

Quarterly
Groundwater Monitoring Report

April 1991

PG&E
General Construction Gas Yard
4930 Coliseum Way
Oakland, California

Prepared by:

Aqua Resources Inc.
2030 Addison Street, Suite 500
Berkeley, CA 94704

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1.0 BACKGROUND

This report presents the results of the quarterly groundwater monitoring performed in April 1991 at the PG&E General Construction Gas Yard. The yard is located at 4930 Coliseum Way in Oakland, California. The groundwater analyses were performed to monitor the distribution of waste oil, solvents, and fuel compounds in the uppermost aquifer beneath the northwestern part of the yard, near the former sites of five underground storage tanks.

The tanks were excavated and removed in January 1988. Analysis of their contents revealed that of the four tanks formerly located in a cluster near the north corner of the yard, two tanks contained mineral spirits and two tanks contained heavy oil. A concrete sump formerly connected to the tank cluster is located approximately 50 feet northeast of the tank cluster. The fifth tank formerly located near the west corner of the yard contained diesel fuel.

2.0 SAMPLING ACTIVITIES

In addition to the four previously existing shallow monitoring wells OW-1 through OW-4, a fifth monitoring well, OW-5, was installed by Aqua Resources Inc. (ARI) on April 16, 1991 at the east end of the welding shop. The goal of this effort was to aid in determining if upgradient sources of fuel contamination may have impacted the site. Figure 1 presents the site plan including all monitoring wells. On April 17, 1991, groundwater samples were collected by ARI personnel from monitoring wells OW-1, OW-2, OW-3, OW-4, and the new well, OW-5. Prior to sampling, three casing volumes were purged from each well.

Groundwater samples collected from each well were analyzed by The Earth Technology Analytical Laboratory, Huntington Beach, California for extractable petroleum hydrocarbons as diesel (TPH-D; EPA 8015 modified/EPA 3550), total petroleum hydrocarbons (TPH; EPA method 418.1), volatile organic compounds (EPA methods 601 and 602), and total dissolved solids, (TDS; EPA method 160.1).

One trip blank was analyzed for purgeable aromatics (EPA method 602) for quality control purposes. The sample designated OW-3-2 is a duplicate sample of OW-3-1 collected from monitoring well OW-3.

Certified laboratory results are presented in Appendix A. Chain-of-Custody documentation is provided in Appendix B.

3.0 ANALYTICAL RESULTS

Table 1 summarizes the analytical results for petroleum hydrocarbons detected in the groundwater samples collected in April 1991. TPH-Diesel was detected only in monitoring well OW-4 at 0.58 mg/l. According to the laboratory analyses, hydrocarbon fuels which did not match diesel fuel, were detected in samples from OW-3 and OW-5, at 0.7 mg/l and 0.6 mg/l, respectively. All samples were below the method detection limit for TPH.

Table 2 presents the analytical results for volatile organic compounds. Several volatile organics were detected in all groundwater samples. The State maximum contaminant level (MCL) for 1,1-Dichloroethane of 5 $\mu\text{g/l}$ was exceeded in monitoring wells OW-3 (16 $\mu\text{g/l}$) and OW-4 (6.1 $\mu\text{g/l}$). Samples from OW-1 (0.63 $\mu\text{g/l}$) and OW-3 (0.55 $\mu\text{g/l}$) exceeded the MCL for 1,2-Dichloroethane. In OW-1, 1,4-Dichlorobenzene was detected at 6.7 $\mu\text{g/l}$ above the MCL of 5 $\mu\text{g/l}$. The concentration of benzene in the new monitoring well OW-5 was measured at 15 $\mu\text{g/l}$ exceeding the MCL of 1 $\mu\text{g/l}$. All other organic compounds are below the MCLs.

Total dissolved solids were measured in OW-3-1 at 780 mg/l indicating that groundwater beneath the site would be considered a potential drinking water source by the Water Quality Control Board, San Francisco Bay Region.

4.0 GROUNDWATER FLOW DIRECTION

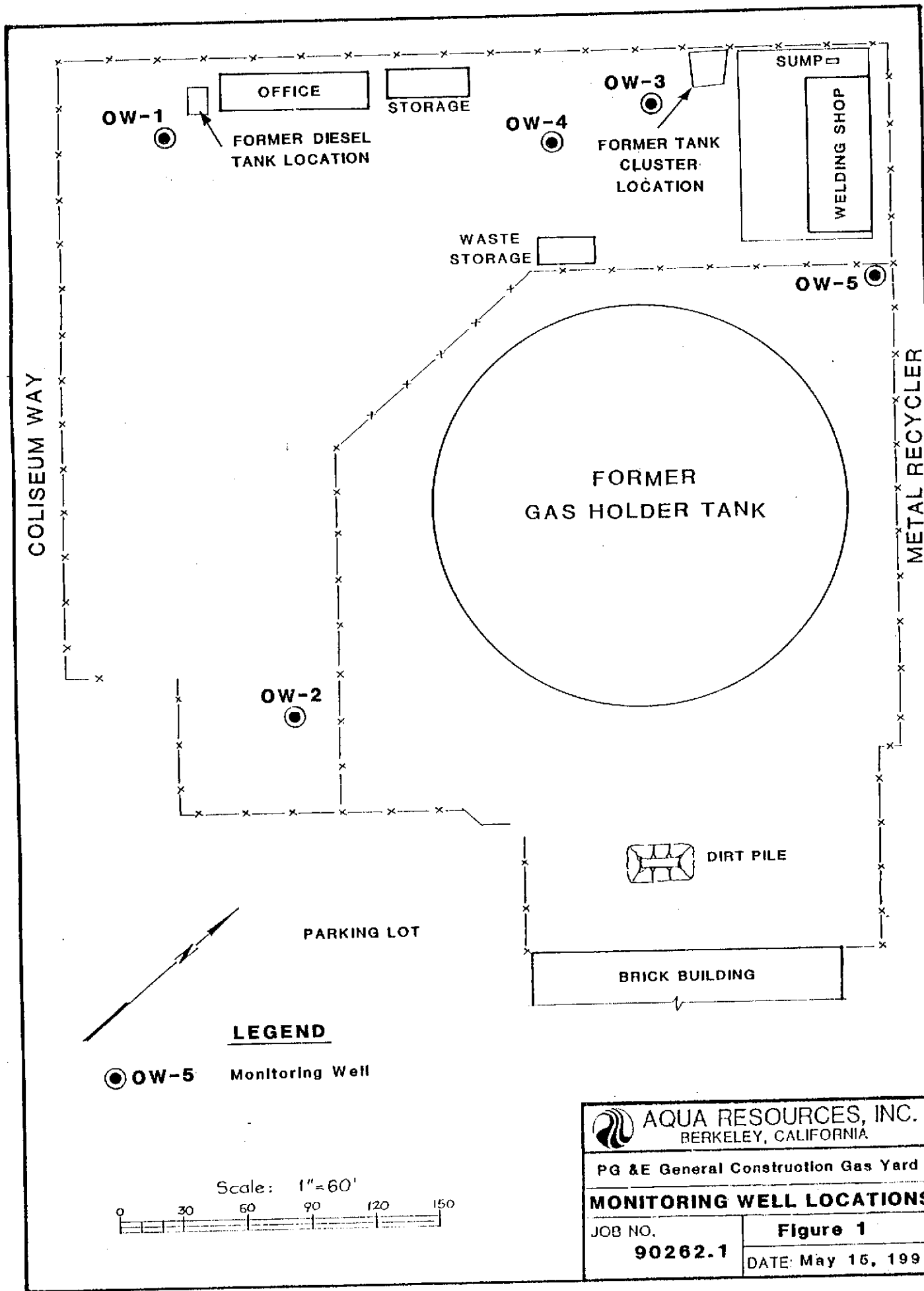
Water level measurements were collected on April 17, 1991 prior to sampling wells OW-1 through OW-5. Groundwater elevations are related to a site specific coordinate system for consistency with previous reports. Groundwater surface elevations are presented in Figure 2. Elevations in OW-1, OW-2, and OW-5 confirm a general regional groundwater flow direction to the southwest. However, if horizontal isotropic conditions prevailed on the whole site, elevations in OW-3 and OW-4 would be about 1.5 feet lower than actually measured. This might indicate the presence of an artificial water source in the vicinity of OW-3 and OW-4.

