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June 10, 2005

Norman Shopay
Project Manager
California Department of Toxic Substances Control
Geology and Corrective Action Branch
700 Heinz Avenue, Suite 200
Berkeley, California 94710

Subject: Baseline Groundwater Quality Technical Memorandum for IM No. 3 Injection
Area, PG&E Topock Compressor Station, Needles, California

Dear Mr. Shopay:

The letter transmits a technical memorandum of baseline water quality data for the Interim Measure (IM) No. 3 injection wellfield area, submitted in compliance with the Item 2 requirement in the Department of Toxic Substances Control's (DTSC) May 24, 2005 letter. The baseline water quality data contained in this technical memorandum includes the water quality data collected in accordance with DTSC April 25, 2005 letter, and will also be presented and discussed in the forthcoming submittal of the final *Groundwater and Hydrogeologic Investigation Report for Interim Measures No. 3 Injection Area*.

If you have any questions on the technical memorandum, please call me at (805) 546-5243.

Sincerely,

Cc: Kate Burger
Karen Baker
Fred Zanolina
Aaron Yue

Baseline Groundwater Quality for the IM No. 3 Injection Area

PG&E Topock Compressor Station

DATE: June 10, 2005

Introduction

This technical memorandum presents baseline water quality data for the Interim Measure (IM) No. 3 injections wellfield area, including water quality data reported in the Draft Groundwater and Hydrogeological Investigation Report (CH2M HILL 2005), as well as additional water quality data collected in May 2005 in accordance with Department of Toxic Substances Control's (DTSC) April 25, 2005 letter. This technical memorandum addresses the requirements in DTSC's subsequent May 24, 2005 letter and contains:

- Updated average and median concentration values for the shallow, middle-depth and deeper depths of the alluvial aquifer.
- Updated concentration values that are representative of the entire alluvial aquifer.
- Target Values (i.e. - discharge concentrations) as required by Waste Discharge Requirements (WDR) Order No. R7-2004-0103.

The baseline water quality data contained in this technical memorandum will also be provided in a revised Groundwater and Hydrogeologic Investigation Report for the IM No. 3 wellfield area.

Updated Average and Median Concentration Values

Tables 1 through 4 present the results of the simple statistical evaluation (average and median values) of the data set for the injection wellfield area. Table 1 presents the results of the chromium sampling, including hexavalent chromium [Cr(VI)]; dissolved total chromium [Cr(T)]; and the field parameters of temperature, specific conductance, pH and oxidation/reduction potential (ORP). Table 2 presents the results of general chemical parameters, including major cations/anions and total dissolved solids (TDS). Table 3 presents the results of Title 22 metals analyses, and Table 4 presents the results of the volatile organic compound (VOC) and semivolatile organic compound (SVOC) analyses.

For the purpose of the IM-3 hydrogeologic and water quality characterization, the Alluvial Aquifer is subdivided into three depth intervals. As defined in the Draft Groundwater Investigation Report (CH2M HILL 2005), the depth intervals are designated: (a) **Upper depth**, comprising the shallow saturated interval from the water table (average elevation of

454 feet msl) to an approximate elevation of 400 feet msl; (b) **Middle depth**, comprising the saturated interval between approximate elevations of 310 to 400 feet msl; and (c) **Lower depth**, comprising the deeper saturated interval from an approximate elevation of 310 feet msl to the base of the Alluvial Aquifer. The monitoring zones defined above include all unconsolidated deposits in the saturated zone. Because the alluvial aquifer is one hydrostratigraphic unit (one aquifer), the monitoring zones do not reflect individual hydrostratigraphic units or separate aquifer zones.

The location of the IM-3 injection area and wells addressed in this water quality summary are shown on attached Figure 1. For the purpose of data presentation in Tables 1 through 4, the wells are grouped into the following categories:

- Upper Depth (Shallow) Wells include OW-1S, OW-2S, and OW-5S in the East Mesa injection area; and OW-3S and MW-18 in the West Mesa area.
- Middle Depth Wells include OW-1M, OW-2M, OW-5M, CW-1M, CW-2M, and CW-3M ; and CW-4M in injection area; and OW-3M in the West Mesa Area.
- Lower Depth (Deep) Wells include OW-1D, OW-2D, OW-5D, CW-01D, CW-2D, CW-3D and CW-4D in the injection area and OW-3D in the West Mesa area.

Chromium and Field Quality Parameters

Table 1 presents the chromium and field quality parameters data and simple statistics. In the East Mesa Area, which includes the three clustered well sites of OW-1, OW-2, and OW-5, the median values for both Cr(VI) and Cr(T) decrease with depth. The median concentrations for Cr(VI)/Cr(T) decrease from 19.8/23.4 micrograms per liter ($\mu\text{g/L}$) in the shallow wells, to 9.7/9.7 $\mu\text{g/L}$ in the middle-depth wells, to non-detect in the deeper wells. (There is one instance of 4.8 $\mu\text{g/L}$ Cr(T) in well OW-1D for December, 2004, but this detection was not repeated in any other sample.)

The median and average values for Cr(VI) and total Cr(T) are reasonably comparable for these sample groupings, which indicates that the median is a good approximator of the central tendency. The range for Cr(VI)/Cr(T) values in the shallow wells is 4.9 to 32.6/3.4 to 29.5 $\mu\text{g/L}$, and the range in the middle wells is 2.3 to 15.6/4.0 to 18.6 $\mu\text{g/L}$. The available samples were collected over an approximate 6-month period, so there is not enough information at this time to make definitive statements on temporal trends.

The field parameters of temperature and specific conductance show the opposite effect as chromium, both increasing with depth. The median values for shallow/middle/deep wells for the East Mesa Area are 27.3/28.0/28.9 °C and 3,740/6,830/13,800 microSiemens per centimeter, respectively. The range for values is again quite large, which may be a function of the field collection level of data quality, or may be a seasonal effect (river inflows increase during the spring, decrease in summer). Not enough temporal range exists to make a definitive conclusion.

The field pH does not appear to vary significantly with depth, having median values for shallow/middle/deep wells of 8.00/8.05/8.01, respectively. Overall, pH varies between 7.5 and 8.6 throughout the East Mesa.

The field ORP shows a great deal of variability in the shallow- and middle-depth wells but is reasonably stable at depth. The average and median values for ORP in the shallow wells are -76 and -99 millivolts (mV), respectively, with a range of +91 to -197 mV. The average and median values in the middle-depth wells are -0.3 and +18 mV, respectively, with a range of +116 to -144 mV. The large variability in ORP measurements may be a function of variable recharge in these shallower zones, may be a seasonal effect, or may be related to the field level quality of the measurement. Less variability is seen at depth, with the average value of -207 mV being close to the median of -213 mV. The range is -82 to -263 mV but is always negative.

General Chemistry Parameters

Table 2 presents the general chemistry parameters data and simple statistics. In the East Mesa Area, the majority of these parameters have a comparable average to median values and an increase in concentration with depth. This correlates with what was discussed above for specific conductance. TDS is a good example of this trend, with average/median values of 1,020/966 milligrams per liter (mg/L) for shallow wells, 3,810/3,285 mg/L for middle depth wells, and 7,080/6,670 mg/L for deep wells.

There are three exceptions to this trend; dissolved iron, nitrate as N, and alkalinity (total). (Other parameters have too few sample points to determine if they follow the trend or not, and are not discussed here.) Nitrate and alkalinity show the opposite trend of decreasing with depth. Iron does not show a trend but is the lowest in the middle depth and the higher in the shallow and deep wells. An explanation for this distribution of iron is not clear. It is common for iron oxide colloids to be present even in filtered samples where there are zones of fine materials. This may be the case in the shallow zone, where boring logs show the aquifer matrix to contain a greater percentage of silt and clay. On the other hand, the higher iron concentrations in deep wells correlate with the more reduced chemical conditions in this part of the aquifer.

Title 22 Metals

Table 3 presents the Title 22 metals data and simple statistics. The majority of metals concentrations for the 16 parameters fall below detection limits. The exceptions are molybdenum, nickel, vanadium, and zinc. Nickel has an average/median value of 5.55/5.0 µg/L for the shallow wells, 5.64/5.0 µg/L for middle depths wells, and 5.65/5.3 µg/L for deep wells. There are more non-detect sample results with depth and more variability in the range of detections with depth, but there does not appear to be either an increasing or declining trend.

Molybdenum does show an increasing trend with depth and is found in every sample analyzed at the East Mesa injection area. The average/median concentrations for molybdenum are 35.3/21.3 µg/L for shallow wells, 29.8/28 µg/L for middle depth wells, and 56.9/54.4 µg/L for deep wells.

