PES Environmental, Inc.
Engineering & Environmental Services

April 3, 1995

131.0100.003

Alameda County Environmental Health Services
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502

Attention: Ms. Susan Hugo

QUARTERLY GROUNDWATER MONITORING REPORT
FEBRUARY 1995 SAMPLING EVENT
EMERY BAY PLAZA
1650 65TH STREET
EMERYVILLE, CALIFORNIA

Dear Ms. Hugo:

This letter presents data collected by PES Environmental, Inc. (PES) during the February 9, 1995 quarterly groundwater monitoring. PES has been retained by Emery Bay Plaza to conduct groundwater monitoring at the subject site.

The objective of the groundwater monitoring program at this site is to: (1) evaluate the presence of hydrocarbons in groundwater; (2) provide data to assess the performance and effectiveness of the groundwater remedial program; and (3) monitor seasonal water level variations at the site. The monitoring is performed in accordance with California Regional Water Quality Control Board (RWQCB) guidelines and the approved remedial action plan for this site.

BACKGROUND INFORMATION

Six monitoring wells and one extraction well were installed at the site (Plate 2) following removal of an onsite underground storage tank (UST) in July 1987 and several offsite USTs in September and October 1989. Groundwater monitoring has been conducted at this facility since November 1989. An activated carbon groundwater treatment system was installed and operated under the authority of an East Bay Municipal Utility District wastewater discharge permit (Permit # 502-45131) from December 1990 until it was discontinued on October 25, 1993, pending start of an in-situ bioremediation pilot program in December 1994. Pilot study activities are ongoing and monitoring results will be presented in this and subsequent monitoring reports. The present sampling is the twenty-second consecutive sampling event since groundwater monitoring was initiated, and the thirteenth to be conducted by PES.

On September 22, 1994, PES installed an additional monitoring well, MW-8, near the eastern boundary of the subject property. The purpose of this upgradient well is to evaluate upgradient water quality and to provide an additional upgradient point of introduction for the in-situ bioremediation pilot study.

GROUNDWATER MEASUREMENTS

Water-Level Measurement Procedures

Quarterly groundwater monitoring activities were conducted on February 9, 1995. Prior to sampling, the groundwater level in each of the monitoring wells was measured to a precision of 0.01 feet using an electronic water-level indicator. Prior to each measurement, the portion of the water-level indicator that was submerged in the well was cleaned with a mild detergent solution and rinsed with de-ionized water.

Water-Level Measurement Results

Water-level data were converted to water-level elevations referenced to mean sea level (MSL). A groundwater elevation map constructed from the data is presented on Plate 3. An historical summary of groundwater elevations for wells at the site is presented in Table 1.

As compared with the prior quarterly monitoring event, groundwater elevations have increased in all of the monitoring wells. The water-level measured in MW-8 was not used in determining groundwater contours during this sampling event because the data was not consistent with nearby water-levels in MW-2, MW-6, and MW-7. Based on measured water levels on February 9, 1995, groundwater flow direction at the site was calculated to be toward the southwest, with an approximate gradient of 0.0005 to 0.014 foot per foot. This is consistent with historical groundwater flow direction and gradient.

Dissolved Oxygen Measurement Procedures

As part of the in-situ bioremediation pilot study at the subject property, dissolved oxygen measurements were collected prior to and following nutrient addition in December and during the February 1995 quarterly monitoring event. Prior to purging and sampling, the total dissolved oxygen in each of the seven monitoring wells and the extraction well was measured within the well using a YSI, Inc. dissolved oxygen meter. The equipment was calibrated according to the manufacturer's specifications before use. Prior to each measurement, the portion of the equipment submerged in the well was cleaned with a mild detergent solution and rinsed with de-ionized water. The total dissolved oxygen measurements were collected from each well within the middle portion of the water column.

Oxygen Enhancement

As part of the bioremediation pilot study, an oxygen source in the form of a solution of hydrogen peroxide, and nutrients (nitrogen and phosphorous) are periodically administered into wells EW-1, MW-2 and MW-8. On December 29, 1994, the first application of approximately 500 gallons of nutrient solution was introduced into the test wells. During nutrient addition, water levels and flow rates were monitored to allow an evaluation of permeability and hydraulic impact of the nutrient addition. Dissolved oxygen measurements were made prior to and following the introduction. The data generated during the nutrient addition is summarized in Tables 3 and 4.

