100	0.0100	0.0020	0.0100	0.0100	0.0050	0.0020	0.0050	0.0100

NOTES:  
(---) = not required by the WDR Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
MDL = method detection limit  
mg/L = milligrams per liter  
ND = parameter not detected at the listed value  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

<sup>a</sup> Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&ID TP-PR-10-10-08).  
<sup>b</sup> Units reported in this table are those units required in the WDRs.  
<sup>c</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 7  
Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)  
Sludge Monitoring Results<sup>a</sup>  
Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Required Sampling Frequency		Quarterly																		
<div> </div> <div>Analytes</div> <div>Units<sup>b</sup></div> <div>MDL</div> <div>Sample ID</div> <div>Date</div>		Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		2.47	1.23	0.0041	0.0041	0.0041	0.0012	0.00041	0.00041	0.0041	0.0494	0.0041	0.0012	0.00049	0.0012	0.0082	0.0082	0.0041	0.0012	0.0082
SC-Sludge-WDR-233	12/2/2009	14600	128	73.6	19.4	120	4.23	25.6	26.0	58.6	73.2	15.7	26.2	0.607	37.9	ND (2.04)	ND (2.04)	ND (2.04)	212	149
RL		408	8.23	2.04	2.04	2.04	2.04	2.04	2.04	2.04	16.5	2.04	2.04	0.408	2.04	2.04	2.04	2.04	2.04	2.04

NOTES:  
(---) = not required by the WDR Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
mg/kg = milligrams per killogram  
mg/L = milligrams per liter  
MDL = method detection limit  
ND = parameter not detected at the listed reporting limit  
RL = project reporting limit

<sup>a</sup> Sampling location for all sludge samples is the sludge collection bin (see attached P&ID TP-PR-10-10-06).  
<sup>b</sup> Units reported in this table are those units required in the WDRs.



**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-225	C. Knight	10/7/2009	8:09:00 AM	TLI	EPA 120.1	SC	10/8/2009	Tina Acquiat
					TLI	EPA 200.7	B	10/20/2009	Kris Collins
					TLI	EPA 200.7	FE	10/20/2009	Kris Collins
					TLI	EPA 200.8	AL	10/22/2009	Daniel Kang
					TLI	EPA 200.8	AS	10/20/2009	Daniel Kang
					TLI	EPA 200.8	BA	10/21/2009	Daniel Kang
					TLI	EPA 200.8	CR	10/20/2009	Daniel Kang
					TLI	EPA 200.8	CU	10/20/2009	Daniel Kang
					TLI	EPA 200.8	MN	10/20/2009	Daniel Kang
					TLI	EPA 200.8	MO	10/20/2009	Daniel Kang
					TLI	EPA 200.8	NI	10/20/2009	Daniel Kang
					TLI	EPA 200.8	PB	10/20/2009	Daniel Kang
					TLI	EPA 200.8	SB	10/20/2009	Daniel Kang
					TLI	EPA 200.8	ZN	10/25/2009	Daniel Kang
					TLI	EPA 218.6	CR6	10/8/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	10/8/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	10/8/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	10/9/2009	Giawad Ghenniwa
					FIELD	HACH	PH	10/7/2009	C. Knight
					TLI	SM2130B	TRB	10/8/2009	Gautam Savani
					TLI	SM2540C	TDS	10/8/2009	Tina Acquiat
					TLI	SM4500NH3D	NH3N	10/9/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	10/8/2009	Tina Acquiat
SC-100B	SC-100B-WDR-229	J. Aide	11/4/2009	7:40:00 AM	TLI	EPA 120.1	SC	11/5/2009	Tina Acquiat
					TLI	EPA 200.7	B	11/11/2009	Kris Collins
					TLI	EPA 200.7	FE	11/11/2009	Kris Collins
					TLI	EPA 200.8	AL	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	AS	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	BA	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	CR	11/5/2009	Romuel Chavez
					TLI	EPA 200.8	CU	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	MN	11/10/2009	Romuel Chavez
					TLI	EPA 200.8	MO	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	NI	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	PB	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	SB	11/9/2009	Romuel Chavez

TABLE 8

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-229	J. Aide	11/4/2009	7:40:00 AM	TLI	EPA 200.8	ZN	11/10/2009	Romuel Chavez
					TLI	EPA 218.6	CR6	11/5/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	11/5/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	11/5/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	11/5/2009	Giawad Ghenniwa
					FIELD	HACH	PH	11/4/2009	J. Aide
					TLI	SM2130B	TRB	11/5/2009	Gautam Savani
					TLI	SM2540C	TDS	11/5/2009	Tina Acquiati
					TLI	SM4500NH3D	NH3N	11/9/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	11/5/2009	Tina Acquiati
SC-100B	SC-100B-WDR-233	J. Aide	12/2/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/3/2009	Tina Acquiati
					TLI	EPA 200.7	B	12/4/2009	Kris Collins
					TLI	EPA 200.7	FE	12/4/2009	Kris Collins
					TLI	EPA 200.7	ZN	12/9/2009	Kris Collins
					TLI	EPA 200.8	AL	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	AS	12/7/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	BA	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	CR	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	CU	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	MN	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	MO	12/4/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	NI	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	PB	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	SB	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 218.6	CR6	12/3/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	12/3/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	12/3/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	12/3/2009	Giawad Ghenniwa
					FIELD	HACH	PH	12/2/2009	J. Aide
					TLI	SM2130B	TRB	12/3/2009	Gautam Savani
					TLI	SM2540C	TDS	12/3/2009	Tina Acquiati
					TLI	SM4500NH3D	NH3N	12/7/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	12/3/2009	Tina Acquiati
SC-700B	SC-700B-WDR-225	C. Knight	10/7/2009	8:09:00 AM	TLI	EPA 120.1	SC	10/8/2009	Tina Acquiati
					TLI	EPA 200.7	B	10/20/2009	Kris Collins
					TLI	EPA 200.7	FE	10/20/2009	Kris Collins

**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-225	C. Knight	10/7/2009	8:09:00 AM	TLI	EPA 200.8	AL	10/22/2009	Daniel Kang
					TLI	EPA 200.8	AS	10/20/2009	Daniel Kang
					TLI	EPA 200.8	BA	10/21/2009	Daniel Kang
					TLI	EPA 200.8	CR	10/20/2009	Daniel Kang
					TLI	EPA 200.8	CU	10/20/2009	Daniel Kang
					TLI	EPA 200.8	MN	10/20/2009	Daniel Kang
					TLI	EPA 200.8	MO	10/20/2009	Daniel Kang
					TLI	EPA 200.8	NI	10/20/2009	Daniel Kang
					TLI	EPA 200.8	PB	10/20/2009	Daniel Kang
					TLI	EPA 200.8	SB	10/20/2009	Daniel Kang
					TLI	EPA 200.8	ZN	10/25/2009	Daniel Kang
					TLI	EPA 218.6	CR6	10/14/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	10/8/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	10/8/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	10/9/2009	Giawad Ghenniwa
					FIELD	HACH	PH	10/7/2009	C. Knight
					TLI	SM2130B	TRB	10/8/2009	Gautam Savani
					TLI	SM2540C	TDS	10/8/2009	Tina Acquiati
					TLI	SM4500NH3D	NH3N	10/9/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	10/8/2009	Tina Acquiati
SC-700B	SC-700B-WDR-226	Ron Phelps	10/13/2009	8:15:00 AM	TLI	EPA 120.1	SC	10/14/2009	Tina Acquiati
					TLI	EPA 200.8	CR	10/16/2009	Daniel Kang
					TLI	EPA 218.6	CR6	10/14/2009	Sonya Bersudsky
					FIELD	HACH	PH	10/13/2009	Ron Phelps
					TLI	SM2130B	TRB	10/14/2009	Gautam Savani
					TLI	SM2540C	TDS	10/15/2009	Tina Acquiati
SC-700B	SC-700B-WDR-227	Ron Phelps	10/20/2009	8:00:00 AM	TLI	EPA 120.1	SC	10/21/2009	Tina Acquiati
					TLI	EPA 200.8	CR	10/21/2009	Daniel Kang
					TLI	EPA 218.6	CR6	10/22/2009	Sonya Bersudsky
					FIELD	HACH	PH	10/20/2009	Ron Phelps
					TLI	SM2130B	TRB	10/21/2009	Gautam Savani
					TLI	SM2540C	TDS	10/23/2009	Tina Acquiati
SC-700B	SC-700B-WDR-228	J. Aide	10/28/2009	9:00:00 AM	TLI	EPA 120.1	SC	10/29/2009	Tina Acquiati
					TLI	EPA 200.8	CR	10/30/2009	Daniel Kang
					TLI	EPA 218.6	CR6	10/29/2009	Sonya Bersudsky
					FIELD	HACH	PH	10/28/2009	J. Aide

**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-228	J. Aide	10/28/2009	9:00:00 AM	TLI	SM2130B	TRB	10/29/2009	Gautam Savani
					TLI	SM2540C	TDS	10/29/2009	Tina Acquiat
SC-700B	SC-700B-WDR-229	J. Aide	11/4/2009	7:40:00 AM	TLI	EPA 120.1	SC	11/5/2009	Tina Acquiat
					TLI	EPA 200.7	B	11/11/2009	Kris Collins
					TLI	EPA 200.7	FE	11/11/2009	Kris Collins
					TLI	EPA 200.8	AL	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	AS	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	BA	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	CR	11/5/2009	Romuel Chavez
					TLI	EPA 200.8	CU	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	MN	11/10/2009	Romuel Chavez
					TLI	EPA 200.8	MO	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	NI	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	PB	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	SB	11/9/2009	Romuel Chavez
					TLI	EPA 200.8	ZN	11/10/2009	Romuel Chavez
					TLI	EPA 218.6	CR6	11/5/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	11/5/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	11/5/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	11/5/2009	Giawad Ghenniwa
					FIELD	HACH	PH	11/4/2009	J. Aide
					TLI	SM2130B	TRB	11/5/2009	Gautam Savani
					TLI	SM2540C	TDS	11/5/2009	Tina Acquiat
					TLI	SM4500NH3D	NH3N	11/9/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	11/5/2009	Tina Acquiat
SC-700B	SC-700B-WDR-230	Ron Phelps	11/10/2009	8:00:00 AM	TLI	EPA 120.1	SC	11/11/2009	Tina Acquiat
					TLI	EPA 200.8	CR	11/12/2009	Romuel Chavez
					TLI	EPA 218.6	CR6	11/11/2009	Sonya Bersudsky
					FIELD	HACH	PH	11/10/2009	Ron Phelps
					TLI	SM2130B	TRB	11/11/2009	Gautam Savani
					TLI	SM2540C	TDS	11/12/2009	Tina Acquiat
SC-700B	SC-700B-WDR-231	Ron Phelps	11/17/2009	8:00:00 AM	TLI	EPA 120.1	SC	11/18/2009	Tina Acquiat
					TLI	EPA 200.8	CR	11/24/2009	Romuel Chavez
					TLI	EPA 218.6	CR6	11/18/2009	Sonya Bersudsky
					FIELD	HACH	PH	11/17/2009	Ron Phelps
					TLI	SM2130B	TRB	11/18/2009	Gautam Savani

