



**Pacific Gas and
Electric
Company**

March 14, 2008

Mr. Robert Perdue
Executive Officer
California Regional Water Quality Control Board
Colorado River Basin Region
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Subject: Board Order R7-2007-0015
PG&E Topock Compressor Station, Needles, California
Upland In-Situ Pilot Test
February 2008 Monitoring Report

Dear Mr. Perdue:

Enclosed is the Board Order R7-2007-0015 February 2008 Monitoring Report for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station, upland reductive zone in situ pilot test. This report is being submitted in compliance with the Waste Discharge Requirements (WDRs) issued by the Colorado River Basin Regional Water Quality Control Board (Water Board) under Board Order R7-2007-0015. WDRs under Board Order R7-2009-0015 apply to the upland reductive zone in situ pilot test only.

If you have any questions regarding this report, please call me at (805) 234-2257.

Sincerely,

A handwritten signature in black ink that reads "Yvonne Meeks".

Yvonne Meeks
Topock Project Manager

Enclosures:

Board Order R7-2007-0015 February 2008 Monitoring Report for the Upland Reductive Zone In Situ Pilot Test.

cc: Abdi Haile, Water Board
Cliff Raley, Water Board
Aaron Yue, DTSC (2 copies)

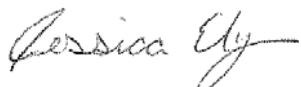
Pacific Gas and Electric Company

**February 2008 Monitoring Report
for the Upland Reductive Zone In-
Situ Pilot Test**

Waste Discharge Requirements
Order No. R7-2007-0015
PG&E Topock Compressor Station
San Bernardino County, California

14 March 2008

This report was prepared under the supervision of a California licensed Professional Geologist (PG)



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**February 2008 Monitoring
Report for the Upland
Reductive Zone In-Situ Pilot
Test**

Waste Discharge Requirements
Order No. R7-2007-0015
PG&E Topock Compressor
Station
San Bernardino County,
California

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Our Ref.:
RC000689.0004.00009

Date:
14 March 2008

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of the individual or entity for which it was
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is privileged, confidential, and exempt from
disclosure under applicable law.*

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(on Compact Disc)

AST	Aboveground storage tank
EMAX	EMAX Laboratories, Inc.
gpm	Gallons per minute
ISPT	In-Situ Pilot Test
MRP	Monitoring and Reporting Program
PG&E	Pacific Gas and Electric Company
RWQCB	California Regional Water Quality Control Board, Colorado River Basin Region
SAFPM	<i>Sampling, Analysis, and Field Procedures Manual, PG&E Topock Program, Revision 1</i>
S/M/D	Shallow/Middle/Deep
TOC	Total Organic Carbon
Truesdail	Truesdail Laboratories
USCS	United Soil Classification System
USEPA	United States Environmental Protection Agency
WDC	WDC Exploration and Wells
Work Plan	<i>In-Situ Hexavalent Chromium Reduction Pilot Test Plan – Upland Plume Treatment (September 2006)</i>

1.0 Introduction

Pacific Gas and Electric (PG&E) is implementing an upland reductive zone in-situ pilot test (ISPT) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The purpose of the upland ISPT is to evaluate the efficacy of using a reagent mixture to reduce hexavalent chromium in groundwater to form stable, insoluble trivalent chromium. The upland ISPT consists of the recirculation of the reagent mixture between the two recirculation wells (PTR-1 and PTR-2) and monitoring the results in surrounding groundwater monitoring wells (PT-7Shallow/Middle/Deep [S/M/D] through PT-9S/M/D, MW-11, MW-24A/B, and MW-38S/D). Figure 1 provides a map of the PG&E Topock Compressor Station and ISPT area. (All figures are provided at the end of the report.)

California Regional Water Quality Control Board, Colorado River Basin Region (RWQCB), Order No. R7-2007-0015 authorizes PG&E to inject approximately 100 gallons of reagent into each well each day at a rate of 5 gallons per minute (gpm) per well for a total of approximately 38,000 gallons through the duration of the test. An automated reagent dosing system will meter the reagent injections at regular interval during each day of the pilot test.

The Monitoring and Reporting Program (MRP) under Order No. R7-2007-0015 requires monthly monitoring reports to be submitted by the 15th day of the following month. This report describes monitoring activities related to the upland ISPT for February 2008.

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2.0 In-Situ Pilot Test Sampling Locations

Table 1 summarizes the well construction details of the recirculation wells (PTR-1 and PTR-2) and monitoring wells (PT-7S/M/D through PT-9S/M/D, MW-11, MW-24A/B, and MW-38S/D). Figure 2 provides a map of the sampling locations.

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3.0 Description of Activities

The procedures of the upland ISPT are outlined in the *In-Situ Hexavalent Chromium Reduction Pilot Test Work Plan – Upland Plume Treatment* (Work Plan; ARCADIS 2006).

In January and February 2008, ARCADIS completed the second baseline sampling event, and the construction of the upland ISPT system and the aquifer testing, respectively, which are described in this report. Field activities were performed in accordance with the Work Plan and the applicable procedures contained within the *Sampling, Analysis, and Field Procedures Manual, PG&E Topock Program, Revision 1* (SAFPM) (CH2M Hill, 2005) and the MRP.

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3.1 Well Installation

From April 23, 2007 through July 18, 2007, WDC Exploration and Wells (WDC) of Montclair, California, installed three three-level well clusters (PT-7S/M/D, PT-8S/M/D, and PT-9S/M/D) and two recirculation wells (PTR-1 and PTR-2). A pilot boring was advanced using rotosonic drilling techniques at each monitoring well cluster and each recirculation well location. During each advancement, a field geologist, under the supervision of a California Professional Geologist, recorded the lithology of the subsurface state in accordance with Unified Soil Classification System (USCS) by observing continuous core samples retrieved from the boreholes. Soil samples were collected from each of the borings and analyzed, and the results will be reported in the 60-Day Report as required by the WDR.

WDC installed the well clusters and the recirculation wells upon completion of the pilot borings, using mud rotary techniques. The monitoring wells were designated with S for the shallow interval well, M for the middle interval well, and D for the deep interval well. Table 1 summarizes the well construction details.

3.2 Baseline Sampling Activities

Prior to injection activities, two baseline sampling events were performed. The first event was performed from July 16 through 18, 2007 and was reported in the July monthly letter to the RWCQB (dated August 15, 2007). The second baseline sampling event was performed from January 22 through 25, 2008 and the data is reported in Section 5 of this report.

Samples were collected, labeled, and packaged according to the SAFPM and are summarized in Section 4.0. Table 2 presents the field parameter results. Tables 3 and 4 present the groundwater analytical results. As required under the MRP, calibration logs for field-monitoring instruments are included in Appendix A. Groundwater sampling logs are included in Appendix B.

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Groundwater samples from the baseline event were analyzed for hexavalent chromium (United States Environmental Protection Agency [USEPA] Method 7199) by Truesdail Laboratories (Truesdail); and dissolved chromium, dissolved iron, dissolved manganese, dissolved arsenic, dissolved calcium, dissolved sodium, dissolved potassium (USEPA 200.7), total iron and manganese (USEPA 200.8), anions (orthophosphate, chloride, nitrate, nitrite, sulfate, (USEPA 300), carbonate, bicarbonate alkalinity (SM 2320B), total organic carbon (TOC) (USEPA Method 5310B), and sulfide (USEPA Method 4500-S²⁻) by EMAX Laboratories, Inc. (EMAX).

3.3 Construction Activities

From August 6, 2007 to February 8, 2008, Pivox Corporation of Irvine, California, completed the system construction. Activities consisted of the installation of underground piping between the recirculation wells and the above ground storage (AST) tank, a control panel, and the reagent fill line. The construction activities were all performed in accordance with the Work Plan, the permit requirements of the Mohave Desert Air Quality Management District, the San Bernardino County Fire Department Permit, and all other applicable permits.

3.4 Aquifer Test Activities

On February 11, 2008, ARCADIS began the aquifer testing at the uplands ISPT area. Per the Work Plan, ARCADIS completed extraction tests and injection tests at both PTR-1 and PTR-2 as well as a recirculation test using both wells simultaneously. The purpose of the aquifer testing was to:

- Further develop the pumping intervals of PTR-1 and PTR-2 in order to optimize well performance;
- Test well capacities for pumping and injection of groundwater; and
- Characterize the hydraulic performance of the recirculation system wells and observe the groundwater flow under operating conditions.

Prior to the aquifer testing, 12 temporary transducers for water level monitoring were placed in wells PT-7S/M/D, PT-8S/M/D, PT-9S/M/D, MW-24A/B, and MW-11. Permanent transducers were placed in PTR-1 and PTR-2 during construction. Each transducer was tested for potential drift prior to deploying in the wells and no drift was noted.

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On February 2 and 6, 2008 ARCADIS completed extraction step tests on PTR-1 and PTR-2, respectively. Each well was pumped at three or more progressively greater rates (approximately 5 gpm, 15 gpm, and 30 gpm). Each rate was maintained until the drawdown in the well stabilized or a maximum time of 2 hours was reached. Water levels were monitored throughout the tests, and drawdown did not exceed 10 feet in any of the wells during the extraction tests. The purge water from the extraction tests were transported and treated in the IM-3 treatment plant.

On February 14 and 25, 2008, ARCADIS completed injection step tests at PTR-2 and PTR-1, respectively. Three injection rates were tested in each well (approximately 5 gpm, 15 gpm, and 30 gpm). Each injection rate was maintained until the mounding in the well stabilized or a maximum time of 2 hours was reached. Groundwater extracted during the extraction tests was re-injected for the injection tests. In compliance with the WDRs, injected groundwater was amended with approximately 100 gallons of the ethanol solution (40 percent ethanol). Water levels were monitored throughout the test.

A longer term constant-rate recirculation test was completed from February 26 through 29, 2008, using both PTR-1 and PTR-2. The wells were operated simultaneously to create recirculation to evaluate the optimal recirculation rate. A constant recirculation rate of 30 gpm was sustained during the first 8 hours of this test. During the first overnight run of the system, the recirculation rate was lowered to 15 gpm. The recirculation rate was returned to 30 gpm the second day of the test and was maintained at 30 gpm for the remainder of the test. Groundwater recirculated in each well during this test was amended with approximately 50 gallons of the ethanol solution (40 percent ethanol). Water levels were monitored throughout the recirculation test and for three days following the test (through March 3, 2008) to monitor recovery of the water levels.

The aquifer test results demonstrated that the recirculation system operation could be sustained at 30 gpm. This flow rate was used for the start up of the system. The start up of the system will be reported in the March 2008 report.

4.0 Sampling and Analytical Procedures

Groundwater sampling and associated tasks were performed in accordance with the applicable procedures contained in the SAFPM (CH2M Hill, 2005) and as summarized below.

Monitoring wells were purged and sampled. Prior to groundwater sampling, the depth to water was recorded for each well. These data were used to evaluate the volume of standing water in the well. The monitoring wells were purged using a WaTerra® purge pump with dedicated polyethylene tubing. Purging continued until three casing volumes had been removed. The field parameters, such as pH, specific conductance, and temperature were recorded (Table 2). After completion of purging, the groundwater samples were collected into the appropriate containers.