5.0 CONCLUSIONS

Results of analyses performed on groundwater samples collected in April 1991 from monitoring wells OW-1, OW-2, OW-3, OW-4, and OW-5 show that diesel fuel was detected only in OW-4 above the method detection limit. A nonspecified long-chain hydrocarbon fuel, which did not match diesel fuel, was detected in OW-3 and OW-5. This could be mineral spirits or lubricating oil.

Samples from OW-1, OW-3, and OW-4 exceeded the maximum contaminant level for several volatile organic compounds for drinking water. Benzene, detected in OW-5 above the MCL, might indicate an upgradient (off-site) source of fuel contamination.

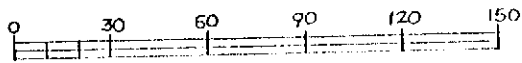
Groundwater flow across most of the site appears to be to the southwest toward Coliseum Way. Anomalously high water levels were found in wells OW-3 and OW-4, possibly indicating the presence of an artificial water source, such as a leaking pipe, in that area.



LEGEND

● OW-5 Monitoring Well

Scale: 1" = 60'



AQUA RESOURCES, INC.
BERKELEY, CALIFORNIA

PG & E General Construction Gas Yard

MONITORING WELL LOCATIONS

JOB NO.

90262.1

Figure 1

DATE: May 15, 1991

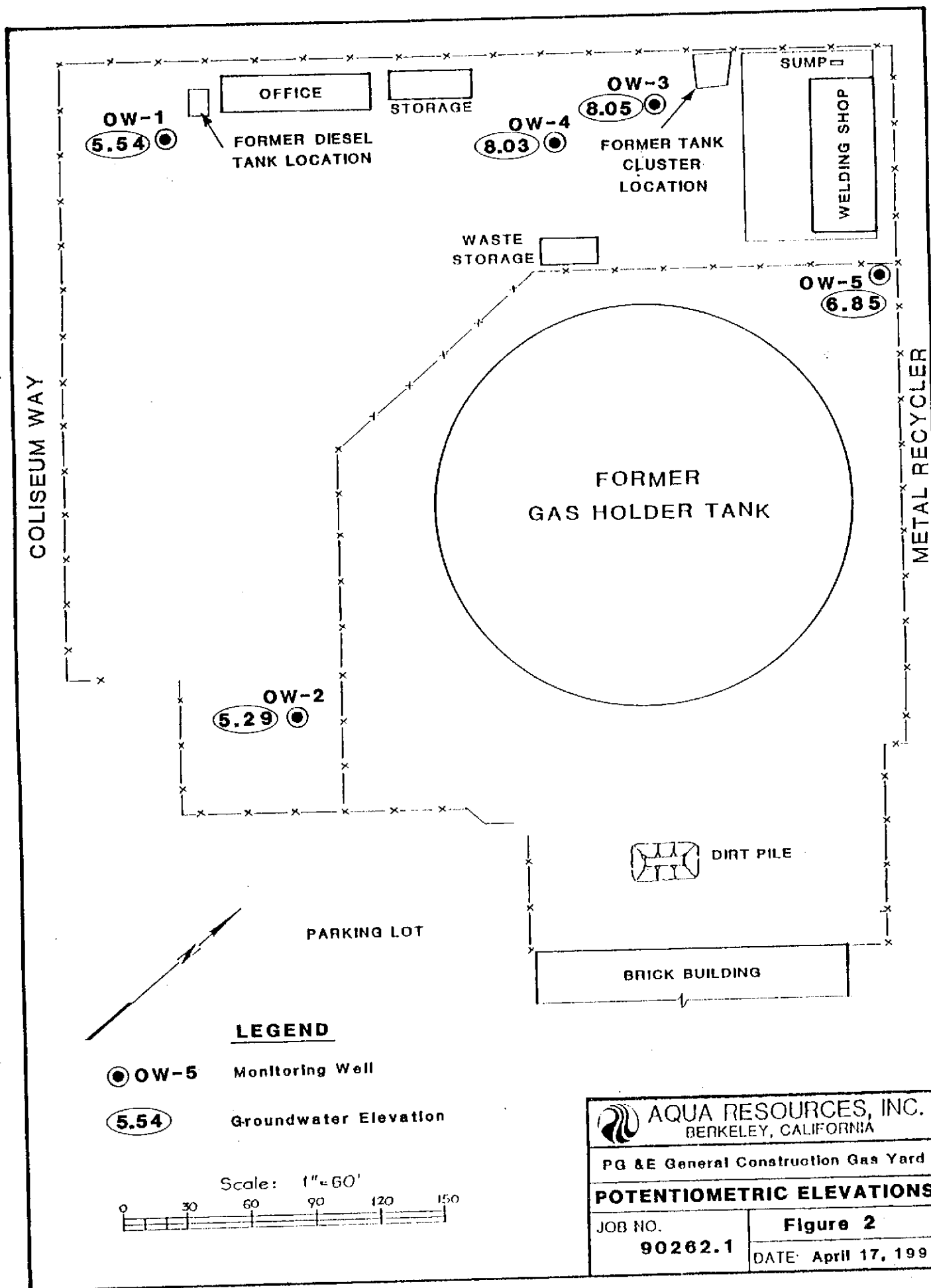


TABLE 1. PETROLEUM HYDROCARBONS IN GROUNDWATER, in mg/l

Sample ID	TPH	TPH-Diesel
OW-1-1	ND	ND
OW-2-1	ND	ND
OW-3-1	ND	ND (a)
OW-3-2	ND	ND(a)
OW-4-1	ND	0.58
OW-5-1	ND	ND(b)

Notes:

1) ND = Not Detected at or above Method Detection Limit (MDL)

2) TPH = Total Petroleum Hydrocarbons (EPA method 418.1); MDL = 0.5 mg/l

3) TPH-Diesel = Total Extractable Petroleum Hydrocarbons as Diesel (EPA 8015 mod./EPA 3550); MDL = 0.2 mg/l