TABLE 8

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-231	Ron Phelps	11/17/2009	8:00:00 AM	TLI	SM2540C	TDS	11/18/2009	Tina Acquiati
SC-700B	SC-700B-WDR-232	Ron Phelps	11/24/2009	8:00:00 AM	TLI	EPA 120.1	SC	11/30/2009	Tina Acquiati
					TLI	EPA 200.7	CR	12/1/2009	Kris Collins
					TLI	EPA 218.6	CR6	11/25/2009	Sonya Bersudsky
					FIELD	HACH	PH	11/24/2009	Ron Phelps
					TLI	SM2130B	TRB	11/25/2009	Gautam Savani
					TLI	SM2540C	TDS	11/30/2009	Tina Acquiati
SC-700B	SC-700B-WDR-233	J. Aide	12/2/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/3/2009	Tina Acquiati
					TLI	EPA 200.7	B	12/4/2009	Kris Collins
					TLI	EPA 200.7	FE	12/4/2009	Kris Collins
					TLI	EPA 200.7	ZN	12/10/2009	Kris Collins
					TLI	EPA 200.8	AL	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	AS	12/7/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	BA	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	CR	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	CU	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	MN	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	MO	12/4/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	NI	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	PB	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 200.8	SB	12/3/2009	Romuel Chavez/Daniel Kang
					TLI	EPA 218.6	CR6	12/3/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	12/3/2009	Giawad Ghenniwa
					TLI	EPA 300.0	NO3N	12/3/2009	Giawad Ghenniwa
					TLI	EPA 300.0	SO4	12/3/2009	Giawad Ghenniwa
					FIELD	HACH	PH	12/2/2009	J. Aide
					TLI	SM2130B	TRB	12/3/2009	Gautam Savani
					TLI	SM2540C	TDS	12/3/2009	Tina Acquiati
					TLI	SM4500NH3D	NH3N	12/7/2009	Iordan Stavrev
					TLI	SM4500NO2B	NO2N	12/3/2009	Tina Acquiati
SC-700B	SC-700B-WDR-234	J. Aide	12/9/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/10/2009	Tina Acquiati
					TLI	EPA 200.8	CR	1/6/2010	Romuel Chavez/Hope Trinidad
					TLI	EPA 218.6	CR6	12/10/2009	Sonya Bersudsky
					FIELD	HACH	PH	12/9/2009	J. Aide
					TLI	SM2130B	TRB	12/10/2009	Gautam Savani
					TLI	SM2540C	TDS	12/10/2009	Tina Acquiati

**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-235	Ron Phelps	12/15/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/16/2009	Tina Acquiati
					TLI	EPA 200.7	CR	12/28/2009	Kris Collins
					TLI	EPA 218.6	CR6	12/17/2009	Sonya Bersudsky
					FIELD	HACH	PH	12/15/2009	Ron Phelps
					TLI	SM2130B	TRB	12/16/2009	Gautam Savani
					TLI	SM2540C	TDS	12/16/2009	Tina Acquiati
SC-700B	SC-700B-WDR-236	C. Knight	12/22/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/28/2009	Tina Acquiati
					TLI	EPA 200.7	CR	12/28/2009	Kris Collins
					TLI	EPA 218.6	CR6	12/23/2009	Sonya Bersudsky
					FIELD	HACH	PH	12/22/2009	C. Knight
					TLI	SM2130B	TRB	12/23/2009	Gautam Savani
					TLI	SM2540C	TDS	12/28/2009	Tina Acquiati
SC-700B	SC-700B-WDR-237	Ron Phelps	12/29/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/30/2009	Tina Acquiati
					TLI	EPA 200.8	CR	1/4/2010	Romuel Chaves
					TLI	EPA 218.6	CR6	12/30/2009	Sonya Bersudsky
					FIELD	HACH	PH	12/29/2009	Ron Phelps
					TLI	SM2130B	TRB	12/30/2009	Gautam Savani
					TLI	SM2540C	TDS	12/30/2009	Tina Acquiati
SC-701	SC-701-WDR-234	J. Aide	12/9/2009	8:00:00 AM	TLI	EPA 120.1	SC	12/10/2009	Tina Acquiati
					TLI	EPA 200.7	BE	12/28/2009	Kris Collins
					TLI	EPA 200.8	AG	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	AS	12/28/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	BA	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	CD	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	CO	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	CR	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	CU	12/28/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	HG	12/16/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	MO	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	NI	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	PB	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	SB	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	SE	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	TL	12/15/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 200.8	V	12/15/2009	Romuel Chavez/Hope Trinidad

**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-701	SC-701-WDR-234	J. Aide	12/9/2009	8:00:00 AM	TLI	EPA 200.8	ZN	12/29/2009	Romuel Chavez/Hope Trinidad
					TLI	EPA 218.6	CR6	12/10/2009	Sonya Bersudsky
					TLI	EPA 300.0	FL	12/11/2009	Giawad Ghenniwa
					FIELD	HACH	PH	12/9/2009	J. Aide
					TLI	SM2540C	TDS	12/10/2009	Tina Acquiat
Phase Seperator	SC-Sludge-WDR-233	J. Aide	12/2/2009	8:45:00 AM	TLI	EPA 300.0	FL	12/3/2009	Giawad Ghenniwa
					TLI	EPA 6010B	AG	12/13/2009	Kris Collins
					TLI	EPA 6010B	AS	12/9/2009	Kris Collins
					TLI	EPA 6010B	BA	12/13/2009	Kris Collins
					TLI	EPA 6010B	BE	12/13/2009	Kris Collins
					TLI	EPA 6010B	CD	12/9/2009	Kris Collins
					TLI	EPA 6010B	CO	12/9/2009	Kris Collins
					TLI	EPA 6010B	CR	12/13/2009	Kris Collins
					TLI	EPA 6010B	CU	12/9/2009	Kris Collins
					TLI	EPA 6010B	MO	12/9/2009	Kris Collins
					TLI	EPA 6010B	NI	12/9/2009	Kris Collins
					TLI	EPA 6010B	PB	12/9/2009	Kris Collins
					TLI	EPA 6010B	SB	12/13/2009	Kris Collins
					TLI	EPA 6010B	SE	12/9/2009	Kris Collins
					TLI	EPA 6010B	TL	12/9/2009	Kris Collins
					TLI	EPA 6010B	V	12/9/2009	Kris Collins
					TLI	EPA 6010B	ZN	12/9/2009	Kris Collins
					TLI	SW 6020A	HG	12/16/2009	Romuel Chaves
					TLI	SW 7199	CR6	12/7/2009	Sonya Bersudsky

**TABLE 8**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Monitoring Information

*Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System***NOTES:**

SC-700B = Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection well IW-2 (see attached P&amp;ID TP-PR-10-10-04).

SC-100B = Sampling location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&amp;ID TP-PR-10-10-04).

SC-701 = Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&amp;ID TP-PR-10-10-08).

Prior to April 11, 2007 the analytical methods listed in the 40 CFR Part 136 for pH and TDS were E150.1 and E160.1, respectively. Per EPA and Department of Health Services guidelines, the analytical methods listed in the current 40 CFR Part 136 have changed to SM4500-H B and SM2540C as shown on the table.

AL =	aluminum	NH3N =	ammonia (as N)
Ag =	silver	NI =	nickel
AS =	arsenic	NO2N =	nitrite (as N)
B =	boron	NO3N =	nitrate (as N)
BA =	barium	PB =	lead
BE =	beryllium	PH =	pH
CD =	cadmium	SB =	antimony
CO =	cobalt	SC =	specific conductance
CR =	chromium	SE =	selenium
CR6 =	hexavalent chromium	SO4 =	sulfate
CU =	copper	TDS =	total dissolved solids
FE =	iron	TL =	thallium
FL =	fluoride	TLI =	Truesdail Laboratories, Inc.
HG =	mercury	TRB =	turbidity
MN =	manganese	V =	vanadium
MO =	molybdenum	ZN =	zinc



**TABLE 9**

Board Order No. R7-2006-0060 Waste Discharge Requirements (WDRs)

Additional Effluent Parameters<sup>a</sup>*Fourth Quarter 2009 Monitoring Report for Interim Measure No.3 Groundwater Treatment System*

Location	Date	TPH Diesel	TPH Motor Oil
		(µg/L)	(µg/L)
SC-700B	9/16/2009	55.0	ND (51)
SC-700B	9/17/2009	ND (50)	ND (50)
SC-700B	9/18/2009	ND (50)	ND (50)
SC-700B	9/19/2009	ND (50)	ND (50)
SC-700B	9/20/2009	ND (50)	ND (50)
SC-700B	9/21/2009	ND (50)	ND (50)
SC-700B	10/9/2009	ND (50)	ND (50)
SC-700B	11/4/2009	ND (51)	ND (51)

