

  
CLEARWATER  
GROUP, INC.  
Environmental Services

Mr. Barney Chan  
Alameda County Health Care Services  
Department of Environmental Health  
1131 Harbor Bay Parkway  
Alameda, CA 94502-6577

June 11, 1998

Re: **Quarterly Groundwater Monitoring Report**  
**Hertz Service Center**  
**1 Airport Drive, Oakland, California**

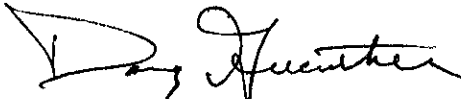
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Dear Mr. Chan,

Enclosed is a copy of the *Quarterly Groundwater Monitoring Report* for the Hertz property at the International Airport in Oakland, California. This report presents groundwater monitoring and sampling data for the first quarter 1998.

Please feel free to call me at 510-893-5160 (extension 15) if you have questions regarding this report or other project matters.

Sincerely,  
CLEARWATER GROUP, INC.

  
Douglas C. Guenther  
Project Geologist

New Hertz contact:

Roland Costanzo  
The Hertz Co.  
225 Brae Blvd.  
Park Ridge NJ 07656-0713

cc: Mr. Jeff Rubin - Port of Oakland

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JUN 16 1998

ENVIRONMENTAL HEALTH SERVICES  
NORTH COUNTY

# CLEARWATER

G R O U P, I N C.

Environmental Services

## GROUNDWATER MONITORING REPORT

FIRST QUARTER 1998

Hertz Service Center,

1 Airport Drive,

Oakland, California

June 11, 1998

### BACKGROUND

The property, located adjacent to the passenger terminal at Oakland International Airport, is currently used as a rental car service facility. Reports previously submitted by Environmental Science & Engineering, Inc. (ESE) indicate that one underground storage tank (UST) is present at the site, and that three USTs have been removed from the facility. Two additional USTs, located adjacent to the property, are used by the Port of Oakland and the Federal Aviation Administration for fuel storage, *the FAA UST have been recently removed & deemed "clean"*.

Nine monitoring wells were installed as part of the site investigation; groundwater monitoring has been conducted since December, 1993. MW-8 has not been located since 1996 and is believed to have been paved over. In accordance with a directive from the Alameda County Environmental Health Services (EHS), a minimum of two monitoring wells (MW-4 and MW-6) will be monitored on a quarterly basis, and wells MW-5, MW-7, and MW-9 will be monitored annually. The annual monitoring will occur in the second quarter of 1998.

### GROUNDWATER MONITORING AND SAMPLING ACTIVITIES (FIRST QUARTER, 1998)

Date of groundwater sampling:	March 10, 1998
Wells gauged:	MW-1 through MW-7, and MW-9
Wells purged and sampled:	MW-1, MW-4, MW-6, and MW-9
Analytes tested:	TPHg, BTEX, MTBE, nitrate, dissolved iron, sulfate
Laboratory:	American Environmental Network (Pleasant Hill, CA)
Field measurements:	Dissolved oxygen (DO), redox potential (Eh)

### GROUNDWATER MONITORING AND SAMPLING RESULTS

Depth to groundwater:	2.11 to 3.50 feet below top of casing
Flow direction:	Southwest
TPHg concentration range:	<50 µg/l (MW-1, MW-6 and MW-9) to 15,000 µg/l (MW-4)
Benzene concentration range:	<0.5 µg/l (MW-1, MW-6 and MW-9) to 2,500 µg/l (MW-4)
MTBE concentration range:	<5 µg/l (MW-1 and MW-9) to 400 µg/l (MW-4)
DO concentration range:	2.6 mg/L (MW-4) to 5.0 mg/L (MW-1)
Eh range:	-165 mV (MW-4) to 165 mV (MW-9)
Nitrate concentration range:	ND<0.1 mg/L (MW-4, MW-6) to 1.4 mg/L (MW-1)
Dissolved Iron concentration range:	ND<0.1 mg/L (MW-1) to 1.0 mg/L (MW-4)
Sulfate concentration range:	23 mg/L (MW-9) to 59 mg/L (MW-1, MW-6)

Remarks: DO is most depleted and Eh most reducing in the contaminated well, MW-4, followed by MW-6 a short distance downgradient. This configuration is indicative of ongoing intrinsic biodegradation of the central part of the hydrocarbon plume. Nitrate is depleted below detection limits in MW-4 and MW-6. Dissolved iron concentrations are most elevated in MW-4, followed by MW-6. Sulfate concentrations do not appear to be significantly depleted. These results indicate that aerobic



biodegradation processes are occurring in the central part of the plume, and that groundwater conditions associated with this process migrate downgradient with the groundwater to MW-6.

One monitoring well (MW-4) was analyzed by EPA Method 8260 for methyl-tert butyl ether (MTBE) as required by the EHS. The MTBE concentration obtained by this method was 380 mg/L.

## PROJECT STATUS

The EHS has approved the *Workplan for Remediation Services* dated June 13, 1997. This workplan proposes baseline groundwater sampling, the application of Oxygen Release Compound (ORC), and subsequent groundwater monitoring. Baseline data has been collected during recent groundwater sampling events. Currently, there are no plans to remove the active UST~~s~~ at this facility, however, the implementation of remedial activities is being evaluated in response to the possible changes to rental car facility locations, which may occur during the upcoming Oakland Airport expansion. The result of this evaluation will be communicated to the EHS under a separate cover.

## APPENDIX

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Contour Map - 3/10/98 (Figure 3)
- Hydrocarbon Distribution Map - 3/10/98 (Figure 4)
- Natural Attenuation Parameter Distribution Map - 3/10/98 (Figure 5)
- Groundwater Elevations and Analytical Results (Table 1)
- Intrinsic Bioremediation Data (Table 2)
- Clearwater Gauging Data/Purge Calculations and Well Purging Data
- Certified Laboratory Reports, Chromatograms, and Chain-of-Custody Form
- Clearwater Groundwater Monitoring and Sampling Protocols

**CERTIFICATION**

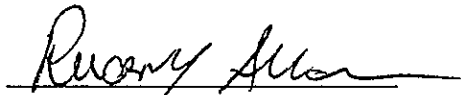
This report was prepared under the supervision of a professional registered geologist at Clearwater Group, Inc. All statements, conclusions, and recommendations are based solely upon field observations by Clearwater Group, Inc. and analyses performed by a State-certified laboratory related to the work performed by Clearwater Group, Inc.

It is possible that variations in the soil or groundwater conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage or other factors.


The service performed by Clearwater Group, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

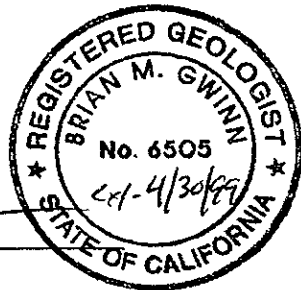
Clearwater Group, Inc. includes in this report chemical analytical data from a State-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Clearwater Group, Inc. is not responsible for laboratory errors in procedure or result reporting.

Prepared by:

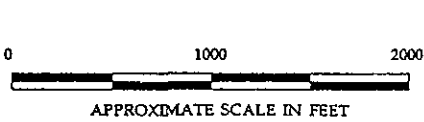
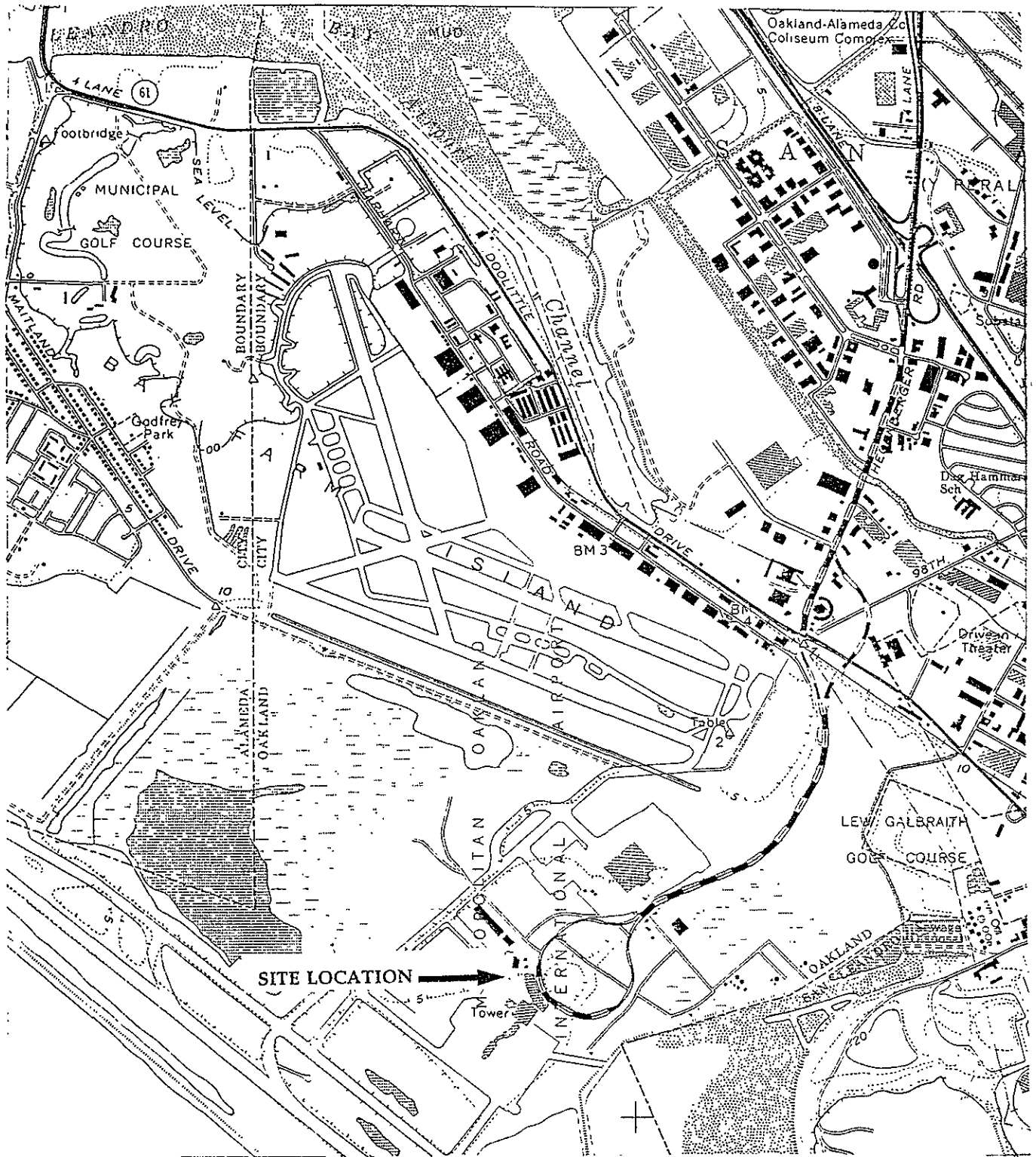
  