Recirculation wells (PTR-1 and PTR-2) samples were collected from dedicated sampling ports. Water was purged from the sample port prior to sampling the recirculation well to remove any stagnant water from the port.

The samples were stored in coolers at 4 degrees Celsius and transported to Truesdail and EMAX via a courier service under chain-of-custody documentation. Truesdail and EMAX are certified by the California Department of Health Services (Certification #1247 and #02116CA, respectively) under the State of California's Environmental Laboratory Accreditation Program.

Analyses were performed in accordance with the latest edition of the "Guidelines Establishing Test Procedures for Analysis of Pollutants" (40 CFR Part 136), or equivalent methods promulgated by the USEPA.

Baseline sampling was conducted in accordance with the sampling frequency required by the MRP. Sample results are summarized in Tables 3 and 4. Calibration logs for field-monitoring instruments are presented in Appendix A. Sampling logs are presented in Appendix B. Copies of laboratory analytical results are presented on compact disc in Appendix C.

Table 5 identifies the laboratory that performed each analysis and lists the following required monitoring information:

- Sample Location

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

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No operational and maintenance issues or interruptions to remedial systems occurred during the reporting period.

5.0 Analytical Results

Summaries of the field test parameters, primary parameters, and secondary parameters are presented in Tables 2, 3, and 4, respectively.

The upland ISPT system will begin full operation in March 2008. Weekly, bi-weekly, and monthly sampling events are scheduled for the next 6 to 9 months.

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6.0 Conclusions

This report summarizes the results of the month of February 2008 sampling activities, which included the installation of monitoring well clusters (PT-7 though PT-9) and recirculation wells (PTR-1 and PTR-2), the construction of the upland system, the baseline sampling events, and the aquifer testing.

There were no incidents of non-compliance with respect to Order No. R7-2007-0015.

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7.0 References

ARCADIS, 2006. In-Situ Hexavalent Chromium Reduction Pilot Test Work Plan, Upland Plume Treatment (Work Plan), Waste Discharge Requirements, Order No. R7-2006-0015, PG&E Topock Compressor Station, San Bernardino County, California, September 29.

CH2M Hill. 2005. Sampling, Analysis, and Field Procedures Manual (SAFPM), PG&E Topock Program, PG&E Topock Compressor Station Needles, California, March 31, 2005.

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8.0 Certification

PG&E submitted a signature delegation letter to the RWQCB on July 5, 2006. The letter delegated PG&E's signature authority to Mr. Curt Russell and Ms. Yvonne Meeks.

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.

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Signature:



Name: Yvonne Meeks
Company: PG&E
Title: Project Manager
Date: March 14, 2008

Table 1
Boring and Well Construction Detail Summary
PG&E Topock
Needles, California
February 2008 Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Well or Boring Designation	Date Completed	Aquifer Zone	Ground Elevation*	TOC Elevation**	Total Depth of Boring	Casing Diameter	Boring Diameter	Well Completion Depth	Well Completion Elevation	Screen Depth Interval	Screen Elevation Interval	Sand Pack Depth Interval	Sand Pack Elevation Interval	Bentonite Depth Interval	Bentonite Elevation Interval	Well Permit Number	Distance From PTR-1 (feet)	Distance From PTR-2 (feet)	Latitude	Longitude
PT-7S	11-May-07	S	-	560.54***	155	2	6	230	330.54	130-150	431-411	129-155	432-406	127-129	434-432	2007040400	17	122	34.71663	-114.49390
PT-7M	11-May-07	M	-	560.66***	187.5	2	6	187.5	373.66	165-185	396-376	164-187	397-374	162-164	399-397	2007040401	20	118	34.71662	-114.49391
PT-7D	11-May-07	D	-	560.42***	221.5	2	6	230	330.42	197-217	363-343	196-221.5	364-338.5	194-196	366-364	2007040402	17	122	34.71663	-114.49390
PT-8S	21-May-07	S	-	562.60***	152	2	6	225	337.60	127-147	436-416	126-152	437-411	124-126	439-437	2007040403	68	70	34.71650	-114.49382
PT-8M	21-May-07	M	562.47	562.60	184.5	2	6	184.5	378.10	162-182	401-381	161-184.5	402-378.5	159-161	404-402	2007040404	67	71	34.71651	-114.49381
PT-8D	21-May-07	D	-	562.59	212.5	2	6	225	337.59	190-210	373-353	189-212.5	374-350.5	187-189	376-374	2007040405	68	70	34.71650	-114.49382
PT-9S	6-Jun-07	S	-	559.67***	153	2	6	218	341.67	128-148	432-412	126-153	434-407	120-126	440-434	2007040406	119	180	34.71684	-114.49362
PT-9M	6-Jun-07	M	559.50	559.67	187	2	6	187	372.67	162-182	398-378	158-187	402-373	155-158	405-402	2007040407	116	181	34.71684	-114.49364
PT-9D	6-Jun-07	D	559.56	559.66	212.5	2	6	218	341.66	190-210	370-350	188-212.5	372-347.5	156-188	404-372	2007040408	120	181	34.71684	-114.49362
MW-11	30-Jun-97	S	-	522.19	86.5	4	6	84	438.19	62-82	460-480	59-83	522.83-509.83	55-59	467.19-463.19	-	179	282	-	-
MW-24A	13-May-96	S	-	566***	124.5	4	-	124.5	441.50	104-124	162-182	99-124.5	441.5-416.5	91-99	475-467	-	131	12	-	-
MW-24B	16-May-98	M	-	566***	217.5	4	-	217.5	348.50	193-213	373-393	188-217.5	378-348.5	182.5-188	383.5-378	-	127	59	-	-
MW-38S	11-Apr-04	S	522.8	530***	130	2	-	130	400.00	75-95	455-475	70-95.3	460-434.7	65-70	465-460	-	308	270	34.718640	-114.494285
MW-38D	10-Apr-04	D	523.0	530***	195	2	-	195	335.00	166-188	364-384	152.8 - 188.3	377.2-341.7	147-152.8	383-377.2	-	323	280	34.715851	-114.494402
PTR-1	2-May-07	S/D	554***	560.21	225	10	6	225	335.21	125-160	435-470	123-162	442-403	118-123	442-437	2007040409	0	138	34.71666	-114.49395
PTR-2	2-May-07	S/D	554***	564.94	223	10	6	223	341.94	118-158	447-407	117-159	448-406	115-117	450-448	2007040410	138	0	34.71634	-114.49369

Notes:

feet bgs Feet below ground surface

feet msl Feet mean sea level

PTI- Pilot test injection well

PT- Pilot test monitoring well

S Shallow

M Middle

D Deep

TOC Top of casing

* Elevations are in feet, North American Vertical Datum of 1988 (NAVD 88), NGS data sheet EU0763.

** Reference elevation

*** Elevations are approximate, resurvey in progress

- Not available

Table 2
Summary of Field Parameters
PG&E Topock
Needles, California
February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Sample Type	Screen Interval (ft bgs)	ORP (mV)	pH	Specific Conductance (µS/cm)	Temperature (°C)	DO (mg/L)	Depth to Water (feet below TOC)	Hexavalent Chromium Field (µg/L)
PT-7S	18-Jul-07	N	130-150	-62.7	7.67	5,697	31.25	4.13	103.58	920
	22-Jan-08	N		132	7.60	4,369	23.5	4.12	105.75	1,760
PT-7M	19-Jul-07	N	165-185	-40.2	7.76	7,224	33.99	3.75	103.90	1,480
	24-Jan-08	N		10.6	7.17	9,257	30.06	0.85	105.79	2,840
PT-7D	18-Jul-07	N	197-217	-76.7	7.91	16,327	31.46	1.9	103.65	6,240
	24-Jan-07	N		10.9	7.86	19,260	30.35	0.58	105.90	9,280
PT-8S	16-Jul-07	N	127-147	-66.4	7.90	5,389	31.07	7.02	105.29	1,670
	23-Jan-08	N		109.1	7.49	5,890	29.44	5.68	107.38	1,980
PT-8M	18-Jul-07	N	162-182	54.9	7.18	6,698	29.67	2.9	105.18	3,740
	23-Jan-08	N		36.1	7.17	8,047	29.95	1.72	107.30	4,660
PT-8D	16-Jul-07	N	190-210	-54.6	7.99	16,042	33.76	6.39	105.09	6,120
	23-Jan-08	N		24.1	7.86	17,790	30.23	0.97	107.34	6,980
PT-9S	17-Jul-07	N	128-148	-61.5	7.86	4,919	33.28	4.97	102.33	2,620
	22-Jan-08	N		157.1	7.53	4,784	27.16	3.97	104.50	1,580
PT-9M	17-Jul-07	N	162-182	-57.0	7.34	6,605	31.74	4.09	102.34	3,460
	22-Jan-08	N		58.8	7.03	7,963	30.05	3.34	104.49	3,000
PT-9D	17-Jul-07	N	190-210	-74.8	7.87	14,027	31.46	1.14	102.18	10,050
	22-Jan-07	N		47.9	7.76	17,070	30.4	1.23	104.38	17,080
MW-11	17-Jul-07	N	63-88	-23.7	7.56	2,176	30.15	8.81	65.60	260
	24-Jan-08	N		137.3	7.40	2,312	28710	7.61	67.67	342
MW-24A	18-Jul-07	N	104-124	-43.9	7.67	2,707	32.20	2.89	110.05	1,100
	24-Jan-08	N		79.8	7.51	3,090	28.51	1.95	112.20	2,980
MW-24B	18-Jul-07	N	193-213	-57.9	7.86	15,371	31.40	3.02	107.92	2,340
	24-Jan-08	N		-9.7	7.74	17,450	29.91	0.85	109.75	5,400
MW-38S	17-Jul-07	N	75-95	27.2	7.52	3,306	29.00	6.02	69.04	720
	23-Jan-08	N		36.6	7.56	3,175	27.08	5.33	71.05	1,140
MW-38D	17-Jul-07	N	166-188	-62.9	7.81	20,894	30.63	1.2	69.37	1,410
	23-Jan-08	N		-32.8	7.78	23,020	30.28	0.14	71.29	69
PTR-1	19-Jul-07	N	*	-50.9	7.91	8,927	31.2	1.6	102.65	201
	25-Jan-08	N		228.7	7.48	7,093	22.52	2.09	---	920
PTR-2	18-Jul-07	N	*	-56.7	7.40	9,367	30.52	1.01	110.34	2,020
	25-Jan-08	N		167.8	7.31	9,122	28.41	2.37	---	4,920

Notes appear on the following page.