**NOTES:**

ND = parameter not detected at the listed value

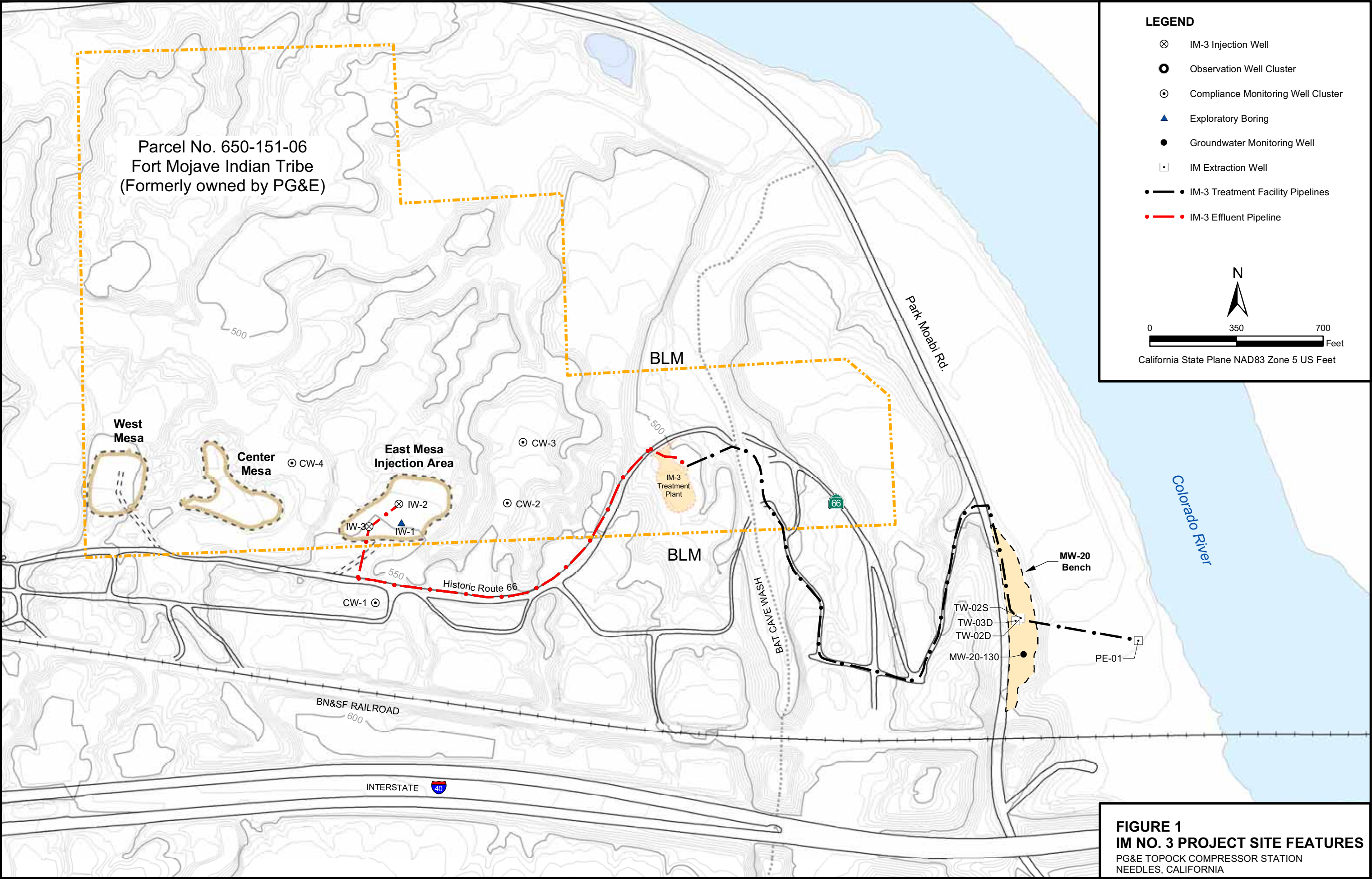
µg/L = micrograms per liter

TPH = Total Petroleum Hydrocarbon

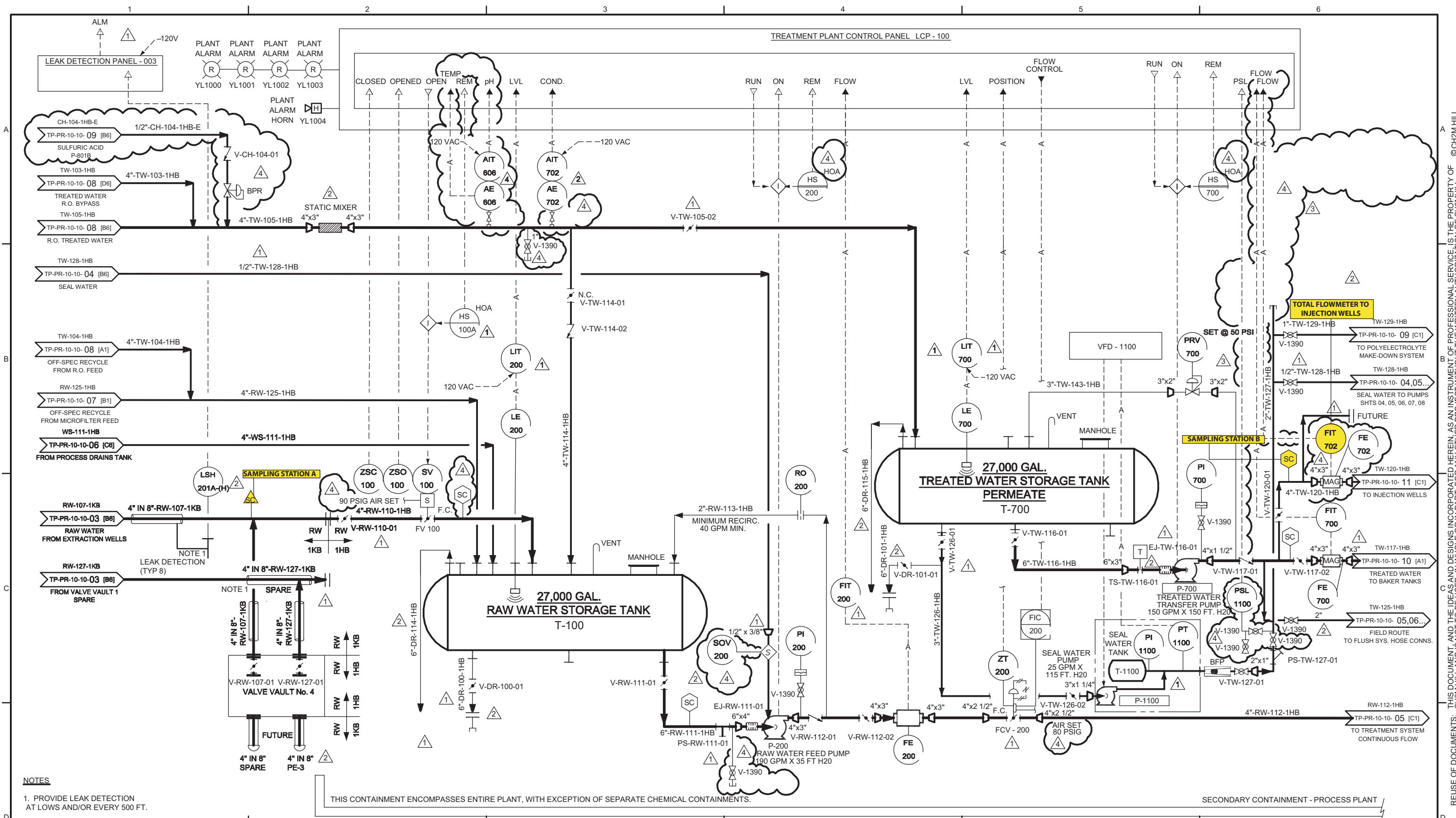
<sup>a</sup> Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection wells (see attached P&ID TP-PR-10-10-04).

## Figures

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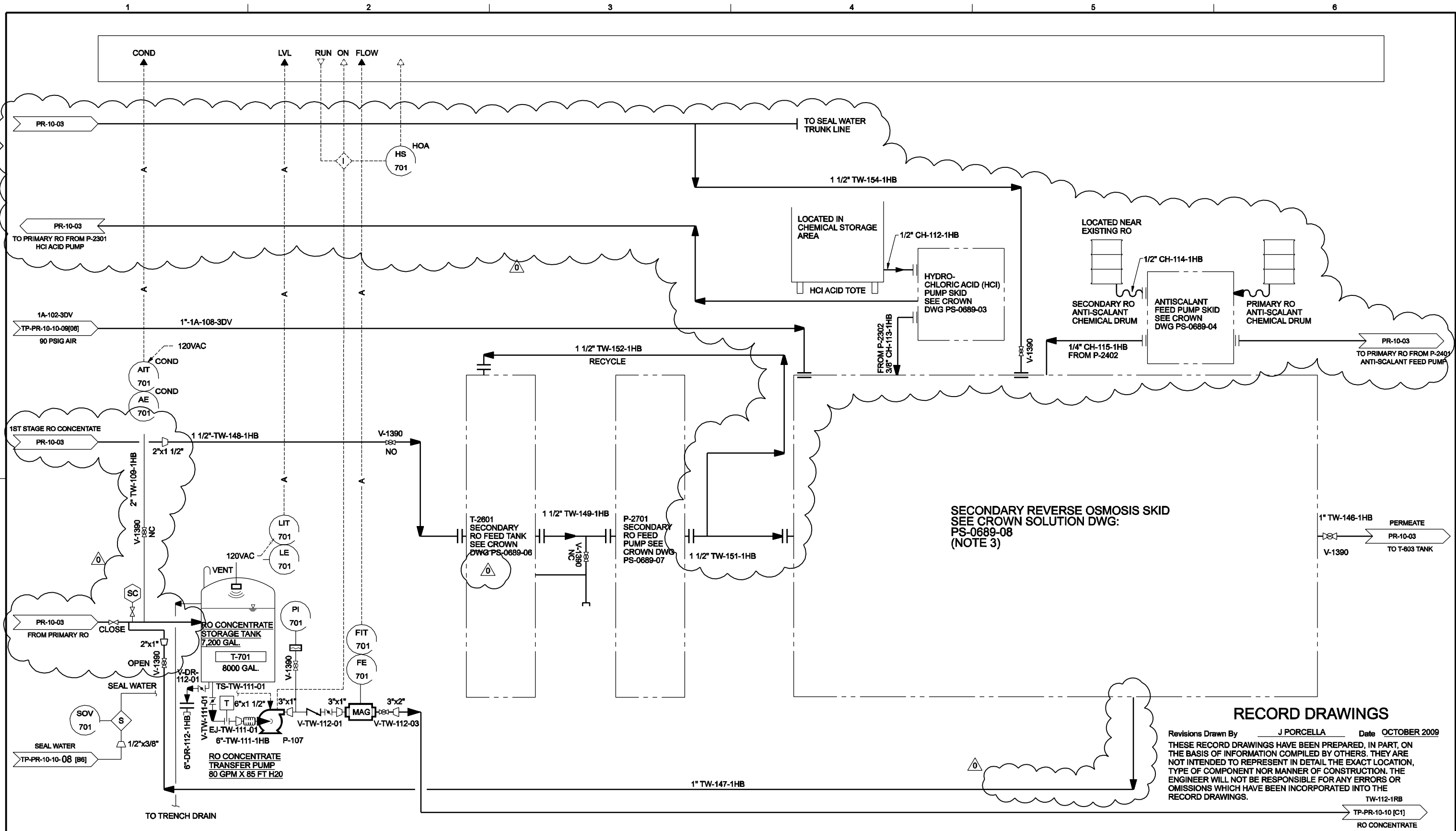






RESPONSIBLE ENGINEER: Kenneth L. Martins CH4876 PE #	NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL	REV 4	DATE 09/21/05	PRINT DISTRIBUTION	STATUS					PACIFIC GAS & ELECTRIC CO. TOPOCK COMPRESSOR STATION INTERIM MEASURE 3 EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM PROJ NO. 315994	PROCESS AND INSTRUMENTATION DIAGRAM  SHEET 04 STORAGE AREA		
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	0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL		STATUS	PRELIMINARY							
	1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL		REV.	FOR REVIEW AND APPROVAL	D	07/28/04					
	2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL		CLIENT	APPROVED FOR CONSTRUCTION	0	09/03/04	KLM				TP
	3	02/14/05	ADDED RECIRC. LINE AND PRV VALVE TO T-700 - APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL		FIELD	REVISED & APPROVED FOR CONSTRUCTION	4	/ /					
	4	09/21/05	REVISED PER AS-BUILT CONDITIONS	EFC	AJ	PIPING		GEN. ARRANG.		INTRA CO.								
										SCALE NONE					CH2MHILL	DWG. NO. TP-PR-10-10-04	REV. 4	



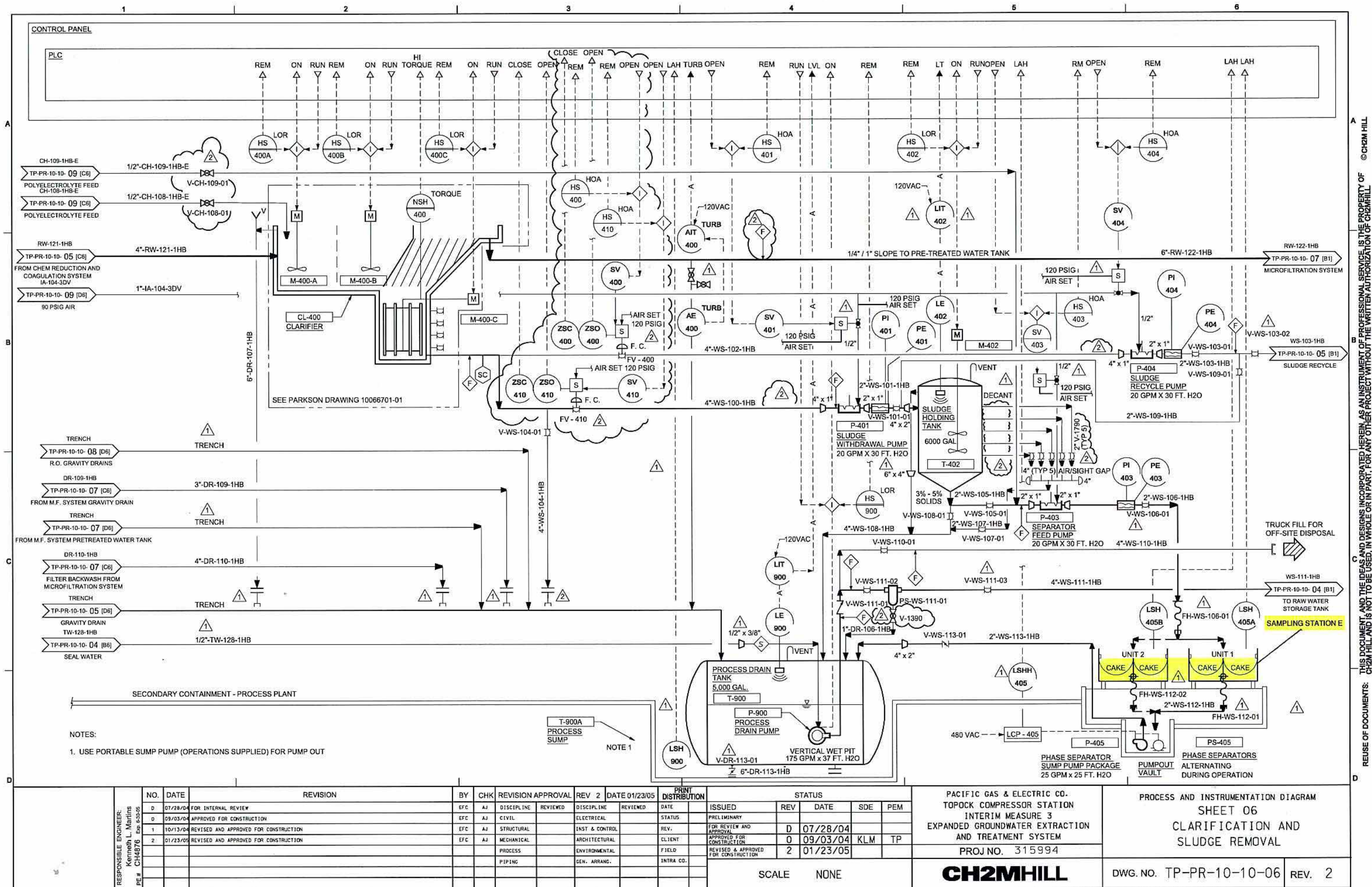


RECORD DRAWINGS

Revisions Drawn By J PORCELLA Date OCTOBER 2009  
THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