Ruary Allan  
Staff Geologist

Reviewed by:

  
Brian Gwinn, R.G.  
Senior Geologist



# FIGURES



BASE MAP FROM U.S.G.S. 7.5 MINUTE SERIES: SAN LEANDRO, CALIFORNIA

**SITE LOCATION MAP**

Hertz Service Center,  
1 Airport Drive,  
Oakland, California

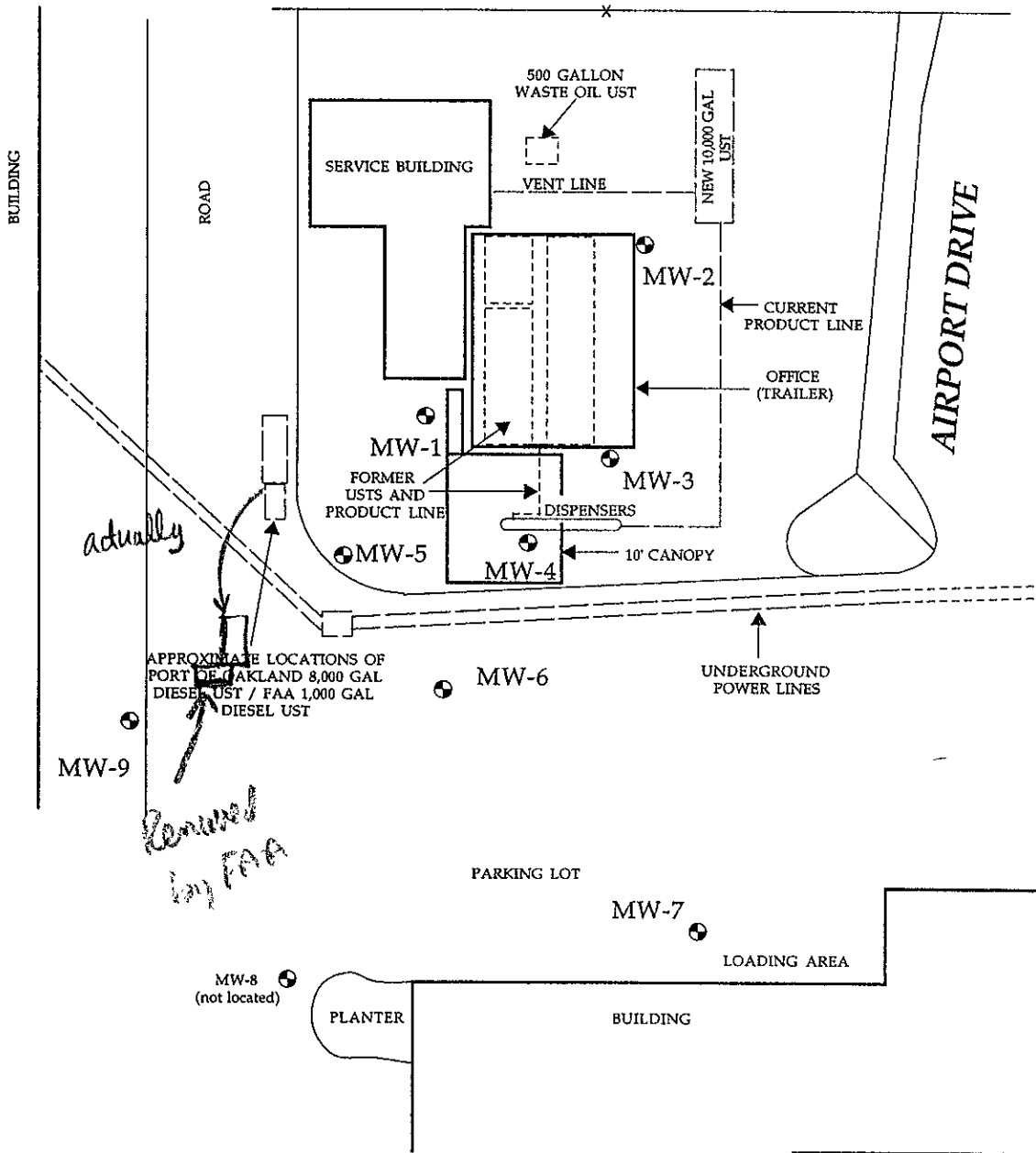
**CLEARWATER GROUP, INC.**

Project No.  
C-156

Figure Date  
10/96

Figure  
1

# ALAN SHEPARD WAY


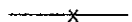


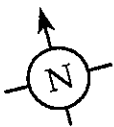
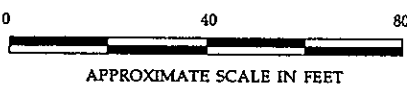
APPROXIMATE LOCATIONS OF  
PORT OF OAKLAND 8,000 GAL  
DIESEL UST / FAA 1,000 GAL  
DIESEL UST

*actually*

*Removed  
by FAA*

## EXPLANATION

-  GROUNDWATER MONITORING WELL
-  FENCELINE



SITE PLAN BASED ON MAP BY ESE, INC.  
JANUARY 4, 1994

## SITE PLAN

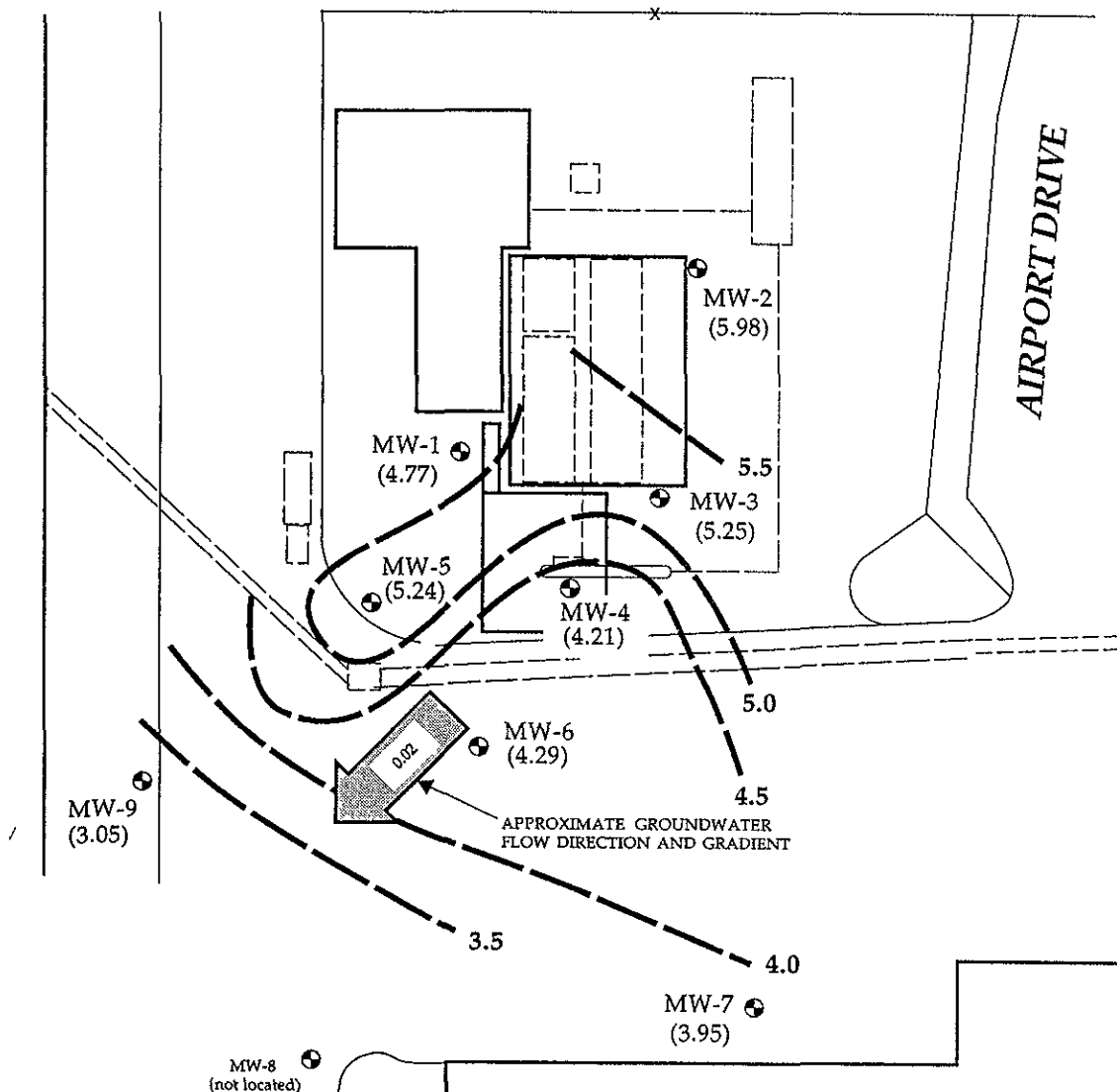
Hertz Service Center,  
1 Airport Drive,  
Oakland, California