Dissolved Oxygen Measurement Results

Dissolved oxygen measurements are used as an indication of the effectiveness of the oxygenation achieved during the pilot study. Total dissolved oxygen concentrations measured in onsite wells during the February monitoring event ranged from 0.6 milligrams per liter (mg/L) to 1.0 mg/L. Dissolved oxygen concentrations have increased in all wells since the previous measurements. Dissolved oxygen concentrations for the February 1995 monitoring event are provided in the groundwater sampling report in Appendix A. An historical summary of dissolved oxygen measurements is presented in Table 3. Concentrations of dissolved oxygen in the nutrient amended wells declined to concentrations comparable to non-amended wells since the December 1994 addition.

GROUNDWATER SAMPLING AND ANALYTICAL TESTING

Sampling Protocol

Groundwater samples were collected on February 9, 1995 by Blaine Tech Services, Inc. (Blaine Tech). Prior to sampling, the groundwater was visually inspected to assess the presence of floating product. A minimum of three well volumes were evacuated prior to sampling using a teflon bladder pump. During pumping the discharge water was measured for pH, temperature, electrical conductivity, and turbidity. Groundwater samples were collected with a clean teflon bailer and decanted into clean 40-milliliter glass vials with teflon lined caps.

Samples were immediately labeled to designate sample number, time and date collected, and analysis requested, and stored in a chilled, thermally-insulated cooler for transport to the analytical laboratory. The information collected during the groundwater sampling and the chain of custody records are presented in a groundwater sampling report prepared by Blaine Tech, provided in Appendix A.

Analytical Program

Groundwater samples from all wells including the extraction well were analyzed by American Environmental Network (AEN), a State-certified laboratory located in Pleasant Hill, California. Samples were analyzed for total petroleum hydrocarbons quantified as gasoline (TPH-gas) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Test Method 8015M/8020.

Analytical Results

Concentrations of TPH-gas and BTEX declined significantly in the wells in which nutrients were introduced as part of the pilot study. Consistent with historical monitoring data, TPH-gas was detected in Wells MW-2, MW-3, MW-4, MW-5, MW-7, and EW-1. Detectable concentrations of BTEX were found in MW-2 and EW-1; benzene, toluene and/or total xylenes were also detected in MW-3, MW-4, MW-5, and MW-7. No TPH-gas or BTEX was detected in MW-6 and MW-8. Consistent with previous analytical results, Well MW-2, located within the backfill of the former UST excavation, exhibited the highest levels of dissolved hydrocarbons (TPH-gas and BTEX).

Analytical results for all wells, including historical monitoring results for the previous sampling events and relevant federal and state standards, are presented in Table 2. Laboratory reports and chain of custody records are provided in Appendix B. The distribution of hydrocarbons in groundwater at the site on February 9, 1995 is presented on Plate 4.

SUMMARY

Groundwater elevations have generally increased since the November 3, 1994 sampling event. The increase is consistent with the seasonal water-level fluctuations coinciding with the rainy season. As with prior monitoring events, the groundwater flow direction continues to be toward the southwest.

Concentrations of dissolved hydrocarbons in wells in which nutrients were added decreased significantly. Additionally, initially high concentrations of dissolved oxygen following nutrient introduction were depleted, indicating accelerated aerobic biodegredation.

Concentrations of dissolved hydrocarbons in groundwater wells not subject to nutrient addition have either decreased or have not changed significantly since the prior quarterly monitoring event.

Because the nutrients added in December were totally depleted prior to the February monitoring event, the frequency of dissolved oxygen measurements following future nutrient additions will be increased to evaluate the rate of oxygen depletion.

If you have any questions or comments, please do not hesitate to call either of the undersigned.

Yours very truly,

PES ENVIRONMENTAL, INC.

Jenny F. Han
Staff Geologist

Andrew A. Briefer, P. E.
Associate Engineer

REGISTERED PROFESSIONAL ENGINEER
ANDREW A. BRIEFER
No. 046518
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CIVIL
STATE OF CALIFORNIA

Attachments:

	Table 1	Summary of Groundwater Elevations Through February 1995
	Table 2	Summary of Analytical Results for Groundwater Samples Through February 1995
	Table 3	Summary of Total Dissolved Oxygen February 1995
	Table 4	Summary of Nutrient Introduction Through February 1995
	Plate 1	Site Location Map
	Plate 2	Well Location Map
	Plate 3	Groundwater Elevation Contours on February 9, 1995
	Plate 4	Dissolved Hydrocarbons in Groundwater on February 9, 1995
	Appendix A	Groundwater Sampling Report
	Appendix B	Analytical Laboratory Reports

pc: Mr. Thomas Gram - P. O. Partners
Ms. Lynn Tolin - Emery Bay Plaza
Matt Dulka, Esq. - Hanson, Bridgett, Marcus, Vlahos & Rudy