4) (a) sample contains a hydrocarbon fuel of approximately 0.7 mg/l, which does not match diesel fuel

5) (b) sample contains a hydrocarbon fuel of approximately 0.6 mg/l, which does not match diesel fuel

TABLE 2. VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER, in ug/l

PURGEABLE HALOCARBONS	MCL	MDL	Sample ID					
			OW-1-1	OW-2-1	OW-3-1	OW-3-2	OW-4-1	OW-5-1
			(Duplicate of OW-3-1)					
Chloromethane		2	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.5	1	ND	ND	ND	ND	ND	ND
Bromomethane		1	ND	ND	ND	ND	ND	ND
Chloroethane		1	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	150	0.5	ND	ND	0.82	ND	ND	ND
1,1-Dichloroethene	6	0.5	ND	ND	ND	0.69	ND	ND
Dichloromethane	5#	0.5	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	10	0.5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	0.4	2.6	ND	16	17	6.1	1.8
Chloroform	100#*	0.2	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	0.2	ND	ND	2.5	1.6	ND	6
Carbon Tetrachloride	0.5	0.5	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	0.2	0.63	ND	0.55	0.43	0.49	ND
Trichloroethene	5	0.5	ND	ND	ND	ND	ND	0.75
1,2-Dichloropropane	5	0.2	ND	ND	ND	ND	ND	ND
Bromodichloromethane	100#*	0.5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	5***	0.5	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	5***	0.5	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	32	0.1	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	0.2	1.1	0.53	1.4	0.68	ND	0.7
Dibromochloromethane	100#*	0.5	ND	ND	ND	ND	ND	ND
Chlorobenzene	30	0.5	ND	ND	2.3	1	ND	ND
Bromoform	100#*	0.5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	0.2	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene		0.5	1.8	ND	3.3	1.8	ND	ND
1,4-Dichlorobenzene	5	0.5	6.7	ND	3.1	1.8	ND	ND
1,2-Dichlorobenzene	600#	0.5	0.58	ND	2.3	1.2	ND	ND
PURGEABLE AROMATICS								
Benzene	1	0.5	ND	ND	0.54	ND	ND	14
Toluene	1000#	0.5	ND	ND	ND	ND	ND	0.57
Chlorobenzene	30	0.5	ND	ND	2.8	2.9	ND	ND
Ethylbenzene	680	0.5	ND	ND	ND	ND	ND	0.58
P-&m-xylene	1750**	1	ND	ND	ND	ND	ND	4.5
O-xylene	1750**	0.5	ND	ND	ND	ND	ND	1.1
1,3-Dichlorobenzene		0.5	1.6	ND	3.2	3.7	ND	ND
1,4-Dichlorobenzene	5	0.5	7.2	ND	3	3.1	ND	ND
1,2-Dichlorobenzene	600#	0.5	ND	ND	2.1	2.7	ND	ND

Notes:

- 1) MDL = Method Detection Limit
- 2) MCL = Maximum Contaminant Level (State MCL, if not noted otherwise)
- 3) # = EPA MCL
- 4) * = MCL for sum of four compounds
- 5) ** = MCL for sum of all xylene isomers
- 6) *** = MCL for sum of trans- and cis-1,3-Dichloropropene
- 7) ND = Not Detected at or above MDL
- 8) Purgeable Halocarbons (EPA method 601)
- 9) Purgeable Aromatics (EPA method 602)

APPENDIX A

CERTIFIED LABORATORY RESULTS

Received: 04/19/91

Results by Sample

SAMPLE ID DW-1-1 FRACTION 09A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST JB
 UNITS mg/L
 BATCH_ID WTPH-13
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-2-1 FRACTION 27A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	ND	0.50	1.0	05/02/91

Notes and Definitions for this Report:

EXTRACTED 05/02/91

ANALYST JB

UNITS mg/L

BATCH_ID WTPH-13

COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-1 FRACTION 39A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST JB
 UNITS mg/L
 BATCH_ID WTPH-13
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-2 FRACTION 41A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST JB
 UNITS mg/L
 BATCH_ID WTPH-13
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-4-1 FRACTION 37A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST JB
 UNITS mg/L
 BATCH_ID WTPH-13
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-5-1 FRACTION 21A TEST CODE WTPH NAME Total petroleum HCs/water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Petroleum HCs	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST JB
 UNITS mg/L
 BATCH_ID WTPH-13
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-1-1 FRACTION 10A TEST CODE WLPTD NAME HCS Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCS Diesel fuel	<u>ND</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91

ANALYST MP

FILE ID N/A

UNITS mg/L

BATCH ID LDW-8

COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-2-1 FRACTION 26A TEST CODE WLPTD NAME HCS Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCS Diesel fuel	<u>ND</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91

ANALYST MP

FILE ID N/A

UNITS mg/L

BATCH ID LDW-8

COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-1 FRACTION 38A TEST CODE WLFID NAME HCS Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCS Diesel fuel	<u>ND</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91
 ANALYST MP
 FILE ID N/A
 UNITS mg/L
 BATCH_ID LDW-8
 COMMENTS _____ SEE APPENDIX

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-2 FRACTION 40A TEST CODE WLPTD NAME HCS Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCS Diesel fuel	<u>ND</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91
 ANALYST MP
 FILE ID N/A
 UNITS mg/L
 BATCH_ID LDW-8
 COMMENTS _____ SEE APPENDIX

Received: 04/19/91

Results by Sample

SAMPLE ID DW-4-1 FRACTION 36A TEST CODE WLFTD NAME HCs Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCs Diesel fuel	<u>0.58</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91

ANALYST MP

FILE ID N/A

UNITS mg/L

BATCH_ID LDW-8

COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-5-1 FRACTION 22A TEST CODE WLPTD NAME HCS Diesel by EXT in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
HCS Diesel fuel	<u>ND</u>	<u>0.20</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED 04/22/91

ANALYST MP

FILE ID N/A

UNITS mg/L

BATCH ID LDW-8

COMMENTS _____ SEE APPENDIX

Received: 04/19/91

Results by Sample

SAMPLE ID OW-1-1FRACTION 17ATEST CODE 601NAME VOA Halo. HCs in waterDate & Time Collected 04/17/91

Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.			
Chloromethane	ND	2.0	1.0	04/23/91
Vinyl chloride	ND	1.0	1.0	04/23/91
Bromomethane	ND	1.0	1.0	04/23/91
Chloroethane	ND	1.0	1.0	04/23/91
Trichlorofluoromethane	ND	0.50	1.0	04/23/91
1,1-dichloroethene	ND	0.50	1.0	04/23/91
Dichloromethane	0.85 B	0.50	1.0	04/23/91
Trans-1,2-DCE	ND	0.50	1.0	04/23/91
1,1-dichloroethane	2.6	0.40	1.0	04/23/91
Chloroform	ND	0.20	1.0	04/23/91
1,1,1-trichloroethane	ND	0.20	1.0	04/23/91
Carbon Tetrachloride	ND	0.50	1.0	04/23/91
1,2-dichloroethane	0.63	0.20	1.0	04/23/91
Trichloroethylene	ND	0.50	1.0	04/23/91
1,2-dichloropropane	ND	0.20	1.0	04/23/91
Bromodichloromethane	ND	0.50	1.0	04/23/91
Trans-1,3-DCP	ND	0.50	1.0	04/23/91
Cis-1,3-DCP	ND	0.50	1.0	04/23/91
1,1,2-trichloroethane	ND	0.10	1.0	04/23/91
Tetrachloroethene	1.1	0.20	1.0	04/23/91
Dibromchloromethane	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Bromoform	ND	0.50	1.0	04/23/91
1,1,2,2-TCA	ND	0.20	1.0	04/23/91
1,2,3-Trichloropropane	NOT REQ.			
2-Chlorotoluene	NOT REQ.			
1,3-dichlorobenzene	1.8	0.50	1.0	04/23/91
1,4-dichlorobenzene	6.7	0.50	1.0	04/23/91
1,2-dichlorobenzene	0.58	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____