## CLEARWATER GROUP, INC.

Project No. C-156	Figure Date 10/96	Figure 2
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ALAN SHEPARD WAY

AIRPORT DRIVE

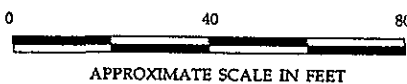


APPROXIMATE GROUNDWATER FLOW DIRECTION AND GRADIENT

EXPLANATION

- GROUNDWATER MONITORING WELL
- (2.15) GROUNDWATER ELEVATION (IN FEET) - REFERENCED TO MEAN SEA LEVEL
- NM GROUNDWATER ELEVATION NOT MEASURED
- 4.0 - - - GROUNDWATER ELEVATION CONTOUR - CONTOUR INTERVAL 1.0 FEET

SITE PLAN BASED ON MAP BY ESE, INC. JANUARY 4, 1994



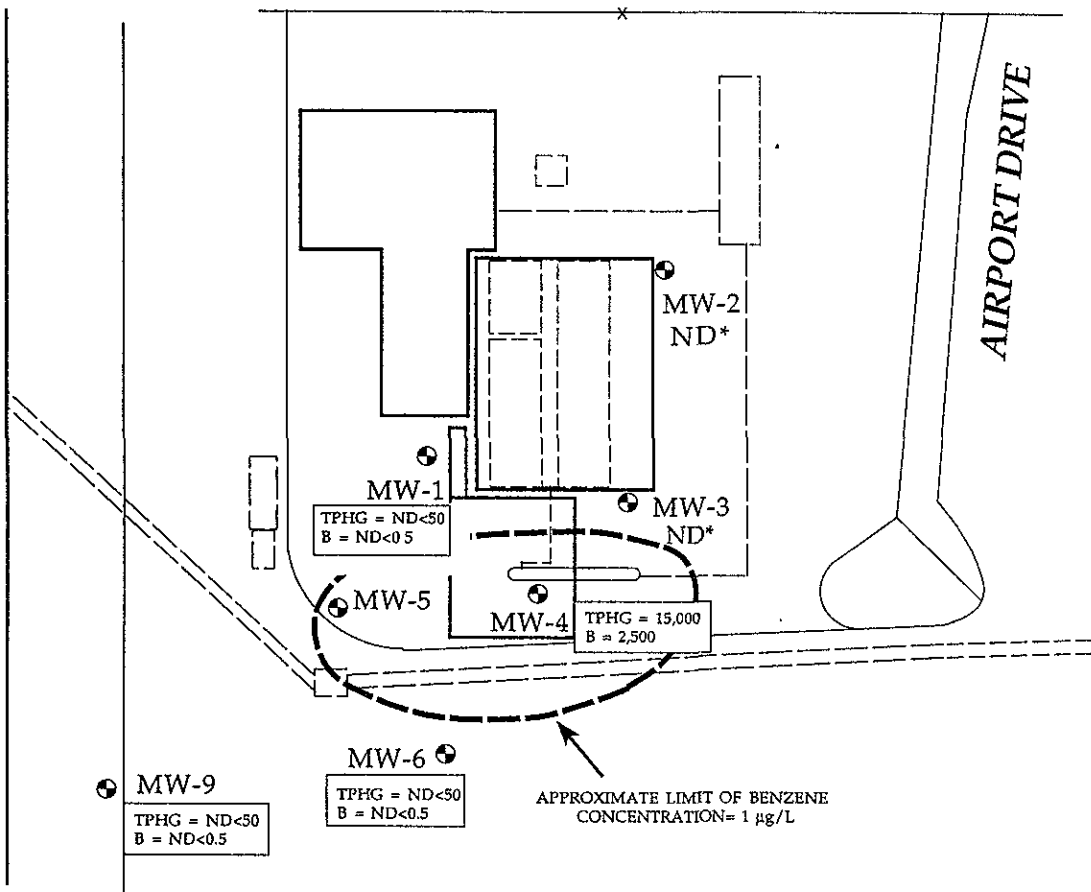
**GROUNDWATER CONTOUR MAP- 3/10/98**  
Hertz Service Center,  
1 Airport Drive,  
Oakland, California

**CLEARWATER GROUP, INC.**

Project No. C-156	Figure Date 3/98	Figure 3
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ALAN SHEPARD WAY



AIRPORT DRIVE

APPROXIMATE LIMIT OF BENZENE CONCENTRATION = 1 µg/L

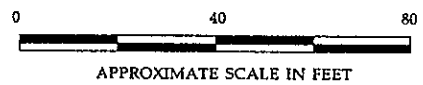
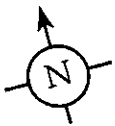
EXPLANATION

- GROUNDWATER MONITORING WELL
- MW-2

TPHG = ND < 50	B = 0.6
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CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHG) & BENZENE (B) DETECTED IN GROUNDWATER SAMPLES - IN PARTS PER BILLION. SAMPLES COLLECTED ON 3/10/98. ND=COMPOUND NOT DETECTED.
- ND\*

TPHG AND BENZENE CONCENTRATIONS NOT DETECTABLE (ON THE BASIS OF HISTORICAL ANALYTICAL DATA)
- APPROXIMATE EXTENT OF BENZENE GROUNDWATER CONCENTRATION = 1 PPB



SITE PLAN BASED ON MAP BY ESE, INC. JANUARY 4, 1994

HYDROCARBON DISTRIBUTION MAP  
3/10/98

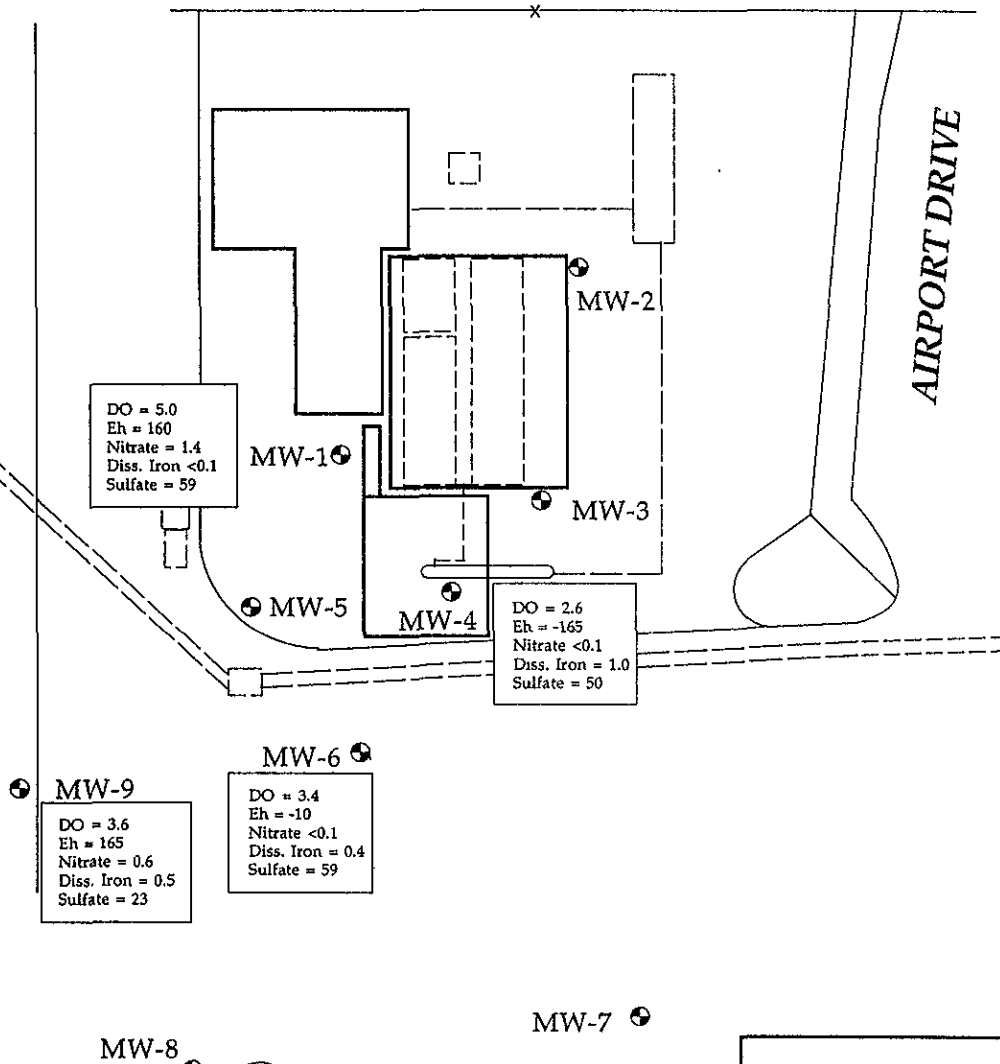
Hertz Service Center,  
1 Airport Drive,  
Oakland, California