Vanadium and zinc do not show trends with depth. In both cases, the highest concentrations are found within the middle-depth wells. For vanadium, the average/median concentrations with depth are 8.59/7 µg/L for shallow wells, 58.0/59.1 µg/L for middle depth wells, and 41.2/12.4 µg/L for deep wells. There is a large difference

between the average and median values for vanadium, which indicates that the average value is not a good indicator of the central tendency. For zinc, the average/median concentrations with depth are 23.3/25.6 µg/L for shallow wells, 31.1/31.6 µg/L for middle depth wells, and 24.3/25.0 µg/L for deep wells. There is not a great deal of difference between these values and, although it does not show a trend with depth, zinc may be behaving more like nickel (no significant difference with depth) than vanadium.

VOCs and SVOCs

Table 4 presents the VOC and SVOC data. The groundwater sample from Well OW-1D showed low levels of benzene, carbon disulfide, and toluene in one sample from September 2004. Groundwater samples from for all OW wells, including OW-1D, OW-2D, and OW-5D in May 2005, were non-detect for all VOCs and SVOCs.

Representative Aquifer Samples and Target Values

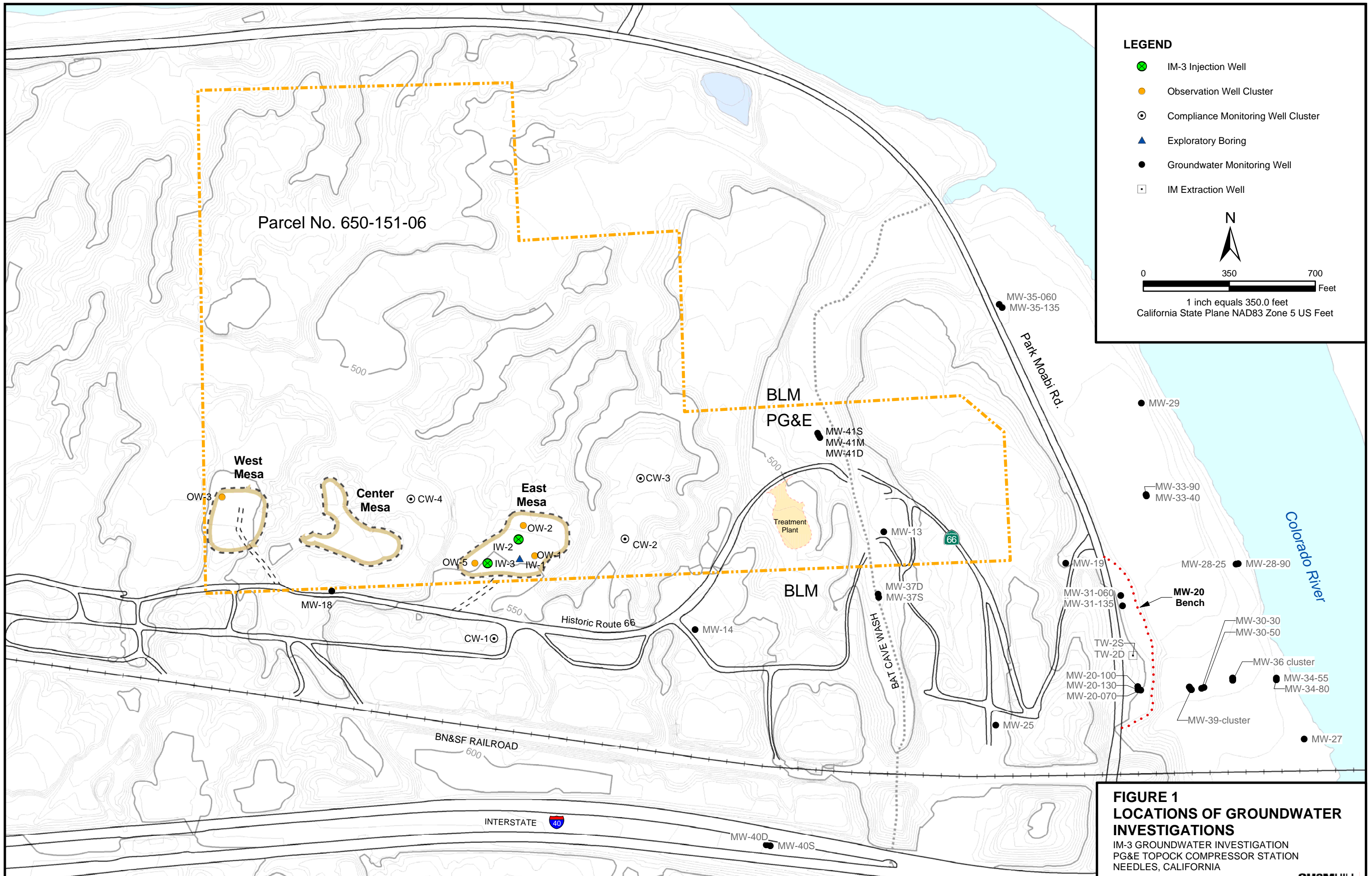
The concentrations discussed above and presented in Tables 1 through 4 illustrate the complex nature of the Alluvial Aquifer at the Topock site. A cursory review of these tables shows that there is not only variability to parameter concentration with depth, but variability between areas and variability over time within individual wells. The Alluvial Aquifer at the Topock site, as with many similar aquifers of alluvial origin, is known to have this type of spatial variability, which is why the clustered monitoring wells located around the injection site were designed to collect both hydraulic and chemical data from various depths and locations in the study area. As such, the results from an individual observation or monitoring well, when viewed alone, do not yield samples representative of the Alluvial Aquifer as a whole. While it is possible to calculate an aquifer average by using statistical methods to combine the water quality information obtained from clustered wells (and necessary for some analyses, such as geochemical modeling, which tries to predict the long-term effect of mixing large volumes of water), calculating such an average could prove misleading when discussing baseline water quality.

By definition, the average value, or any statistical measure of central tendency, will always be lower than approximately 50 percent of the measured concentrations and would not be representative from the perspective of establishing threshold values for measuring significant change to a natural system. A more useful technique, where there is variability to the measured data, is the use of ranges. The range of values coupled with the median, as presented in the discussion of data results, have been prepared for the parameters identified in the WDRs and are presented in Table 5. For comparative purposes, the average and maximum treatment effluent concentrations are presented on this table. Instances where the median aquifer concentration value exceeds the WDR effluent limits are noted, as are instances where the upper limit to the range exceeds the WDR limit. While there is considerable overlap between these exceedances, individual point concentrations for manganese, nickel, pH, and zinc exceed the effluent limits, where the median value for these parameters does not. In the case where the median value was used as representative concentration or as a threshold target, these naturally-occurring concentrations would have been seen as above the aquifer baseline.

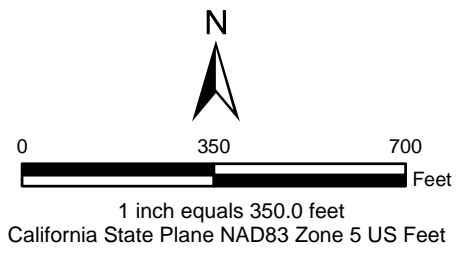
From a review of the comparison, roughly half the WDR effluent limits are exceeded in the pre-injection groundwater at the IM No. 3 injection area. For these constituents, a target value for judging significant impact would better be established using the baseline values represented by the upper limit to the range of occurrence. For the constituents where the effluent limits are not exceeded, the WDR limit itself would become the target value. Table 5 presents the results of using this method for establishing target values for measuring significant impact. It is important to note that target levels are not action levels, which are used to determine response levels for the contingency plan. Action levels are provided in the Groundwater Compliance Monitoring Plan for Interim Measure No. 3 Injection Area as part of the data evaluation procedures.

References

CH2M HILL 2005. Draft Groundwater and Hydrogeologic Investigation Report. March 31.