ANALYST DLFILE ID 9AA-292UNITS ug/LBATCH ID 5VOA-253COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-1-1 FRACTION 18A TEST CODE 602 NAME VOA Arom. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Toluene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Chlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Ethylbenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
P- <i>m</i> -xylene	<u>ND</u>	<u>1.0</u>	<u>1.0</u>	<u>04/23/91</u>
O-xylene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,3-dichlorobenzene	<u>1.6</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,4-dichlorobenzene	<u>7.2</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,2-dichlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 1DAA-292
 UNITS ug/L
 BATCH_ID 5VOA-251
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-2-1 FRACTION 24A TEST CODE 601 NAME VOA Halo. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.	.		
Chloromethane	ND	2.0	1.0	04/23/91
Vinyl chloride	ND	1.0	1.0	04/23/91
Bromomethane	ND	1.0	1.0	04/23/91
Chloroethane	ND	1.0	1.0	04/23/91
Trichlorofluoromethane	ND	0.50	1.0	04/23/91
1,1-dichloroethene	ND	0.50	1.0	04/23/91
Dichloromethane	2.0 B	0.50	1.0	04/23/91
Trans-1,2-DCE	ND	0.50	1.0	04/23/91
1,1-dichloroethane	ND	0.40	1.0	04/23/91
Chloroform	ND	0.20	1.0	04/23/91
1,1,1-trichloroethane	ND	0.20	1.0	04/23/91
Carbon Tetrachloride	ND	0.50	1.0	04/23/91
1,2-dichloroethane	ND	0.20	1.0	04/23/91
Trichloroethylene	ND	0.50	1.0	04/23/91
1,2-dichloropropane	ND	0.20	1.0	04/23/91
Bromodichloromethane	ND	0.50	1.0	04/23/91
Trans-1,3-DCP	ND	0.50	1.0	04/23/91
Cis-1,3-DCP	ND	0.50	1.0	04/23/91
1,1,2-trichloroethane	ND	0.10	1.0	04/23/91
Tetrachloroethene	0.53	0.20	1.0	04/23/91
Dibromchloromethane	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Bromoform	ND	0.50	1.0	04/23/91
1,1,2,2-TCA	ND	0.20	1.0	04/23/91
1,2,3-Trichloropropane	NOT REQ.	.		
2-Chlorotoluene	NOT REQ.	.		
1,3-dichlorobenzene	ND	0.50	1.0	04/23/91
1,4-dichlorobenzene	ND	0.50	1.0	04/23/91
1,2-dichlorobenzene	ND	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 9AA-294
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-2-1 FRACTION 25A TEST CODE 602 NAME VOA Arcm. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	ND	0.50	1.0	04/23/91
Toluene	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Ethylbenzene	ND	0.50	1.0	04/23/91
P-4m-xylene	ND	1.0	1.0	04/23/91
O-xylene	ND	0.50	1.0	04/23/91
1,3-dichlorobenzene	ND	0.50	1.0	04/23/91
1,4-dichlorobenzene	ND	0.50	1.0	04/23/91
1,2-dichlorobenzene	ND	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 10AA-294
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-1 FRACTION 13A TEST CODE 601 NAME VOA Halo. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.	.		
Chloromethane	ND	2.0	1.0	04/23/91
Vinyl chloride	ND	1.0	1.0	04/23/91
Bromomethane	ND	1.0	1.0	04/23/91
Chloroethane	ND	1.0	1.0	04/23/91
Trichlorofluoromethane	0.82	0.50	1.0	04/23/91
1,1-dichloroethane	ND	0.50	1.0	04/23/91
Dichloromethane	1.9 B	0.50	1.0	04/23/91
Trans-1,2-DCE	ND	0.50	1.0	04/23/91
1,1-dichloroethane	16	0.40	1.0	04/23/91
Chloroform	ND	0.20	1.0	04/23/91
1,1,1-trichloroethane	2.5	0.20	1.0	04/23/91
Carbon Tetrachloride	ND	0.50	1.0	04/23/91
1,2-dichloroethane	0.55	0.20	1.0	04/23/91
Trichloroethylene	ND	0.50	1.0	04/23/91
1,2-dichloropropane	ND	0.20	1.0	04/23/91
Bromodichloromethane	ND	0.50	1.0	04/23/91
Trans-1,3-DCP	ND	0.50	1.0	04/23/91
Cis-1,3-DCP	ND	0.50	1.0	04/23/91
1,1,2-trichloroethane	ND	0.10	1.0	04/23/91
Tetrachloroethene	1.4	0.20	1.0	04/23/91
Dibromchloromethane	ND	0.50	1.0	04/23/91
Chlorobenzene	2.3	0.50	1.0	04/23/91
Bromoform	ND	0.50	1.0	04/23/91
1,1,2,2-TCA	ND	0.20	1.0	04/23/91
1,2,3-Trichloropropane	NOT REQ.	.		
2-Chlorotoluene	NOT REQ.	.		
1,3-dichlorobenzene	3.3	0.50	1.0	04/23/91
1,4-dichlorobenzene	3.1	0.50	1.0	04/23/91
1,2-dichlorobenzene	2.3	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 9AA-290
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-1 FRACTION 14A TEST CODE 602 NAME VOA Arom. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	<u>0.54</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Toluene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Chlorobenzene	<u>2.8</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Ethylbenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
P-4m-xylene	<u>ND</u>	<u>1.0</u>	<u>1.0</u>	<u>04/23/91</u>
O-xylene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,3-dichlorobenzene	<u>3.2</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,4-dichlorobenzene	<u>3.0</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,2-dichlorobenzene	<u>2.1</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 10AA-290
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-2 FRACTION 15A TEST CODE 601 NAME VOA Halo. BCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.	.		
Chloromethane	ND	2.0	1.0	04/27/91
Vinyl chloride	ND	1.0	1.0	04/27/91
Bromomethane	ND	1.0	1.0	04/27/91
Chloroethane	ND	1.0	1.0	04/27/91
Trichlorofluoromethane	ND	0.50	1.0	04/27/91
1,1-dichloroethene	0.69	0.50	1.0	04/27/91
Dichloromethane	1.1 B	0.50	1.0	04/27/91
Trans-1,2-DCE	ND	0.50	1.0	04/27/91
1,1-dichloroethane	17	0.40	1.0	04/27/91
Chloroform	ND	0.20	1.0	04/27/91
1,1,1-trichloroethane	1.6	0.20	1.0	04/27/91
Carbon Tetrachloride	ND	0.50	1.0	04/27/91
1,2-dichloroethane	0.43	0.20	1.0	04/27/91
Trichloroethylene	ND	0.50	1.0	04/27/91
1,2-dichloropropane	ND	0.20	1.0	04/27/91
Bromodichloromethane	ND	0.50	1.0	04/27/91
Trans-1,3-DCP	ND	0.50	1.0	04/27/91
Cis-1,3-DCP	ND	0.50	1.0	04/27/91
1,1,2-trichloroethane	ND	0.10	1.0	04/27/91
Tetrachloroethene	0.68	0.20	1.0	04/27/91
Dibromchloromethane	ND	0.50	1.0	04/27/91
Chlorobenzene	1.0	0.50	1.0	04/27/91
Bromoform	ND	0.50	1.0	04/27/91
1,1,2,2-TCA	ND	0.20	1.0	04/27/91
1,2,3-Trichloropropane	NOT REQ.	.		
2-Chlorotoluene	NOT REQ.	.		
1,3-dichlorobenzene	1.8	0.50	1.0	04/27/91
1,4-dichlorobenzene	1.8	0.50	1.0	04/27/91
1,2-dichlorobenzene	1.2	0.50	1.0	04/27/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 9AA-291
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-2 FRACTION 16A TEST CODE 602 NAME VOA Arom. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Toluene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Chlorobenzene	<u>2.9</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Ethylbenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
P-tm-xylene	<u>ND</u>	<u>1.0</u>	<u>1.0</u>	<u>04/23/91</u>
O-xylene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,3-dichlorobenzene	<u>3.7</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,4-dichlorobenzene	<u>3.1</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,2-dichlorobenzene	<u>2.7</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 6AA-390
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-4-1 FRACTION 11A TEST CODE 601 NAME VOA Halo. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.	.		
Chloromethane	ND	2.0	1.0	04/23/91
Vinyl chloride	ND	1.0	1.0	04/23/91
Bromomethane	ND	1.0	1.0	04/23/91
Chloroethane	ND	1.0	1.0	04/23/91
Trichlorofluoromethane	ND	0.50	1.0	04/23/91
1,1-dichloroethene	ND	0.50	1.0	04/23/91
Dichloromethane	ND	0.50	1.0	04/23/91
Trans-1,2-DCE	ND	0.50	1.0	04/23/91
1,1-dichloroethane	6.1	0.40	1.0	04/23/91
Chloroform	ND	0.20	1.0	04/23/91
1,1,1-trichloroethane	ND	0.20	1.0	04/23/91
Carbon Tetrachloride	ND	0.50	1.0	04/23/91
1,2-dichloroethane	0.49	0.20	1.0	04/23/91
Trichloroethylene	ND	0.50	1.0	04/23/91
1,2-dichloropropane	ND	0.20	1.0	04/23/91
Bromodichloromethane	ND	0.50	1.0	04/23/91
Trans-1,3-DCP	ND	0.50	1.0	04/23/91
Cis-1,3-DCP	ND	0.50	1.0	04/23/91
1,1,2-trichloroethane	ND	0.10	1.0	04/23/91
Tetrachloroethene	ND	0.20	1.0	04/23/91
Dibromchloromethane	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Bromoform	ND	0.50	1.0	04/23/91
1,1,2,2-TCA	ND	0.20	1.0	04/23/91
1,2,3-Trichloropropane	NOT REQ.	.		
2-Chlorotoluene	NOT REQ.	.		
1,3-dichlorobenzene	ND	0.50	1.0	04/23/91
1,4-dichlorobenzene	ND	0.50	1.0	04/23/91
1,2-dichlorobenzene	ND	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 9AA-289
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-4-1 FRACTION 12A TEST CODE 602 NAME VOA Arom. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	ND	0.50	1.0	04/23/91
Toluene	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Ethylbenzene	ND	0.50	1.0	04/23/91
P-4m-xylene	ND	1.0	1.0	04/23/91
O-xylene	ND	0.50	1.0	04/23/91
1,3-dichlorobenzene	ND	0.50	1.0	04/23/91
1,4-dichlorobenzene	ND	0.50	1.0	04/23/91
1,2-dichlorobenzene	ND	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 10AA-289
 UNITS ug/L
 BATCH ID 5VOA-253
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-5-1 FRACTION 19A TEST CODE 601 NAME VOA Hal. HCs in water
 Data & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	NOT REQ.	.		
Chloromethane	ND	2.0	1.0	04/23/91
Vinyl chloride	ND	1.0	1.0	04/23/91
Bromomethane	ND	1.0	1.0	04/23/91
Chloroethane	ND	1.0	1.0	04/23/91
Trichlorofluoromethane	ND	0.50	1.0	04/23/91
1,1-dichloroethene	ND	0.50	1.0	04/23/91
Dichloromethane	2.4 B	0.50	1.0	04/23/91
Trans-1,2-DCE	ND	0.50	1.0	04/23/91
1,1-dichloroethane	1.8	0.40	1.0	04/23/91
Chloroform	ND	0.20	1.0	04/23/91
1,1,1-trichloroethane	6.0	0.20	1.0	04/23/91
Carbon Tetrachloride	ND	0.50	1.0	04/23/91
1,2-dichloroethane	ND	0.20	1.0	04/23/91
Trichloroethylene	0.75	0.50	1.0	04/23/91
1,2-dichloropropane	ND	0.20	1.0	04/23/91
Bromodichloromethane	ND	0.50	1.0	04/23/91
Trans-1,3-DCP	ND	0.50	1.0	04/23/91
Cis-1,3-DCP	ND	0.50	1.0	04/23/91
1,1,2-trichloroethane	ND	0.10	1.0	04/23/91
Tetrachloroethene	0.7	0.20	1.0	04/23/91
Dibromchloromethane	ND	0.50	1.0	04/23/91
Chlorobenzene	ND	0.50	1.0	04/23/91
Bromoform	ND	0.50	1.0	04/23/91
1,1,2,2-TCA	ND	0.20	1.0	04/23/91
1,2,3-Trichloropropane	NOT REQ.	.		
2-Chlorotoluene	NOT REQ.	.		
1,3-dichlorobenzene	ND	0.50	1.0	04/23/91
1,4-dichlorobenzene	ND	0.50	1.0	04/23/91
1,2-dichlorobenzene	ND	0.50	1.0	04/23/91

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 9AA-293
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS NOT REQ. = TARGET ANALYTE NOT REQUIRED