CLEARWATER GROUP, INC.

Project No. C-156	Figure Date 4/98	Figure 4
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ALAN SHEPARD WAY

AIRPORT DRIVE



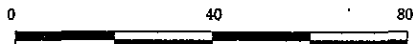
EXPLANATION



GROUNDWATER MONITORING WELL

DO = 3.4  
Eh = -10  
Nitrate <0.1  
Diss. Iron = 0.4  
Sulfate = 59

CONCENTRATIONS OF NITRATE, SULFATE AND DISSOLVED IRON (mg/L) IN GROUNDWATER SAMPLES, AND REDOX POTENTIAL (mV) AND DISSOLVED OXYGEN (mg/L) IN FIELD MEASUREMENTS.



APPROXIMATE SCALE IN FEET

NATURAL ATTENUATION  
PARAMETER DISTRIBUTION MAP  
- 3/10/98

Hertz Service Center,  
1 Airport Drive,  
Oakland, California

CLEARWATER GROUP, INC.

Project No.  
C-156

Figure Date  
4/98

Figure  
5

# TABLES

**Table 1**  
**GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS**

Hertz Service Center  
 1 Airport Drive  
 Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)
MW-1	8/20/91	7.45	5.15	2.30	ND	ND	ND	ND	ND	--	ND
	11/12/91	7.45	4.39	3.06	ND	ND	ND	ND	ND	--	ND
	2/18/92	7.45	4.39	3.06	ND	ND	ND	ND	ND	--	ND
	5/13/92	7.45	4.52	2.93	ND	ND	ND	ND	ND	--	--
	9/1/92	7.45	4.90	2.55	ND	ND	ND	ND	ND	--	--
	11/5/92	7.45	5.06	2.39	ND	ND	ND	ND	ND	--	--
	2/3/93	7.45	4.11	3.34	ND	ND	ND	ND	ND	--	--
	5/27/93	7.45	4.14	3.31	ND	ND	ND	ND	ND	--	ND
	12/2/93	7.45	4.54	2.91	ND	ND	ND	ND	ND	--	ND
	9/17/96	7.45	4.09	3.36	--	--	--	--	--	--	--
	11/27/96	7.45	3.82	3.63	--	--	--	--	--	--	--
	2/14/97	7.45	3.29	4.16	--	--	--	--	--	--	--
	12/3/97	7.45	3.52	3.93	--	--	--	--	--	--	--
	3/10/98	7.45	2.68	4.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2.0	ND<5.0	--
	MW-2	8/20/91	8.09	4.00	4.09	ND	ND	ND	ND	ND	--
11/12/91		8.09	4.23	3.86	ND	ND	ND	ND	ND	--	52
2/18/92		8.09	4.23	3.86	ND	ND	ND	ND	ND	--	ND
5/13/92		8.09	3.43	4.66	ND	ND	ND	ND	ND	--	--
9/1/92		8.09	3.94	4.15	56	2.0	3.0	0.8	3.1	--	--
11/5/92		8.09	4.04	4.05	ND	ND	ND	ND	ND	--	--
2/3/93		8.09	3.25	4.84	ND	ND	ND	ND	ND	--	--
5/27/93		8.09	3.27	4.82	ND	ND	ND	ND	ND	--	ND
12/2/93		8.09	3.65	4.44	ND	ND	ND	ND	ND	--	ND
9/17/96		8.09	3.35	4.74	--	--	--	--	--	--	--
11/27/96		8.09	3.18	4.91	--	--	--	--	--	--	--
2/14/97		8.09	2.65	5.44	--	--	--	--	--	--	--
12/3/97		8.09	2.95	5.14	--	--	--	--	--	--	--
3/10/98		8.09	2.11	5.98	--	--	--	--	--	--	--

**Table 1**  
**GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS**

Hertz Service Center  
 1 Airport Drive  
 Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)
MW-3	8/20/91	7.66	4.60	3.06	ND	ND	ND	ND	ND	--	ND
	11/12/91	7.66	4.74	2.92	ND	ND	ND	ND	ND	--	ND
	2/18/92	7.66	4.74	2.92	ND	ND	ND	ND	ND	--	ND
	5/13/92	7.66	4.02	3.64	ND	ND	ND	ND	ND	--	--
	9/1/92	7.66	4.45	3.21	ND	1.1	1.6	ND	1.9	--	--
	11/5/92	7.66	4.59	3.07	ND	ND	ND	ND	ND	--	--
	2/3/93	7.66	3.63	4.03	ND	ND	ND	ND	ND	--	--
	5/27/93	7.66	3.82	3.84	ND	ND	ND	ND	ND	--	55
	12/2/93	7.66	4.06	3.60	ND	ND	ND	ND	ND	--	ND
	9/17/96	7.66	3.76	3.90	--	--	--	--	--	--	--
	11/27/96	7.66	3.58	4.08	--	--	--	--	--	--	--
	2/14/97	7.66	3.01	4.65	--	--	--	--	--	--	--
	12/3/97	7.66	3.31	4.35	--	--	--	--	--	--	--
3/10/98	7.66	2.41	5.25	--	--	--	--	--	--	--	
MW-4	2/18/92	7.11	3.68	3.43	6,600	910	1,900	280	1,700	--	ND
	5/13/92	7.11	3.54	3.57	62,000	3,400	5,200	990	5,200	--	--
	9/1/92	7.11	3.97	3.14	120,000	8,800	14,000	2,100	11,000	--	--
	11/5/92	7.11	5.23	1.88	24,000	2,600	3,300	510	2,100	--	--
	2/3/93	7.11	4.22	2.89	50,000	4,700	5,000	1,500	6,600	--	--
	5/27/93	7.11	4.33	2.78	48,000	6,300	7,200	1,600	6,800	--	4,900
	12/2/93	7.11	4.72	2.39	21,000	3,500	3,800	640	2,000	--	770
	9/17/96	7.11	4.38	2.73	16,000	4,300	1,900	750	1,900	100	220
	11/27/96	7.11	4.20	2.91	14,000	5,100	2,600	1,300	2,500	ND<300	ND<200
	2/14/97 (b,c)	7.11	3.58	3.53	19,000	3,300	3,100	980	2,600	150	210
	12/3/97	7.11	3.92	3.19	19,000	3,300	3,100	980	2,600	150	210
3/10/98	7.11	2.90	4.21	15,000	2,500	2,600	80	3,900	400	--	