- LEGEND**
- IM-3 Injection Well
 - Observation Well Cluster
 - ⊙ Compliance Monitoring Well Cluster
 - ▲ Exploratory Boring
 - Groundwater Monitoring Well
 - IM Extraction Well



**FIGURE 1
LOCATIONS OF GROUNDWATER
INVESTIGATIONS**
IM-3 GROUNDWATER INVESTIGATION
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

TABLE 1

Groundwater Analytical Results - Chromium and Field Quality Parameters
Baseline Groundwater Quality Technical Memorandum
Interim Measures No 3. Injection Area, PG&E Topock Compressor Station

Location ID	Sample Date	Concentrations in µg/L		Field Water Quality Parameters			
		Hexavalent Chromium	Dissolved Total Chromium	Temperature (° Celsius)	pH (pH units)	Specific Conductance (µS/cm)	ORP (mV)
East Mesa Area-Upper Zone							
OW-01S	21-Dec-04	4.90	3.40	23.7	7.79	---	-128
OW-02S	29-Dec-04	ND (0.2)	3.40	25.9	8.02	3740	-197
OW-05S	21-Dec-04	32.6	29.5	28.7	8.11	4800	-70
OW-05S	11-May-05	22.3	24.3	29.0	7.98	2600	91
OW-05S FD	11-May-05	19.8	23.4	---	---	---	---
	Average: ¹	16.0	16.8	26.8	7.98	3710	-76
	Median: ¹	19.8	23.4	27.3	8.00	3740	-99
East Mesa Area-Middle Zone							
OW-01M	01-Oct-04	7.50	7.00	30.2	8.06	---	-8
OW-01M	18-Nov-04	8.30 J	---	27.0	8.59	---	-138
OW-01M	21-Dec-04	9.70	8.80	28.2	8.04	---	-144
OW-01M	10-May-05	14.5	13.8	29.6	8.18	6190	110
OW-02M	27-Jan-05	2.30	8.90	27.7	7.93	---	-144
OW-02M	11-May-05	4.90	4.00	29.6	7.93	7520	68
OW-05M	13-Jan-05	8.00	6.20	26.5	8.41	9230	-73
OW-05M	11-May-05	8.90	7.40	30.2	7.98	9310	61
CW-01M	08-Feb-05	13.4	12.8	28.1	7.85	4460	93
CW-01M	22-Feb-05	14.9	15.8	27.4	7.53	4380	116
CW-02M	09-Feb-05	13.0	11.6	28.1	8.11	5760	43
CW-02M FD	09-Feb-05	13.1	11.9	---	---	---	---
CW-02M	23-Feb-05	14.6	18.6	25.8	8.39	6830	73
CW-03M	10-Feb-05	5.70	6.40	27.8	8.11	---	-44
CW-03M	22-Feb-05	6.30	7.70	27.4	7.56	7830	100
CW-04M	07-Feb-05	11.1	10.5	28.2	7.99	5900	-81
CW-04M	23-Feb-05	15.6	14.9	26.7	8.44	7390	-36
	Average: ¹	10.1	10.4	28.0	8.07	6800	-0.3
	Median: ¹	9.7	9.7	28.0	8.05	6830	18

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Location ID	Sample Date	Concentrations in µg/L		Field Water Quality Parameters			
		Hexavalent Chromium	Dissolved Total Chromium	Temperature (° Celsius)	pH (pH units)	Specific Conductance (µS/cm)	ORP (mV)
East Mesa Area-Lower Zone							
OW-01D	30-Sep-04	ND (2.0)	ND (1.0)	31.6	8.00	---	-239
OW-01D	18-Oct-04	---	---	30.0	8.31	---	-223
OW-01D	18-Nov-04	ND (1.0)	---	29.1	8.38	---	-181
OW-01D	21-Dec-04	ND (0.2) R	4.80	28.9	7.87	---	-213
OW-01D	10-May-05	ND (1.0)	ND (1.0)	30.5	8.00	9400	-225
OW-02D	02-Dec-04	---	---	---	8.30	3900	---
OW-02D	13-Jan-05	ND (1.0)	ND (1.0)	29.8	8.36	13900	-246
OW-02D	10-May-05	ND (1.0)	ND (1.0)	30.4	7.94	14000	-199
OW-05D	22-Dec-04	ND (0.2) J	ND (1.0)	29.8	7.77	---	-210
OW-05D FD	22-Dec-04	ND (0.2) J	ND (1.0)	---	---	---	---
OW-05D	11-May-05	ND (1.0)	ND (1.0)	30.7	7.98	10600	-248
CW-01D	07-Feb-05	ND (1.0)	ND (1.0)	27.1	7.76	11500	-166
CW-01D	22-Feb-05	ND (1.0)	ND (1.0)	28.5	7.68	8960	-82
CW-02D	08-Feb-05	ND (1.0)	ND (1.0)	28.8	8.02	---	-230
CW-02D	23-Feb-05	ND (1.0)	ND (1.0) J	27.4	8.61	15500	-174
CW-03D	08-Feb-05	ND (1.0)	ND (1.0)	27.5	8.08	18300	-208
CW-03D	22-Feb-05	ND (1.0)	ND (1.0)	28.1	7.77	13700	-189
CW-04D	07-Feb-05	ND (1.0)	ND (1.0)	28.6	8.25	15000	-263
CW-04D	23-Feb-05	ND (1.0)	ND (1.0) J	28.0	8.62	15900	-225
	Average: ¹	---	4.8	29.1	8.09	12600	-207
	Median: ¹		1.0	28.9	8.01	13800	-213

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Location ID	Sample Date	Concentrations in µg/L		Field Water Quality Parameters			
		Hexavalent Chromium	Dissolved Total Chromium	Temperature (° Celsius)	pH (pH units)	Specific Conductance (µS/cm)	ORP (mV)
Bat Cave Wash Area-Upper Zone							
MW-13	09-Jun-04	18.8	17.6	28.4	7.54	2270	10
MW-13	29-Jul-04	18.1	17.6	---	---	---	---
MW-13	FD 29-Jul-04	18.1	17.1	---	---	---	---
MW-13	24-Sep-04	19.7	20.9	28.4	7.83	1950	107
MW-13	FD 24-Sep-04	19.7	19.7	---	---	---	---
MW-13	16-Dec-04	19.3	16.0	28.2	7.64	1750	152
MW-13	11-Mar-05	19.2	19.0	29.2	7.47	1950	69
MW-14	08-Jun-04	32.6	36.3	29.6	7.77	2930	73
MW-14	FD 08-Jun-04	32.2	34.3	---	---	---	---
MW-14	08-Sep-04	---	---	30.4	6.50	---	170
MW-14	09-Sep-04	---	---	29.2	7.43	1570	---
MW-14	20-Sep-04	33.6	30.3	28.9	7.45	1590	47
MW-14	FD 20-Sep-04	33.4	31.4	---	---	---	---
MW-14	16-Dec-04	31.3	24.2	26.5	7.76	1350	156
MW-14	09-Mar-05	32.0	32.5	28.9	7.68	1640	160
MW-14	07-Apr-05	34.3	38.0	28.7	7.66	---	75
MW-14	11-May-05	32.0	36.9	28.6	7.08	1680	185
MW-41S	18-Nov-04	7.40	7.30	26.7	8.43	1690	-99
MW-41S	16-Dec-04	11.8	11.0	28.7	7.91	4260	-19
MW-41S	10-Mar-05	16.8	15.6	29.5	7.83	5080	87
	Average: ¹	23.9	23.6	28.6	7.60	2290	84
	Median: ¹	19.7	20.3	28.7	7.66	1750	81
Bat Cave Wash Area-Middle Zone							
MW-37S	10-Jun-04	2.80	2.70	29.5	7.76	5180	-60
MW-37S	23-Sep-04	7.50	6.80	29.6	7.46	4380	16
MW-37S	13-Dec-04	6.20	7.00	28.7	7.74	4470	-66
MW-37S	11-Mar-05	7.40	5.40	29.4	7.88	---	36
MW-37S	07-Apr-05	5.90	5.40	31.1	7.67	---	-68
MW-41M	18-Nov-04	4.10	3.50	26.0	8.21	20800	-115
MW-41M	15-Dec-04	5.30	5.20	29.1	7.68	18800	-102
MW-41M	11-Mar-05	8.10	4.90	30.0	7.74	16100	-66
	Average: ¹	5.91	5.11	29.2	7.77	11600	-53
	Median: ¹	6.1	5.3	29.4	7.74	10640	-66