Received: 04/19/91

Results by Sample

SAMPLE ID OW-5-1 FRACTION 20A TEST CODE 602 NAME VOA Arom. HCs in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Benzene	<u>14</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Toluene	<u>0.57</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Chlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
Ethylbenzene	<u>0.58</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
P-tm-xylene	<u>4.5</u>	<u>1.0</u>	<u>1.0</u>	<u>04/23/91</u>
O-xylene	<u>1.1</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,3-dichlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,4-dichlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>
1,2-dichlorobenzene	<u>ND</u>	<u>0.50</u>	<u>1.0</u>	<u>04/23/91</u>

Notes and Definitions for this Report:

EXTRACTED _____
 ANALYST DL
 FILE ID 10AA-293
 UNITS ug/L
 BATCH_ID 5VOA-253
 COMMENTS _____

Received: 04/19/91

Results by Sample

SAMPLE ID OW-3-1 FRACTION 23A TEST CODE WTDS NAME Total DIS. solids in water
 Date & Time Collected 04/17/91 Category _____

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Dissolved Solids	<u>780</u>	<u>10</u>	<u>N/A</u>	<u>05/02/91</u>

Notes and Definitions for this Report:

EXTRACTED 05/02/91
 ANALYST WN
 UNITS mg/L
 BATCH_ID TDS-4
 COMMENTS _____

Received: 04/19/91

05/22/91 15:46:33

Aqua Resources, Inc.

WLFTD:

Sample 22A contains a hydrocarbon fuel at approximately 0.6 mg/L.
This fuel does not match diesel fuel.

Sample 38A contains a hydrocarbon fuel at approximately 0.7 mg/L.
This fuel does not match diesel fuel.

Sample 40A contains a hydrocarbon fuel at approximately 0.7 mg/L.
This fuel does not match diesel fuel.

ANALYTICAL RESULTS SUMMARY
 Aromatic Volatile Organic Compounds
 EPA Method 802

Laboratory Job Number **5027**

Laboratory Sample No	Blank	ML					
Client Sample No							
Date Analyzed	5-14-91						
Dilution Factor	1.0						
File Name	LAB-479	LAB-480					
Batch Number	200A-47						
Analyst	PLSK						

Detection Limit

COMPOUND NAME	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Benzene	ND	ND				0.50
Toluene						0.50
Chlorobenzene						0.50
Ethylbenzene						1.00
p & m-Xylene						0.50
o-Xylene						0.50
1,3-Dichlorobenzene						0.50
1,4-Dichlorobenzene						0.50
1,2-Dichlorobenzene						0.50

COMMENTS	

f:\lotus\602sum.wk1

Analytical Laboratories

5702 Bolsa Avenue

Huntington Beach, California 92649

Telephone: (714) 892-2566 Fax: (714) 892-4017

QC SUMMARY DATA SHEETS

Laboratory Job No.: 91-04-071
 Client Name: Aqua Resources
 Project No.: 690262
 Project Name: PG&E

QC SUMMARY
 Halogenated Volatile Organics
 EPA Method 601
 Water Matrix

Laboratory Sample No.:	LMB	LMB
Batch No.:	5VOA-253	3VOA-012
Date Analyzed:	04/23/91	04/23/91
Dilution Factor: (1)	1.0	1.0

<u>Compound Name</u>			Detection
	<u>(ug/L)</u>	<u>(ug/L)</u>	<u>Limit</u> <u>(ug/L)</u>
Chloromethane	ND	ND	2.0
Vinyl Chloride	ND	ND	1.0
Bromomethane	ND	ND	1.0
Chloroethane	ND	ND	1.0
Trichlorofluoromethane	ND	ND	0.50
1,1-dichloroethene	ND	ND	0.50
Dichloromethane	2.1	ND	0.50
Trans-1,2-dichloroethene	ND	ND	0.50
1,1-dichloroethane	ND	ND	0.40
Chloroform	ND	ND	0.20
1,1,1-trichloroethane	ND	ND	0.20
Carbon Tetrachloride	ND	ND	0.50
1,2-dichloroethane	ND	ND	0.20
Trichloroethylene	ND	ND	0.50
1,2-dichloropropane	ND	ND	0.20
Bromodichloromethane	ND	ND	0.50
Trans-1,3-dichloropropene	ND	ND	0.50
Cis-1,3-dichloropropene	ND	ND	0.50
1,1,2-trichloroethane	ND	ND	0.10
Tetrachloroethylene	ND	ND	0.20
Dibromochloromethane	ND	ND	0.50
Chlorobenzene	ND	ND	0.50
Bromoform	ND	ND	0.50
1,1,2,2-tetrachloroethane	ND	ND	0.20
1,3-dichlorobenzene	ND	ND	0.50
1,4-dichlorobenzene	ND	ND	0.50
1,2-dichlorobenzene	ND	ND	0.50

(1) If the dilution factor listed is other than one (1.0), please multiply the Dilution Factor times the Detection Limit (D.F. X D.L.) to determine individual sample detection limit.

ND = Not Detected

Laboratory Job No.: 91-04-071
Client Name: Aqua Resources
Project No.: 690262
Project Name: PG&E

QC SUMMARY
Aromatic Volatile Organics
EPA Method 602
Water Matrix

Laboratory Sample No.: LMB
Batch No.: 5VOA-253
Date Analyzed: 04/23/91
Dilution Factor: (1) 1.0

<u>Compound Name</u>	<u>(ug/L)</u>	<u>Detection Limit (ug/L)</u>
Benzene	ND	0.50
Toluene	ND	0.50
Chlorobenzene	ND	0.50
Ethylbenzene	ND	0.50
p-4m-xylene	ND	1.0
O-xylene	ND	0.50
1,3-dichlorobenzene	ND	0.50
1,4-dichlorobenzene	ND	0.50
1,2-dichlorobenzene	ND	0.50

(1) If the dilution factor listed is other than one (1.0), please multiply the Dilution Factor times the Detection Limit (D.F. X D.L.) to determine individual sample detection limit.

ND = Not Detected

Laboratory Job No.: 91-04-071
Client Name: Aqua Resources
Project No.: 690262
Project Name: PG&E

QC SUMMARY
DIESEL FUEL
Water Matrix

Laboratory Sample No.: LMB
Batch No.: LDW-8
Date Analyzed: 04/23/91
Dilution Factor: (1) 1.0

<u>Parameter</u>	<u>(mg/L)</u>	Detection Limit <u>(mg/L)</u>
HC Diesel Fuel	ND	0.20

(1) If the dilution factor listed is other than one (1.0), please multiply the Dilution Factor times the Detection Limit (D.F. X D.L.) to determine individual sample detection limit.