Table 2
Summary of Field Parameters
PG&E Topock
Needles, California
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Location Name	Sample Date	Sample Type	Screen Interval (ft bgs)	ORP (mV)	pH	Specific Conductance ($\mu\text{S}/\text{cm}$)	Temperature ($^{\circ}\text{C}$)	DO (mg/L)	Depth to Water (feet below TOC)	Hexavalent Chromium Field ($\mu\text{g}/\text{L}$)
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Notes:

Most recent data indicated in **BOLD**

Depth to water recorded prior to any sampling activities. Recirculation wells PTR-1 and PTR-2 cannot be gauged post-construction due to necessary piping and well caps

ft bgs Feet below ground surface

mV Millivolts

$\mu\text{S}/\text{cm}$ Microsiemens per centimeter

$^{\circ}\text{C}$ Degrees Celsius

$\mu\text{g}/\text{L}$ Micrograms per liter

mg/L Milligrams per liter

ORP Oxidation Reduction Potential

N Normal

DO Dissolved oxygen

TOC Top of Casing

--- Not analyzed/Not available

* PTR-1 Screen: 125-160 and 175-220 ft bgs. PTR-2 Screen: 118-158 and 173-218 ft bgs.

Table 3
Summary of Primary Analytical Parameters
PG&E Topock
Needles, California

February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Notes	Sample Type	Screen Interval (ft bgs)	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Dissolved Manganese (µg/L)	Total Manganese (µg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)
PT-7S	18-Jul-07		N	130-150	1,200	1,260	1,080	22.0	<.1	6,160	<500	55.6	1,050	674	1.18
	23-Jan-08	a	N		1,400	1,390	---	18.7	<.1	558	<2,500	<2,500	462	608	2.99
PT-7M	19-Jul-07		N	165-185	2,320	2,240	2,110	25.2	<.1	6,260	<500	31.6	1,150	1,250	1.02
	24-Jan-08	a	N		2,440	2,340	---	30.4	<.5	<500	<1,000	<1,000	<10	1,280	<1
PT-7D	18-Jul-07		N	197-217	7,260	7,890	7,750	7.41	<.1	<500	<500	48.3	54	1,140	<1
	24-Jan-08	a	N		8,010	7,920	---	9.87	<.5	<500	<1,000	<1,000	13.6	1,150	<1
PT-8S	16-Jul-07		N	127-147	1,750	1,660	1,620	25.1	<.1	2,670	<500	25.1	269	869	1.35
	23-Jan-08	a	N		1,620	1,680	---	24.9	<.1	<500	<2,500	<2,500	<10	734	1.03
PT-8M	18-Jul-07		N	162-182	3,960	4,120	4,140	31.8	<.1	<500	<500	15.5	22.7	1,330	1.40
	23-Jan-08	a	N		4,050	4,030	---	34.9	<1	<500	<2,500	<2,500	<10	1,210	1.31
PT-8D	16-Jul-07		N	190-210	6,540	7,260	7,290	9.72	<.2	2,620	<500	23.5	186	1,110	<1
	23-Jan-08	a	N		6,210	6,340	---	11.4	<.5	<500	<5,000	<5,000	<10	1,080	<1
PT-9S	17-Jul-07		N	128-148	1,180	1,150	1,170	16.4	<.1	1,080	<500	29.0	125	689	1.24
	22-Jan-08		N		1,380	1,250	---	17.3	<.5	917	1,000	<500	36.7	644	<1
PT-9M	17-Jul-07		N	162-182	2,340	2,270	2,250	24.4	<.1	<500	<500	18.7	27.2	1,410	1.17
	17-Jul-07		FD		2,240	2,270	2,220	24.6	<.1	<500	<500	18.2	32.3	1,410	1.21
	22-Jan-08		N		2,940	2,400	---	24.3	<.5	<500	<500	<500	<10	1,390	1.02
PT-9D	17-Jul-07		N	190-210	15,700	15,600	<1	9.30	<.2	<500	<500	29.4	33.8	1,260	1.14
	22-Jan-08	a	N		17,400	15,300	---	11.8	<.5	<500	<5,000	<5,000	<10	1,390	<1
	22-Jan-08	a	FD		16,400	15,500	---	10.9	<.5	<500	<5,000	<5,000	<10	1,310	<1
MW-11	17-Jul-07		N	63-88	321	314	339	8.44	<.1	<500	<500	<5	<10	251	1.06
	24-Jan-08		N		321	310	---	8.65	<.1	<500	<500	<500	<10	241	<1
MW-24A	18-Jul-07		N	104-124	2,480	2,550	2,600	18.3	<.1	<500	<500	<5	<10	372	3.82
	24-Jan-08		N		2,620	2,570	---	18.5	<.1	<500	<500	<500	<10	380	3.79
MW-24B	18-Jul-07		N	193-213	5,540	6,020	5,680	12.1	<.1	<500	<500	22.7	25.1	1,060	<1
	24-Jan-08	a	N		4,870	4,760	---	11.3	<.5	<500	<1,000	<1,000	20.3	1,050	<1
MW-38S	17-Jul-07		N	75-95	911	920	948	10.5	<.1	1,910	<500	<5	234	465	1.07
	23-Jan-08		N		899	885	---	10.7	<.1	<500	<500	<500	<10	366	<1
MW-38D	17-Jul-07		N	166-188	104	72.1	66.2	0.697	<.5	<500	<500	10.4	20.4	724	<1
	23-Jan-08	a	N		58.8	67.7	---	<2.5	<.5	<500	<10,000	<10,000	<10	723	<1

Table 3
Summary of Primary Analytical Parameters
PG&E Topock
Needles, California
February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Notes	Sample Type	Screen Interval (ft bgs)	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Total Iron (µg/L)	Dissolved Iron (µg/L)	Dissolved Manganese (µg/L)	Total Manganese (µg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	
PTR-1	19-Jul-07		N	*	538	713	1,240	18.4	<.1	6,010	<500	92.2	119	983	<1	
	25-Jan-08		N		904	991	---	20.4	<.1	2,920	<500	<500	25.8	742	3.82	
PTR-2	18-Jul-07		N	*	3,190	3,380	4,020	25.8	<.1	3,720	<500	68.7	73.6	1,200	1.63	
	25-Jan-08	a	N		4,240	4,310	---	32.8	<.1	6,920	<1,000	<1,000	29.4	1,280	6.35	
Equipment Blank	17-Jul-07		EB		<0.2			<1	<.5	<.1	<500	<500	<5	<10	<.5	<1
	22-Jan-08		EB		<0.2		---		<.5	<.1	<500	<500	<500	<10	<.5	<1
Field Blank	17-Jul-07		FB		<0.2			<1	<.5	<.1	<500	<500	<5	<10	<.5	<1
	22-Jan-08		FB		<0.2		---		<.5	<.1	<500	<500	<500	<10	36.4	<1

Notes:

Most recent data indicated in **BOLD**

a Samples were diluted in the laboratory

Dissolved Samples were field filtered with a 0.45 micron filter.

ft bgs Feet below ground surface

mg/L Milligrams per liter

µg/L Micrograms per liter

< Symbol indicates not detected at or above laboratory detection limit as noted

N Normal

EB Equipment blank

FB Field blank

FD Field duplicate

Nitrate-N Nitrate as Nitrogen

Nitrite-N Nitrite as Nitrogen

--- Not analyzed/Not available

* PTR-1 Screen: 125-160 and 175-220 ft bgs. PTR-2 Screen: 118-158 and 173-218 ft bgs.

Table 4
Summary of Secondary Analytical Parameters

PG&E Topock
 Needles, California

February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Notes	Sample Type	Screen Interval (ft bgs)	Dissolved Calcium (µg/L)	Dissolved Arsenic (µg/L)	Dissolved Potassium (µg/L)	Dissolved Sodium (µg/L)	Alkalinity bicarbonate (mg/L)	Alkalinity carbonate (mg/L)	Chloride-Cl (mg/L)	Orthophosphate-P (mg/L)	Sulfide (mg/L)
PT-7S	18-Jul-07		N	130-150	159,000	<5	14,500	999,000	125	<5	1,250	<.5	<2
	23-Jan-08	a	N		259,000	<25	13,600	942,000	135	---	1,060	<.5	<2
PT-7M	19-Jul-07		N	165-185	419,000	<5	23,900	1,350,000	97.5	<5	1,920	<.5	<2
	24-Jan-08	a	N		434,000	<10	24,600	1,460,000	80.0	---	2,180	<.5	<2
PT-7D	18-Jul-07		N	197-217	321,000	7.96	38,600	3,630,000	52.5	<5	5,490	<.5	<2
	24-Jan-08	a	N		339,000	<10	39,100	3,890,000	47.5	---	5,540	<1	<2
PT-8S	16-Jul-07		N	127-147	132,000	<5	12,500	955,000	125	<5	1,190	<.5	<2
	23-Jan-08	a	N		141,000	<25	12,600	1,040,000	128	---	1,220	<.5	2.00
PT-8M	18-Jul-07		N	162-182	353,000	<5	22,200	1,130,000	103	<5	1,510	<.5	<2
	23-Jan-08	a	N		403,000	<25	24,100	1,230,000	100	---	1,700	<.5	4.00
PT-8D	16-Jul-07		N	190-210	281,000	7.07	35,100	3,300,000	45.0	<5	5,360	<.5	<2
	23-Jan-08	a	N		325,000	<50	35,200	3,420,000	50.0	---	5,190	<1	<2
PT-9S	17-Jul-07		N	128-148	108,000	<5	11,800	<1,000	155	<5	895	<.5	<2
	22-Jan-08		N		107,000	5.63	9,140	848,000	205	---	924	<.5	<2
PT-9M	17-Jul-07		N	162-182	<1,000	<5	30,200	<1,000	97.5	<5	1,400	<.5	<2
	17-Jul-07		FD		<1,000	<5	29,800	<1,000	100	<5	1,400	<.5	<2
	22-Jan-08		N		525,000	<5	29,800	1,140,000	97.5	---	1,640	<.5	<2
PT-9D	17-Jul-07		N	190-210	<1,000	6.28	34,200	<1,000	52.5	<5	4,350	<1	<2
	22-Jan-08	a	N		399,000	<50	35,500	3,230,000	50.0	---	4,790	<1	<2
	22-Jan-08	a	FD		404,000	<50	35,400	3,260,000	55.0	---	4,940	<1	<2
MW-11	17-Jul-07		N	63-88	125,000	<5	8,330	280,000	87.5	<5	470	<.5	<2
	24-Jan-08		N		122,000	<5	8,160	280,000	103	---	442	<.5	<2

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Summary of Secondary Analytical Parameters
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Needles, California
February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Notes	Sample Type	Screen Interval (ft bgs)	Dissolved Calcium ($\mu\text{g/L}$)	Dissolved Arsenic ($\mu\text{g/L}$)	Dissolved Potassium ($\mu\text{g/L}$)	Dissolved Sodium ($\mu\text{g/L}$)	Alkalinity bicarbonate (mg/L)	Alkalinity carbonate (mg/L)	Chloride-Cl (mg/L)	Orthophosphate-P (mg/L)	Sulfide (mg/L)
MW-24A	18-Jul-07		N	104-124	42,000	5.40	5,610	565,000	310	<5	410	<.5	<2
	24-Jan-08		N		46,300	5.11	5,860	585,000	365	---	452	<.5	<2
MW-24B	18-Jul-07		N	193-213	329,000	7.13	34,500	3,270,000	50.0	<5	4,820	<.5	<2
	24-Jan-08	a	N		341,000	<10	36,400	3,470,000	50.0	---	5,270	<1	2.00
MW-38S	17-Jul-07		N	75-95	84,200	<5	8,710	627,000	175	<5	680	<.5	<2
	23-Jan-08				63,900	<5	7,400	546,000	175	---	546	<.5	<2
MW-38D	17-Jul-07		N	166-188	352,000	7.85	45,600	4,710,000	35.0	<5	7,240	<.5	<2
	23-Jan-08	a			353,000	<100	43,100	4,560,000	40	---	7,690	<2.5	<2
PTR-1	19-Jul-07		N	*	254,000	<5	21,500	1,500,000	97.5	<5	1,940	<.5	<2
	25-Jan-08		N		206,000	<5	16,400	1,190,000	123	---	1,610	<.5	<2
PTR-2	18-Jul-07		N	*	335,000	<5	23,200	1,610,000	92.5	<5	2,200	<.5	<2
	25-Jan-08	a	N		427,000	<10	25,000	1,450,000	103	---	2,060	<.5	2.00
Equipment Blank	17-Jul-07		EB		<1,000	<5	<1,000	<1,000	<5	<5	<.5	<.5	<2
	22-Jan-08		EB		<1,000	<5	<1,000	<1,000	<5	---	<.5	<.5	<2
Field Blank	17-Jul-07		FB		<1,000	<5	<1,000	<1,000	<5	<5	<.5	<.5	<2
	22-Jan-08		FB		<1,000	<5	<1,000	<1,000	<5	---	116	<.5	<2

Notes appear on the following page.