Table 1. **Summary of Groundwater Elevations Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Groundwater Elevations (feet MSL)
MW-2	21-Feb-90	ES	15.75	11.72	4.03
	25-May-90	ES	15.75	11.83	3.92
	29-Aug-90	ES	15.75	11.72	4.03
	29-Nov-90	ES	15.75	11.99	3.76
	1-Mar-91	ES	15.79	12.87	2.92
	28-May-91	ES	15.79	12.21	3.58
	1-Aug-91	ES	15.79	NA	NA
	27-Jan-92	PES	15.79	11.78	4.01
	28-Feb-92	PES	15.79	11.70	4.09
	28-May-92	PES	15.79	11.83	3.96
	27-Aug-92	PES	15.79	12.28	3.51
	10-Nov-92	PES	15.79	12.40	3.39
	18-Feb-93	PES	15.79	12.00	3.79
	20-May-93	PES	15.79	12.00	3.79
	19-Aug-93	PES	15.79	12.11	3.68
	15-Nov-93	PES	15.79	11.64	4.15
	14-Feb-94	PES	15.79	11.45	4.34
	16-May-94	PES	15.79	11.25	4.54
	10-Aug-94	PES	15.79	11.22	4.57
	3-Nov-94	PES	15.79	11.32	4.47
	9-Feb-95	**PES**	**15.79**	**10.64**	**5.15**
MW-3	21-Feb-90	ES	12.45	9.18	3.27
	25-May-90	ES	12.45	9.25	3.20
	29-Aug-90	ES	12.45	9.50	2.95
	29-Nov-90	ES	12.45	9.80	2.65
	1-Mar-91	ES	12.43	9.51	2.92
	28-May-91	ES	12.43	9.03	3.40
	1-Aug-91	ES	12.43	NA	NA
	27-Jan-92	PES	12.43	9.44	2.99
	28-Feb-92	PES	12.43	8.80	3.63
	28-May-92	PES	12.43	8.80	3.63
	27-Aug-92	PES	12.43	9.18	3.25
	10-Nov-92	PES	12.43	9.44	2.99
	18-Feb-93	PES	12.43	7.59	4.84
	20-May-93	PES	12.43	8.21	4.22
	19-Aug-93	PES	12.43	8.71	3.72
	15-Nov-93	PES	12.43	9.09	3.34
	14-Feb-94	PES	12.43	8.84	3.59
	16-May-94	PES	12.43	8.18	4.25
	10-Aug-94	PES	12.43	8.72	3.71

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Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Groundwater Elevations (feet MSL)
MW-3	3-Nov-94	PES	12.43	8.13	4.30
Cont.	**9-Feb-95**	**PES**	**12.43**	**6.86**	**5.57**
MW-4	21-Feb-90	ES	12.24	8.63	3.61
	25-May-90	ES	12.24	8.58	3.66
	29-Aug-90	ES	12.24	8.50	3.74
	29-Nov-90	ES	12.24	8.74	3.50
	1-Mar-91	ES	12.24	8.65	3.59
	28-May-91	ES	12.24	8.57	3.67
	1-Aug-91	ES	12.24	NA	NA
	27-Jan-92	PES	12.24	8.62	3.62
	28-Feb-92	PES	12.24	8.52	3.72
	28-May-92	PES	12.94	8.35	3.89
	27-Aug-92	PES	12.24	9.00	3.24
	10-Nov-92	PES	12.24	8.85	3.39
	18-Feb-93	PES	12.24	8.17	4.07
	20-May-93	PES	12.24	8.21	4.03
	19-Aug-93	PES	12.24	8.20	4.04
	15-Nov-93	PES	12.24	8.33	3.91
	14-Feb-94	PES	12.24	8.30	3.94
	16-May-94	PES	12.24	8.20	4.04
	10-Aug-94	PES	12.24	8.14	4.10
	3-Nov-94	PES	12.24	8.30	3.94
	9-Feb-95	**PES**	**12.24**	**8.11**	**4.13**
MW-5	21-Feb-90	ES	12.81	6.91	5.90
	25-May-90	ES	12.81	7.58	5.23
	29-Aug-90	ES	12.81	7.75	5.06
	29-Nov-90	ES	12.81	8.17	4.64
	1-Mar-91	ES	12.82	8.11	4.71
	28-May-91	ES	12.82	7.39	5.43
	1-Aug-91	ES	12.82	NA	NA
	27-Jan-92	PES	12.82	7.90	4.92
	28-Feb-92	PES	12.82	7.73	5.09
	28-May-92	PES	12.82	7.18	5.64
	27-Aug-92	PES	12.82	7.54	5.28
	10-Nov-92	PES	12.82	7.90	4.92
	18-Feb-93	PES	12.82	6.58	6.24
	20-May-93	PES	12.82	6.29	6.53
	19-Aug-93	PES	12.82	6.89	5.93
	15-Nov-93	PES	12.82	7.43	5.39