ND = Not Detected

QC SUMMARY

Method	8010
Batch No.	5V00-253
Date Extracted	
Date Analyzed	4-23-91

NCR No.	
Spiked Sample ID	4071-11
Concentration Units	ppb

ANALYTE	LMB		LCS			MS/MSD							
	Result	PDL MDL	Amount Added	Amount Found	%Rec.	Spiked Amount	Sample Amount	MS Amount	MSD Amount	MS %Rec.	MSD %Rec.	RPD	
1,1-DCE	ND	0.5	X			50	ND	22.7	20.6	113.4	102.8	11	
TCE	↓	↓					↓	↓	20.7	23.9	103.3	119.6	14
Chlorobenzene	↓	↓					↓	↓	25.2	24.6	125.7	123.2	2

Comments	

a:qcsummary

SURROGATE RECOVERY SUMMARY
EPA METHOD 8010

BATCH NUMBER: SVDA-253W

LAB NO.	DATA FILE NAME	ACQUISITION DATE	S1	S2	S3
20 PP8 STD	9AA-285	4-23-91	90.1	81.109 ⁴⁻²⁴⁻⁹¹	112.
BLANK	9AA-287	4-23-91	80.1	80.8	123.
4071-11 MSD	9AA-296	4-23-91	152.	127	131.
4071-11 MSD	9AA-302	4-24-91	103.	102	101.
4072-02 1:10	9AA-288	4-23-91	71.1	86.1	114.
4071-11	9AA-289	4-23-91	79.5	69.7	87.4
4071-13	9AA-290	4-23-91	86.3	88.4	106.
4071-15	9AA-291	4-23-91	65.8	44.7	55.6
4071-17	9AA-292	4-23-91	92.9	81.7	96.0
4071-19	9AA-293	4-23-91	79.7	73.2	86.0
4071-24	9AA-294	4-23-91	94.7	73.2	84.3

SOIL OC LIMITS WATER LIMITS

S1 = BROMOCHLOROMETHANE
S2 = BROMOCHLOROPROPANE
S3 = 1,4-DICHLOROBUTANE

61-130
60-140
57-144

56-139
75-125
46-159

QC SUMMARY

Method	801D
Batch No.	3000-02
Date Extracted	
Date Analyzed	4-28-91

NCR No.	GC-91-131
Spiked Sample ID	Blank water
Concentration Units	ppb

ANALYTE	LMB		LCS			MS/MSD						
	Result	PQL -MDE	Amount Added	Amount Found	%Rec.	Spiked Amount	Sample Amount	MS Amount	MSD Amount	MS %Rec.	MSD %Rec.	RPD
1,1-DCE	ND	0.5	X	X	X	DO	ND	15.2	13.0	76	65	8
ICE	↓	↓				↓	↓	17.5	16.4	87	82	3
Chlorobenzene	↓	↓				↓	↓	18.2	13.4	91	67	15

Comments	

a:\qcsummary

SURROGATE RECOVERY SUMMARY
EPA METHOD 8010
SOIL

BATCH NUMBER: ~~W~~3VOA-012

NCR NO:

LAB NO.	DATA FILE NAME	ACQUISITION DATE	S1	S2	S3
20 PPB STD	5AA-352	4-28-91	110.	109.	106.
BLANK	5AA-357	4-28-91	154.	117.	86.7
WATER LCS	5AA-343	4-27-91	113.	93.5	52.5
WATER LCS	5AA-344	4-27-91	92.8	69.1	45.2
4083-03	5AA-358	4-28-91	148.	110.	90.8
4071-15	5AA-339	4-27-91	121	87.3	79.6

QC LIMITS: SOIL WATER

S1 = BROMOCHLOROMETHANE	61-130	56-139
S2 = 2-BROMO-1-CHLOROPROPANE	60-140	75-125
S3 = 1,4-DICHLOROBUTANE	57-144	46-159

QC SUMMARY

Method	8020
Batch No.	5V00-753
Date Extracted	
Date Analyzed	4-23-91

NCR No.	
Spiked Sample ID	4071-11
Concentration Units	ppb

ANALYTE	LMB		LCS			MS/MSD								
	Result	POL MDE	Amount Added	Amount Found	%Rec.	Spiked Amount	Sample Amount	MS Amount	MSD Amount	MS %Rec.	MSD %Rec.	RPD		
Benzene	ND	0.5	X	X	X	20	ND	19.6	21.3	98.1	106.7	8.4		
Toluene	↓	↓				↓	↓	20.3	21.4	20.3	21.4	101.3	107.1	5.6
Chlorobenzene	↓	↓				↓	↓	22.9	21.4	22.9	21.4	114.4	106.9	6.6

Comments	

a:\qcsummary

SURROGATE (a,a,a-Trifluorotoluene) RECOVERY SUMMARY
EPA METHOD 8020

BATCH NUMBER: *SVOA-253 W*

LAB NO.	DATA FILE NAME	ACQUISITION DATE	AM'NT ADDED	RESULT	% R
20 PP8 STD	10AA-286	4-23-91	30	33.8	113
BLANK	10AA-287	4-23-91	30	32.0	107
4071-11 MSD	10AA-296	4-23-91	30	34.5	115
4071-11 MSD	10AA-302	4-24-91	30	32.5	108
4072-02 1:10	10AA-288	4-23-91	30	34.7	116
4071-11	10AA-289	4-23-91	30	25.2	84.1
4071-13	10AA-290	4-23-91	30	30.2	101
4071-15	10AA-291	4-23-91	30	16.6	55.2
4071-17	10AA-292	4-23-91	30	27.9	93.0
4071-19	10AA-293	4-23-91	30	22.7	75.8
4071-24	10AA-294	4-23-91	30	25.5	85.2

QC SUMMARY

Method ICP
 Batch No. IFW-60
 Date Extracted 04-29-91
 Date Analyzed 04-29-91

NER No.
 Spiked Sample ID 4071-7A
 Concentration Units mg/L
 Actual Spike (mg/L) MS MSD
 2 2

ANALYTE	LMB		LCS			Spiked Sample		MS/MSD		MS %Rec.	MSD %Rec.	RPD
	Result	MDL	Amount Added	Amount Found	%Rec.	Amount	Amount	MS	MSD			
Lead	0.000	<i>0.05</i>	1	0.989	98.9	2.0	0.00	2.01	2.01	100.4	100.9	0.4

MSU
5-1-91

QC SUMMARY

Method	TPH water 418.1
Batch No.	WPH-13
Date Extracted	5-2-91
Date Analyzed	5-2-91

Spiked Sample ID	4071-39A
Concentration Units	mg/L

ANALYTE	LMB		LCS			MS/MSD						
	Result	MDL	Amount Added	Amount Found	%Rec.	Spiked Amount	Sample Amount	MS Amount	MSD Amount	MS %Rec.	MSD %Rec.	RPD
TPH water	0.28	0.05	16.43	14.94	90.67	16.48	0.36	15.52	15.40	96.47	90.69	1.45

Comments

QC SUMMARY

Method	TDSw-160-1
Batch No.	TPS-4
Date Extracted	5-7-91
Date Analyzed	5-2-91

Spiked Sample ID	4087-11A
Concentration Units	mg/L

ANALYTE	LMB		LCS			MS/MSD						
	Result	MDL	Amount Added	Amount Found	%Rec.	Spiked Amount	Sample Amount	MS Amount	MSD Amount	MS %Rec.	MSD %Rec.	RPD
TDS	6.0	10	500	460	92	500	44	550	562	106.2	103.6	2.3