Table 4
Summary of Secondary Analytical Parameters

PG&E Topock
 Needles, California

February Monitoring Report for the Upland Reductive Zone In-Situ Pilot Test

Location Name	Sample Date	Notes	Sample Type	Screen Interval (ft bgs)	Dissolved Calcium (µg/L)	Dissolved Arsenic (µg/L)	Dissolved Potassium (µg/L)	Dissolved Sodium (µg/L)	Alkalinity bicarbonate (mg/L)	Alkalinity carbonate (mg/L)	Chloride-Cl (mg/L)	Orthophosphate-P (mg/L)	Sulfide (mg/L)
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Notes:

Most recent data indicated in **BOLD**

- a Samples were diluted in the laboratory
- ft bgs Feet below ground surface
- mg/L Milligrams per liter
- µg/L Micrograms per liter
- < Symbol indicates not detected at or above laboratory detection limit as noted.
- EB Equipment blank
- FB Field blank
- FD Field duplicate
- J Reported Value is estimated.
- N Normal
- NA Not applicable
- Dissolved Samples were field filtered with a 0.45 micron filter.
- Not analyzed/not sampled
- * PTR-1 Screen: 125-160 and 175-220 ft bgs. PTR-2 Screen: 118-158 and 173-218 ft bgs.

Table 5
Summary of Monitoring Information

PG&E Topock

Needles, CA

February 2008 Monitoring Report for the Upland Reductive Zone In Situ Pilot Test

Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name	
PT-7S	PT-07S-20080122	Cody Montoya	1/22/2008	09:50 AM	FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/22/2008	Gary Clift	
						EMXT	Iron-Total	1/29/2008	Chris Capulong	
						EMXT	Manganese	1/29/2008	Chris Capulong	
						EMXT	Arsenic	2/6/2008	Chris Capulong	
						EMXT	Calcium	2/6/2008	Chris Capulong	
						EMXT	Chromium	2/6/2008	Chris Capulong	
						EMXT	Iron-Dissolved	2/6/2008	Chris Capulong	
						EMXT	Manganese	2/6/2008	Chris Capulong	
						EMXT	Potassium	2/6/2008	Chris Capulong	
						EMXT	Sodium	2/6/2008	Chris Capulong	
						EMXT	Chloride-cl	1/28/2008	Sandy Duong	
						EMXT	Nitrate-n	1/24/2008	Sandy Duong	
						EMXT	Nitrite-n	1/24/2008	Sandy Duong	
						EMXT	Orthophosphate-p	1/24/2008	Sandy Duong	
						EMXT	Sulfate	1/28/2008	Sandy Duong	
						EMXT	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha	
						EMXT	Sulfide	1/28/2008	Supakit Deesopha	
						EMXT	Total Organic Carbon	1/25/2008	Michael Amador	
					Truesdail	SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson	
PT-7M	PT-07M-20080124	Cody Montoya	1/24/2008	01:55 PM		EMXT	Iron-Total	1/30/2008	Chris Capulong	
						EMXT	Manganese	1/30/2008	Chris Capulong	
						EMXT	Arsenic	2/11/2008	Chris Capulong	
						EMXT	Calcium	2/11/2008	Chris Capulong	
						EMXT	Chromium	2/11/2008	Chris Capulong	
						EMXT	Iron-Dissolved	2/11/2008	Chris Capulong	
						EMXT	Manganese	2/11/2008	Chris Capulong	
						EMXT	Potassium	2/11/2008	Chris Capulong	
						EMXT	Sodium	2/11/2008	Chris Capulong	
						EMXT	Chloride-cl	1/28/2008	Sandy Duong	
						EMXT	Nitrate-n	1/25/2008	Sandy Duong	
						EMXT	Nitrite-n	1/25/2008	Sandy Duong	
						EMXT	Orthophosphate-p	1/26/2008	Sandy Duong	
						EMXT	Sulfate	1/28/2008	Sandy Duong	
						EMXT	Alkalinity bicarbonate	1/31/2008	Supakit Deesopha	
						EMXT	Sulfide	1/30/2008	Supakit Deesopha	
						EMXT	Total Organic Carbon	1/28/2008	Michael Amador	
				FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/24/2008	Gary Clift		
					Truesdail	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson		

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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
PT-7D	PT-07D-20080124	Cody Montoya	1/24/2008	10:50 AM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
						E200.7	Manganese	1/30/2008	Chris Capulong
						E200.8	Arsenic	2/11/2008	Chris Capulong
						E200.8	Calcium	2/11/2008	Chris Capulong
						E200.8	Chromium	2/11/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/11/2008	Chris Capulong
						E200.8	Manganese	2/11/2008	Chris Capulong
						E200.8	Potassium	2/11/2008	Chris Capulong
						E200.8	Sodium	2/11/2008	Chris Capulong
						E300.0	Chloride-cl	1/29/2008	Sandy Duong
						E300.0	Nitrate-n	1/25/2008	Sandy Duong
						E300.0	Nitrite-n	1/25/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
						E300.0	Sulfate	1/28/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/31/2008	Supakit Deesopha
						E376.1	Sulfide	1/30/2008	Supakit Deesopha
						E415.1	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis Truesdail	IM-3	Chromium, hexavalent-Field	1/24/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson
PT-8S	PT-08S-20080123	Cody Montoya	1/23/2008	10:25 AM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						E200.7	Manganese	1/29/2008	Chris Capulong
						E200.8	Arsenic	2/6/2008	Chris Capulong
						E200.8	Calcium	2/6/2008	Chris Capulong
						E200.8	Chromium	2/6/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
						E200.8	Manganese	2/6/2008	Chris Capulong
						E200.8	Potassium	2/6/2008	Chris Capulong
						E200.8	Sodium	2/6/2008	Chris Capulong
						E300.0	Chloride-cl	1/28/2008	Sandy Duong
						E300.0	Nitrate-n	1/24/2008	Sandy Duong
						E300.0	Nitrite-n	1/25/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
						E300.0	Sulfate	1/28/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						E376.1	Sulfide	1/28/2008	Supakit Deesopha
					FieldAnalysis Truesdail	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
						IM-3	Chromium, hexavalent-Field	1/23/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson

Table 5
Summary of Monitoring Information

PG&E Topock

Needles, CA

February 2008 Monitoring Report for the Upland Reductive Zone In Situ Pilot Test

Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
PT-8M	PT-08M-20080123	Cody Montoya	1/23/2008	12:15 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
					EMXT	E200.7	Manganese	1/29/2008	Chris Capulong
					EMXT	E200.8	Arsenic	2/6/2008	Chris Capulong
					EMXT	E200.8	Calcium	2/6/2008	Chris Capulong
					EMXT	E200.8	Chromium	2/6/2008	Chris Capulong
					EMXT	E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
					EMXT	E200.8	Manganese	2/6/2008	Chris Capulong
					EMXT	E200.8	Potassium	2/6/2008	Chris Capulong
					EMXT	E200.8	Sodium	2/6/2008	Chris Capulong
					EMXT	E300.0	Chloride-cl	1/28/2008	Sandy Duong
					EMXT	E300.0	Nitrate-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Nitrite-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
					EMXT	E300.0	Sulfate	1/28/2008	Sandy Duong
					EMXT	E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
					EMXT	E376.1	Sulfide	1/28/2008	Supakit Deesopha
					EMXT	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
					FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/23/2008	Gary Clift
					Truesdail	SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson
PT-8D	PT-08D-20080123	Cody Montoya	1/23/2008	11:20 AM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
					EMXT	E200.7	Manganese	1/29/2008	Chris Capulong
					EMXT	E200.8	Arsenic	2/6/2008	Chris Capulong
					EMXT	E200.8	Calcium	2/6/2008	Chris Capulong
					EMXT	E200.8	Chromium	2/6/2008	Chris Capulong
					EMXT	E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
					EMXT	E200.8	Manganese	2/6/2008	Chris Capulong
					EMXT	E200.8	Potassium	2/6/2008	Chris Capulong
					EMXT	E200.8	Sodium	2/6/2008	Chris Capulong
					EMXT	E300.0	Chloride-cl	1/28/2008	Sandy Duong
					EMXT	E300.0	Nitrate-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Nitrite-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
					EMXT	E300.0	Sulfate	1/28/2008	Sandy Duong
					EMXT	E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
					EMXT	E376.1	Sulfide	1/28/2008	Supakit Deesopha
					EMXT	E415.1	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/23/2008	Gary Clift
					Truesdail	SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson

Table 5
Summary of Monitoring Information

PG&E Topock

Needles, CA

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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
PT-9S	PT-09S-20080122	Cody Montoya	1/22/2008	12:15 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						E200.7	Manganese	1/29/2008	Chris Capulong
						E200.8	Arsenic	2/6/2008	Chris Capulong
						E200.8	Calcium	2/6/2008	Chris Capulong
						E200.8	Chromium	2/6/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
						E200.8	Manganese	2/6/2008	Chris Capulong
						E200.8	Potassium	2/6/2008	Chris Capulong
						E200.8	Sodium	2/6/2008	Chris Capulong
						E300.0	Chloride-cl	1/24/2008	Sandy Duong
						E300.0	Nitrate-n	1/23/2008	Sandy Duong
						E300.0	Nitrite-n	1/23/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/23/2008	Sandy Duong
						E300.0	Sulfate	1/24/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						E376.1	Sulfide	1/24/2008	Supakit Deesopha
						E415.1	Total Organic Carbon	1/25/2008	Michael Amador
			FieldAnalysis	IM-3	Truesdail	IM-3	Chromium, hexavalent-Field	1/22/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/23/2008	Jean Paul Gleeson
PT-9M	PT-09M-20080122	Cody Montoya	1/22/2008	02:30 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						E200.7	Manganese	1/29/2008	Chris Capulong
						E200.8	Arsenic	2/6/2008	Chris Capulong
						E200.8	Calcium	2/6/2008	Chris Capulong
						E200.8	Chromium	2/6/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
						E200.8	Manganese	2/6/2008	Chris Capulong
						E200.8	Potassium	2/6/2008	Chris Capulong
						E200.8	Sodium	2/6/2008	Chris Capulong
						E300.0	Chloride-cl	1/24/2008	Sandy Duong
						E300.0	Nitrate-n	1/23/2008	Sandy Duong
						E300.0	Nitrite-n	1/23/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/23/2008	Sandy Duong
						E300.0	Sulfate	1/24/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						E376.1	Sulfide	1/24/2008	Supakit Deesopha
			FieldAnalysis	IM-3	Truesdail	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
						SW7199	Chromium, hexavalent-Field	1/22/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/23/2008	Jean Paul Gleeson