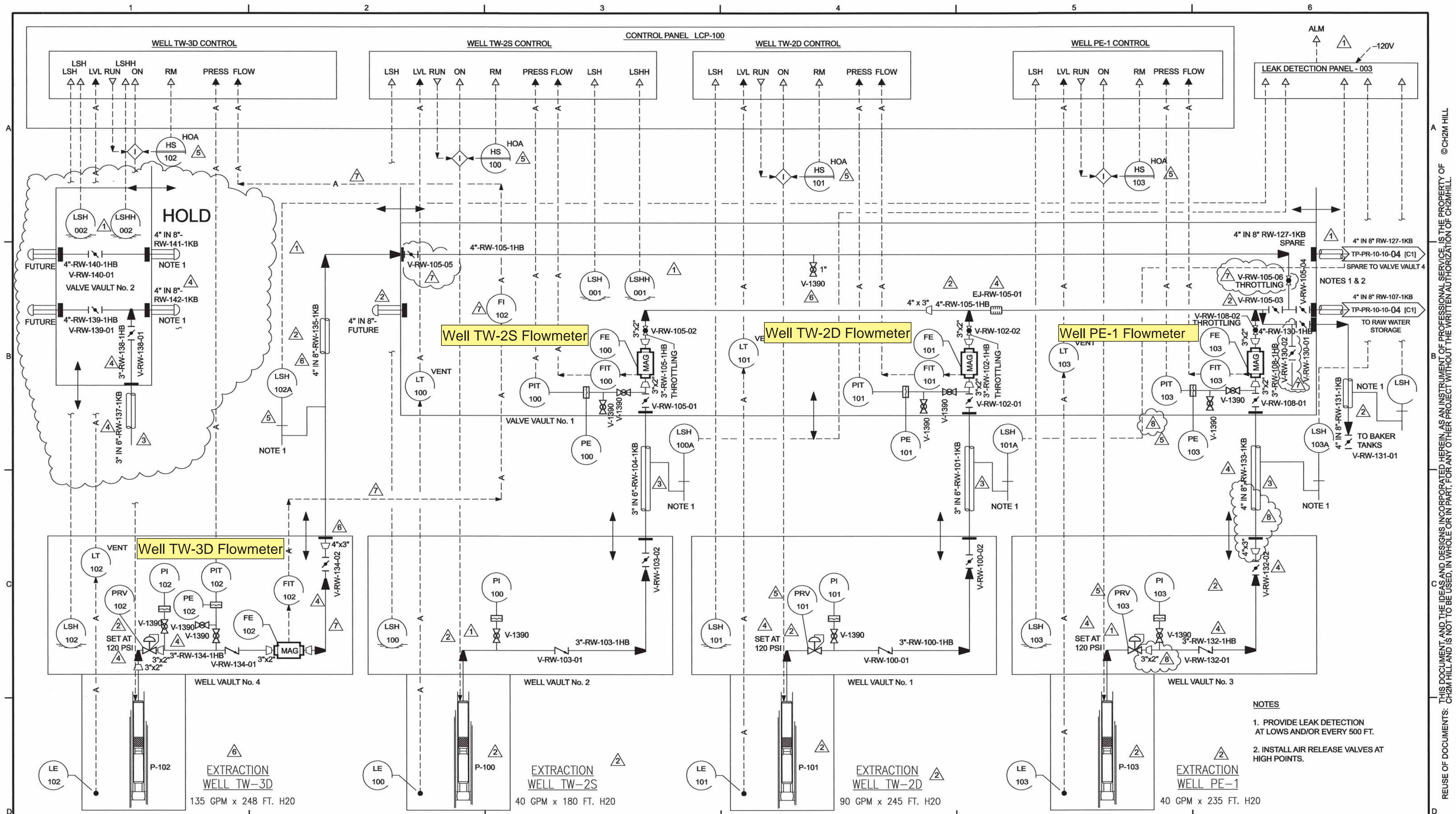
** ORIGINALLY STAMPED AND SIGNED BY: JOHN PORCELLA CALIFORNIA PE NO. C70145 ON 04-01-2009 **	RESPONSIBLE ENGINEER: John Porcella PE # C70145 Exp. 03-04-10	NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL		REV 0	DATE 10/02/09	PRINT DISTRIBUTION	STATUS					PACIFIC GAS & ELECTRIC CO. TOPOCK COMPRESSOR STATION INTERIM MEASURE 3 PLANT PERFORMANCE IMPROVEMENTS  PROJ NO. 362032	PROCESS AND INSTRUMENTATION DIAGRAM REVERSE OSMOSIS SYSTEM SHEET TWO OF TWO			
		A	2/12/09	INTERNAL REVIEW			DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE		ISSUED	REV	DATE	SDE					PEM
		B	2/12/09	CLIENT REVIEW			CIVIL	SJ	ELECTRICAL	FH	STATUS		PRELIMINARY	A	2/12/09	JP					JP
		C	4/01/09	FOR REVIEW AND APPROVAL	JR	JP	STRUCTURAL		INST & CONTROL	JG	REV.		FOR REVIEW AND APPROVAL	C	4/01/09	JP					JP
		D	11/17/09	FINAL RECORD ISSUE	JR	JP	MECHANICAL	SJ	ARCHITECTURAL		CLIENT		APPROVED FOR CONSTRUCTION								
							PROCESS	DF	ENVIRONMENTAL		FIELD		REVISED & APPROVED FOR CONSTRUCTION	0	10/02/09	JP	JP				
							PIPING	SJ	GEN. ARRANG.	SJ	INTRA CO.		SCALE NONE					CH2MHILL	DWG. NO. PR-10-04	REV. 0	





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RESPONSIBLE ENGINEER:  
Kenneth L. Martins  
PE # CH4876 Exp. 6-30-05

NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL	REV 8	DATE 12/06/05	PRINT DISTRIBUTION	STATUS
8	12/07/05	REMOVED PE-1 HOLDS	JBW	SDH	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL	—	ELECTRICAL	—	STATUS
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL	—	INST & CONTROL	—	REV.
3	03/16/05	DELETED NOTES. APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL	—	ARCHITECTURAL	—	CLIENT
4	07/20/05	RELIEF VALVE SETTINGS. WELL PE-1 LINE TAGS. HOLDS REMOVED. APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS	—	ENVIRONMENTAL	—	FIELD
5	09/27/05	FINAL RECORD ISSUE	EFC	AJ	PIPING	SDH	GEN. ARRANG.	—	INTRA CO.
6	10/06/05	REVISED FINAL RECORD - ADDED TW-3D	EFC	AJ	—	—	—	—	—
7	10/19/05	REVISED AS NOTED	EFC	AJ	—	—	—	—	—

SCALE NONE

PACIFIC GAS & ELECTRIC CO.  
TOPOCK COMPRESSOR STATION  
INTERIM MEASURE 3  
EXPANDED GROUNDWATER EXTRACTION  
AND TREATMENT SYSTEM  
PROJ. NO. 315994

**CH2MHILL**

PROCESS AND INSTRUMENTATION DIAGRAM  
SHEET 03  
EXTRACTION WELLS  
PE-1, TW-2D, TW-2S AND TW-3D

DWG. NO. TP-PR-10-10-03 REV. 8

FILENAME: tppr101003.dwg

PLOT DATE: 19-OCT-2005

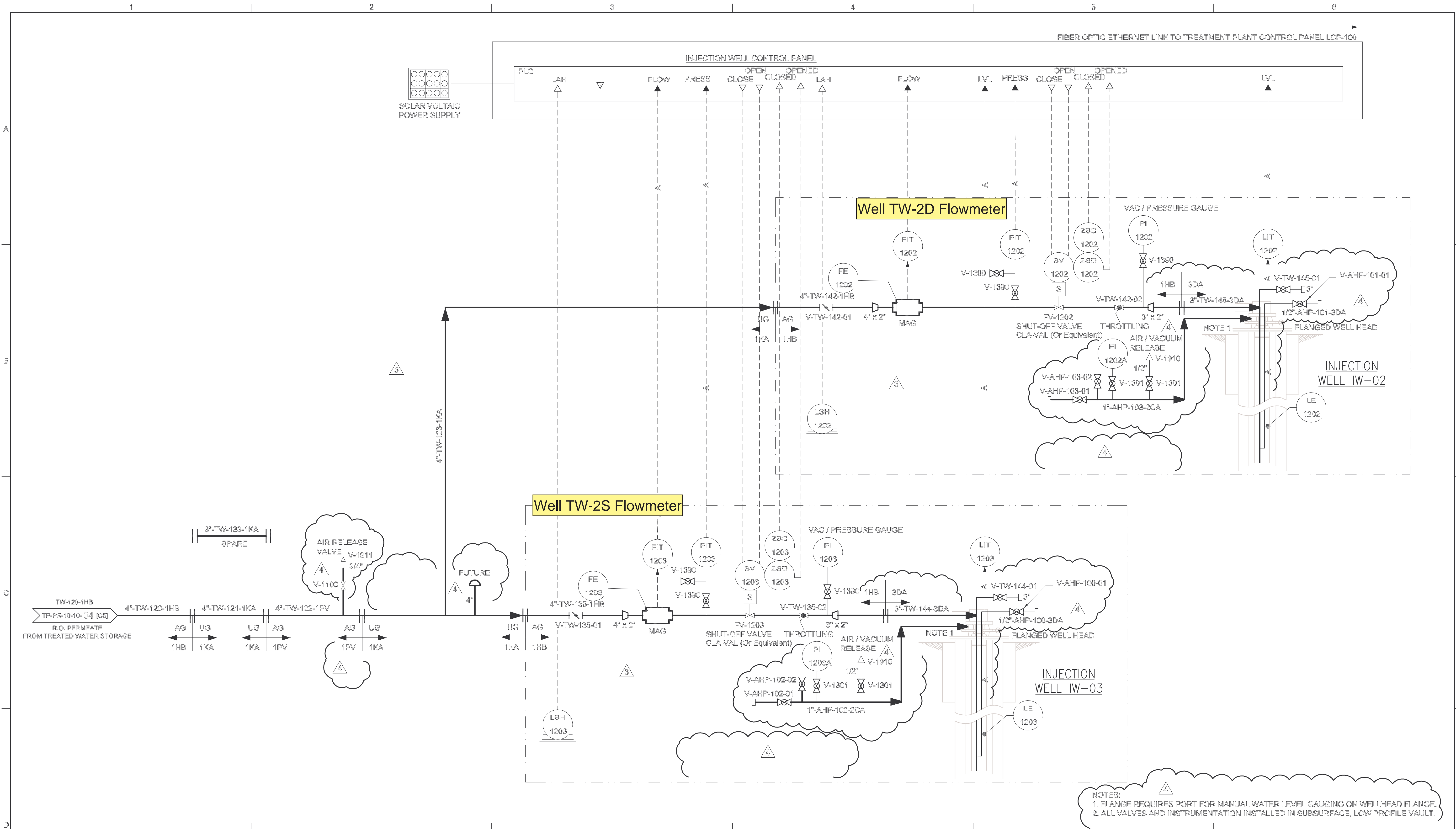
PLOT TIME:

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RESPONSIBLE ENGINEER: Kenneth L. Martins PE # CH4876 Exp. 5-30-05	NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL	REV 4	DATE 03/10/05	PRINT DISTRIBUTION	STATUS					PACIFIC GAS & ELECTRIC CO. TOPOCK COMPRESSOR STATION INTERIM MEASURE 3 EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM PROJ NO. 315994	PROCESS AND INSTRUMENTATION DIAGRAM SHEET 11 INJECTION WELLS	
	A	07/28/04	FOR INTERNAL REVIEW	EFC	AJ	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE	ISSUED	REV	DATE	SDE	PEM		
	0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL		STATUS	PRELIMINARY						
	1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL		REV.	FOR REVIEW AND APPROVAL	A	07/28/04				
	2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL		CLIENT	APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP		
	3	02/14/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL		FIELD	REVISED & APPROVED FOR CONSTRUCTION	4	/ /				
	4	03/10/05	REMOVED HOLD AND APPROVED FOR CONSTRUCTION	EFC	AJ	PIPING		GEN. ARRANG.		INTRA CO.						DWG. NO. TP-PR-10-10-11 REV. 4	
											SCALE NONE		CH2MHILL				

**Appendix A**  
**Semiannual Operations and Maintenance Log,**  
**July 1, 2009 through December 31, 2009**

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# Semiannual Operations and Maintenance Log, July 1, 2009 through December 31, 2009

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Downtime is defined as any periods when all extraction wells are not operating, so that no groundwater is being extracted and piped into IM No. 3 as influent. Periods of planned and unplanned extraction system downtime are summarized here. The times shown are in Pacific Standard Time to be consistent with other data collected at the site.