Comments

APPENDIX B

CHAIN-OF-CUSTODY DOCUMENTATION



Analytical Laboratories
 5702 Bolsa Ave.
 Huntington Beach, Ca. 92649
 (714) 892-2565 FAX (714) 890-4032

Chain of Custody Record

Lab Job no.: _____
 Date _____
 Page _____ of _____

Client ARI - Berkeley

Project Manager Wancy Tenley

Address _____

Telephone No. 415-540-6954

Project Name / Number PG&E/690262

Fax No. 415-540-7496

Contract / Purchase Order / Quote _____

Samplers: (Signature) Beate Neuenhofer

No. of Containers
 Pb ~~2~~ 1
 Luft Diesel
 8-2-86
 601
 (Hydrocarbons) 418.1

Laboratory Sample Number	Field Sample Number	Location	Date	Time	Sample Type	Type/Size of Container	Preservation		No. of Containers	Analysis Required	Remarks
							Temp.	Chemical			
Triplank			4/17			Plastic bottle	3°C				Hold until results are in
OW-1-1					Water	Plastic bottle / qt		/	1	✓	
OW-1-2								/	1	✓	
OW-3-1								/	1	✓	
OW-3-2								/	1	✓	
OW-4-1								/	1	✓	
OW-4-2								/	1	✓	
OW-5-1								/	1	✓	
OW-5-2								/	1	✓	
OW-1-1						Jar / qt		H ₂ SO ₄	1	✓	
OW-1-1						Jar / qt		/	1	✓	
OW-4-1						VOA vial		/	1	✓	

Relinquished by: Signature <u>Beate Neuenhofer</u> Printed <u>BEATE NEUENHOFER</u> Company <u>ARI - Berkeley</u> Reason <u>lab analysis</u>	Date <u>04/18</u> Time <u>6pm</u>	Received by: Signature _____ Printed _____ Company _____ Reason _____	Relinquished by: Signature _____ Printed _____ Company _____ Reason _____	Date _____ Time _____	Received by: Signature _____ Printed _____ Company _____ Reason _____
---	--------------------------------------	---	---	--------------------------	---

Method of Shipment: <u>Fed EX</u> Shipment No. _____ Special Instructions: _____	Comments: <u>* Pb samples need to be filtered before analysis!</u>	After analysis, samples are to be: <input type="checkbox"/> Disposed of (additional fee) <input type="checkbox"/> Stored (90 days max) <input type="checkbox"/> Stored over 90 days (additional fee) <input type="checkbox"/> Returned to customer
--	--	--

Chain of Custody Record

Analytical Laboratories
5702 Bolsa Ave.
Huntington Beach, Ca. 92649
(714) 892-2565 FAX (714) 890-4032

Lab job no.: _____
Date _____
Page _____ of _____

Client ARI - Berkeley
Address _____
Project Name / Number PG & E 1690262
Contract / Purchase Order / Quote _____

Project Manager Clancy Tenley
Telephone No. 415-540-6954
Fax No. 415-540-7496
Samplers: (Signature) Beate Neuenhofer

No. of Containers	Analysis Requested		Remarks
	601	602	
601	✓		} Hold until results of samples are in
602	✓		
Luft Diesel		✓	
Oil / Diesel		✓	
Pb *		✓	
		✓	
		✓	
		✓	
		✓	
		✓	

Laboratory Sample Number	Field Sample Number	Location	Date	Time	Sample Type	Type/Size of Container	Preservation						
							Temp.	Chemical					
	OW-2-1		4/17		Water	VOA vial	3°C	/	1	✓			
	OW-2-1					VOA vial		HCl	1	✓			
	OW-2-1					Jar 1 qt.		/	1		✓		
	OW-2-1					Jar 1 qt.		H ₂ SO ₄	1		✓		
	OW-2-1					Plastic bottle 1 qt.		/	1			✓	
	OW-2-2					Plastic bottle 1 qt.		/	1			✓	
	Field blank				Dist. Water	Jar 1 qt.		/	1		✓		
	Field blank					Jar 1 qt.		H ₂ SO ₄	1		✓		
	Field blank					Plastic bottle 1 qt.		/	1			✓	
	Trip blank					Jar 1 qt.		H ₂ SO ₄	1		✓		
	Trip blank					Jar 1 qt.		/	1		✓		
	Trip blank					VOA vial		HCl	1	✓			

Relinquished by: Signature <u>Beate Neuenhofer</u> Printed <u>BEATE NEUENHOFER</u> Company <u>ARI - Berkeley</u> Reason <u>Lab Analysis</u>	Date <u>04/18</u> Time <u>4 p.m.</u>	Received by: Signature _____ Printed _____ Company _____ Reason _____	Relinquished by: Signature _____ Printed _____ Company _____ Reason _____	Date _____ Time _____	Received by: Signature _____ Printed _____ Company _____ Reason _____
---	---	---	---	--------------------------	---

Method of Shipment: <u>Fed Ex</u> Shipment No. _____ Special Instructions: _____	Comments: <u>* Pb samples must be filtered before analysis</u>	After analysis, samples are to be: <input type="checkbox"/> Disposed of (additional fee) <input type="checkbox"/> Stored (90 days max) <input type="checkbox"/> Stored over 90 days (additional fee) <input type="checkbox"/> Returned to customer
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Chain of Custody Record

Lab job no.: _____

Laboratory Earth Technology Analytical Laboratories

Date _____

Address 5702 Bolsa Ave.

Method of Shipment: Fed Ex

Huntington Beach, CA. 92649

Shipment No. _____

714.892.2565 Fax 714.890.4032

Project Manager Nancy Tonley

Client ARI - Berkeley

Telephone No. 415-540-6954

Address _____

Fax No. 415-540-7496

Project Name / Number PG&E / 690262

Samplers: (Signature) Beate Nauenhofer

Contract / Purchase Order / Quote _____

Filtered /
 No. of Containers
 Left Direct
 one 16 gram (Hydrocarbons) (418)

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Analysis Required	Remarks
						Temp.	Chemical		
OW-4-1		04/17		Water	Jar / 9+	3°C	/		
OW-4-1							H ₂ SO ₄		
OW-3-1							/		
OW-3-1							H ₂ SO ₄		
OW-3-2							/		
OW-3-2							H ₂ SO ₄		

Relinquished by: <u>Beate Nauenhofer</u>	Date: <u>04/18</u>	Received by: _____	Date: _____	Relinquished by: _____	Date: _____	Received by: _____	Date: _____
Signature: _____		Signature: _____		Signature: _____		Signature: _____	
Printed: <u>BEATE NAUENHOFER</u>		Printed: _____		Printed: _____		Printed: _____	
Company: <u>ARI - Berkeley</u>	Time: <u>4pm</u>	Company: _____	Time: _____	Company: _____	Time: _____	Company: _____	Time: _____
Reason: <u>lab analysis</u>		Reason: _____		Reason: _____		Reason: _____	

Comments: _____	Relinquished by: _____	Date: _____	Received by: _____	Date: _____
_____	Signature: _____		Signature: _____	
_____	Printed: _____		Printed: _____	
_____	Company: _____	Time: _____	Company: _____	Time: _____
_____	Reason: _____		Reason: _____	