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Location ID	Sample Date	Concentrations in µg/L		Field Water Quality Parameters			
		Hexavalent Chromium	Dissolved Total Chromium	Temperature (° Celsius)	pH (pH units)	Specific Conductance (µS/cm)	ORP (mV)
Bat Cave Wash Area-Lower Zone							
MW-37D	11-Jun-04	951	854	30.6	7.62	13800	-152
MW-37D	24-Sep-04	1250	1310	30.4	7.49	11900	-41
MW-37D FD	24-Sep-04	1250	1250	---	---	---	---
MW-37D	14-Dec-04	1480	1520	29.8	7.70	17000	3
MW-37D FD	14-Dec-04	1480	1490	---	---	---	---
MW-37D	11-Mar-05	1610	1530	30.8	7.99	---	21
MW-41D	18-Nov-04	ND (2.0)	8.10	28.3	8.29	21600	-181
MW-41D	15-Dec-04	ND (1.0)	ND (1.0)	29.8	7.80	---	-222
MW-41D	11-Mar-05	ND (1.0)	ND (1.0)	29.6	7.90	22700	-244
	Average: ¹	892	885	29.9	7.83	17400	-117
	Median: ¹	1250.0	1250.0	29.8	7.80	17000	-152
West Mesa Area-Upper Zone							
OW-03S	28-Oct-04	13.5	12.1	27.9	8.18	1000	53
OW-03S	16-Nov-04	17.7	---	29.5	7.90	1290	17
OW-03S	15-Dec-04	17.7	15.1 J	27.0	8.09	1400	39
MW-18	09-Jun-04	24.5	25.6	28.5	7.54	1660	101
MW-18	29-Jul-04	26.9	24.6	---	---	---	---
MW-18	08-Sep-04	---	---	32.5	6.67	---	164
MW-18	09-Sep-04	---	---	29.5	7.27	1310	16
MW-18	24-Sep-04	29.1	30.9	28.4	7.47	1280	132
MW-18	16-Dec-04	30.6	25.2	26.0	7.76	1120	183
MW-18	09-Mar-05	34.1	34.6	28.6	7.58	1290	150
MW-18 FD	09-Mar-05	33.3	36.0	---	---	---	---
MW-18	11-May-05	26.5	27.1	28.4	7.51	1600	159
MW-18	12-May-05	---	---	28.4	7.51	1600	159
	Average: ¹	25.4	25.7	28.6	7.59	1360	107
	Median: ¹	26.7	25.6	28.4	7.54	1300	132
West Mesa Area-Middle Zone							
OW-03M	28-Oct-04	10.4	11.2	29.8	8.10	2950	-10
OW-03M FD	28-Oct-04	10.3	9.40	---	---	---	---
OW-03M	16-Nov-04	12.6	---	30.0	7.81	4760	-37
OW-03M	15-Dec-04	15.7	12.9	28.0	7.86	5790	-71
	Average: ¹	12.2	11.2	29.3	7.92	4500	-39
	Median: ¹	11.5	11.2	29.8	7.86	4760	-37

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		Hexavalent Chromium	Dissolved Total Chromium	Temperature (° Celsius)	pH (pH units)	Specific Conductance (µS/cm)	ORP (mV)
West Mesa Area-Lower Zone							
OW-03D	28-Oct-04	ND (0.2)	ND (1.0)	30.5	7.82	3360	-232
OW-03D	16-Nov-04	ND (0.2)	---	30.2	7.61	5690	-228
OW-03D	14-Dec-04	ND (0.2)	ND (1.0)	29.8	7.98	6950	-215
	Average: ¹	---	---	30.2	7.80	5330	-225
	Median: ¹			30.2	7.82	5690	-228

Notes:

¹ The reporting limit is used when nondetect. Rejected data is not used in the calculation

- µg/L results in micrograms per liter
- FD field duplicate
- ND parameter not detected at the listed reporting limit.
- not applicable
- R rejected data
- J estimated value

TABLE 2
 Groundwater Analytical Results - General Chemistry Parameters
 Baseline Groundwater Quality Technical Memorandum
 Interim Measures No 3. Injection Area, PG&E Topock Compressor Station

		Concentrations and MCLs in mg/L																			
Maximum Contaminant Level:		500 ¹	NA	250 ¹	250 ¹	2	NA	0.3 ¹	NA	0.05 ¹	NA	NA	10	1	NA	NA	NA	NA	NA	NA	NA
Location ID	Sample Date	Total Dissolved Solids	Specific Conductance (mS/cm)	Chloride	Sulfate	Barium	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium	Nitrate as N	Nitrite as N	TKN	Ammonia	Alkalinity (Total)	Orthophosphate	TOC	Boron	Bromide
East Mesa Area-Upper Zone																					
OW-01S	21-Dec-04	1190	2090	---	---	0.0662	78.8	0.407	14.1	ND (0.05)	12.6	291	---	---	---	---	---	---	---	0.374	---
OW-02S	29-Dec-04	966	1620	---	---	0.0319	33.7	ND (0.3)	5.56	0.131	11.3	218	---	---	---	---	---	---	---	0.707	---
OW-05S	21-Dec-04	908	1650	---	---	0.0513	52.5	ND (0.3)	8.06	ND (0.05)	11.8	194	---	---	---	---	---	---	---	0.442	---
OW-05S	FD 11-May-05	---	---	400	107	0.0644	55.2	ND (0.1)	9.30	0.00647	6.71	280	3.13	---	---	---	---	---	---	---	ND (0.5)
OW-05S	11-May-05	---	---	401	108	0.053	54.2	ND (0.1)	9.12	0.00535	6.64	274	3.18	---	---	---	---	---	---	---	ND (0.5)
Average: ²		1020	1790	401	108	0.0534	54.9	0.41	9.23	0.0486	9.81	251	3.16	---	---	---	---	---	---	0.508	---
Median: ²		966	1650	401	108	0.053	54	0.30	9.1	0.05	11.3	274	3.2	---	---	---	---	---	---	0.4	---
East Mesa Area-Middle Zone																					
OW-01M	01-Oct-04	2890	5110	1550	260	0.0597	99.8	ND (0.3)	7.95	ND (0.05)	19.9	1260	0.91	0.046	---	ND (0.5)	59.0	ND (0.02)	ND (3.0)	0.974	---
OW-01M	18-Nov-04	3280	---	---	---	---	---	ND (0.021)	---	ND (0.01)	---	---	---	---	---	---	---	---	---	---	ND (0.4)
OW-01M	21-Dec-04	3220	5460	---	---	0.0581	96.8	ND (0.3)	8.05	ND (0.05)	15.8	863	---	---	---	---	---	---	---	0.998	---
OW-01M	10-May-05	---	---	1650	291	0.0516	94.8	ND (0.1)	7.93	0.00107	9.30	1130	0.892	---	---	---	---	---	---	---	ND (0.5)
OW-02M	27-Jan-05	3680	7010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-02M	11-May-05	---	---	2080	316	0.0603	142	ND (0.1)	11.8	0.0442	10.8	1310	0.574	---	---	---	---	---	---	---	ND (0.5)
OW-05M	13-Jan-05	8020	8260	---	---	0.0601	290	ND (0.05)	10.4	ND (0.05)	26.0	1220	---	---	---	---	---	---	---	1.34	---
OW-05M	11-May-05	---	---	2590	386	0.0511	182	ND (0.1)	13.2	0.00283	12.9	1820	0.51	---	---	---	---	---	---	---	ND (0.5)
CW-01M	08-Feb-05	2640	4430	1210	478	0.0444	91.0	ND (0.05)	13.0	ND (0.05)	14.4	570	1.55	0.0184	ND (0.8)	ND (0.5)	64.0	---	---	0.836	---
CW-01M	22-Feb-05	2760	4250	1250	239	0.0509	94.9	ND (0.5)	13.3	0.00509	10.3	732	1.57	ND (1.0)	ND (0.5)	ND (0.5)	74.5 J	---	---	0.772	---
CW-02M	FD 09-Feb-05	3220	5620	1550	294	0.068	87.8	0.0533	7.50	ND (0.05)	16.4	833	1.08	0.014	ND (0.8)	ND (0.5)	61.0	---	---	1.12	---
CW-02M	09-Feb-05	3010	5630	1600	280	0.0684	85.7	ND (0.05)	7.34	ND (0.05)	15.7	837	1.08	0.0143	ND (0.8)	ND (0.5)	61.0	---	---	1.25	---
CW-02M	23-Feb-05	3940	5800	1620	289	0.0596	98.2	ND (0.5)	7.58	ND (0.005)	10.1	1190	0.945	ND (1.0)	ND (0.5)	ND (0.5)	67.1 J	---	---	1.08	---
CW-03M	10-Feb-05	4600	7390	2370	352	0.0611	152	ND (0.05)	14.6	0.0541	24.4	1080	0.87	0.0437	ND (0.8)	ND (0.5)	51.0	---	---	1.58	---
CW-03M	22-Feb-05	5180	7820	2250	351	0.0543	186	ND (0.5)	15.5	0.0232	12.5	1530	0.604	ND (1.0)	ND (0.5)	ND (0.5)	87.0 J	---	---	1.10	---
CW-04M	07-Feb-05	3290	5690	1600	241	0.0699	124	0.0509	10.4	ND (0.05)	17.9	751	1.48	0.0203	ND (0.8)	ND (0.5)	58.0	---	---	0.847	---
CW-04M	23-Feb-05	3580	5510	1590	237	0.0674	113	ND (0.5)	9.48	0.0152	9.80	1010	1.46	ND (1.0)	ND (0.5)	ND (0.5)	64.6 J	---	---	0.719	---
Average: ²		3810	6000	1760	309	0.059	129	0.202	10.5	0.0319	15.1	1080	1.04	0.416	---	---	64.7	---	---	1.05	---
Median: ²		3285	5630	1600	291	0.060	100	0.05	10.4	0.05	14.4	1080	0.9	0.04	---	---	62.5	---	---	1.0	---