## July 2009

- **July 2, 2009 (planned):** The extraction well system was offline from 2:37 p.m. to 6:14 p.m. for electrical and mechanical work associated with the reverse osmosis (RO) upgrade. Extraction system downtime was 3 hours and 37 minutes.
- **July 3, 2009 (planned):** The extraction well system was offline from 2:02 p.m. to 9:41 p.m. for a microfilter repair. Extraction system downtime was 7 hours and 39 minutes.
- **July 4, 2009 (unplanned):** The extraction well system was offline from 3:04 p.m. to 4:18 p.m. and from 11:33 p.m. to 11:44 p.m. when City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 1 hour and 25 minutes.
- **July 8, 2009 (planned):** The extraction well system was offline from 12:24 p.m. to 12:25 p.m. and from 12:38 p.m. to 12:39 p.m. to measure and calculate the specific capacity of the extraction wells. Extraction system downtime was 2 minutes.
- **July 9, 2009 (planned):** The extraction well system was offline from 12:54 p.m. to 12:55 p.m., 12:59 p.m. to 1:00 p.m., and 1:05 p.m. to 1:06 p.m. while testing the pipeline leak detection system. Extraction system downtime was 3 minutes.
- **July 10, 2009 (unplanned):** The extraction well system was offline from 6:47 a.m. to 6:56 p.m. when the transient voltage surge suppressor (TVSS) failed after the City of Needles power supply imbalance alarmed and shut down the extraction wells. The TVSS was replaced with a spare. Since the plant was down, additional electrical work associated with the RO upgrade was completed. Extraction well downtime was 12 hours and 9 minutes.
- **July 13 - 16, 2009 (planned):** The extraction well system was offline from 9:01 a.m. on July 13, 2009 to 4:14 p.m. on July 16, 2009 for beginning the commissioning and startup of the new RO equipment that replaced the aging RO equipment. Extraction well downtime was 3 days, 7 hours, and 13 minutes.
- **July 16, 2009 (planned):** The extraction well system was offline from 5:43 p.m. to 6:18 p.m. for maintenance prior to starting up the plant with the existing RO system. Extraction well downtime was 35 minutes.

- **July 17, 2009 (planned):** The extraction well system was offline from 5:38 a.m. to 11:32 a.m. and from 11:33 a.m. to 7:45 p.m. for plant maintenance. Extraction well downtime was 14 hours and 6 minutes.
- **July 18 - 19, 2009 (unplanned):** The extraction well system was offline from 1:27 p.m. to 1:50 p.m. on July 18, 2009 and from 11:52 p.m. on July 18, 2009 to 12:21 a.m. on July 19, 2009 when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction well downtime was 52 minutes.
- **July 20, 2009 (planned):** The extraction well system was offline from 10:07 a.m. to 11:04 a.m. and 11:07 a.m. to 12:24 p.m. to switch from generator power to City of Needles power. Extraction well downtime was 2 hours and 14 minutes.
- **July 22 - 27, 2009 (planned):** The extraction well system was offline from 7:21 a.m. on July 22, 2009 to 4:13 p.m. on July 27, 2009 to complete the commissioning and startup of the new RO equipment that replaced the aging RO equipment. Extraction well downtime was 5 days, 8 hours, and 52 minutes.
- **July 28, 2009 (unplanned):** The extraction well system was offline from 7:54 a.m. to 8:17 a.m., 10:19 a.m. to 5:09 p.m., and 5:13 p.m. to 6:29 p.m. for microfilter repairs. Extraction well downtime was 8 hours and 29 minutes.
- **July 30, 2009 (unplanned):** The extraction well system was offline from 3:39 p.m. to 7:03 p.m. to replace a membrane element in the new primary RO. Extraction well downtime was 3 hours and 24 minutes.
- **July 30, 2009 (unplanned):** The extraction well system was offline from 11:56 p.m. to 11:57 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction well downtime was 1 minute.
- **July 31, 2009 (unplanned):** The extraction well system was offline from 12:00 a.m. to 12:01 a.m., from 12:06 a.m. to 12:11 a.m., 12:14 a.m. to 12:15 a.m., 12:16 a.m. to 12:21 a.m., 10:06 a.m. to 3:04 p.m., and 3:59 p.m. to 4:01 p.m. due to power supply imbalances and for plant maintenance. Extraction well downtime was 5 hours and 12 minutes.

## August 2009

- **August 1, 2009 (unplanned):** The extraction well system was offline from 6:06 a.m. to 6:14 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **August 5, 2009 (unplanned):** The extraction well system was offline from 6:17 a.m. to 6:25 a.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **August 7, 2009 (planned):** The extraction well system was offline from 12:03 p.m. to 12:04 p.m., 12:15 p.m. to 12:20 p.m., 12:33 p.m. to 12:34 p.m., and from 12:37 p.m. to 12:38 p.m. while testing the pipeline leak detection system. Extraction system downtime was 8 minutes.

- **August 10, 2009 (planned):** The extraction well system was offline from 11:31 a.m. to 1:16 p.m. to maintain proper levels in tanks. Extraction system downtime was 1 hour and 45 minutes.
- **August 11, 2009 (planned):** The extraction well system was offline from 1:31 a.m. to 2:22 a.m. to maintain proper levels in tanks. Extraction system downtime was 51 minutes.
- **August 11, 2009 (planned):** The extraction well system was offline from 7:53 a.m. to 6:15 p.m. to perform scheduled monthly maintenance. Extraction well downtime was 10 hours and 22 minutes.
- **August 16, 2009 (unplanned):** The extraction well system was offline from 12:45 p.m. to 1:04 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction well downtime was 19 minutes.
- **August 31, 2009 (planned):** The extraction well system was offline from 7:21 a.m. to 1:58 p.m. for the microfilter bank switch. Extraction well downtime was 6 hours and 37 minutes.

## September 2009

- **September 6, 2009 (unplanned):** The extraction well system was offline from 8:29 a.m. to 8:30 a.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 1 minute.
- **September 8, 2009 (planned):** The extraction well system was offline from 11:20 a.m. to 11:28 a.m., 11:32 a.m. to 11:33 a.m., 11:41 a.m. to 11:42 a.m., 11:47 a.m. to 11:48 a.m., 12:04 p.m. to 12:05 p.m. and 12:10 p.m. to 12:11 p.m. for testing of the pipeline leak detection alarm system. Extraction system downtime was 13 minutes.
- **September 8, 2009 (planned):** The extraction well system was offline from 1:21 p.m. to 1:44 p.m., 1:54 p.m. to 2:17 p.m., and 2:27 p.m. to 6:59 p.m. for the microfilter bank switch. Extraction system downtime was 5 hours and 18 minutes.
- **September 9 -14, 2009 (unplanned):** The extraction well system was offline from 11:00 a.m. on September 9 to 2:19 p.m. on September 14 due to an equipment failure resulting in synthetic oil fouling of the treatment stream in operation tank T301A from the tank mixer gearbox. Extraction system downtime was 5 days, 3 hours and 19 minutes.
- **September 14 -16, 2009 (planned):** The extraction well system was offline from 3:10 p.m. to 3:26 p.m. on September 14 and from 3:32 p.m. on September 14 to 3:42 p.m. on September 16 to collect samples and to maintain proper levels in tanks. Extraction system downtime was 2 days, and 26 minutes.
- **September 23, 2009 (planned):** The extraction well system was offline from 7:58 a.m. to 3:49 p.m. for the microfilter bank switch and injection line maintenance. Extraction system downtime was 6 hours and 51 minutes.

- **September 25, 2009 (unplanned):** The extraction well system was offline from 12:12 p.m. to 2:37 p.m. due to failure of polymer feed. Extraction well downtime was 2 hours and 25 minutes.
- **September 26, 2009 (unplanned):** The extraction well system was offline from 2:00 p.m. to 2:02 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction well downtime was 2 minutes.
- **September 27, 2009 (unplanned):** The extraction well system was offline from 10:11 a.m. to 10:32 p.m. due to low pressure in the TW-3D extraction well pipeline. Extraction well downtime was 21 minutes.
- **September 27-28, 2009 (unplanned):** The extraction well system was offline from 12:54 p.m. to 2:25 p.m. on September 27, from 5:23 a.m. to 5:27 a.m. on September 28, and 5:28 a.m. to 6:38 a.m. on September 28 due to high water level in the raw water tank, T-100. Extraction well downtime was 3 hours and 45 minutes.
- **September 28, 2009 (planned):** The extraction well system was offline from 7:43 a.m. to 12:32 p.m. to install new modules in the microfilter. Extraction well downtime was 4 hours and 49 minutes.

## October 2009

- **October 4-5, 2009 (unplanned):** The extraction well system was offline from 11:37 p.m. on October 4 to 12:50 a.m. on October 5 to install new modules in the microfilter . Extraction system downtime was 1 hour and 13 minutes.
- **October 14, 2009 (planned):** The extraction well system was offline from 8:47 a.m. to 8:48 a.m., from 8:51 a.m. to 8:52 a.m. from 9:04 a.m. to 9:05 a.m., and from 9:15 a.m. to 9:16 a.m. for testing of the pipeline leak detection alarm system. Extraction system downtime was 4 minutes.
- **October 21, 2009 (planned):** The extraction well system was offline from 7:33 a.m. to 3:49 p.m., from 3:50 p.m. to 3:52 p.m., and from 3:54 p.m. to 4:56 p.m. to perform scheduled monthly maintenance. Extraction system downtime was 9 hours and 20 minutes.
- **October 26, 2009 (unplanned):** The extraction well system was offline from 12:32 p.m. to 12:58 p.m. due to when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 26 minutes.
- **October 27, 2009 (unplanned):** The extraction well system was offline from 12:52 p.m. to 12:54 p.m. due to when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 2 minutes.

## November 2009

- **November 4, 2009 (planned):** The extraction well system was offline from 8:38 a.m. to 1:56 p.m. for maintenance on the loop reactor. Extraction system downtime was 5 hours and 18 minutes.
- **November 4, 2009 (planned):** The extraction well system was offline from 3:15 p.m. to 3:52 p.m. to lower the level in the raw water storage tank. Extraction system downtime was 37 minutes.
- **November 4, 2009 (unplanned):** The extraction well system was offline from 4:17 p.m. to 4:55 p.m. due to electrical failure at the reverse osmosis booster pump A. Extraction system downtime was 38 minutes.
- **November 10, 2009 (planned):** The extraction well system was offline from 5:11 p.m. to 5:42 p.m. to load a new programmable logic controller (PLC) program. Extraction system downtime was 31 minutes.
- **November 15, 2009 (unplanned):** The extraction well system was offline from 1:41 p.m. to 4:43 p.m. due to low flow of sodium hydroxide. Extraction system downtime was 3 hours and 2 minutes.
- **November 17, 2009 (planned):** The extraction well system was offline from 4:13 p.m. to 4:59 p.m. and 5:53 p.m. to 6:26 p.m. due to power hookup at the Bench. Extraction system downtime was 1 hour and 19 minutes.
- **November 20, 2009 (unplanned):** The extraction well system was offline from 5:22 p.m. to 5:23 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 1 minute.
- **November 24, 2009 (unplanned):** The extraction well system was offline from 4:17 p.m. to 4:18 p.m. and from 5:05 p.m. to 5:06 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 2 minutes.

## December 2009

- **December 1, 2009 (planned):** The extraction well system was offline from 1:45 p.m. to 5:44 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 59 minutes.
- **December 8, 2009 (unplanned):** The extraction well system was offline from 11:06 a.m. to 11:07 a.m. due to control panel power outage that shut down extraction pumps. Extraction system downtime was 1 minute.
- **December 9, 2009 (planned):** The extraction well system was offline from 11:24 a.m. to 7:25 p.m. for microfilter maintenance. Extraction system downtime was 8 hours and 1 minute.