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Summary of Monitoring Information

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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
PT-9D	PT-09D-20080122	Cody Montoya	1/22/2008	01:20 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						E200.7	Manganese	1/29/2008	Chris Capulong
						E200.8	Arsenic	2/6/2008	Chris Capulong
						E200.8	Calcium	2/6/2008	Chris Capulong
						E200.8	Chromium	2/6/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
						E200.8	Manganese	2/6/2008	Chris Capulong
						E200.8	Potassium	2/6/2008	Chris Capulong
						E200.8	Sodium	2/6/2008	Chris Capulong
						E300.0	Chloride-cl	1/24/2008	Sandy Duong
						E300.0	Nitrate-n	1/23/2008	Sandy Duong
						E300.0	Nitrite-n	1/23/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/23/2008	Sandy Duong
						E300.0	Sulfate	1/24/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						E376.1	Sulfide	1/24/2008	Supakit Deesopha
						E415.1	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis Truesdail	IM-3	Chromium, hexavalent-Field	1/22/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/23/2008	Jean Paul Gleeson
PT-9D	PT-09D-20080122D	Cody Montoya	1/22/2008		EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						E200.7	Manganese	1/29/2008	Chris Capulong
						E200.8	Arsenic	2/6/2008	Chris Capulong
						E200.8	Calcium	2/6/2008	Chris Capulong
						E200.8	Chromium	2/6/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
						E200.8	Manganese	2/6/2008	Chris Capulong
						E200.8	Potassium	2/6/2008	Chris Capulong
						E200.8	Sodium	2/6/2008	Chris Capulong
						E300.0	Chloride-cl	1/24/2008	Sandy Duong
						E300.0	Nitrate-n	1/23/2008	Sandy Duong
						E300.0	Nitrite-n	1/23/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/23/2008	Sandy Duong
						E300.0	Sulfate	1/24/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						E376.1	Sulfide	1/24/2008	Supakit Deesopha
						E415.1	Total Organic Carbon	1/28/2008	Michael Amador
						SW7199	Chromium, hexavalent	1/22/2008	Jean Paul Gleeson

Table 5
Summary of Monitoring Information

PG&E Topock

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February 2008 Monitoring Report for the Upland Reductive Zone In Situ Pilot Test

Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
MW-11	MW-11-20080124	Cody Montoya	1/24/2008	08:30 AM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
						E200.7	Manganese	1/30/2008	Chris Capulong
						E200.8	Arsenic	2/11/2008	Chris Capulong
						E200.8	Calcium	2/11/2008	Chris Capulong
						E200.8	Chromium	2/11/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/11/2008	Chris Capulong
						E200.8	Manganese	2/11/2008	Chris Capulong
						E200.8	Potassium	2/11/2008	Chris Capulong
						E200.8	Sodium	2/11/2008	Chris Capulong
						E300.0	Chloride-cl	1/28/2008	Sandy Duong
						E300.0	Nitrate-n	1/25/2008	Sandy Duong
						E300.0	Nitrite-n	1/25/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
						E300.0	Sulfate	1/28/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/31/2008	Supakit Deesopha
						E376.1	Sulfide	1/30/2008	Supakit Deesopha
						E415.1	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis Truesdail	IM-3	Chromium, hexavalent-Field	1/24/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson
MW-24A	MW-24A-20080124	Cody Montoya	1/24/2008	09:50 AM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
						E200.7	Manganese	1/30/2008	Chris Capulong
						E200.8	Arsenic	2/11/2008	Chris Capulong
						E200.8	Calcium	2/11/2008	Chris Capulong
						E200.8	Chromium	2/11/2008	Chris Capulong
						E200.8	Iron-Dissolved	2/11/2008	Chris Capulong
						E200.8	Manganese	2/11/2008	Chris Capulong
						E200.8	Potassium	2/11/2008	Chris Capulong
						E200.8	Sodium	2/11/2008	Chris Capulong
						E300.0	Chloride-cl	2/4/2008	Sandy Duong
						E300.0	Nitrate-n	1/25/2008	Sandy Duong
						E300.0	Nitrite-n	1/25/2008	Sandy Duong
						E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
						E300.0	Sulfate	2/4/2008	Sandy Duong
						E310.1	Alkalinity bicarbonate	1/31/2008	Supakit Deesopha
						E376.1	Sulfide	1/30/2008	Supakit Deesopha
					FieldAnalysis Truesdail	E415.1	Total Organic Carbon	1/28/2008	Michael Amador
						IM-3	Chromium, hexavalent-Field	1/24/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson

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Summary of Monitoring Information

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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
MW-24B	MW-24B-20080124	Cody Montoya	1/24/2008	12:30 PM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
						EMXT	Manganese	1/30/2008	Chris Capulong
						EMXT	Arsenic	2/11/2008	Chris Capulong
						EMXT	Calcium	2/11/2008	Chris Capulong
						EMXT	Chromium	2/11/2008	Chris Capulong
						EMXT	Iron-Dissolved	2/11/2008	Chris Capulong
						EMXT	Manganese	2/11/2008	Chris Capulong
						EMXT	Potassium	2/11/2008	Chris Capulong
						EMXT	Sodium	2/11/2008	Chris Capulong
						EMXT	Chloride-cl	1/29/2008	Sandy Duong
						EMXT	Nitrate-n	1/25/2008	Sandy Duong
						EMXT	Nitrite-n	1/25/2008	Sandy Duong
						EMXT	Orthophosphate-p	1/25/2008	Sandy Duong
						EMXT	Sulfate	1/28/2008	Sandy Duong
						EMXT	Alkalinity bicarbonate	1/31/2008	Supakit Deesopha
						EMXT	Sulfide	1/30/2008	Supakit Deesopha
						EMXT	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/24/2008	Gary Clift
						Truesdail	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson
MW-38S	MW-38S-20080123	Cody Montoya	1/23/2008	01:10 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						EMXT	Manganese	1/29/2008	Chris Capulong
						EMXT	Arsenic	2/6/2008	Chris Capulong
						EMXT	Calcium	2/6/2008	Chris Capulong
						EMXT	Chromium	2/6/2008	Chris Capulong
						EMXT	Iron-Dissolved	2/6/2008	Chris Capulong
						EMXT	Manganese	2/6/2008	Chris Capulong
						EMXT	Potassium	2/6/2008	Chris Capulong
						EMXT	Sodium	2/6/2008	Chris Capulong
						EMXT	Chloride-cl	1/28/2008	Sandy Duong
						EMXT	Nitrate-n	1/24/2008	Sandy Duong
						EMXT	Nitrite-n	1/25/2008	Sandy Duong
						EMXT	Orthophosphate-p	1/25/2008	Sandy Duong
						EMXT	Sulfate	1/28/2008	Sandy Duong
						EMXT	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						EMXT	Sulfide	1/28/2008	Supakit Deesopha
					FieldAnalysis	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
						Truesdail	IM-3	1/23/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson

Table 5
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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
MW-38D	MW-38D-20080123	Cody Montoya	1/23/2008	02:30 PM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
					EMXT	E200.7	Manganese	1/29/2008	Chris Capulong
					EMXT	E200.8	Arsenic	2/6/2008	Chris Capulong
					EMXT	E200.8	Calcium	2/6/2008	Chris Capulong
					EMXT	E200.8	Chromium	2/6/2008	Chris Capulong
					EMXT	E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
					EMXT	E200.8	Manganese	2/6/2008	Chris Capulong
					EMXT	E200.8	Potassium	2/6/2008	Chris Capulong
					EMXT	E200.8	Sodium	2/6/2008	Chris Capulong
					EMXT	E300.0	Chloride-cl	1/28/2008	Sandy Duong
					EMXT	E300.0	Nitrate-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Nitrite-n	1/24/2008	Sandy Duong
					EMXT	E300.0	Orthophosphate-p	1/24/2008	Sandy Duong
					EMXT	E300.0	Sulfate	1/28/2008	Sandy Duong
					EMXT	E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
					EMXT	E376.1	Sulfide	1/28/2008	Supakit Deesopha
					EMXT	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
					FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/23/2008	Gary Clift
					Truesdail	SW7199	Chromium, hexavalent	1/24/2008	Jean Paul Gleeson
PTR-1	PTR-01-20080125	Cody Montoya	1/25/2008	09:30 AM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
					EMXT	E200.7	Manganese	1/30/2008	Chris Capulong
					EMXT	E200.8	Arsenic	2/11/2008	Chris Capulong
					EMXT	E200.8	Calcium	2/11/2008	Chris Capulong
					EMXT	E200.8	Chromium	2/11/2008	Chris Capulong
					EMXT	E200.8	Iron-Dissolved	2/11/2008	Chris Capulong
					EMXT	E200.8	Manganese	2/11/2008	Chris Capulong
					EMXT	E200.8	Potassium	2/11/2008	Chris Capulong
					EMXT	E200.8	Sodium	2/11/2008	Chris Capulong
					EMXT	E300.0	Chloride-cl	1/28/2008	Sandy Duong
					EMXT	E300.0	Nitrate-n	1/25/2008	Sandy Duong
					EMXT	E300.0	Nitrite-n	1/25/2008	Sandy Duong
					EMXT	E300.0	Orthophosphate-p	1/25/2008	Sandy Duong
					EMXT	E300.0	Sulfate	1/28/2008	Sandy Duong
					EMXT	E310.1	Alkalinity bicarbonate	1/30/2008	Supakit Deesopha
					EMXT	E376.1	Sulfide	1/30/2008	Supakit Deesopha
					EMXT	E415.1	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis	IM-3	Chromium, hexavalent-Field	1/25/2008	Gary Clift
					Truesdail	SW7199	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson

Table 5
Summary of Monitoring Information
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Location	Sample ID	Sampler	Sample Date	Sample Time	Laboratory	Test Method	Analyte	Analysis Date	Analyst Name
PTR-2	PTR-02-20080125	Cody Montoya	1/25/2008	10:55 AM	EMXT	E200.7	Iron-Total	1/30/2008	Chris Capulong
						EMXT	Manganese	1/30/2008	Chris Capulong
						EMXT	Arsenic	2/11/2008	Chris Capulong
						EMXT	Calcium	2/11/2008	Chris Capulong
						EMXT	Chromium	2/11/2008	Chris Capulong
						EMXT	Iron-Dissolved	2/11/2008	Chris Capulong
						EMXT	Manganese	2/11/2008	Chris Capulong
						EMXT	Potassium	2/11/2008	Chris Capulong
						EMXT	Sodium	2/11/2008	Chris Capulong
						EMXT	Chloride-cl	1/28/2008	Sandy Duong
						EMXT	Nitrate-n	1/25/2008	Sandy Duong
						EMXT	Nitrite-n	1/25/2008	Sandy Duong
						EMXT	Orthophosphate-p	1/25/2008	Sandy Duong
						EMXT	Sulfate	1/29/2008	Sandy Duong
						EMXT	Alkalinity bicarbonate	1/30/2008	Supakit Deesopha
						EMXT	Sulfide	1/30/2008	Supakit Deesopha
						EMXT	Total Organic Carbon	1/28/2008	Michael Amador
					FieldAnalysis Truesdail	IM-3	Chromium, hexavalent-Field	1/25/2008	Gary Clift
						SW7199	Chromium, hexavalent	1/25/2008	Jean Paul Gleeson
Equipment Blank EB-20080122	EB-20080122	Cody Montoya	1/22/2008	11:10 AM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
						EMXT	Manganese	1/29/2008	Chris Capulong
						EMXT	Arsenic	2/6/2008	Chris Capulong
						EMXT	Calcium	2/6/2008	Chris Capulong
						EMXT	Chromium	2/6/2008	Chris Capulong
						EMXT	Iron-Dissolved	2/6/2008	Chris Capulong
						EMXT	Manganese	2/6/2008	Chris Capulong
						EMXT	Potassium	2/6/2008	Chris Capulong
						EMXT	Sodium	2/6/2008	Chris Capulong
						EMXT	Chloride-cl	1/23/2008	Sandy Duong
						EMXT	Nitrate-n	1/23/2008	Sandy Duong
						EMXT	Nitrite-n	1/23/2008	Sandy Duong
						EMXT	Orthophosphate-p	1/23/2008	Sandy Duong
						EMXT	Sulfate	1/23/2008	Sandy Duong
						EMXT	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
						EMXT	Sulfide	1/24/2008	Supakit Deesopha
						EMXT	Total Organic Carbon	1/25/2008	Michael Amador
						Truesdail	Chromium, hexavalent	1/22/2008	Jean Paul Gleeson

Table 5
Summary of Monitoring Information

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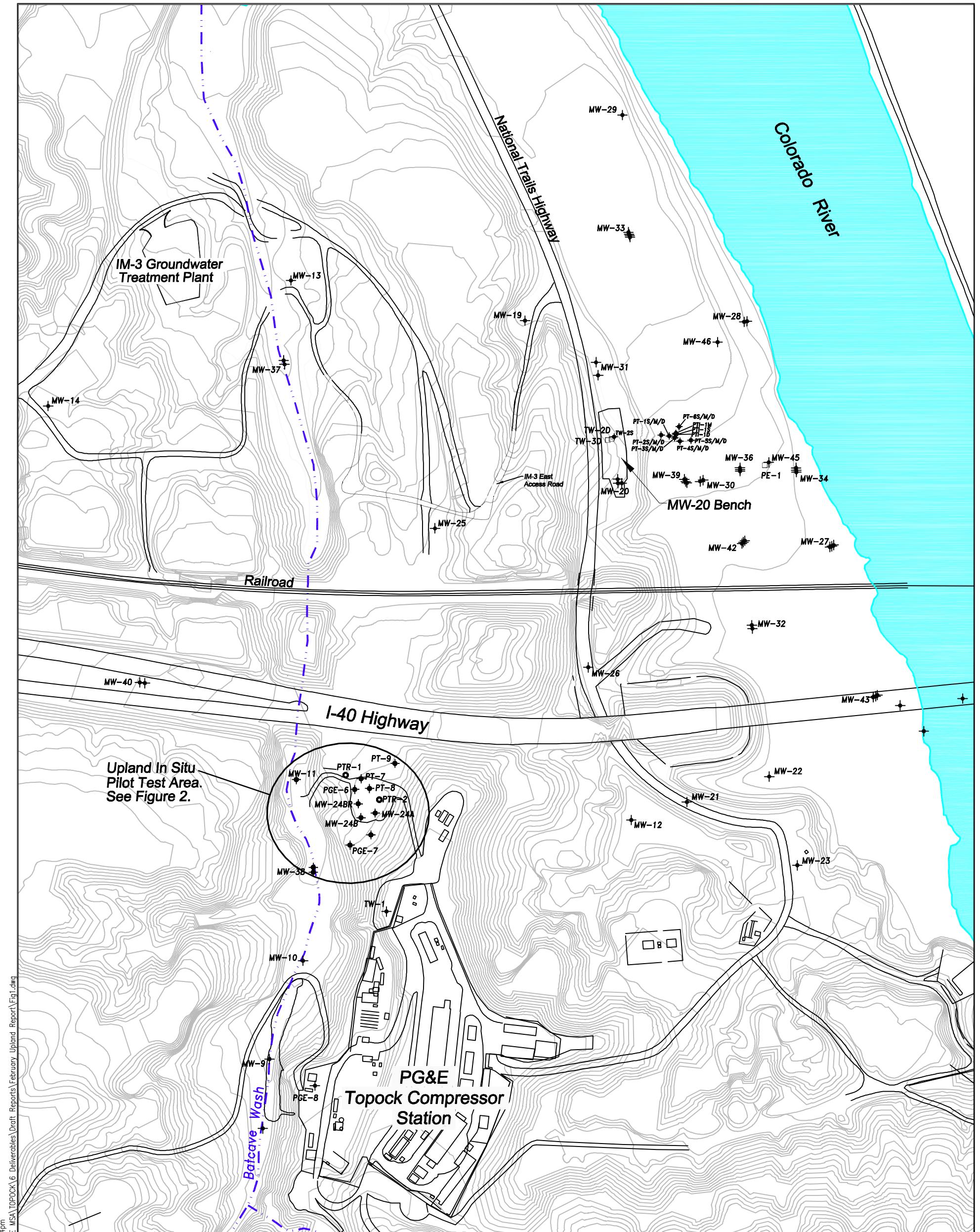
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Field Blank	FB-20080122	Cody Montoya	1/22/2008	11:00 AM	EMXT	E200.7	Iron-Total	1/29/2008	Chris Capulong
					EMXT	E200.7	Manganese	1/29/2008	Chris Capulong
					EMXT	E200.8	Arsenic	2/6/2008	Chris Capulong
					EMXT	E200.8	Calcium	2/6/2008	Chris Capulong
					EMXT	E200.8	Chromium	2/6/2008	Chris Capulong
					EMXT	E200.8	Iron-Dissolved	2/6/2008	Chris Capulong
					EMXT	E200.8	Manganese	2/6/2008	Chris Capulong
					EMXT	E200.8	Potassium	2/6/2008	Chris Capulong
					EMXT	E200.8	Sodium	2/6/2008	Chris Capulong
					EMXT	E300.0	Chloride-cl	1/24/2008	Sandy Duong
					EMXT	E300.0	Nitrate-n	1/23/2008	Sandy Duong
					EMXT	E300.0	Nitrite-n	1/23/2008	Sandy Duong
					EMXT	E300.0	Orthophosphate-p	1/23/2008	Sandy Duong
					EMXT	E300.0	Sulfate	1/24/2008	Sandy Duong
					EMXT	E310.1	Alkalinity bicarbonate	1/29/2008	Supakit Deesopha
					EMXT	E376.1	Sulfide	1/24/2008	Supakit Deesopha
					EMXT	E415.1	Total Organic Carbon	1/25/2008	Michael Amador
					Truesdail	SW7199	Chromium, hexavalent	1/22/2008	Jean Paul Gleeson

Notes:

EMXT EMAX Laboratories, Inc

Ozark Ozark Underground Laboratory

Truesdail Truesdail Laboratory



Legend

- Monitoring Well Locations
- Extraction Well Locations
- ♦ Injection Well Locations
- Recirculation Well Locations

0 FEET 300
SCALE

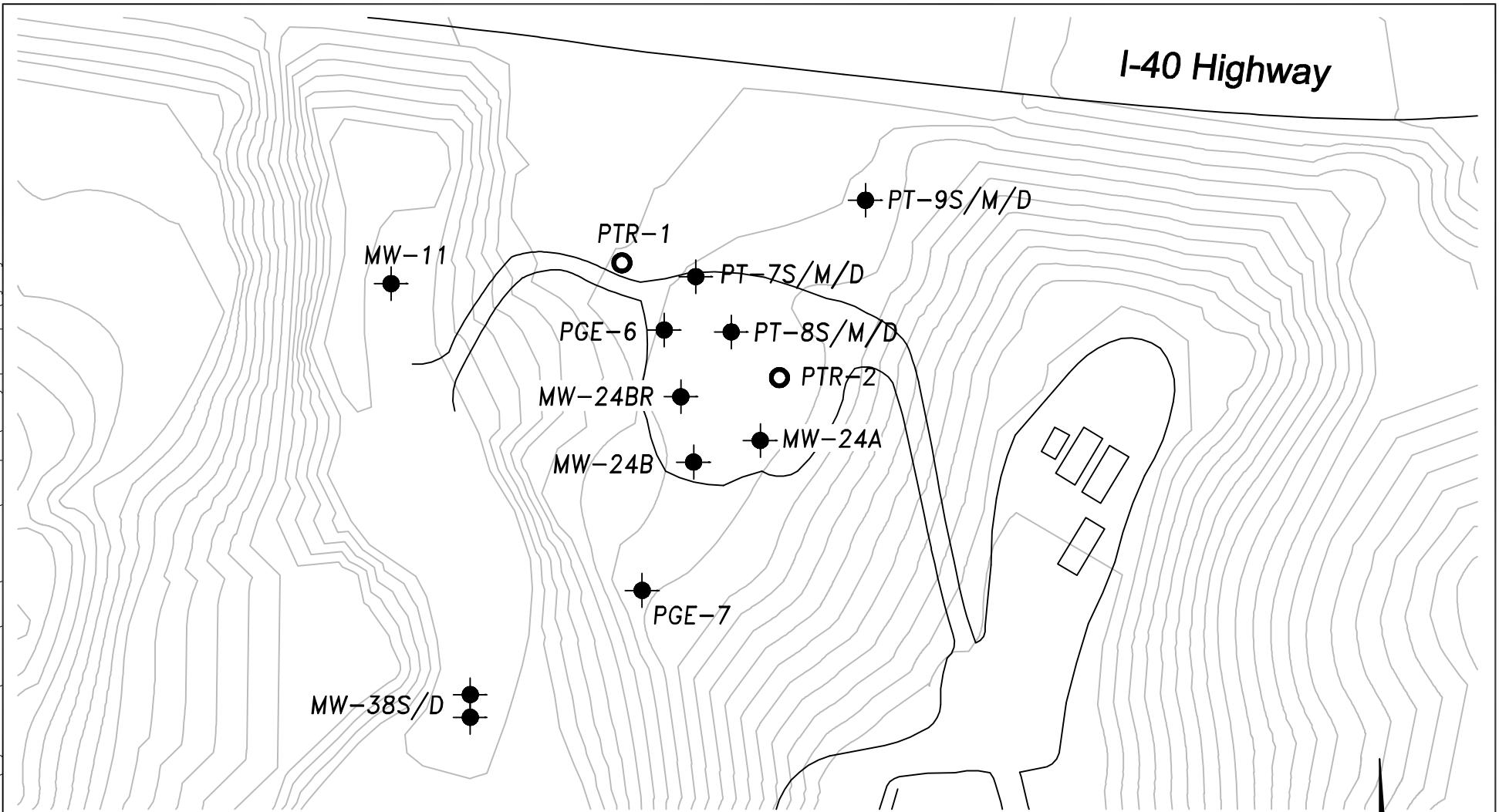


ARCADIS, Inc.
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Richmond, CA 94804
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www.arcadis-us.com