TABLE 2
 Groundwater Analytical Results - General Chemistry Parameters
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		Concentrations and MCLs in mg/L																			
Maximum Contaminant Level:		500 ¹	NA	250 ¹	250 ¹	2	NA	0.3 ¹	NA	0.05 ¹	NA	NA	10	1	NA	NA	NA	NA	NA	NA	
Location ID	Sample Date	Total Dissolved Solids	Specific Conductance (mS/cm)	Chloride	Sulfate	Barium	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium	Nitrate as N	Nitrite as N	TKN	Ammonia	Alkalinity (Total)	Orthophosphate	TOC	Boron	Bromide
East Mesa Area-Lower Zone																					
OW-01D	30-Sep-04	5670	9350	3040	440	0.102	340	ND (0.3)	17.5	0.378	35.4	2580	0.35	0.0446	---	ND (0.5)	39.0	ND (0.02)	ND (3.0)	1.31	---
OW-01D	18-Oct-04	6010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01D	18-Nov-04	5780	---	---	---	---	---	ND (0.021)	---	0.301	---	---	---	---	---	---	---	---	---	---	ND (1.0)
OW-01D	21-Dec-04	5830	9530	---	---	0.113	234	ND (0.3)	18.8	0.332	33.4	1250	---	---	---	---	---	---	---	1.34	---
OW-01D	10-May-05	---	---	3170	369	0.091	230	0.104	19.0	0.299	15.5	2140	0.252	---	---	---	---	---	---	---	ND (0.5)
OW-02D	02-Dec-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-02D	13-Jan-05	7390	12800	---	---	0.0833	303	0.164	15.2	0.39	46.6	2000	---	---	---	---	---	---	---	1.80	---
OW-02D	10-May-05	---	---	4460	535	0.0716	319	0.161	19.3	0.286	18.6	3000	0.107	---	---	---	---	---	---	---	ND (0.5)
OW-05D	22-Dec-04	6480	9950	---	---	0.0844	222	ND (0.3)	15.2	0.363	32.3	1480	---	---	---	---	---	---	---	1.54	---
OW-05D	22-Dec-04	6670	10000	---	---	0.0784	212	ND (0.3)	14.6	0.371	30.2	1370	---	---	---	---	---	---	---	1.59	---
OW-05D	11-May-05	---	---	3610	461	0.0658	254	0.237	16.8	0.269	17.0	2460	0.159	---	---	---	---	---	---	---	ND (0.5)
CW-01D	07-Feb-05	5000	9080	3410	344	0.0721	175	0.168	19.4	0.172	26.0	1320	0.58	0.0263	ND (0.8)	ND (0.5)	53.0	---	---	1.43	---
CW-01D	22-Feb-05	6260	9130	2830	339	0.0693	225	ND (0.5)	19.6	0.169	15.1	1810	0.566	ND (1.0)	ND (0.5)	ND (0.5)	77.0 J	---	---	1.27	---
CW-02D	08-Feb-05	7200	13700	5260	571	0.0766	280	0.0812	15.7	0.332	37.2	2080	0.28	0.0111	ND (0.8)	ND (0.5)	33.0	---	---	1.77	---
CW-02D	23-Feb-05	8610	13400	4160	526	0.0702	278	ND (0.5)	16.3	0.245	19.0	2590	ND (0.5)	ND (1.0)	ND (0.5)	ND (0.5)	37.3 J	---	---	1.58	---
CW-03D	08-Feb-05	8800	15100	5100	561	0.10	340	0.182	29.5	0.628	41.0	2160	0.34	0.02	ND (0.8)	ND (0.5)	43.0	---	---	1.60	---
CW-03D	22-Feb-05	10800	15200	5060	546	0.119	346	ND (0.5)	29.2	0.81	26.4	3160	ND (0.5)	ND (1.0)	ND (0.5)	ND (0.5)	77.0 J	---	---	1.45	---
CW-04D	07-Feb-05	7320	12500	4270	530	0.0741	287	0.114	18.6	0.302	34.2	1890	0.27	0.0146	ND (0.8)	ND (0.5)	54.0	---	---	1.59	---
CW-04D	23-Feb-05	8410	12300	4130	508	0.0703	282	ND (0.5)	19.8	0.308	18.0	2530	ND (0.5)	ND (1.0)	ND (0.5)	ND (0.5)	39.7 J	---	---	1.46	---
Average: ²		7080	11700	4040	478	0.0838	270	0.261	19.0	0.35	27.9	2110	0.367	0.457	---	---	50.3	---	---	1.52	---
Median: ²		6670	12300	4145	517	0.081	279	0.17	18.7	0.33	28.3	2110	0.3	0.04	---	---	43.0	---	---	1.5	---

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		Concentrations and MCLs in mg/L																			
Maximum Contaminant Level:		500 ¹	NA	250 ¹	250 ¹	2	NA	0.3 ¹	NA	0.05 ¹	NA	NA	10	1	NA	NA	NA	NA	NA	NA	
Location ID	Sample Date	Total Dissolved Solids	Specific Conductance (mS/cm)	Chloride	Sulfate	Barium	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium	Nitrate as N	Nitrite as N	TKN	Ammonia	Alkalinity (Total)	Orthophosphate	TOC	Boron	Bromide
Bat Cave Wash Area-Upper Zone																					
MW-13	09-Jun-04	1300	1970	500	150	0.057	124	ND (0.5)	13.3	ND (0.01)	5.47	300	4.40	---	---	ND (0.1)	79.0	ND (0.5)	ND (3.0)	---	---
MW-13	FD 29-Jul-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	29-Jul-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	FD 24-Sep-04	---	2120	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	24-Sep-04	---	2150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	16-Dec-04	---	1910	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-13	11-Mar-05	---	1850	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	FD 08-Jun-04	880	1570	310	140	0.10	73.3	ND (0.5)	9.10	ND (0.01)	6.93	262	5.50	---	---	ND (0.1)	88.0	ND (0.5)	ND (3.0)	---	---
MW-14	08-Jun-04	860	1340	310	140	0.11	66.5	ND (0.5)	9.00	ND (0.01)	6.43	237	5.50	---	---	ND (0.1)	89.0	ND (0.5)	ND (3.0)	---	---
MW-14	08-Sep-04	---	---	---	---	---	---	ND (0.021)	---	---	---	---	5.74	ND (0.005)	---	---	---	---	---	0.31	---
MW-14	09-Sep-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	FD 20-Sep-04	---	1540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	20-Sep-04	---	1520	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	16-Dec-04	---	1530	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	09-Mar-05	---	1510	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	07-Apr-05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-14	11-May-05	---	---	---	---	0.0968	70.7	1.01	10.3	0.034	7.81	227	---	---	---	---	---	---	---	---	---
MW-41S	18-Nov-04	2820	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND (1.0)
MW-41S	16-Dec-04	2880	4950	1400	282	---	105	---	15.4	---	15.4	844	1.33	---	---	ND (0.5)	52.5	---	ND (0.5)	0.928	ND (0.5)
MW-41S	10-Mar-05	---	4830	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Average: ²		1750	2210	630	178	0.091	87.9	1.0	11.4	0.034	8.41	374	4.49	---	---	---	77.1	---	---	0.619	---
Median: ²		1300	1850	405	145	0.098	73	0.50	10.3	0.01	6.9	262	5.5	---	---	---	83.5	---	---	0.6	---
Bat Cave Wash Area-Middle Zone																					
MW-37S	10-Jun-04	2400	---	1100	210	0.11	144	ND (0.5)	19.9	0.22	8.63	701	1.30	---	---	ND (0.1)	69.0	ND (0.5)	ND (3.0)	---	---
MW-37S	23-Sep-04	---	4430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-37S	13-Dec-04	---	4480	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-37S	11-Mar-05	---	4260	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-37S	07-Apr-05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-41M	18-Nov-04	8150	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND (2.0)
MW-41M	15-Dec-04	8780	13800	4520	524	---	388	---	32.9	---	49.9	2200	0.638	---	---	ND (0.5)	37.3	---	ND (0.5)	1.48	ND (0.5)
MW-41M	11-Mar-05	---	14500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Average: ²		6440	8290	2810	367	0.11	266	---	26.4	0.22	29.3	1450	0.969	---	---	---	53.1	---	---	1.5	---
Median: ²		8150	4480	2810	367	0.110	266	0.50	26.4	0.22	29.3	1451	1.0	---	---	---	53.2	---	1.8	1.5	---