- **December 10, 2009 (planned):** The extraction well system was offline from 5:30 p.m. to 9:29 p.m. for microfilter maintenance. Extraction system downtime was 3 hours and 59 minutes.
- **December 11, 2009 (unplanned):** The extraction well system was offline from 3:46 p.m. to 3:51 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 5 minutes.
- **December 13, 2009 (unplanned):** The extraction well system was offline from 7:03 a.m. to 7:06 a.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 3 minutes.
- **December 19, 2009 (unplanned):** The extraction well system was offline from 4:04 p.m. to 4:12 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **December 21, 2009 (planned):** The extraction well system was offline from 10:36 a.m. to 4:19 p.m. for loop reactor maintenance. Extraction system downtime was 5 hours and 43 minutes.
- **December 26, 2009 (planned):** The extraction well system was offline from 9:49 p.m. to 11:06 p.m. for microfilter maintenance. Extraction system downtime was 1 hour and 17 minutes.
- **December 26 - 30, 2009 (planned):** The extraction well system was offline from 11:31 p.m. December 26th to 12:22 a.m. on December 27th, 12:47 a.m. to 4:57 a.m. on December 27th, 4:31 p.m. to 7:26 p.m. on December 27th, 10:43 p.m. December 27th to 12:21 a.m. on December 28th, 10:30 a.m. to 11:50 a.m. on December 28th, 2:02 p.m. to 3:23 p.m. on December 28th, 12:37 p.m. to 2:04 p.m. on December 29th, and 12:32 p.m. to 1:19 p.m. on December 30th to change out filter modules for off-skid cleaning. Extraction system downtime was 14 hours and 29 minutes.
- **December 30 - 31, 2009 (planned):** The extraction well system was offline from 7:23 p.m. to 7:54 p.m. on December 30th, 1:14 p.m. to 1:59 p.m. on December 31st, and 7:33 p.m. to 8:28 p.m. on December 31st for microfilter maintenance. Extraction system downtime was 2 hours and 11 minutes.



**Appendix B**  
**Daily Volumes of Groundwater Treated**

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# July 2009 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
July	1	2009	--	--	155,603	38,726	194,329	179,040	18,665	197,704	3,147
July	2	2009	--	--	131,911	32,520	164,431	164,450	21	164,471	3,140
July	3	2009	--	--	105,637	26,200	131,837	126,448	23	126,471	6
July	4	2009	--	--	145,845	36,320	182,165	176,276	21	176,298	3,160
July	5	2009	--	--	155,489	38,491	193,980	191,481	25	191,505	3,143
July	6	2009	--	--	155,433	38,967	194,399	188,876	20	188,896	3,166
July	7	2009	--	--	155,750	38,452	194,202	189,708	22	189,730	3,138
July	8	2009	--	--	154,468	37,890	192,358	96,913	94,194	191,107	3,138
July	9	2009	--	--	155,166	38,192	193,358	19	187,341	187,360	3
July	10	2009	--	--	75,681	20,053	95,734	7	97,123	97,129	3,991
July	11	2009	--	--	154,442	39,304	193,746	15	174,949	174,964	3,174
July	12	2009	--	--	154,367	39,365	193,732	7	191,234	191,241	3,159
July	13	2009	--	--	57,834	15,063	72,897	15	71,531	71,546	3
July	14	2009	--	--	14	16	30	18	134	151	2,720
July	15	2009	--	--	12	17	29	7	76	83	2
July	16	2009	--	--	45,541	11,678	57,220	10	44,516	44,525	2,428
July	17	2009	--	--	63,454	16,061	79,516	18	82,048	82,066	9,955
July	18	2009	--	--	151,135	38,143	189,279	13	167,777	167,790	3,124
July	19	2009	--	--	151,591	39,103	190,693	10	187,970	187,980	6,321
July	20	2009	--	--	139,247	36,229	175,477	10	171,280	171,289	3,229
July	21	2009	--	--	153,960	39,949	193,909	15,472	173,577	189,048	3,284
July	22	2009	--	--	46,924	12,409	59,332	16	54,498	54,513	3,290
July	23	2009	--	--	12	22	34	8	17	25	3
July	24	2009	--	--	15	25	39	7	16	22	1
July	25	2009	--	--	14	16	30	12	19	31	2
July	26	2009	--	--	17	24	41	9	29	38	2
July	27	2009	--	--	49,687	12,795	62,482	8	62,887	62,895	2
July	28	2009	--	--	98,863	26,122	124,985	9	119,475	119,484	1,860
July	29	2009	--	--	154,137	39,711	193,848	11,808	178,229	190,037	6,820
July	30	2009	--	--	131,561	34,174	165,734	19,010	136,390	155,400	6,796
July	31	2009	--	--	120,083	30,219	150,301	14	151,242	151,256	3
Total Monthly Volumes (gal)			0	0	3,063,892	776,256	3,840,148	1,359,714	2,365,345	3,725,059	82,213
Average Pump/Injection Rates (gpm)			0.0	0.0	68.6	17.4	86.0	30.5	53.0	83.4	1.8

NOTES: gal: gallons  
gpm: gallons per minute  
RO: Reverse Osmosis

# August 2009 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System		RO Brine	
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
August	1	2009	--	--	153,783	38,444	192,227	9	189,375	189,384	5,654
August	2	2009	--	--	154,832	38,845	193,677	17	189,336	189,353	6,454
August	3	2009	--	--	154,561	39,234	193,795	10	183,329	183,339	4,297
August	4	2009	--	--	155,238	38,212	193,450	11	189,557	189,568	3,145
August	5	2009	--	--	153,322	37,719	191,041	8,121	172,983	181,104	6,552
August	6	2009	--	--	155,028	38,582	193,610	18	194,619	194,638	3,080
August	7	2009	--	--	154,068	38,783	192,851	6	180,197	180,203	3,382
August	8	2009	--	--	156,464	39,935	196,399	18	193,845	193,863	5
August	9	2009	--	--	156,614	39,711	196,324	13	191,524	191,536	3,313
August	10	2009	--	--	144,612	36,450	181,063	11	178,118	178,129	5
August	11	2009	--	--	83,070	21,000	104,071	14	98,392	98,406	6,719
August	12	2009	--	--	156,829	38,772	195,602	111,916	77,771	189,687	3,488
August	13	2009	--	--	158,374	38,561	196,935	92,912	101,063	193,976	4,945
August	14	2009	--	--	158,650	38,214	196,864	69,088	120,786	189,874	6,223
August	15	2009	--	--	158,336	38,856	197,192	18	194,657	194,675	3,278
August	16	2009	--	--	155,716	38,568	194,284	89,027	101,057	190,084	3,340
August	17	2009	--	--	157,789	39,586	197,375	107,956	76,374	184,330	4,550
August	18	2009	--	--	156,770	39,376	196,147	10	191,217	191,228	6,193
August	19	2009	--	--	156,144	39,036	195,180	30,027	159,219	189,246	3,462
August	20	2009	--	--	156,169	39,007	195,176	11	189,326	189,337	6,645
August	21	2009	--	--	155,611	38,582	194,193	9	191,355	191,363	4,510
August	22	2009	--	--	153,915	39,457	193,373	22	177,871	177,893	6,207
August	23	2009	--	--	153,431	39,809	193,240	18	188,467	188,485	3,154
August	24	2009	--	--	153,521	39,604	193,126	11	194,414	194,425	6,405
August	25	2009	--	--	153,778	39,241	193,019	17	186,527	186,544	3,197
August	26	2009	--	--	153,243	39,974	193,217	10	182,259	182,269	9,714
August	27	2009	--	--	153,517	39,527	193,044	10	187,236	187,246	3,201
August	28	2009	--	--	154,040	38,768	192,808	12	182,740	182,753	3,398
August	29	2009	--	--	153,858	39,220	193,078	16	188,778	188,793	8,844
August	30	2009	--	--	153,842	39,281	193,123	11	180,320	180,331	3,120
August	31	2009	--	--	110,329	28,947	139,276	18	138,863	138,881	5,394
<b>Total Monthly Volumes (gal)</b>			<b>0</b>	<b>0</b>	<b>4,685,456</b>	<b>1,179,304</b>	<b>5,864,759</b>	<b>509,366</b>	<b>5,171,576</b>	<b>5,680,943</b>	<b>141,874</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>105.0</b>	<b>26.4</b>	<b>131.4</b>	<b>11.4</b>	<b>115.9</b>	<b>127.3</b>	<b>3.2</b>

NOTES: gal: gallons  
gpm: gallons per minute  
RO: Reverse Osmosis

**September 2009 Operational Data**

IM-3 Groundwater Extraction and Treatment System  
PG&E Topock Compressor Station, Needles California

Month	Day	Year	Extraction Well System <sup>a</sup>					Injection Well System <sup>a</sup>			RO Brine <sup>a</sup>
			TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
September	1	2009	--	--	153,067	39,574	192,642	13	182,494	182,507	3,118
September	2	2009	--	--	153,302	39,517	192,819	12	182,544	182,557	6,081
September	3	2009	--	--	153,681	39,124	192,804	13	193,330	193,342	3,798
September	4	2009	--	--	153,918	38,866	192,784	6	184,347	184,353	6,107
September	5	2009	--	--	153,948	38,946	192,895	10	179,995	180,006	3,071
September	6	2009	--	--	154,282	38,177	192,459	9	191,369	191,378	6,275
September	7	2009	--	--	154,275	38,514	192,789	6	184,199	184,206	3,148
September	8	2009	--	--	116,254	30,106	146,360	13	140,461	140,474	4,092
September	9	2009	--	--	70,142	18,599	88,741	13	87,084	87,097	3,162
September	10	2009	--	--	15	23	38	8	21	29	3
September	11	2009	--	--	15	27	42	10	20	30	3
September	12	2009	--	--	14	19	33	7	51	58	3
September	13	2009	--	--	17	28	45	184	640	824 <sup>b</sup>	2
September	14	2009	--	--	6,415	26	6,441	24	7,604	7,628 <sup>b</sup>	5
September	15	2009	--	--	12	29	41	18	6,552	6,570 <sup>b</sup>	4
September	16	2009	--	--	52,420	14,182	66,602	61,668	690	62,357	7
September	17	2009	--	--	152,907	40,515	193,423	190,110	335	190,445	3,178
September	18	2009	--	--	153,023	40,253	193,276	189,086	480	189,566	3,850
September	19	2009	--	--	153,141	40,052	193,194	191,396	334	191,730	3,705
September	20	2009	--	--	153,101	40,154	193,255	186,295	85	186,380	4,116
September	21	2009	--	--	152,952	40,465	193,417	185,372	204	185,576	6,139
September	22	2009	--	--	154,252	40,373	194,625	182,675	546	183,221	6,275
September	23	2009	--	--	103,822	27,063	130,885	131,713	773	132,486	3,279
September	24	2009	--	--	155,532	38,909	194,441	187,412	88	187,500	3,270
September	25	2009	--	--	135,341	29,766	165,106	164,036	52	164,088	5,255
September	26	2009	--	--	145,076	17,156	162,231	161,147	20	161,167	4,421
September	27	2009	--	--	166,644	26	166,669	148,646	14	148,661	4
September	28	2009	--	--	122,327	18,696	141,023	145,227	66	145,293	5,253
September	29	2009	--	--	155,568	39,153	194,720	185,758	50	185,809	4,177
September	30	2009	--	--	155,492	39,270	194,762	185,110	251	185,361	6,536
<b>Total Monthly Volumes (gal)</b>			<b>0</b>	<b>0</b>	<b>3,380,954</b>	<b>787,608</b>	<b>4,168,562</b>	<b>2,496,000</b>	<b>1,544,698</b>	<b>4,040,699</b>	<b>98,338</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>78.3</b>	<b>18.2</b>	<b>92.0</b>	<b>57.8</b>	<b>35.8</b>	<b>89.2</b>	<b>2.3</b>

**NOTES:**

--- : Not in operation during reporting period.

gal: gallons

gpm: gallons per minute

RO: Reverse Osmosis

<sup>a</sup> Flow Readings tabulated from the date historian at the IM-3 Facility.

<sup>b</sup> No water pumped to injection wells on Sept. 10-15. Water was drained and flushed out from injection line and measured back flow through IW-03 flow meter.