SITE PLAN PG&E TOPOCK FACILITY NEEDLES, CALIFORNIA

Project Number
RC000689.0001

Figure
1



Project Director	Area Manager
L. KELLOGG	J. PETERS
Task Manager	Technical Review
J. ELY	J. GILLOW
Drawing Date	Drawn By
4 MAR 08	M. CHIU

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UPLAND ISPT AREA
PG&E TOPOCK FACILITY
NEEDLES, CALIFORNIA

Project Number	RC000689.0001
Figure	2

Appendix A

Calibration Logs for Field
Monitoring Instruments

MULTIPARAMETER INSTRUMENT CALIBRATION RECORD

Project No.:

Location: *Torbeck CA*Instrument: YSI 556Serial Number: 06F2009 AD

Date	Calibrated by	Parameter	Standards Used	Calibrated Achieved (Y/N)	Remarks
1-22-08	<i>Cody Montoya</i>	pH { 4.0 7.0 10.0	conductivity 3900 DO 100% ORP 248.0	Yes Yes Yes Yes	
1-23-08	<i>Cody Montoya</i>	pH { 4.0 7.0 10.0	conductivity 3900 DO 100% ORP 257.0	Yes Yes Yes	
1-24-08	<i>Cody Montoya</i>	pH { 4.0 7.0 10.0	conductivity 3900 DO 100% ORP 252.0	Yes Yes Yes	
1-25-08	<i>Cody Montoya</i>	pH { 4.0 7.0 10.0	conductivity 3900 DO 100% ORP 252.0	Yes Yes Yes	

ARCADIS

Appendix B

Groundwater Sampling Logs

RECORD OF WATER LEVEL MEASUREMENTS

Date: 07- 16 -07

Tools used (circle one): Interface Probe DTW Meter Measuring Tape	Project Name: Topock			Job No.: RC000689.0004.00008
	Location: Needles, CA		ARCADIS Personnel: BK	

Well Number	Time Measured	Depth to Product (DTP) (feet)	Depth to Water (DTW) (feet)	Depth to Bottom (DTB) (feet)	Product Thickness = DTW - DTP (feet)	Remarks:
PTR-1	0728 7/19/07		102.65			
PTR-2	0752 7/18/07		110.34			
PT-7S	1410 7/19/07		103.58			
PT-7M	0830 7/19/07		103.90			
PT-7D	1414 7/18/07		103.65			
PT-8S	1149 7/16/07		105.29			
PT-8M	0639 7/18/07		105.18			
PT-8D	1354 7/16/07		105.09			
PT-9S	1410 7/17/07		102.33			
PT-9M	1231 7/17/07		102.34			
PT-9D	1415 7/17/07		102.18			

RECORD OF WATER LEVEL MEASUREMENTS

Date: 07- 16 -07

Tools used (circle one): Interface Probe DTW Meter Measuring Tape			Project Name: Topock Location: Needles, CA			Job No.: RC000689.0004.00008 ARCADIS Personnel: BK
Well Number	Time Measured	Depth to Product (DTP) (feet)	Depth to Water (DTW) (feet)	Depth to Bottom (DTB) (feet)	Product Thickness = DTW - DTP (feet)	Remarks:
MW-11	0939 7/17/07		65.60			
MW-24A	1325 7/18/07		110.05			
MW-24B	1057 7/18/07		107.92			
MW-38S	0650 7/17/07		69.04			
MW-38D	0819 7/17/07		69.37			

RECORD OF WATER LEVEL MEASUREMENTS

1-22-08

Date: 1-22-08

Tools used (circle one): Interface Probe DTW Meter Measuring Tape		Project Name: Topock Location: Needles, CA			Job No.: RC000689.0001.00006 ARCADIS Personnel: GC	
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Well Number	Time Measured	Depth to Product (DTP) (feet)	Depth to Water (DTW) (feet)	Depth to Bottom (DTB) (feet)	Product Thickness = DTW - DTP (feet)	Remarks:
PT-9S	1115		104.50	147'		#DTB's taken from datasheets
PT-9D	1235		104.38	210'		
PT-9M	1355		104.49	182'		
PT-7D	0830		105.90	217'		
PT-7S	0835		105.75	150'		
PT-8S	1005		107.38	147'		
PT-8D	1040		107.34	210'		
PT-8M	1150		107.30	182'		
MW-38S	1245		71.05	95.3'		
MW-38D	1340		71.29	188.3'		
MW-11	0810		67.67	88'		

RECORD OF WATER LEVEL MEASUREMENTS

Date: 11- -07

Tools used (circle one): Interface Probe DTW Meter Measuring Tape	Project Name: Topock	Job No.: RC000689.0001.00006
	Location: Needles, CA	

Well Number	Time Measured	Depth to Product (DTP) (feet)	Depth to Water (DTW) (feet)	Depth to Bottom (DTB) (feet)	Product Thickness = DTW - DTP (feet)	Remarks:
MW-24B	0900		109.75	213'		
MW-24A	0905		112.20	124'		
PT-7M	1330		105.79	185'		

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: PT-7S
 Date: 11-22-08 Sampled By: GC
 Weather: WARM Recorded By: CM
 Coded Duplicate No.: N/A

Instrument Identification

	PID	Water Quality Meter(s)
Model	=	YSI-556 MPS
Serial #:	=	06FZ009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 150'
 Depth to Water: 105.75
 Water Column: 44.25
 Gallons/Foot: 0.16
 Gallons in Well: 7.08

Wet well > Dry Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry

Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 130' To: 150'

Pump Intake Setting:

Volumes to be Purged:

Total Volume Purged:

Pump on: 0915

Off: 0955

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3½" = 0.50	4" = 0.65
	6" = 1.46	

CRT6 (1560) 1.76 mg/L

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate ()	Volume Purged ()	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond (µmhos/cm) mS/cm	Temp (°C)	DO (mg/L)	Comments
0915	0		0	71000	173.2	7.79	3.382	20.71	8.79		
0928	13		8	71000	140.3	7.68	4.059	22.30	9.83		
0936	21		16	71000	128.5	7.60	4.981	24.17	4.03		
0945	30		22	71000	132.0	7.60	4.366	23.50	4.12		

Observations During Sampling

Well Condition: GOOD, top of casing bent
 Color: brown
 Odor: NW

Purge Water Disposal: On site
 Turbidity(qualitative): 10W
 Other (OVA, HNU,etc.):

Sample ID: PT-75

Sample Date & Time: 1-22-08

0950

Samples Analyzed For: See the COC

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: PT-7D
 Date: 11-24 -07 Sampled By: GC
 Weather: WARM Recorded By: EM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI-556 MPS
Serial #:	—	06F2009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 217'
 Depth to Water: 105.90
 Water Column: 111.10
 Gallons/Foot: 0.16
 Gallons in Well: 17.77

Z² Grnd fcs
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 197' To: 217'
 Pump Intake Setting: = 207'
 Volumes to be Purged: 3
 Total Volume Purged: 53.31
 Pump on: 1022 Off: 1055

Well Casing Volumes (gal/ft):	<u>2"</u> = 0.16	<u>3"</u> = 0.37
	<u>3 1/2"</u> = 0.50	<u>4"</u> = 0.65
	<u>6"</u> = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu\text{mhos/cm}$)	Temp (°C)	DO (mg/L)	Comments
1022	0	—	0	—	71000	148.7	7.65	16.34	27.33	7.70	
1031	9	2	18	106.41	29	40.8	7.87	19.76	30.10	0.56	
1040	18	2	36	106.40	4	16.6	7.87	19.42	30.30	0.56	
1049	27	2	54	106.40	3	10.9	7.86	19.26	30.35	0.58	

Observations During Sampling

Well Condition: GOOD
 Color: greenish
 Odor: NONE

Purge Water Disposal: OMF
 Turbidity(qualitative): low
 Other (OVA, HNU,etc.):

Sample ID: PT-7 D
 Samples Analyzed For: See the COC

Sample Date & Time: 1-24-08 1050
24

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004.
 Date: 11- 23 -08
 Weather: Warm

Task: 00008 Well ID: PT-85
 Sampled By: GC
 Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI -556 MPS
Serial #:	—	06FZ009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 147'
 Depth to Water: 107.38
 Water Column: 39.62
 Gallons/Foot: 0.16
 Gallons in Well: 6.33

Cr+6
(1560)

1.98 myL

Z Grundfos
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Baile
 Screen Interval: From: 127' To: 147'
 Pump Intake Setting: ~137'
 Volumes to be Purged: 3
 Total Volume Purged: 18.99
 Pump on: 1011 Off: 1030

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3 1/2" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal.)	DTW (ft btoc)	Turbidity (NTUS)	ORP (mV)	pH (SI Units)	Spec Cond (µmhos/cm)	Temp (°C)	DO (mg/L)	Comments
1011	0	—	0	—	509	181.2	7.44	5.889	28.24	6.37	
1015	4	2	8	107.52	73	143.9	7.49	5.920	29.10	5.90	
1019	8	2	16	107.52	21	114.6	7.49	5.845	29.43	5.71	
1022	11	2	22	107.52	15	109.1	7.49	5.890	29.44	5.68	

Observations During Sampling

Well Condition: GOOD
 Color: clear, slightly greenish
 Odor: None

Purge Water Disposal: OME
 Turbidity(qualitative): 10W
 Other (OVA, HNU,etc.): —

Sample ID: PT-85

Sample Date & Time: 1-23-08 / 1025

Samples Analyzed For: See the COC

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: PT-8M
 Date: 1-23-08 Sampled By: GC
 Weather: warm Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI - 556 MPS
Serial #:	—	06F2009AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 182'
 Depth to Water: 107.30
 Water Column: 74.70
 Gallons/Foot: 0.16
 Gallons in Well: 11.95

Z Grundfos
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 162' To: 182'
 Pump Intake Setting: ~172'
 Volumes to be Purged: 3
 Total Volume Purged: 35.85
 Pump on: 1155 Off: 1220

Well Casing Volumes (gal/ft):	$2'' = 0.16$	$3'' = 0.37$
	$3\frac{1}{2}'' = 0.50$	$4'' = 0.65$
	$6'' = 1.46$	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu \text{hos/cm}$)	Temp (°C)	DO (mg/L)	Comments
1155	0	—	0	—	480	45.7	7.18	8.124	28.28	2.22	
1201	6	2	12	107.52	10	37.0	7.19	8.070	29.73	1.75	
1207	12	2	24	107.52	2	35.7	7.17	8.046	29.87	1.75	
1213	18	2	36	107.52	1	36.1	7.17	8.047	29.95	1.72	