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		Concentrations and MCLs in mg/L																			
Maximum Contaminant Level:		500 ¹	NA	250 ¹	250 ¹	2	NA	0.3 ¹	NA	0.05 ¹	NA	NA	10	1	NA	NA	NA	NA	NA	NA	
Location ID	Sample Date	Total Dissolved Solids	Specific Conductance (mS/cm)	Chloride	Sulfate	Barium	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium	Nitrate as N	Nitrite as N	TKN	Ammonia	Alkalinity (Total)	Orthophosphate	TOC	Boron	Bromide
Bat Cave Wash Area-Lower Zone																					
MW-37D	11-Jun-04	8900	---	3800	620	0.055	384	ND (0.5)	19.1	0.09	16.9	3650	2.10	---	---	ND (0.1)	46.0	ND (0.5)	5.30	1.65	---
MW-37D	FD 24-Sep-04	---	14200	---	---	0.0659	---	---	20.2	ND (0.5)	---	---	---	---	---	---	---	---	---	---	---
MW-37D	24-Sep-04	---	13900	---	---	0.065	---	---	20.8	ND (0.5)	---	---	---	---	---	---	---	---	---	---	---
MW-37D	FD 14-Dec-04	---	13900	---	---	0.0499	364	ND (0.3)	18.8	ND (0.05)	35.4	2230	---	---	---	---	---	---	---	1.79	---
MW-37D	14-Dec-04	---	13900	---	---	0.0464	387	ND (0.3)	19.1	ND (0.05)	42.7	2180	---	---	---	---	---	---	---	1.77	---
MW-37D	11-Mar-05	---	13800	---	---	0.0539	350	ND (0.05)	21.9	ND (0.05)	56.1	2600	---	---	---	---	---	---	---	1.88	---
MW-41D	18-Nov-04	11700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND (2.0)
MW-41D	15-Dec-04	12400	19500	6910	713	---	365	---	30.2	---	74.5	2910	ND (0.5)	---	---	ND (0.5)	42.3	---	0.596 J	1.88	ND (0.5)
MW-41D	11-Mar-05	---	20700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Average: ²		11000	15700	5360	667	0.056	370	---	21.4	0.09	45.1	2710	2.1	---	---	---	44.1	---	2.95	1.79	---
Median: ²		11700	13900	5355	667	0.054	365	0.30	20.2	0.07	42.7	2600	1.3	---	---	---	44.2	---	2.9	1.8	---
West Mesa Area-Upper Zone																					
OW-03S	28-Oct-04	674	---	280	64.8	0.0206	27.2	ND (0.3)	4.53	ND (0.05)	10.3	183	2.53 J	0.0106 J	---	ND (0.5)	99.0	ND (0.02)	0.675	0.296	---
OW-03S	16-Nov-04	675	---	---	---	---	---	ND (0.021)	---	ND (0.01)	---	---	---	---	---	---	---	---	---	---	0.39
OW-03S	15-Dec-04	650	1210	---	---	0.0167	21.1	---	4.01	---	5.35	174	---	---	---	---	---	---	---	---	---
MW-18	09-Jun-04	870	716	340	87.0	0.082	106	ND (0.5)	13.6	ND (0.01)	7.11	171	3.90	---	---	ND (0.1)	82.0	ND (0.5)	ND (3.0)	---	---
MW-18	29-Jul-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	08-Sep-04	---	---	---	---	---	---	ND (0.021)	---	---	---	---	3.88	ND (0.005)	---	---	---	---	---	0.184	---
MW-18	09-Sep-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	24-Sep-04	---	1300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	16-Dec-04	---	1270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	FD 09-Mar-05	---	1180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	09-Mar-05	---	1190	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-18	11-May-05	---	---	---	---	0.0831	105	0.298	16.0	0.00672	8.70	178	---	---	---	---	---	---	---	0.176	---
MW-18	12-May-05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Average: ²		717	1140	310	75.9	0.0506	64.8	0.3	9.54	0.0067	7.87	177	3.44	0.011	---	---	90.5	---	0.68	0.219	0.39
Median: ²		675	1200	310	76	0.051	66	0.30	9.1	0.01	7.9	176	3.9	0.01	---	---	90.5	---	1.8	0.2	0.39
West Mesa Area-Middle Zone																					
OW-03M	FD 28-Oct-04	2100	3970	1080	197	0.056	44.8	ND (0.3)	6.10	ND (0.05)	13.2	676	1.53	0.0114	---	ND (0.5)	61.0	ND (0.02)	0.563	0.828	---
OW-03M	28-Oct-04	2110	4010	1060	219	0.0555	47.4	ND (0.3)	5.91	ND (0.05)	13.1	596	1.53	0.0122	---	ND (0.5)	62.0	ND (0.02)	0.645	0.781	---
OW-03M	16-Nov-04	2560	---	---	---	---	---	ND (0.021)	---	ND (0.01)	---	---	---	---	---	---	---	---	---	---	ND (1.0)
OW-03M	15-Dec-04	2750	4790	---	---	0.0734	67.3	---	6.47	---	12.4	723	---	---	---	---	---	---	---	---	---
Average: ²		2380	4260	1070	208	0.0616	53.2	---	6.16	---	12.9	665	1.53	0.0118	---	---	61.5	---	0.604	0.805	---
Median: ²		2335	4010	1070	208	0.056	47	0.30	6.1	0.05	13.1	676	1.5	0.01	---	---	61.5	---	0.6	0.8	---
West Mesa Area-Lower Zone																					
OW-03D	28-Oct-04	2420	4630	1240	218	0.0407	54.5	ND (0.3)	7.37	0.125	15.8	743	0.36	0.0809	---	ND (0.5)	70.0	ND (0.02)	1.65	0.942	---
OW-03D	16-Nov-04	3140	---	---	---	---	---	0.132	---	0.13	---	---	---	---	---	---	---	---	---	---	ND (1.0)
OW-03D	14-Dec-04	3400	6220	---	---	0.0634	96.0	ND (0.3)	8.68	0.136	17.2	956	---	---	---	---	---	---	---	1.08	---
Average: ²		2990	5430	1200	220	0.0521	75.3	0.13	8.03	0.13	16.5	850	0.36	0.081	---	---	70	---	1.6	1.01	---
Median: ²		3140	5425	1240	218	0.052	75	0.30	8.0	0.13	16.5	850	0.4	0.08	---	---	70.0	---	1.6	1.0	---

TABLE 2

Groundwater Analytical Results - General Chemistry Parameters
Baseline Groundwater Quality Technical Memorandum
Interim Measures No 3. Injection Area, PG&E Topock Compressor Station

Notes:

- ¹ Secondary California Maximum contaminant level (MCL)
- ² The reporting limit is used when nondetect. Rejected data is not included in the calculation.

mg/L results in milligrams per liter
FD field duplicate
ND parameter not detected at the listed reporting limit.
--- not applicable
R rejected data
J estimated value
S screening data, level II validation

TABLE 3
 Groundwater Analytical Results - Other Metals
 Groundwater and Hydrogeologic Investigation
 Interim Measures No 3. Injection Area,, PG&E Topock Compressor Station