# **October 2009 Operational Data**

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

Extraction Well System							Injection Well System			RO Brine	
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
October	1	2009	--	13,168	132,948	39,721	185,836	189,852	608	190,460	4,559
October	2	2009	--	--	155,146	40,088	195,234	196,841	1,320	198,160	4,219
October	3	2009	--	--	154,773	40,710	195,484	188,447	28	188,475	6,553
October	4	2009	--	--	152,832	39,403	192,235	181,029	46	181,074	3,349
October	5	2009	--	--	149,090	39,194	188,284	183,928	45	183,973	6,232
October	6	2009	--	--	154,780	40,865	195,645	190,984	27	191,011	6,131
October	7	2009	--	--	154,987	40,639	195,627	183,539	98	183,637	5,812
October	8	2009	--	--	155,103	40,480	195,584	197,220	1,245	198,465	191
October	9	2009	--	--	155,321	40,217	195,538	194,596	385	194,982	2,254
October	10	2009	--	--	155,534	40,008	195,542	191,817	24	191,841	3,058
October	11	2009	--	--	155,415	40,258	195,673	196,055	30	196,085	3,035
October	12	2009	--	--	155,375	40,361	195,736	187,031	25	187,056	5
October	13	2009	--	--	155,009	40,878	195,887	188,537	27	188,564	3,084
October	14	2009	--	--	152,385	39,935	192,319	194,731	130	194,861	3,020
October	15	2009	--	--	155,440	39,851	195,290	183,041	26	183,067	3,169
October	16	2009	--	--	155,639	39,397	195,036	191,414	26	191,441	3,045
October	17	2009	--	--	155,448	39,765	195,213	193,624	22	193,646	3,123
October	18	2009	--	--	155,216	40,185	195,400	194,137	22	194,158	7
October	19	2009	--	--	155,608	39,740	195,348	193,437	22	193,459	3,194
October	20	2009	--	--	155,678	39,072	194,750	191,415	22	191,438	3,056
October	21	2009	--	--	93,588	24,770	118,357	102,267	127	102,394	5
October	22	2009	--	--	153,439	41,006	194,445	195,228	27	195,254	3,134
October	23	2009	--	--	152,738	40,487	193,225	191,472	33	191,505	2,592
October	24	2009	--	--	153,603	40,888	194,491	196,817	23	196,840	3,061
October	25	2009	--	--	153,508	41,061	194,568	192,166	27	192,193	1,330
October	26	2009	--	--	151,107	40,031	191,137	187,722	24	187,746	2,758
October	27	2009	--	--	154,938	39,905	194,843	194,032	26	194,058	6
October	28	2009	--	--	156,166	39,214	195,381	182,002	24	182,026	7
October	29	2009	--	--	156,769	39,404	196,173	192,373	26	192,399	6
October	30	2009	--	--	157,848	38,888	196,735	200,314	21	200,335	311
October	31	2009	--	--	157,905	39,090	196,995	202,910	25	202,934	3,177
Total Monthly Volumes (gal)			0	13,168	4,713,335	1,225,509	5,952,012	5,848,977	4,559	5,853,536	83,480
Average Pump/Injection Rates (gpm)			0.0	0.3	105.6	27.5	133.3	131.0	0.1	131.1	1.9

NOTES: gal: gallons  
gpm: gallons per minute  
RO: Reverse Osmosis

- Extraction wells TW-3D and PE-01 were operated during October 2009 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2D was operated for a short period of time on October 1, 2009 for groundwater sampling. Extraction well TW-2S was not operated during October 2009.
- All plant effluent was discharged to injection well IW-02 during October 2009. IW-03 will not be operated until this well is rehabilitated in Nov 2009.
- The percentage difference between the influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during October 2009 is approximately 0.25 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

# November 2009 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
November	1	2009	--	--	158,302	38,608	196,910	191,815	26	191,841	8
November	2	2009	--	--	157,516	39,780	197,296	189,820	24	189,844	3,190
November	3	2009	--	--	156,444	39,441	195,885	187,270	23	187,293	3,110
November	4	2009	--	--	111,031	28,912	139,942	141,972	30	142,002	3,235
November	5	2009	--	--	154,436	40,023	194,459	194,003	23	194,026	3,129
November	6	2009	--	--	154,626	39,882	194,508	189,886	25	189,911	2,180
November	7	2009	--	--	155,073	39,276	194,349	193,983	22	194,005	4,995
November	8	2009	--	--	154,911	39,616	194,527	183,859	24	183,882	3,195
November	9	2009	--	--	154,726	39,853	194,579	194,086	23	194,109	32
November	10	2009	--	--	149,080	38,773	187,853	178,252	21	178,273	2,053
November	11	2009	--	--	155,133	39,301	194,434	192,238	21	192,259	3,033
November	12	2009	--	--	154,467	40,467	194,934	185,084	36	185,121	4,073
November	13	2009	--	--	156,280	38,966	195,246	198,492	19	198,511	3,154
November	14	2009	--	--	158,481	38,659	197,139	183,148	17	183,164	4,080
November	15	2009	--	--	137,713	34,239	171,952	163,764	23	163,787	0
November	16	2009	--	--	157,435	39,700	197,135	197,278	21	197,299	6,172
November	17	2009	--	--	147,492	37,650	185,141	180,935	42	180,977	4,143
November	18	2009	--	--	156,828	39,375	196,202	198,037	23	198,060	2,642
November	19	2009	--	--	154,911	40,138	195,049	187,685	21	187,706	4,825
November	20	2009	--	--	155,501	39,265	194,766	194,703	31	194,735	3,114
November	21	2009	--	--	156,160	38,731	194,891	161,593	37,932	199,525	2,491
November	22	2009	--	--	156,131	39,042	195,173	202,612	29	202,641	3,534
November	23	2009	--	--	155,477	39,028	194,504	180,995	2,046	183,040	2,077
November	24	2009	--	--	154,386	38,794	193,180	197,053	31	197,084	6,328
November	25	2009	--	--	155,951	39,366	195,317	113,937	74,657	188,593	2,044
November	26	2009	--	--	155,506	40,164	195,669	15	188,900	188,914	4,107
November	27	2009	--	--	155,987	39,343	195,330	13	190,745	190,759	3,135
November	28	2009	--	--	155,637	39,932	195,569	16	188,711	188,727	3,131
November	29	2009	--	--	155,907	39,651	195,559	12	193,386	193,397	3,134
November	30	2009	--	--	156,113	39,394	195,507	12	179,936	179,947	3,076
Total Monthly Volumes (gal)			0	0	4,597,642	1,165,366	5,763,008	4,582,567	1,056,867	5,639,433	93,418
Average Pump/Injection Rates (gpm)			0.0	0.0	106.4	27.0	133.4	106.1	24.5	130.5	2.2

NOTES: gal: gallons  
gpm: gallons per minute  
RO: Reverse Osmosis

- Extraction wells TW 3D and PE 1 were operated during November 2009. Extraction wells TW 2D and TW-2S were not operated during November 2009.
- Effluent was discharged into injection wells IW 02 and IW 03 during November 2009.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the November 2009 is approximately 0.52 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. For flows of 50 gpm or less in a single day, it can be assumed that this well was not online that day and that the flow value of 50 gpm or less is instrument noise.

# December 2009 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

Extraction Well System							Injection Well System			RO Brine	
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
December	1	2009	--	--	129,594	33,201	162,795	7,066	168,830	175,896	2,474
December	2	2009	--	--	155,663	39,054	194,717	10	184,217	184,227	2,534
December	3	2009	--	--	154,493	39,110	193,602	14	193,576	193,590	3,624
December	4	2009	--	--	154,417	39,402	193,819	14	184,040	184,054	2,795
December	5	2009	--	--	153,941	40,128	194,068	14	195,688	195,702	3,471
December	6	2009	--	--	154,093	39,928	194,021	14	175,644	175,658	2,899
December	7	2009	--	--	154,252	39,774	194,027	11	191,376	191,386	3,618
December	8	2009	--	--	154,682	38,437	193,119	15	188,739	188,754	1,610
December	9	2009	--	--	102,875	25,223	128,098	15	126,419	126,433	3,340
December	10	2009	--	--	128,674	32,244	160,918	29	155,643	155,672	3,392
December	11	2009	--	--	148,734	37,493	186,227	13	180,160	180,172	4,235
December	12	2009	--	--	149,520	37,762	187,282	16	178,662	178,678	3,485
December	13	2009	--	--	149,139	37,470	186,610	18	180,362	180,379	6,463
December	14	2009	--	--	147,769	37,623	185,392	12	176,414	176,426	4,787
December	15	2009	--	--	148,796	38,602	187,398	13	182,721	182,734	4,308
December	16	2009	--	--	148,940	38,653	187,593	27,552	159,645	187,197	4,509
December	17	2009	--	--	149,227	38,088	187,315	17	185,541	185,558	7
December	18	2009	--	--	149,500	37,959	187,459	15	172,345	172,360	6,913
December	19	2009	--	--	148,405	37,373	185,778	14	191,430	191,444	2,635
December	20	2009	--	--	149,494	37,667	187,162	14	171,523	171,537	2,599
December	21	2009	--	--	113,559	28,603	142,162	18	139,038	139,056	2,706
December	22	2009	--	--	149,330	37,733	187,063	18	185,836	185,854	5,285
December	23	2009	--	--	149,654	37,428	187,083	15	183,474	183,489	3,135
December	24	2009	--	--	149,296	37,872	187,167	18	181,783	181,801	2,926
December	25	2009	--	--	149,470	37,836	187,306	13	180,213	180,225	3,231
December	26	2009	--	--	117,382	34,985	152,367	14	149,383	149,397	2,966
December	27	2009	--	--	93,657	24,117	117,775	16	112,917	112,933	3,322
December	28	2009	--	--	128,971	33,332	162,303	15	156,365	156,380	4,293
December	29	2009	--	--	139,876	35,784	175,660	14	162,038	162,052	5,735
December	30	2009	--	--	140,145	36,325	176,471	6,588	168,159	174,746	3,868
December	31	2009	--	--	137,938	35,773	173,711	4,664	168,701	173,366	3,597
Total Monthly Volumes (gal)			0	0	4,401,486	1,124,979	5,526,465	46,274	5,330,881	5,377,155	110,761
Average Pump/Injection Rates (gpm)			0.0	0.0	98.6	25.2	123.8	1.0	119.4	120.5	2.5

NOTES: gal: gallons  
gpm: gallons per minute  
RO: Reverse Osmosis

- Extraction wells TW 3D and PE 1 were operated during December 2009 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW 2D and TW-2S were not operated during December 2009.
- Effluent was discharged into injection wells IW 02 and IW 03 during December 2009.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the December 2009 is approximately 0.7 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

**Appendix C**  
**Flowmeter Calibration Records**

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## Flow Calibration with Adjustment

30092171-1385072

WWRA-000923-F

Purchase order number

US-19050353-20 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

7700F216000

Serial N°

- FIT-103

PE-1

Tag N°

FCP-6.F

Calibration rig

155.6102 GPM ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9289

Calibration factor

0

Zero point

74.9 °F

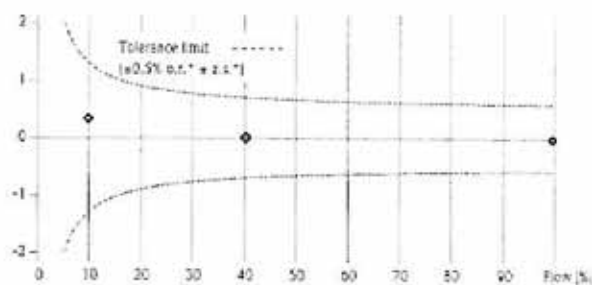
Water temperature

Flow [%]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas. [US GAL]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.5	30.1	7.7642	7.7895	0.33	5.60
40.5	62.9	30.1	31.549	31.556	0.02	10.47
40.5	62.9	30.1	31.546	31.541	-0.02	10.47
99.7	155.1	30.1	77.735	77.718	-0.02	19.95
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



\*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.  
The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

*M. E. Trueblood Jr.*

Morris E. Trueblood Jr.