Observations During Sampling

Well Condition: GOOD
 Color: greenish
 Odor: NONE

Purge Water Disposal: One
 Turbidity(qualitative): Tow
 Other (OVA, HNU,etc.):

Sample ID: PT-8M
 Samples Analyzed For: See the COC

Sample Date & Time: 1-23-08, 1215

ARCADIS
Groundwater Sampling Form

Project Number: RC000689.0004.
 Date: 11- 23 -08
 Weather: WARM

Task: 00008 Well ID: PT-8D
 Sampled By: GC
 Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI -556 mps
Serial #:	—	06F2009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 210'
 Depth to Water: 107.34
 Water Column: 102.66
 Gallons/Foot: 0.16
 Gallons in Well: 16.42

C 46 (1560) 6.98 mg/L

Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 190' To: 210'
 Pump Intake Setting: 200'
 Volumes to be Purged: 3
 Total Volume Purged: 49.26
 Pump on: 1052 Off: 1125

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3 1/2" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (<u>gpm</u>)	Volume Purged (<u>gal</u>)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond (<u>µmhos/cm</u>)	Temp (°C)	DO (mg/L)	Comments
1052	0	1	0	—	397	95.3	7.75	17.21	24.79	2.70	
1100	8	1	16	107.67	7	52.5	7.91	18.74	29.99	1.19	
1108	16	1	32	107.60	3	29.8	7.89	18.22	30.16	1.03	
1117	25	1	50	107.60	3	24.1	7.86	17.97	30.23	0.97	

Observations During Sampling

Well Condition: GOOD
 Color: Greenish
 Odor: NONE

Purge Water Disposal: ON THE GROUND
 Turbidity(qualitative): LOW
 Other (OVA, HNU,etc.): —

Sample ID: PT- 8D
 Samples Analyzed For: See the COC

Sample Date & Time: 1-23-08, 1120

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: PT-9D
 Date: 7-1-07 Sampled By: GC
 Weather: WARM Recorded By: CM
 Coded Duplicate No.: DUP-1 @ 1330

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI -556 MPS
Serial #:	—	06FZ009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 210'
 Depth to Water: 104.38
 Water Column: 105.67
 Gallons/Foot: 0.16
 Gallons in Well: 16.89

Z Grundfos
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 190' To: 210'
 Pump Intake Setting: 2 ZOO'
 Volumes to be Purged: 3
 Total Volume Purged: 50.67
 Pump on: 1251 Off: 1335

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3½" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal.)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu\text{mhos}/\text{cm}$)	Temp (°C)	DO (mg/L)	Comments
1251	0	—	0	104.67	71000	135.5	7.54	16.07	28.19	1.84	
1300	9	2 gpm	18	104.65	43	81.8	7.77	17.15	30.21	1.38	
1309	18	11	36	104.65	5	60.2	7.76	17.12	30.36	1.28	
1317	26	11	52	104.65	3	47.9	7.76	17.07	30.40	1.23	

Observations During Sampling

Well Condition: Good
 Color: Greenish
 Odor: NONE

Purge Water Disposal: OMI
 Turbidity(qualitative): Low
 Other (OVA, HNU,etc.): —

Sample ID: PT-9 D
 Samples Analyzed For: See the COC

Sample Date & Time: 1-22-08 / 1320

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: MW-11
 Date: 11-24-08 Sampled By: GC
 Weather: Cool / RAIN Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

PID	Water Quality Meter(s)
<u>Model</u>	<u>=</u>
<u>Serial #:</u>	<u>=</u>

Purging Information

Casing Material: PVC
 Casing Diameter: 4"
 Total Depth: 88'
 Depth to Water: 67.67
 Water Column: 20.33
 Gallons/Foot: 0.65
 Gallons in Well: 13.21

Cr + 6 .342 my/L
 (156°)

Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 63' To: 88'
 Pump Intake Setting:
 Volumes to be Purged: 3
 Total Volume Purged: 39.63
 Pump on: 0818 Off: 0835

Well Casing Volumes (gal/ft):	$2'' = 0.16$	$3'' = 0.37$
	$3\frac{1}{2}'' = 0.50$	$4'' = 0.65$
	$6'' = 1.46$	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu\text{mhos/cm}$)	Temp (°C)	DO (mg/L)	Comments
0818	0	0	—	113	189.7	7.23	2.518	29.01	7.39		
0822	4	4	16	71.07	19	174.6	7.29	2.378	28.69	7.61	
0826	8	4	32	71.10	13	141.0	7.40	2.329	28.71	7.59	
0828	10	4	40	71.11	13	137.3	7.40	2.312	28.71	7.61	

Observations During Sampling

Well Condition: GOOD
 Color: clear
 Odor: NONE

Purge Water Disposal: OMF
 Turbidity(qualitative): low
 Other (OVA, HNU,etc.):

Sample ID: MW-11 Sample Date & Time: 1-24-08 0830
 Samples Analyzed For: See the COC

ARCADIS
Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: MW-24A
 Date: 1-24-08 Sampled By: GC
 Weather: Cloudy Recorded By: Cm
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	=	YSI 556 mps
Serial #:	=	06F2009 AD

Purging Information

Casing Material: PVC
 Casing Diameter: 4"
 Total Depth: 124'
 Depth to Water: 112.20
 Water Column: 11.80
 Gallons/Foot: .65
 Gallons in Well: 7.67

CRT 6 (1560) 2.98 mg/L

Dedicated ES pump
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 104' To: 124'
 Pump Intake Setting:
 Volumes to be Purged: 3
 Total Volume Purged: 23.01
 Pump on: 0941 Off: 0953

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3 ¹ / ₂ " = 0.50	<u>4"</u> = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu\text{mhos/cm}$)	Temp (°C)	DO (mg/L)	Comments
0941	0	—	0	—	6	93.4	7.50	3.063	27.32	3.20	
0943	2	4.5	8	113.01	2.6	97.9	7.50	3.030	26.29	2.17	
0945	4	4.5	16	113.00	6	86.0	7.51	3.075	28.46	1.98	
0947	8	4	24	113.00	3	79.3	7.51	3.090	28.51	1.95	

Observations During Sampling

Well Condition: GOOD
 Color: greenish
 Odor: NONE

Purge Water Disposal: OMT
 Turbidity(qualitative): low
 Other (OVA, HNU,etc.): —

Sample ID: MW-24A

Sample Date & Time: 1-24-08 0950

Samples Analyzed For: See the COC

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: MW-38D
 Date: 4-23-08 Sampled By: GC
 Weather: Sunny Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI -556 MPS
Serial #:	—	06FZ009AD

Purging Information

Casing Material: PVC
 Casing Diameter: 2"
 Total Depth: 188.3'
 Depth to Water: 71.29
 Water Column: 117.0'
 Gallons/Foot: 0.16
 Gallons in Well: 18.72

Z-Grind Es
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: 166.3' To: 188.3'
 Pump Intake Setting: 176.3'
 Volumes to be Purged: 3
 Total Volume Purged: 56.16
 Pump on: 1358 Off: 1435

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3½" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gpm)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond (µmhos/cm) vs SCN	Temp (°C)	DO (mg/L)	Comments
1358	0	—	0	71000	7	-2.9	7.74	22.26	29.69	1.79	
1407	9	2	18	71.71	21	-24.0	7.73	23.05	30.20	0.32	
1416	18	2	36	71.71	4	-30.1	7.73	23.05	30.30	0.19	
1427	29	2	58	71.70	2	-32.8	7.78	23.02	30.28	0.14	

Observations During Sampling

Well Condition: Good
 Color: clear
 Odor: None

Purge Water Disposal: On Site
 Turbidity(qualitative): low
 Other (OVA, HNU,etc.): —

Sample ID: MW-38D
 Samples Analyzed For: See the COC

Sample Date & Time: 1-23-08, 1430

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0004. Task: 00008 Well ID: PTR-1
 Date: 4-25-08 Sampled By: GC
 Weather: WARM Recorded By: CM
 Coded Duplicate No.: Hone

Instrument Identification

	PID	Water Quality Meter(s)
Model	-	YSI-556 MPS
Serial #:	-	06F2809AD

Purging Information

Casing Material: L
 Casing Diameter: 10
 Total Depth:
 Depth to Water:
 Water Column:
 Gallons/Foot:
 Gallons in Well:

C 10 ft 92 mg/L
(1560)

Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry

Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer

Screen Interval: From: _____ To: _____

Pump Intake Setting: _____

Volumes to be Purged: _____

Total Volume Purged: _____

Pump on: _____ Off: _____

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3½" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate ()	Volume Purged ()	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond ($\mu\text{mhos/cm}$)	Temp (°C)	DO (mg/L)	Comments
<u>0930</u>		<u>210 gal</u>	<u>10</u>	<u>228.7</u>	<u>7.48</u>	<u>7.093</u>	<u>22.52</u>	<u>2.09</u>			

Observations During Sampling

Well Condition: New Vault
 Color: greenish
 Odor: NONE

Purge Water Disposal: OMT
 Turbidity(qualitative): low
 Other (OVA, HNU,etc.):

Sample ID: PTR-1
 Samples Analyzed For: See the COC

Sample Date & Time: 1-25-08 0930

ARCADIS

Groundwater Sampling Form

Project Number: RC000689.0001. Task: 00006 Well ID: PTR-2
 Date: 11-25-08 Sampled By: GC
 Weather: WARM Recorded By: CM
 Coded Duplicate No.: None

Instrument Identification

	PID	Water Quality Meter(s)
Model	—	YSI-556 MPS
Serial #:	—	06F2009 AD

Purging Information

Casing Material: _____
 Casing Diameter: _____
 Total Depth: _____
 Depth to Water: _____
 Water Column: _____
 Gallons/Foot: _____
 Gallons in Well: _____

Vault
 Purge Technique (circle one): Low-Flow Remove 3 Well Volumes Bail Dry
 Purge Equipment (circle one): Submersible Centrifugal Bladder Peristaltic Bailer
 Screen Interval: From: _____ To: _____
 Pump Intake Setting: _____
 Volumes to be Purged: _____
 Total Volume Purged: _____
 Pump on: _____ Off: _____

Well Casing Volumes (gal/ft):	2" = 0.16	3" = 0.37
	3½" = 0.50	4" = 0.65
	6" = 1.46	

Field Parameter Measurements Taken During Purging

Time	Minutes Elapsed	Flow Rate (gal/min)	Volume Purged (gal)	DTW (ft btoc)	Turbidity (NTUs)	ORP (mV)	pH (SI Units)	Spec Cond (µmhos/cm)	Temp (°C)	DO (mg/L)	Comments
1055	—	±50 gal	45	167.8	7.31	9.122	28.41	237			

Observations During Sampling

Well Condition: NEW Vault
 Color: yellow
 Odor: none

Purge Water Disposal: On E
 Turbidity(qualitative): 100
 Other (OVA, HNU,etc.):

Sample ID: PTR-2
 Samples Analyzed For: See the COC

Sample Date & Time: 11-25-08, 1055

ARCADIS

Appendix C

Analytical Reports and
Chain-of-Custody Documentation
(on Compact Disc)