		Concentrations and MCLs in µg/L															
Maximum Contaminant Level :		NA	60	10	NA	50	NA	1300	NA	NA	NA	NA	50	NA	2	NA	NA
Location ID	Sample Date	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
East Mesa Area-Upper Zone																	
OW-01S	21-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	27.3	8.70	ND (10)	ND (3.1)	ND (15)	12.1	26.4
OW-02S	29-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	89.3	ND (5.0)	ND (10)	ND (3.1)	ND (15)	7.00	33.3
OW-05S	21-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	21.3	ND (5.0)	ND (10)	64.9	ND (15)	12.9	25.6
OW-05S FD	11-May-05	---	ND (2.0)	2.22	ND (1.0)	ND (1.0)	1.25	2.26	ND (1.0)	ND (500)	19.4	4.90	2.82	ND (1.0)	ND (1.0)	5.43	14.5
OW-05S	11-May-05	---	ND (2.0)	1.95	ND (1.0)	ND (1.0)	1.07	1.55	ND (1.0)	ND (500)	19.0	4.14	2.82	ND (1.0)	ND (1.0)	5.50	16.6
Average: ²		---	---	6.83	---	---	2.32	3.76	---	---	35.3	5.55	7.13	65	---	8.59	23.3
Median: ²		---	---	10.0	---	---	3.1	5.0	---	---	21.3	5.0	10.0	3.1	---	7.0	25.6
East Mesa Area-Middle Zone																	
OW-01M	01-Oct-04	ND (52)	---	---	---	---	---	ND (5.0)	ND (2.1)	---	26.8	ND (5.0)	---	---	---	---	46.1
OW-01M	18-Nov-04	ND (52)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01M	21-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	26.8	ND (5.0)	ND (10)	ND (3.1)	ND (15)	14.7	20.9
OW-01M	10-May-05	---	ND (2.0)	2.69	ND (1.0)	ND (1.0)	ND (1.0)	2.41	ND (1.0)	ND (500)	23.5	4.68	ND (1.0)	ND (1.0)	ND (1.0)	5.45	13.1
OW-02M	11-May-05	---	ND (2.0)	1.65	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (500)	35.3	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	2.96	11.3
OW-05M	13-Jan-05	ND (52)	11.1	14.4	8.80	10.5	10.0	10.6	10.2	ND (0.2)	50.1	20.1	18.6	20.0	ND (15)	22.9	37.3
OW-05M	11-May-05	---	ND (2.0)	1.70	ND (1.0)	ND (1.0)	ND (1.0)	1.60	ND (1.0)	ND (500)	39.0	1.28	ND (1.0)	ND (1.0)	ND (1.0)	2.61	ND (10)
CW-01M	08-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	19.6	ND (5.0)	ND (10)	ND (3.0)	ND (15)	97.7	80.2
CW-02M FD	09-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	28.0	ND (5.0)	ND (10)	ND (3.0)	ND (15)	124	15.8 J
CW-02M	09-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	29.2	ND (5.0)	ND (10)	ND (3.0)	ND (15)	116	33.2 J
CW-03M	10-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	37.8	5.00	ND (10)	ND (3.0)	ND (15)	98.3	42.4
CW-04M	07-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	11.5	ND (5.0)	ND (10)	ND (3.0)	ND (15)	95.3	31.6
Average: ²		---	11	8.04	8.8	10	10	4.60	10	---	29.8	5.64	19	20	---	58.0	31.1
Median: ²		---	5.0	10.0	3.0	3.0	3.0	5.0	2.1	---	28.0	5.0	10.0	3.0	---	59.1	31.6
East Mesa Area-Lower Zone																	
OW-01D	30-Sep-04	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.1)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	51.8	ND (5.0)	ND (10)	ND (3.1)	ND (15)	ND (3.0)	30.7
OW-01D	18-Nov-04	ND (52)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01D	21-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	35.6	ND (5.0)	ND (10)	ND (3.1)	ND (15)	10.7	36.0
OW-01D	10-May-05	---	ND (2.0)	4.77	ND (1.0)	ND (1.0)	ND (1.0)	2.52	ND (1.0)	ND (500)	43.4	1.05	ND (1.0)	ND (1.0)	ND (1.0)	1.69	ND (10)
OW-02D	13-Jan-05	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	2.90	ND (0.2)	66.5	13.5	17.1	8.50	ND (15)	17.7	17.4
OW-02D	10-May-05	---	ND (2.0)	3.30	ND (1.0)	ND (1.0)	ND (1.0)	3.11	ND (1.0)	ND (500)	57.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (10)
OW-05D FD	22-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	83.8	9.30	ND (10)	ND (3.1)	ND (15)	11.6	28.9
OW-05D	22-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	81.1	8.10	ND (10)	ND (3.1)	ND (15)	13.3	24.3
OW-05D	11-May-05	---	ND (2.0)	4.41	ND (1.0)	ND (1.0)	ND (1.0)	4.09	ND (1.0)	ND (500)	63.8	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (10)
CW-01D	07-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	51.8	ND (5.0)	ND (10)	ND (3.0)	ND (15)	89.3	18.5
CW-02D	08-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	50.1	5.60	ND (10)	ND (3.0)	ND (15)	121	52.2
CW-03D	08-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	59.0	7.60	ND (10)	ND (3.0)	ND (15)	115	27.6
CW-04D	07-Feb-05	ND (52)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (2.1)	ND (0.2)	39.1	5.60	ND (10)	ND (3.0)	ND (15)	109	25.7
Average: ²		---	---	8.54	---	---	---	4.56	2.9	---	56.9	5.65	17	8.5	---	41.2	24.3
Median: ²		---	---	10.0	---	---	---	5.0	2.1	---	54.4	5.3	10.0	3.0	---	12.4	25.0

TABLE 3

Groundwater Analytical Results - Other Metals
 Groundwater and Hydrogeologic Investigation
 Interim Measures No 3. Injection Area,, PG&E Topock Compressor Station

		Concentrations and MCLs in µg/L															
Maximum Contaminant Level :		NA	60	10	NA	50	NA	1300	NA	NA	NA	NA	50	NA	2	NA	NA
Location ID	Sample Date	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Bat Cave Wash Area-Upper Zone																	
MW-13	09-Jun-04	---	---	---	---	---	---	ND (10)	---	---	---	ND (20)	---	---	---	---	ND (76)
MW-14	FD 08-Jun-04	---	---	---	---	---	---	ND (10)	---	---	---	ND (20)	---	---	---	---	ND (68)
MW-14	08-Jun-04	---	---	---	---	---	---	ND (10)	---	---	---	ND (20)	---	---	---	---	ND (68)
MW-14	08-Sep-04	ND (52)	---	---	---	---	---	---	ND (21)	---	ND (21)	---	---	---	---	---	---
MW-14	11-May-05	---	ND (2.0)	1.24	ND (1.0)	ND (1.0)	1.01	3.48	1.38	ND (500)	10.8	12.5	3.65	ND (1.0)	ND (1.0)	6.52	19.6 J
Average: ²		---	---	1.2	---	---	1.0	3.5	1.4	---	11	13	3.7	---	---	6.5	20
Median: ²		---	---	1.2	---	---	1.0	10.4	11.1	---	15.8	20.0	3.7	1.0	---	6.5	68.0
Bat Cave Wash Area-Lower Zone																	
MW-37D	11-Jun-04	ND (50)	ND (4.2)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (0.5)	50.0	ND (5.0)	10.0	ND (3.0)	ND (5.0)	ND (3.0)	ND (10)
MW-37D	FD 24-Sep-04	ND (500)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	9.60	ND (5.0)	ND (0.2)	46.3	ND (5.0)	10.0	ND (3.0)	ND (15)	ND (3.0)	24.8
MW-37D	24-Sep-04	ND (500)	ND (5.0)	ND (10)	ND (3.0)	ND (3.0)	ND (3.0)	8.50	ND (5.0)	ND (0.2)	47.3	ND (5.0)	ND (10)	ND (3.0)	ND (15)	ND (3.0)	17.2
MW-37D	FD 14-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	44.6	8.30	ND (10)	ND (3.1)	ND (15)	20.5 J	91.8 J
MW-37D	14-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	43.3	ND (5.0)	ND (10)	ND (3.1)	ND (15)	31.4 J	33.0 J
MW-37D	11-Mar-05	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	34.1	9.20	ND (10)	ND (3.1)	ND (15)	326	38.7
Average: ²		---	---	---	---	---	---	6.35	---	---	44.3	6.25	10.0	---	---	64.5	35.9
Median: ²		---	---	10.0	---	---	---	5.0	---	---	45.5	5.0	10.0	3.0	---	11.8	28.9
West Mesa Area-Upper Zone																	
OW-03S	28-Oct-04	ND (52)	---	---	---	---	---	ND (5.0)	4.60	---	23.9	ND (5.0)	---	---	---	---	20.4
OW-03S	16-Nov-04	ND (52)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-03S	15-Dec-04	---	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	22.2	ND (5.0)	ND (10)	ND (3.1)	ND (15)	8.70	30.9
MW-18	09-Jun-04	---	---	---	---	---	---	ND (10)	---	---	---	ND (20)	---	---	---	---	ND (150)
MW-18	08-Sep-04	ND (52)	---	---	---	---	---	---	ND (21)	---	ND (21)	---	---	---	---	---	---
MW-18	11-May-05	84.8	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (500)	3.60	ND (1.0)	2.58	ND (1.0)	ND (1.0)	3.37	40.4 J
Average: ²		85	---	---	---	---	---	---	4.6	---	17.6	---	2.6	---	---	6.04	59.9
Median: ²		52	---	5.5	---	---	---	5.0	---	---	21.5	5.0	6.3	2.0	---	6.0	35.6
West Mesa Area-Middle Zone																	
OW-03M	FD 28-Oct-04	ND (52)	---	---	---	---	---	ND (5.0)	ND (2.1)	---	20.5	ND (5.0)	---	---	---	---	ND (10)
OW-03M	28-Oct-04	ND (52)	---	---	---	---	---	ND (5.0)	ND (2.1)	---	20.6	ND (5.0)	---	---	---	---	ND (10)
OW-03M	16-Nov-04	ND (52)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-03M	15-Dec-04	---	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	ND (2.1)	ND (0.2)	14.5	ND (5.0)	ND (10)	ND (3.1)	ND (15)	9.50	30.3
Average: ²		---	---	---	---	---	---	---	---	---	18.5	---	---	---	---	9.5	30
Median: ²		---	---	10.0	---	---	---	5.0	2.1	---	20.5	5.0	10.0	3.1	---	9.5	10.4
West Mesa Area-Lower Zone																	
OW-03D	28-Oct-04	ND (52)	---	---	---	---	---	ND (5.0)	ND (2.1)	---	43.7	ND (5.0)	---	---	---	---	28.8
OW-03D	16-Nov-04	ND (52)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-03D	14-Dec-04	ND (52)	ND (5.0)	ND (10)	ND (3.1)	ND (3.1)	ND (3.1)	ND (5.0)	2.40	ND (0.2)	31.0	ND (5.0)	ND (10)	ND (3.1)	ND (15)	8.40	71.2
Average: ²		---	---	---	---	---	---	---	2.4	---	37.3	---	---	---	---	8.4	50.0
Median: ²		---	---	10.0	---	---	3.1	5.0	2.3	---	37.3	5.0	10.0	3.1	---	8.4	50.0