**Table 1**  
**GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS**

Hertz Service Center  
 1 Airport Drive  
 Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)
MW-5	11/5/92	7.76	4.76	3.00	ND	ND	ND	ND	ND	--	170
	2/3/93	7.76	--	--	--	--	--	--	--	--	--
	5/27/93	7.76	3.88	3.88	ND	ND	ND	ND	ND	--	75
	12/2/93	7.76	4.36	3.40	ND	ND	ND	ND	ND	--	60
	9/17/96	7.76	3.99	3.77	--	--	--	--	--	--	--
	11/27/96	7.76	3.80	3.96	--	--	--	--	--	--	--
	2/14/97 (b)	7.76	3.16	4.60	100	1.2	ND<0.5	0.8	ND<2	95	860
	3/10/98	7.76	2.52	5.24	--	--	--	--	--	--	--
MW-6	11/5/92	7.17	5.28	1.89	820	250	ND	5.9	ND	--	--
	2/3/93	7.17	4.27	2.90	330	120	2.8	19	5.3	--	--
	5/27/93	7.17	4.35	2.82	1,300	370	ND	87	19	--	960
	12/2/93	7.17	4.81	2.36	280	11	1.0	65	3.0	--	700
	9/17/96	7.17	4.39	2.78	ND<50	1.0	0.5	ND<0.5	ND<2.0	ND<5	270
	11/27/96	7.17	4.23	2.94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2.0	7.0	ND<50
	2/14/97 (b)	7.17	3.57	3.60	50	0.9	ND<0.5	ND<0.5	ND<2.0	9.0	600
	12/3/97	7.17	3.92	3.25	50	0.9	ND<0.5	ND<0.5	ND<2.0	9.0	600
3/10/98	7.17	2.88	4.29	ND<50	ND<0.5	ND<0.5	0.6	ND<2.0	7.0	--	
MW-7	5/27/93	6.93	4.58	2.35	ND	ND	ND	ND	ND	--	76
	12/2/93	6.93	4.78	2.15	ND	ND	ND	ND	ND	--	ND
	9/17/96	6.93	4.52	2.41	--	--	--	--	--	--	--
	11/27/96	6.93	4.35	2.58	--	--	--	--	--	--	--
	2/14/97 (b)	6.93	3.70	3.23	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	140
	12/3/97	6.93	4.04	2.89	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	140
	3/10/98	6.93	2.98	3.95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	--
MW-8	5/27/93	6.75	4.84	1.91	ND	ND	ND	ND	ND	--	91
	12/2/93	6.75	5.44	1.31	ND	ND	ND	ND	ND	--	54
	9/17/96 (a)	6.75	--	--	--	--	--	--	--	--	--

**Table 1**  
**GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS**

Hertz Service Center  
1 Airport Drive  
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)
MW-9	5/27/93	6.55	4.97	1.58	ND	ND	ND	ND	ND	--	72
	12/2/93	6.55	5.53	1.02	ND	ND	ND	ND	ND	--	72
	9/17/96	6.55	4.95	1.60	--	--	--	--	--	--	--
	11/27/96	6.55	--	--	--	--	--	--	--	--	--
	2/14/97 (b)	6.55	4.16	2.39	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	130
	12/3/97	6.55	4.40	2.15	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	130
	3/10/98	6.55	3.50	3.05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	--

**Notes:**

- TOC Elevation at the north side of the top of the well casing referenced to mean sea level (wells were surveyed by others)
- DTW Depth to water
- GWE Groundwater elevation
- TPHg Total petroleum hydrocarbons as gasoline using EPA Method 8015 (modified)
- TPHd Total petroleum hydrocarbons as diesel fuel using EPA Method 8015 (modified)
- BTEX Benzene, toluene, ethylbenzene and total xylenes using EPA Method 8020 (modified)
- MTBE Methyl ter butyl ether using EPA Method 8020 (modified)
- µg/L Micrograms per liter
- Not tested, not measured
- ND Not detected in concentrations at or above laboratory reporting limit (indicated if available).
- (a) MW-8 could not be located (paved over)
- (b) Laboratory chromatograms indicate that samples may contain weathered diesel fuel or a light oil
- (c) Reporting limits elevated because of high levels of target compounds; MTBE included in gasoline result

Analytical results prior to September 17, 1996 were taken from the *Report of Findings, Fourth Quarter 1993 Ground Water Monitoring* by Environmental Science & Engineering (January 4, 1994). Analytical results for metals, oil and grease, halogenated volatile compounds, and semi-volatile organics are not included in this table.

**Table 2**  
**INTRINSIC BIOREMEDIATION DATA**

Hertz Service Center  
1 Airport Drive  
Oakland, California

MW-No.	Date	DO (mg/L)	Eh (mV)	Nitrate (mg/L)	Diss. Iron (mg/L)	Sulfate (mg/L)
MW-1	12/3/97	3.5	25	--	--	--
	3/10/98	5.0	160	1.4	ND<0.1	59
MW-4	12/3/97	1.0	-150	ND<0.1	0.5	70
	3/10/98	2.6	-165	ND<0.1	1.0	50
MW-6	12/3/97	1.5	-35	ND<0.1	0.40	150
	3/10/98	3.4	-10	ND<0.1	0.40	59
MW-9	12/3/97	3.2	140	ND<0.1	ND<0.1	1.0
	3/10/98	3.6	165	0.6	0.5	23

**Notes:**

DO           Elevation at the north side of the top of the well casing referenced to mean sea level (wells were surveyed by others)

Eh            Depth to water

Nitrate       Nitrate as nitrogen by EPA Method 300

Diss. Iron    Dissolved iron by EPA Method 6010

Sulfate       Sulfate by EPA Method 300

mg/L         Milligrams per liter

mV            Millivolts



# APPENDIX A

# WELL GAUGING DATA/PURGE CALCULATIONS

Job No.: C 156      Location: Hertz Oakland Airport      Date: 3-10-98      Tech(s): RA

WELL NO.	DIAM (in)	DTB (ft)	DTW (ft)	ST (ft)	CV (gal)	PV (gal)	SPL (ft)	NOTES
MW-1	2	14.8	2.68	12.12	1.94	5.82		
2			2.11					
3			2.41					
4		8.04	2.90	5.14	0.83	2.47		
5			2.52					
6		11.60	2.88	8.72	1.40	4.2		
7			2.98					
9	v	10.58	3.50	7.08	1.14	3.4		

**Explanation:**

DIAM = Well Diameter  
 DTB = Depth to Bottom  
 DTW = Depth to Water  
 ST = Saturated Thickness (DTB-DTW)  
 CV = Casing Volume (ST x cf)  
 PV = Purge Volume (standard 3 x CV,  
 well development 10 x CV)  
 SPL = Thickness of Separate Phase Liquid

**Conversion Factors (cf)**

2 inch diameter well cf = 0.16 gal/ft  
 4 inch diameter well cf = 0.65 gal/ft  
 6 inch diameter well cf = 1.44 gal/ft

**CLEARWATER GROUP, INC.**  
 520 Third St., Ste. 104  
 Oakland, California 94607  
 Phone: (510) 893-5160  
 Fax: (510) 893-5947

# WELL PURGING DATA

Job No.: C 156 Location: Hertz, Oakland Airport, Date: 3-10-98 Tech: RA

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: 520	Sample for: (circle)
MW-6	1430	0	65.6	0.46	7.03		TPHg TPHd TPHmo
Calc. purge		1 1/2	65.7	0.85	7.35		BTEX MTBE 8010
volume		3 1/2	66.4	2.32	7.40		Other: Fe, Nitrate/Sulf.
5.82	1440	6	66.5	2.38	7.42		Sampling Method:
							Dedicated / Disposable bailer
							Purging Method:
							PVC bailer / Pump

DO = 3.4  
Eh = -10

COMMENTS: color, turbidity, recharge, etc.

greenish-grey, low-moderate, good

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: 1630	Sample for: (circle)
MW-4	1600	0	67.4	1.34	7.52		TPHg TPHd TPHmo
Calc. purge		1	65.8	1.36	7.63		BTEX MTBE + 8260 conf 8010
volume		2	65.0	1.35	7.64		Other: Fe, Nit/Sulf.
2.5	1610	2 1/2	63.6	1.33	7.66		Sampling Method:
							Dedicated / Disposable bailer
							Purging Method:
							PVC bailer / Pump

Eh = -165  
DO = 2.6

COMMENTS: color, turbidity, recharge, etc.

black, low mod, poor-fair.

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: 1600	Sample for: (circle)
MW-41	1530	0	63.1	0.73	8.03		TPHg TPHd TPHmo
Calc. purge		1 1/2	63.0	0.74	7.92		BTEX MTBE 8010
volume		3	62.6	0.75	7.92		Other: Fe, Nit/Sulf.
4.2	1540	4 1/2	62.3	0.78	7.91		Sampling Method:
							Dedicated / Disposable bailer
							Purging Method:
							PVC bailer / Pump

DO = 5.0  
Eh = 160

COMMENTS: color, turbidity, recharge, etc.

dk brown-grey, mod, good.