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg.-N° 030502.2

11-30-2006

Date of calibration

Endress+Hauser Flowtec, Division USA  
2330 Endress Place  
Greenwood, IN 46143

## Flow Calibration with Adjustment

30107893-1304706

WWRA-002048-F

Purchase order number

US-19054161-10 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037016000

Serial N°

~~FIT-1202~~ FIT-102 TW-3D

Tag N°

FCP-6.F

Calibration rig

155.6102 GPM ( 100%)

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9154

Calibration factor

0

Zero point

76.2 °F

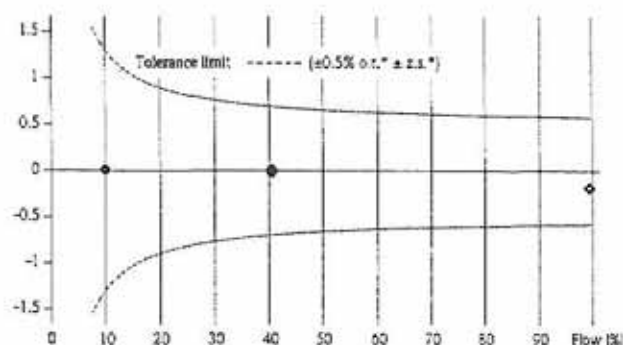
Water temperature

Flow [%]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas. [US GAL]	$\Delta$ o.r.* [%]	Outp.** [mA]
9.9	15.5	30.1	7.7531	7.7537	0.01	5.59
40.5	63.0	30.1	31.560	31.554	-0.02	10.47
40.5	63.0	30.1	31.569	31.574	0.01	10.48
99.5	154.8	30.1	77.589	77.448	-0.18	19.89
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



\*s.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.  
The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA) and Aurangabad (IN).

*Tim Swick*

09-12-2007

Date of calibration

Endress+Hauser Flowtec, Division USA  
2330 Endress Place  
Greenwood, IN 46143

Tim Swick

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg.-N° 030502.2

# Flow Calibration with Adjustment

30057866-1275190

41724888

Purchase Order Number

USA-49310090-40 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1RA022AW

Order Code

PROMAG 23 P 2"

Transmitter/Sensor

6A021F16000

Serial N°

FIT-100 / TW-20 / installed 7/28/05

Tag N°

FCP-6.C

Calibration rig

155.6102 GPM (  $\pm 100\%$  )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9178

Calibration factor

0

Zero point

72.9 °F

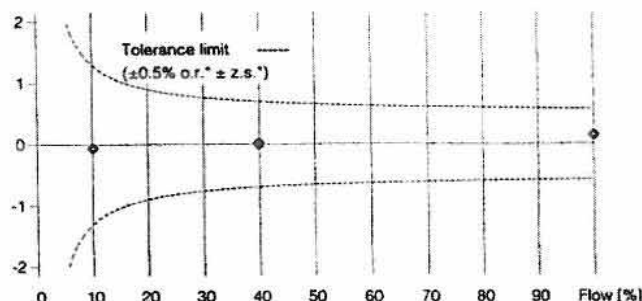
Water temperature

Flow [%]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas. [US GAL]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.5	30.0	7.7502	7.7457	-0.06	5.59
39.9	62.1	30.0	31.071	31.070	0.00	10.38
39.9	62.1	30.0	31.073	31.078	0.02	10.38
100.2	156.0	30.0	78.041	78.156	0.15	20.06
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



\*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI)

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

11-29-2004

Date of calibration

Endress+Hauser  
2350 Endress Place  
Greenwood, IN 46143



Tim Swick

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg.-N° 030502.2

# Flow Calibration with Adjustment

30057870-1275191

41724888

Purchase Order Number

USA-49310090-40 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1RA022AW

Order Code

PROMAG 23 P 2"

Transmitter/Sensor

6A022016000

Serial N°

FIT-101 / TW-25 / installed 7/28/05

Tag N°

FCP-6.C

Calibration rig

155.6102 GPM ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9207

Calibration factor

0

Zero point

74.1 °F

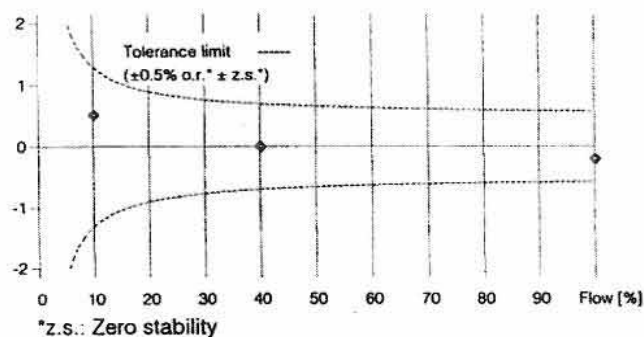
Water temperature

Flow [%]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas. [US GAL]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.6	30.0	7.7910	7.8318	0.52	5.61
40.0	62.3	30.0	31.157	31.160	0.01	10.40
40.1	62.4	30.0	31.229	31.229	0.00	10.42
100.2	155.9	30.0	78.017	77.856	-0.21	20.00
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see technical informations (TI)

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

11-29-2004

Date of calibration

Endress+Hauser  
2350 Endress Place  
Greenwood, IN 46143



Tim Swick

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg.-N° 030502.2



## Flow Calibration with Adjustment

20132467-1304709

WWRA-004329-F

Purchase order number

US-19061458-10 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1AAC22AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037316000

Serial N°

FIT-205 FIT-1202 IW-02

Tag N°

FCP-6.C

Calibration rig

155.6102 GPM ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9146

Calibration factor

0

Zero point

76.2 °F

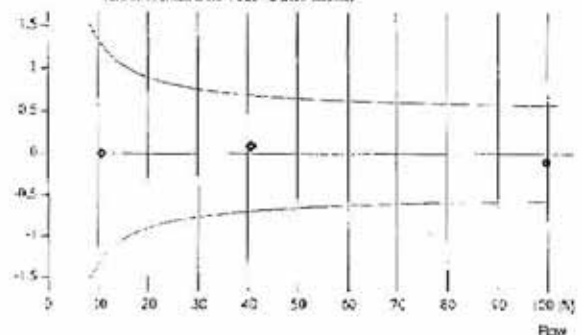
Water temperature

Flow p	Flow [GPM]	Duration [s]	V target [US GAL]	V meas. [US GAL]	$\Delta$ str.* [%]	Outp.** [mA]
10.0	15.5	30.1	7.7933	7.7939	0.01	5.60
40.2	62.5	30.1	31.394	31.422	0.09	10.43
40.2	62.5	30.1	31.416	31.448	0.10	10.44
99.8	155.3	30.1	78.006	77.928	-0.10	19.95
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*% of full

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.

Tolerance limits:  $\pm 0.5\%$  o.r., \* = Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Dornum (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

02-26-2009

Date of calibration:

 Endress+Hauser Flowtec, Division USA  
 2330 Endress Place  
 Greenwood, IN 46143



William Darnell

Operator

 Certified acc. to  
 MIL-STD-45662A  
 ISO 9001, Reg.-N° 03C502.2

## Flow Calibration with Adjustment

XC156406-1304735

WWRA-004329-F

Purchase order number

US-19061458-20 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C036FI6000

Serial N°

~~FIT-1201~~ FIT-1203 IW-03

Tag N°

FCP-6.C

Calibration rig

155.6102 GPM ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9134

Calibration factor

-34

Zero point

76.6 °F

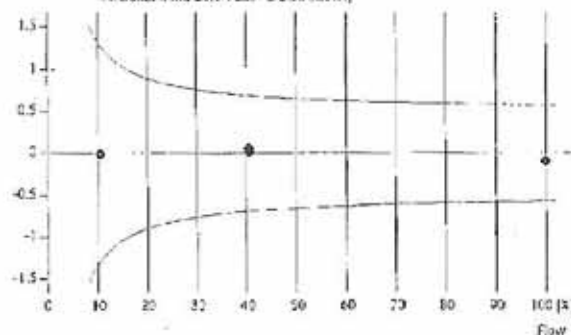
Water temperature

Flow (l)	Flow (GPM)	Duration (s)	V target (US GAL)	V meas. (US GAL)	$\Delta$ cor.* (%)	Outp.** (mA)
10.0	15.5	30.1	7.7977	7.7973	-0.01	5.60
40.1	62.4	30.1	31.343	31.363	0.06	10.42
40.2	62.6	30.1	31.452	31.458	0.02	10.44
99.8	155.4	30.1	78.032	77.959	-0.09	19.96
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*out. of scale

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.

Tolerance limits  $\pm 0.5\%$  out. = zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

02-26-2009

Date of calibration

Endress+Hauser Flowtec, Division USA

2330 Endress Place  
Greenwood, IN 46143


William Darnell

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg. N° 030502.2

## Flow Calibration with Adjustment

50143117-1283113

WWRA-004733-F

Purchase order number

US-19062586-10 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P80-AL1A1AA022AW

Order code

PROMAG 23 P 3"

Transmitter/Sensor

7700C616C00

Serial N°

FIT-700 Combined IW-02 &amp; IW-03

Tag N°

FCP-7.1.B

Calibration rig

398.3621 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

1.1620

Calibration factor

35

Zero point

76.5 °F

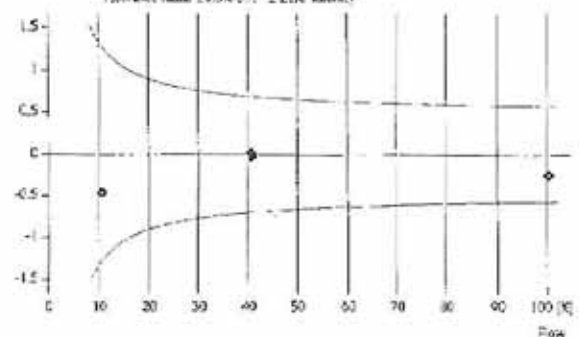
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V <sub>avg.</sub> [us.gal]	V <sub>max.</sub> [us.gal]	$\Delta$ out. [%]	Outp. <sup>**</sup> [mA]
10.1	40.1	60.1	40.140	39.953	-0.47	5.60
40.2	160.1	60.1	160.282	160.320	0.02	10.43
40.3	160.7	60.1	160.807	160.769	-0.02	10.45
100.4	399.8	60.1	400.239	399.278	-0.24	20.02
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*out of box

\*\*calculated value (4 - 20 mA)

Measured error % o.p.

Tolerance limit:  $\pm 0.5\%$  o.p. \*  $\pm$  Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

05-29-2009

Date of calibration

Endress+Hauser Flowtec, Division USA  
 2330 Endress Place  
 Greenwood, IN 46143



William Darnell

Operator

Certified acc. to  
 MIL-STD-45662A  
 ISO 9001, Reg.-N° 030502.2

## Flow Calibration with Adjustment

30060319-1304707

41729921

Purchase order number

US-49311914-10 / Endress+Hauser Flowtec

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037116000

Serial N°

FIT-203 FIT-701 RO Concentrate

Tag N°

FCP-20 SMALL

Calibration rig

155.6102 GPM ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9152

Calibration factor

0

Zero point

72.2 °F

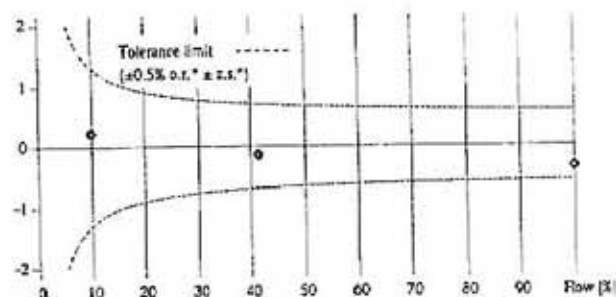
Water temperature

Flow [m]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas. [US GAL]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.5	61.2	15.818	15.853	0.22	5.60
41.6	64.7	61.2	66.050	65.948	-0.15	10.64
41.6	64.8	61.3	66.120	66.024	-0.14	10.65
100.1	155.8	61.2	158.973	158.403	-0.36	19.96
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value [4 - 20 mA]

Measured error % o.r.



\*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics.  
The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

01-31-2005

Date of calibration

Endress+Hauser Flowtec, Division USA  
2330 Endress Place  
Greenwood, IN 46143

Jim Baase

Operator

Certified acc. to  
MIL-STD-45662A  
ISO 9001, Reg.-N° 030502.2