TABLE 3

Groundwater Analytical Results - Other Metals

Groundwater and Hydrogeologic Investigation

Interim Measures No 3. Injection Area,, PG&E Topock Compressor Station

Notes:

¹ secondary MCL

² The reporting limit is used when nondetect. Rejected data is not used in the calculation

µg/L results in micrograms per liter
FD field duplicate
ND parameter not detected at the listed reporting limit.
--- not applicable
R rejected data
J estimated value

TABLE 4

Groundwater Analytical Results - Organic Compounds

Groundwater and Hydrogeologic Investigation

Interim Measures No 3. Injection Area, PG&E Topock Compressor Station

Concentrations and MCLs in µg/L										
		VOCs by SW8260B					SVOCs by SW8270		PCBs by SW8082	
Maximum Contaminant Level :		5	NA	NA	1000	NA	NA	NA	0.5	
Location ID	Sample Date	Benzene	Carbon Disulfide	Chloroform	Toluene	All Other Analytes	Naphthalene	All Other Analytes	All PCBs	
East Mesa Area-Upper Zone										
OW-05S	FD	11-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (9.8)	ND	---
OW-05S		11-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (9.8)	ND	---
East Mesa Area-Middle Zone										
OW-01M		10-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (10)	ND	---
OW-02M		11-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (9.5)	ND	---
OW-05M		11-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (11)	ND	---
East Mesa Area-Lower Zone										
OW-01D		30-Sep-04	0.8	0.7	ND (0.5)	1.1	ND	ND (10)	ND	ND
OW-01D		10-May-05	ND (1) J	ND (1) J	ND (1) J	ND (1) J	ND	ND (9.9)	ND	ND
OW-02D		10-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (9.8)	ND	---
OW-05D		11-May-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (10)	ND	---
CW-02D		23-Feb-05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (10)	ND	---
Bat Cave Wash Area-Lower Zone										
MW-37D		11-Jun-04	ND (0.5)	ND (0.5)	0.5	ND (0.5)	ND	ND (10)	ND	---

Notes:

µg/L results in micrograms per liter
 ND parameter not detected at the listed reporting limit.
 --- parameter not analyzed

TABLE 5

Target Levels for WDR Constituents, East Mesa Injection Area
 Baseline Groundwater Quality Technical Memorandum
 Interim Measures No 3. Injection Area, PG&E Topock Compressor Station

Constituent	Well Depth	Range	Median	Median Exceeds WDR	Range Exceeds WDR	WDR RO Permeate			Target Value
						Average	Maximum	units	
Aluminum	Shallow Middle Deep	ND (52) ND (52) ND (52)	ND (52) ND (52) ND (52)			50	100	µg/L	50
Ammonia (as N)	Shallow Middle Deep	----- ND (0.5) ND (0.5)	----- ND (0.5) ND (0.5)			1.5	3	mg/L	1.5
Barium	Shallow Middle Deep	0.0319 - 0.0662 0.0444 - 0.0699 0.0716 - 0.113	ND (0.1) ND (0.1) ND (0.1)			0.3	0.98	mg/L	0.3
Boron	Shallow Middle Deep	0.374 - 0.707 0.719 - 1.58 1.27 - 1.80	0.4 1 1.5			1.9	3.6	mg/L	1.9
Copper	Shallow Middle Deep	1.55 - 2.6 1.6 - 10.6 2.52 - 4.09	ND (5) ND (5) ND (5)			20	40	µg/L	20
Fluoride	Shallow Middle Deep	2.12 - 2.16 0.693 - 2.13 ND (0.5) - 1.34	2.14 1.41 1.34	X X X	X X X	0.3	0.6	mg/L	2.16
Hexavalent Chromium	Shallow Middle Deep	49 - 32.6 2.3 - 15.6 ND (1.0)	19.8 9.7 ND (1.0)	X X X	X X X	8	16	µg/L	32.6
Iron (total)	Shallow Middle Deep	ND (0.1) - 0.407 ND (0.021) - 0.0533 0.0533 - 0.237	0.3 0.052 0.17	X X X	X X X	0.3	0.6	mg/L	0.407
Lead	Shallow Middle Deep	ND (1) - ND (2.1) ND (2.1) ND (1) - ND (2.1)	ND (2.1) ND (2.1) ND (2.1)			2	4	µg/L	2
Manganese	Shallow Middle Deep	5.35 - 131 1.07 - 54.1 172 - 628	50 50 330		X X X	50	100	µg/L	628
Molybdenum	Shallow Middle Deep	19 - 89.3 11.5 - 50.1 35.6 - 83.8	21.3 28 54	X X X	X X X	10	20	µg/L	89.3
Nickel	Shallow Middle Deep	4.14 - 8.7 ND (1) - 21 ND (1) - 13.5	5 5 5.3		X X	12	24	µg/L	21
Nitrate as N	Shallow Middle Deep	3.13 - 3.18 0.51 - 1.57 0.107 - 0.58	3.2 0.9 0.3			10	20	mg/L	10
pH	Shallow Middle Deep	7.98 - 8.11 7.53 - 8.59 7.68 - 8.62	8.00 8.05 8.01		X X	7.5	8.4	units	8.59
Sulfate	Shallow Middle Deep	107 - 108 241 - 478 339 - 571	108 291 517		X X	250	500	mg/L	571
TDS	Shallow Middle Deep	908 - 1,190 2,640 - 5,180 5,000 - 10,800	966 3,285 6,670		X X X	500	1,000	mg/L	10,800
Total Chromium	Shallow Middle Deep	3.4 - 29.5 5.8 - 18.6 ND (1.0) - 4.80	23.4 9.7 ND (1)		X	25	50	µg/L	29.5
Zinc	Shallow Middle Deep	14.5 - 33 ND (10) - 80.2 ND (10) - 52.2	25.6 31.6 25		X	80	100	µg/L	80.2

Notes:

1. Concentrations: micrograms per liter (µg/L), milligrams per liter (mg/L), and pH units
2. ND = not detected at listed reporting limit
3. Reverse Osmosis (RO) permeate limitations from Waste Discharge Requirements (WDR) R7-2004-0103
4. Shading indicates median or upper limit of range exceeds WDR
5. If the Upper Limit of the Range > WDR, then the Target is set at the Upper Limit of the Range
 If the Upper Limit of the Range is < WDR, then the Target is set at the WDR.