# WELL PURGING DATA

SHEET 2 OF 2

Job No.: C156      Location: Hertz, Oakland Airport      Date: 3-10-98      Tech: RA

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: / 500	Sample for: (circle)		
MW-9	1400	0	65.8	0.30	6.31		(TPHg)	TPHd	TPHmo
Calc. purge		1	65.7	0.35	6.35		(BTEX)	(MTBE)	8010
volume		2 1/2	65.8	0.34	6.70		Other: <u>Fe Nit/Sulfate</u>		
3.4	1410	3 1/2	65.7	0.34	6.77		Sampling Method:		
DO = 3.6 Eh = 165 COMMENTS: color, turbidity, recharge, etc. <u>tan, moderate, fair-good</u>							Dedicated / Disposable bailer		
							Purging Method: <u>PVC bailer / Pump</u>		

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time:	Sample for: (circle)		
							TPHg	TPHd	TPHmo
Calc. purge							BTEX	MTBE	8010
volume							Other:		
							Sampling Method:		
							Dedicated / Disposable bailer		
COMMENTS: color, turbidity, recharge, etc. _____							Purging Method:		
							PVC bailer / Pump		

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time:	Sample for: (circle)		
							TPHg	TPHd	TPHmo
Calc. purge							BTEX	MTBE	8010
volume							Other:		
							Sampling Method:		
							Dedicated / Disposable bailer		
COMMENTS: color, turbidity, recharge, etc. _____							Purging Method:		
							PVC bailer / Pump		

## APPENDIX B

RECEIVED APR - 3 1998

# American Environmental Network

## Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

CLEARWATER GROUP, INC.  
520 THIRD ST., STE. 104  
OAKLAND, CA 94607

ATTN: RUARY ALLEN  
CLIENT PROJ. ID: C-156

REPORT DATE: 03/27/98

DATE(S) SAMPLED: 03/10/98

DATE RECEIVED: 03/11/98

AEN WORK ORDER: 9803128

### PROJECT SUMMARY:

On March 11, 1998, this laboratory received 4 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Reviewed by:

*William Sandoza*

## CLEARWATER GROUP, INC.

SAMPLE ID: MW-1  
 AEN LAB NO: 9803128-01  
 AEN WORK ORDER: 9803128  
 CLIENT PROJ. ID: C-156

DATE SAMPLED: 03/10/98  
 DATE RECEIVED: 03/11/98  
 REPORT DATE: 03/27/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/23/98
Toluene	108-88-3	ND	0.5	ug/L	03/23/98
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/23/98
Xylenes, Total	1330-20-7	ND	2	ug/L	03/23/98
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/23/98
Methyl t-Butyl Ether	1634-04-4	ND	5	ug/L	03/23/98
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	03/19/98
Iron	EPA 6010	ND	0.1	mg/L	03/25/98
#Anion Sample Prep.		-		Prep date	03/12/98
Nitrate as Nitrogen	EPA 300	1.4 *	0.1	mg/L	03/12/98
Sulfate	EPA 300	59 *	0.5	mg/L	03/12/98

ND = Not detected at or above the reporting limit  
 \* = Value at or above reporting limit

## CLEARWATER GROUP, INC.

SAMPLE ID: MW-4  
 AEN LAB NO: 9803128-02  
 AEN WORK ORDER: 9803128  
 CLIENT PROJ. ID: C-156

DATE SAMPLED: 03/10/98  
 DATE RECEIVED: 03/11/98  
 REPORT DATE: 03/27/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	2,500 *	10	ug/L	03/24/98
Toluene	108-88-3	2,600 *	10	ug/L	03/24/98
Ethylbenzene	100-41-4	80 *	10	ug/L	03/24/98
Xylenes, Total	1330-20-7	3,900 *	40	ug/L	03/24/98
Purgeable HCs as Gasoline	5030/GCFID	15 *	1	mg/L	03/24/98
Methyl t-Butyl Ether	1634-04-4	400 *	100	ug/L	03/24/98
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	03/19/98
Iron	EPA 6010	1.0 *	0.1	mg/L	03/25/98
#Anion Sample Prep.		-		Prep date	03/12/98
Nitrate as Nitrogen	EPA 300	ND	0.1	mg/L	03/12/98
Sulfate	EPA 300	50 *	0.5	mg/L	03/12/98
Methyl t-Butyl Ether	EPA 8260	380 *	30	ug/L	03/24/98

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit



## CLEARWATER GROUP, INC.

SAMPLE ID: MW-6  
 AEN LAB NO: 9803128-03  
 AEN WORK ORDER: 9803128  
 CLIENT PROJ. ID: C-156

DATE SAMPLED: 03/10/98  
 DATE RECEIVED: 03/11/98  
 REPORT DATE: 03/27/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/24/98
Toluene	108-88-3	ND	0.5	ug/L	03/24/98
Ethylbenzene	100-41-4	0.6 *	0.5	ug/L	03/24/98
Xylenes, Total	1330-20-7	ND	2	ug/L	03/24/98
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	03/24/98
Methyl t-Butyl Ether	1634-04-4	7 *	5	ug/L	03/24/98
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	03/19/98
Iron	EPA 6010	0.4 *	0.1	mg/L	03/25/98
#Anion Sample Prep.		-		Prep date	03/12/98
Nitrate as Nitrogen	EPA 300	ND	0.1	mg/L	03/12/98
Sulfate	EPA 300	59 *	0.5	mg/L	03/12/98

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

## CLEARWATER GROUP, INC.

SAMPLE ID: MW-9  
 AEN LAB NO: 9803128-04  
 AEN WORK ORDER: 9803128  
 CLIENT PROJ. ID: C-156

DATE SAMPLED: 03/10/98  
 DATE RECEIVED: 03/11/98  
 REPORT DATE: 03/27/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5 ug/L		03/23/98
Toluene	108-88-3	ND	0.5 ug/L		03/23/98
Ethylbenzene	100-41-4	ND	0.5 ug/L		03/23/98
Xylenes, Total	1330-20-7	ND	2 ug/L		03/23/98
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05 mg/L		03/23/98
Methyl t-Butyl Ether	1634-04-4	ND	5 ug/L		03/23/98
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	03/19/98
Iron	EPA 6010	0.5 *	0.1 mg/L		03/25/98
#Anion Sample Prep.		-		Prep date	03/12/98
Nitrate as Nitrogen	EPA 300	0.6 *	0.1 mg/L		03/12/98
Sulfate	EPA 300	23 *	0.5 mg/L		03/12/98

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

AEN (CALIFORNIA)  
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9803128  
CLIENT PROJECT ID: C-156

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9803128

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: Metals Scan by ICP

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank  
 INSTRUMENT: TJA Enviro 36  
 UNITS: mg/L  
 METHOD:

LAB ID: IFW\_PBW\_A  
 PREPARED:  
 ANALYZED: 03/25/98

INSTR RUN: ICP\980325190000/1/  
 BATCH ID: IFW031998-A  
 DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Ag Silver	ND		0.005						
Al Aluminum	ND		0.1						
Ba Barium	ND		0.01						
Be Beryllium	ND		0.002						
Ca Calcium	ND		0.2						
Cd Cadmium	ND		0.005						
Co Cobalt	ND		0.005						
Cr Chromium	ND		0.01						
Cu Copper	ND		0.01						
Fe Iron	ND		0.1						
K Potassium	ND		0.1						
Mg Magnesium	ND		0.04						
Mn Manganese	ND		0.005						
Mo Molybdenum	ND		0.01						
Na Sodium	ND		0.5						
Ni Nickel	ND		0.01						
Pb Lead	ND		0.04						
Sb Antimony	ND		0.02						
Tl Thallium	ND		0.05						
V Vanadium	ND		0.005						
Zn Zinc	ND		0.01						

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank  
 INSTRUMENT: TJA Enviro 36  
 UNITS: mg/L  
 METHOD:

LAB ID: IFW\_LCD\_A  
 PREPARED:  
 ANALYZED: 03/25/98

INSTR RUN: ICP\980325190000/3/1  
 BATCH ID: IFW031998-A  
 DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Ag Silver	0.0252	ND	0.005	0.0250	101	80	120		
Al Aluminum	1.07	ND	0.1	1.00	107	80	120		
Ba Barium	1.03	ND	0.01	1.00	103	80	120		
Be Beryllium	0.0278	ND	0.002	0.0250	111	80	120		
Ca Calcium	10.3	ND	0.2	10.0	103	80	120		
Cd Cadmium	0.0515	ND	0.005	0.0500	103	80	120		
Co Cobalt	0.267	ND	0.005	0.250	107	80	120		
Cr Chromium	0.108	ND	0.01	0.100	108	80	120		
Cu Copper	0.131	ND	0.01	0.125	105	80	120		
Fe Iron	0.532	ND	0.1	0.500	106	80	120		
K Potassium	10.2	ND	0.1	10.0	102	80	120		
Mg Magnesium	10.7	ND	0.04	10.0	107	80	120		
Mn Manganese	0.268	ND	0.005	0.250	107	80	120		
Mo Molybdenum	0.209	ND	0.01	0.200	105	80	120		
Ni Nickel	0.262	ND	0.01	0.250	105	80	120		
Pb Lead	0.536	ND	0.04	0.500	107	80	120		
Sb Antimony	0.496	ND	0.02	0.500	99.2	80	120		
Tl Thallium	0.543	ND	0.05	0.500	109	80	120		
V Vanadium	0.263	ND	0.005	0.250	105	80	120		
Zn Zinc	0.292	ND	0.01	0.250	117	80	120		

SAMPLE TYPE: Spike-Method/Media blank  
 INSTRUMENT: TJA Enviro 36  
 UNITS: mg/L  
 METHOD:

LAB ID: IFW\_LCS\_A  
 PREPARED:  
 ANALYZED: 03/25/98

INSTR RUN: ICP\980325190000/2/1  
 BATCH ID: IFW031998-A  
 DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Ag Silver	0.0247	ND	0.005	0.0250	98.8	80	120		
Al Aluminum	1.03	ND	0.1	1.00	103	80	120		
Ba Barium	1.01	ND	0.01	1.00	101	80	120		

WORK ORDER: 9803128

QUALITY CONTROL REPORT

PAGE QR-3

ANALYSIS: Metals Scan by ICP

MATRIX: Water

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank  
 INSTRUMENT: TJA Enviro 36  
 UNITS: mg/L  
 METHOD:

LAB ID: IFW\_LCS\_A  
 PREPARED:  
 ANALYZED: 03/25/98

INSTR RUN: ICP\980325190000/2/1  
 BATCH ID: IFW031998-A  
 DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Be Beryllium	0.0285	ND	0.002	0.0250	114	80	120		
Ca Calcium	9.85	ND	0.2	10.0	98.5	80	120		
Cd Cadmium	0.0481	ND	0.005	0.0500	96.2	80	120		
Co Cobalt	0.258	ND	0.005	0.250	103	80	120		
Cr Chromium	0.103	ND	0.01	0.100	103	80	120		
Cu Copper	0.127	ND	0.01	0.125	102	80	120		
Fe Iron	0.520	ND	0.1	0.500	104	80	120		
K Potassium	9.80	ND	0.1	10.0	98.0	80	120		
Mg Magnesium	10.2	ND	0.04	10.0	102	80	120		
Mn Manganese	0.259	ND	0.005	0.250	104	80	120		
Mo Molybdenum	0.207	ND	0.01	0.200	104	80	120		
Na Sodium	10.3	ND	0.5	10.0	103	80	120		
Ni Nickel	0.250	ND	0.01	0.250	100	80	120		
Pb Lead	0.508	ND	0.04	0.500	102	80	120		
Sb Antimony	0.486	ND	0.02	0.500	97.2	80	120		
Tl Thallium	0.510	ND	0.05	0.500	102	80	120		
V Vanadium	0.255	ND	0.005	0.250	102	80	120		
Zn Zinc	0.254	ND	0.01	0.250	102	80	120		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Method Spike Sample Duplicate  
 INSTRUMENT: TJA Enviro 36  
 UNITS: mg/L  
 METHOD:

LAB ID: IFW\_LCR\_A  
 PREPARED:  
 ANALYZED: 03/25/98

INSTR RUN: ICP\980325190000/4/2  
 BATCH ID: IFW031998-A  
 DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Ag Silver	0.0252	0.0247	0.005					2.00	20
Al Aluminum	1.07	1.03	0.1					3.81	20
Ba Barium	1.03	1.01	0.01					1.96	20
Be Beryllium	0.0278	0.0285	0.002					2.49	20
Ca Calcium	10.3	9.85	0.2					4.47	20
Cd Cadmium	0.0515	0.0481	0.005					6.83	20
Co Cobalt	0.267	0.258	0.005					3.43	20
Cr Chromium	0.108	0.103	0.01					4.74	20
Cu Copper	0.131	0.127	0.01					3.10	20
Fe Iron	0.532	0.520	0.1					2.28	20
K Potassium	10.2	9.80	0.1					4.00	20
Mg Magnesium	10.7	10.2	0.04					4.78	20
Mn Manganese	0.268	0.259	0.005					3.42	20
Mo Molybdenum	0.209	0.207	0.01					0.962	20
Ni Nickel	0.262	0.250	0.01					4.69	20
Pb Lead	0.536	0.508	0.04					5.36	20
Sb Antimony	0.496	0.486	0.02					2.04	20
Tl Thallium	0.543	0.510	0.05					6.27	20
V Vanadium	0.263	0.255	0.005					3.09	20
Zn Zinc	0.292	0.254	0.01					13.9	20

WORK ORDER: 9803128

QUALITY CONTROL REPORT

PAGE QR-4

ANALYSIS: Nitrate-Nitrogen

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank			LAB ID: IC_BLNK			INSTR RUN: IC\980312000000/1/			
INSTRUMENT: Dionex ion chromatograph			PREPARED:			BATCH ID: IC031298			
UNITS: mg/L			ANALYZED: 03/12/98			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
	LOW	HIGH							
Nitrate as N EPA 300	ND		0.1						

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank			LAB ID: IC_LCD			INSTR RUN: IC\980312000000/3/1			
INSTRUMENT: Dionex ion chromatograph			PREPARED:			BATCH ID: IC031298			
UNITS: mg/L			ANALYZED: 03/12/98			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
	LOW	HIGH							
Nitrate as N EPA 300	1.94	ND	0.1	2.00	97.0	80	120		

SAMPLE TYPE: Spike-Method/Media blank			LAB ID: IC_LCS			INSTR RUN: IC\980312000000/2/1			
INSTRUMENT: Dionex ion chromatograph			PREPARED:			BATCH ID: IC031298			
UNITS: mg/L			ANALYZED: 03/12/98			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
	LOW	HIGH							
Nitrate as N EPA 300	1.94	ND	0.1	2.00	97.0	80	120		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Method Spike Sample Duplicate			LAB ID: IC_LCR			INSTR RUN: IC\980312000000/4/2			
INSTRUMENT: Dionex ion chromatograph			PREPARED:			BATCH ID: IC031298			
UNITS: mg/L			ANALYZED: 03/12/98			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
	LOW	HIGH							
Nitrate as N EPA 300	1.94	1.94	0.1					0	15

MATRIX SPIKE SAMPLES

SAMPLE TYPE: Spike-Sample/Matrix			LAB ID: MS03128-01D			INSTR RUN: IC\980312000000/6/5			
INSTRUMENT: Dionex ion chromatograph			PREPARED:			BATCH ID: IC031298			
UNITS: mg/L			ANALYZED: 03/12/98			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
	LOW	HIGH							
Nitrate as N EPA 300	2.45	1.40	0.1	1.00	105	75	125		

WORK ORDER: 9803128

QUALITY CONTROL REPORT

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ANALYSIS: Volatile GC/MS

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank      LAB ID: BLNK\_0323      INSTR RUN: GCMS12\980323000000/1/  
 INSTRUMENT: HP mass spec for Volatiles      PREPARED:      BATCH ID: MS12W032398  
 UNITS: ug/L      ANALYZED: 03/23/98      DILUTION: 1.00  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
1,2-DCA-d4 (surr)	109			100	109	65	140		
Toluene-d8 (surr)	95.7			100	95.7	70	135		
p-BFB (surr)	101			100	101	70	135		
1,1-Dichloroethene	ND		5						
Benzene	ND		5						
Trichloroethene	ND		5						
Toluene	ND		5						
Chlorobenzene	ND		5						
Bromobenzene	ND		5						
Bromochloromethane	ND		5						
Bromodichloromethane	ND		5						
Bromoform	ND		5						
Bromomethane	ND		10						
n-Butylbenzene	ND		5						
sec-Butylbenzene	ND		5						
tert-Butylbenzene	ND		5						
Carbon Tetrachloride	ND		5						
Chloroethane	ND		10						
Chloroform	ND		5						
Chloromethane	ND		10						
2-Chlorotoluene	ND		5						
4-Chlorotoluene	ND		5						
Dibromochloromethane	ND		5						
1,2-Dibromo-3-chloropropan	ND		5						
1,2-Dibromoethane	ND		5						
Dibromomethane	ND		5						
1,2-Dichlorobenzene	ND		5						
1,3-Dichlorobenzene	ND		5						
1,4-Dichlorobenzene	ND		5						
Dichlorodifluoromethane	ND		10						
1,1-Dichloroethane	ND		5						
1,2-Dichloroethane	ND		5						
cis-1,2-Dichloroethene	ND		5						
trans-1,2-Dichloroethene	ND		5						
1,2-Dichloropropane	ND		5						
1,3-Dichloropropane	ND		5						
2,2-Dichloropropane	ND		5						
1,1-Dichloropropene	ND		5						
Ethylbenzene	ND		5						
Hexachlorobutadiene	ND		5						
Isopropylbenzene	ND		5						
p-Isopropyltoluene	ND		5						
Methylene Chloride	ND		10						
Naphthalene	ND		5						
n-Propylbenzene	ND		5						
Styrene	ND		5						
1,1,1,2-Tetrachloroethane	ND		5						
1,1,1,2,2-Tetrachloroethane	ND		5						
Tetrachloroethene	ND		5						
1,2,3-Trichlorobenzene	ND		5						
1,2,4-Trichlorobenzene	ND		5						
1,1,1-Trichloroethane	ND		5						
1,1,2-Trichloroethane	ND		5						
Trichlorofluoromethane	ND		5						
1,2,3-Trichloropropane	ND		5						
1,2,4-Trimethylbenzene	ND		5						
1,3,5-Trimethylbenzene	ND		5						
Vinyl Chloride	ND		10						
Xylenes, Total	ND		10						
Trichlorotrifluoroethane	ND		5						
Acetone	ND		100						
Acrylonitrile	ND		10						
2-Butanone	ND		100						
Carbon Disulfide	ND		10						

WORK ORDER: 9803128

QUALITY CONTROL REPORT

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ANALYSIS: Volatile GC/MS

MATRIX: Water

METHOD BLANK SAMPLES

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SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK_0323	INSTR RUN: GCMS12\980323000000/1/	
INSTRUMENT: HP mass spec for Volatiles		PREPARED:	BATCH ID: MS12W032398	
UNITS: ug/L		ANALYZED: 03/23/98	DILUTION: 1.00	
METHOD:				

ANALYTE	RESULT-	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
trans-1,4-Dichloro-2-buten	ND		100						
cis-1,3-Dichloropropene	ND		5						
trans-1,3-Dichloropropene	ND		5						
2-Hexanone	ND		50						
Methyl Iodide	ND		200						
4-Methyl-2-pentanone	ND		50						
Vinyl Acetate	ND		50						
2-Chloroethyl Vinyl Ether	ND		10						
o-Xylene	ND		10						
m,p-Xylene	ND		10						
MTBE	ND		5						

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LABORATORY CONTROL SAMPLES

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SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCS_0323	INSTR RUN: GCMS12\980323000000/2/1	
INSTRUMENT: HP mass spec for Volatiles		PREPARED:	BATCH ID: MS12W032398	
UNITS: ug/L		ANALYZED: 03/23/98	DILUTION: 1.00	
METHOD:				

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
1,2-DCA-d4 (surr)	104	109		100	104	65	135		
Toluene-d8 (surr)	97.5	95.7		100	97.5	70	130		
p-BFB (surr)	97.8	101		100	97.8	70	130		
1,1-Dichloroethene	45.8	ND	5	50.0	91.6	70	130		
Benzene	54.2	ND	5	50.0	108	70	130		
Trichloroethene	53.1	ND	5	50.0	106	70	130		
Toluene	60.1	ND	5	50.0	120	70	130		
Chlorobenzene	57.8	ND	5	50.0	116	70	130		

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SAMPLE SURROGATES

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SAMPLE TYPE: Sample-Client		LAB ID: 9803128-02E	INSTR RUN: GCMS12\980323000000/5/	
INSTRUMENT: HP mass spec for Volatiles		PREPARED:	BATCH ID: MS12W032398	
UNITS: ug/L		ANALYZED: 03/24/98	DILUTION: 5.00	
METHOD:				

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
1,2-DCA-d4 (surr)	116			100	116	65	135		
Toluene-d8 (surr)	92.6			100	92.6	70	130		
p-BFB (surr)	98.8			100	98.8	70	130		

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----- End of Quality Control Report -----



QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9803128 -  
 INSTRUMENT: H  
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery	
			Fluorobenzene	
03/23/98	MW-1	01	102	
03/24/98	MW-4	02	104	
03/24/98	MW-6	03	101	
03/23/98	MW-9	04	102	

QC Limits: 70-130

DATE ANALYZED: 03/23/98  
 SAMPLE SPIKED: LCS  
 INSTRUMENT: H

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Percent Recovery	RPD	QC Limits	
				Percent Recovery	RPD
Benzene	200	97	3	70-130	20
Toluene	200	97	3	70-130	20
Ethylbenzene	200	104	3	70-130	20
Total Xylenes	600	106	3	70-130	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

\*\*\* END OF REPORT \*\*\*

1. Client: HERTZ Service Center  
 Address: 1 Airport Drive  
Oakland CA  
 Contact: \_\_\_\_\_  
 Alt. Contact: \_\_\_\_\_

American Environmental Network

**AEN**

3440 Vincent Road, Pleasant Hill, CA 94523  
 Phone (510) 930-9090  
 FAX (510) 930-0256

**RECEIVED APR - 3 1998**

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

9803128

Lab Job Number: \_\_\_\_\_  
 Lab Destination: \_\_\_\_\_  
 Date Samples Shipped: \_\_\_\_\_  
 Lab Contact: \_\_\_\_\_  
 Date Results Required: \_\_\_\_\_  
 Date Report Required: \_\_\_\_\_  
 Client Phone No.: \_\_\_\_\_  
 Client FAX No.: \_\_\_\_\_

Address Report To:

RSSB  
 R3SI  
 Send Invoice To:

2. CLEARWATER GROUP INC  
570 Third St #104  
Oakland CA 94607

3. A52

Send Report To: 1 or 2 (Circle one)

Client P.O. No.: \_\_\_\_\_ Client Project I D. No.: C-156

Sample Team Member (s) \_\_\_\_\_

ANALYSIS									
TPH <sub>g</sub>	BTEX	MTBE	MTBE 8260	Nitrate	Sulfate	Dissolved	Lead	Copper	Zinc
X	X	X	X	X	X				
↓	↓	↓	↓	↓	↓				

Lab Number	Client Sample Identification	Air Volume	Date/Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	Comments / Hazards
1A-E	MW-1		3-10 1600	7	Hellman	5	P/Vol	Dissolved iron samples were filtered in the field and are unpreserved.
2A-H	MW-4		3-10 1630	7		8	↓	
3A-F	MW-6		3-10 1520	7		5	↓	
4A-F	MW-9		3-10 1500	7		5	↓	

Relinquished by: (Signature) <u>Richard Morgan</u>	DATE <u>3/11/98</u> TIME <u>1655</u>	Received by: (Signature) <u>Michael E. Kelle</u>	DATE <u>3/11/98</u> TIME <u>1655</u>
Relinquished by: (Signature) <u>Michael E. Kelle</u>	DATE <u>3/11/98</u> TIME <u>1750</u>	Received by: (Signature) <u>Greg Gibson</u>	DATE <u>3-11-98</u> TIME <u>1750</u>
Relinquished by: (Signature) _____	DATE _____ TIME _____	Received by: (Signature) _____	DATE _____ TIME _____
Method of Shipment _____		Lab Comments _____	

\*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter  
 4) PVC filter, diam. \_\_\_\_\_ pore size \_\_\_\_\_ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample  
 10) Other \_\_\_\_\_ 11) Other \_\_\_\_\_

# APPENDIX C

**CLEARWATER GROUP, INC.**  
**Groundwater Monitoring and Sampling Protocols**

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Groundwater Monitoring

Prior to beginning, a decontamination area is established. Decontamination procedures consist of scrubbing downhole equipment in an Alconox® solution wash (wash solution is pumped through any purging pumps used), and rinsing in a first rinse of potable water and a second rinse of potable water or deionized water if the latter is required. Any non-dedicated down hole equipment is decontaminated prior to use.

Prior to purging and sampling a well, the static water level is measured to the nearest 0.01 feet with an electronic water sounder. Depth to bottom is typically measured once per year, at the request of the project manager, and during Clearwater's first visit to a site. If historical analytical data are not available, with which to establish a reliable order of increasing well contamination, the water sounder and tape will be decontaminated between each well. If floating separate-phase hydrocarbons (SPH) are suspected or observed, SPH is collected using a clear, open-ended product bailer, and the thickness is measured to the nearest 0.01 feet in the bailer. SPH may alternatively be measured with an electronic interface probe. Any monitoring well containing a measurable thickness of SPH before or during purging is not additionally purged and no sample is collected from that well. Wells containing a hydrocarbon sheen are sampled unless otherwise specified by the project manager. Field observations such as well integrity as well as water level measurements and floating product thicknesses are noted on the Gauging Data/Purge Calculations form.

Well Purging

Each monitoring well to be sampled is purged using either a PVC bailer or a submersible pump. Physical parameters (pH, temperature and conductivity) of the purge water are monitored during purging activities to assess if the water sample collected is representative of the aquifer. If required, parameters such as dissolved oxygen, turbidity, salinity etc. are also measured. Samples are considered representative if parameter stability is achieved. Stability is defined as a change of less than 0.25 pH units, less than 10% change in conductivity in micro mhos, and less than 1.0 degree centigrade (1.8 degrees Fahrenheit) change in temperature. Parameters are measured in a discreet sample decanted from the bailer separately from the rest of the purge water. Parameters are measured at least four times during purging; initially, and at volume intervals of one well volume. Purging continues until three well casing volumes have been removed or until the well completely dewater. Wells which dewater or demonstrate a slow recharge, may be sampled after fewer than three well volumes have been removed. Well purging information is recorded on the Purge Data sheet. All meters used to measure parameters are calibrated daily. Purge water is sealed, labeled, and stored on site in D.O.T.-approved 55-gallon drums. After being chemically profiled, the water is removed to an appropriate disposal facility by a licensed waste hauler.

Groundwater Sample Collection

Groundwater samples are collected immediately after purging or, if purging rate exceeds well recharge rate, when the well has recharged to at least 80% of its static water level. If recharge is extremely slow, the well is allowed to recharge for at least two hours, if practicable, or until sufficient volume has accumulated for sampling. The well is sampled within 24 hours of purging or repurged. Samples are collected using polyethylene bailers, either disposable or dedicated to the well. Samples being analyzed for compounds most sensitive to volatilization are collected first. Water samples are placed in appropriate laboratory-supplied containers, labeled, documented on a chain of custody form and placed on ice in a cooler for transport to a state-certified analytical laboratory. Analytical detection limits match or surpass standards required by relevant local or regional guidelines.

Quality Assurance Procedures

To prevent contamination of the samples, CGI personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves are put on prior to sampling each well.
- Wells are gauged, purged and groundwater samples are collected in the expected order of increasing degree of contamination based on historical analytical results.
- All purging equipment will be thoroughly decontaminated between each well, using the procedures previously described at the beginning of this section.
- During sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

**CLEARWATER GROUP, INC.**  
**Groundwater Monitoring and Sampling Protocols**

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Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgable organic compounds.
- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.
- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by CGI depending on site conditions and regulatory requirements.