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Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Groundwater Elevations (feet MSL)
MW-5 Cont.	14-Feb-94	PES	12.82	7.16	5.66
	16-May-94	PES	12.82	6.50	6.32
	10-Aug-94	PES	12.82	6.98	5.84
	3-Nov-94	PES	12.82	7.36	5.46
	9-Feb-95	**PES**	**12.82**	**5.68**	**7.14**
MW-6	1-Mar-91	ES	12.03	8.59	3.44
	28-May-91	ES	12.03	8.35	3.68
	1-Aug-91	ES	12.03	NA	NA
	27-Jan-92	PES	12.03	8.32	3.71
	28-Feb-92	PES	12.03	8.08	3.95
	28-May-92	PES	12.03	8.04	3.99
	27-Aug-92	PES	12.03	8.48	3.55
	10-Nov-92	PES	12.03	8.52	3.51
	18-Feb-93	PES	12.03	8.14	3.89
	20-May-93	PES	12.03	8.46	3.57
	19-Aug-93	PES	12.03	8.61	3.42
	15-Nov-93	PES	12.03	8.30	3.73
	14-Feb-94	PES	12.03	8.09	3.94
	16-May-94	PES	12.03	7.82	4.21
	10-Aug-94	PES	12.03	8.46	3.57
	3-Nov-94	PES	12.03	8.16	3.87
	9-Feb-95	**PES**	**12.03**	**7.66**	**4.37**
MW-7	1-Mar-91	ES	12.9	7.51	5.39
	28-May-91	ES	12.9	7.07	5.83
	1-Aug-91	ES	12.9	NA	NA
	27-Jan-92	PES	12.9	7.28	5.62
	28-Feb-92	PES	12.9	7.04	5.86
	28-May-92	PES	12.9	6.81	6.09
	27-Aug-92	PES	12.9	7.12	5.78
	10-Nov-92	PES	12.9	7.80	5.10
	18-Feb-93	PES	12.9	6.54	6.36
	20-May-93	PES	12.9	6.17	6.73
	19-Aug-93	PES	12.9	6.60	6.30
	15-Nov-93	PES	12.9	6.89	6.01
	14-Feb-94	PES	12.9	6.50	6.40
	17-May-94	PES	12.9	6.07	6.83
	10-Aug-94	PES	12.9	6.34	6.56
	3-Nov-94	PES	12.9	6.18	6.72
	9-Feb-95	**PES**	**12.9**	**5.57**	**7.33**

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1650 65th Street, Emeryville, California

Well Number	Date	Measured by	Top of Casing (feet MSL)	Depth to Water (feet)	Groundwater Elevations (feet MSL)
MW-8	3-Nov-94	PES	15.01	11.06	3.95
	9-Feb-95	**PES**	**15.01**	**10.23**	**4.78**

NOTES:

Ft MSL = feet above Mean Sea Level
ES = Engineering-Science, Inc.
PES = PES Environmental, Inc.
NA = Information not available at this date.

Table 2. **Summary of Analytical Results for Groundwater Samples Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene MCL = 0.00	Toluene DAL = 0.1	Ethyl-Benzene MCL = 0.68	Total Xylenes MCL = 1.75	Purgeable Halocarbons	Lead MCL = 0.005
MW-2	Nov-89	ES	100	NA	8.4	7.4	2.4	13	0.015 *	0.05
	Feb-90	ES	54	NA	7.8	5.6	1.6	8.4	0.032 *	0.021
	May-90	ES	40	NA	7.8	7.5	1.6	7.6	0.076 *	0.025
	Aug-90	ES	49	4.6	9	8	ND	8.9	0.040 *	0.0059
	Nov-90	ES	73	3.5	6.9	5.9	1.4	7.4	NA	NA
	Mar-91	ES	72	1.8	5.5	6.6	1	7.7	NA	NA
	May-91	ES	31	ND	8.4	4.7	1.7	6.3	NA	NA
	Aug-91	ES	47	ND	7.6	1.6	7.3	7.8	NA	NA
	29-Jan-92	PES	77.000	NA	10.000	8.700	2.000	7.600	NA	NA
	28-Feb-92	PES	70.000	NA	9.100	6.400	0.530	7.400	NA	NA
	28-May-92	PES	54.000	NA	8.000	4.800	2.400	6.200	NA	NA
	27-Aug-92	PES	47.000	NA	2.700	2.900	3.400	9.200	NA	NA
	10-Nov-92	PES	45.000	<20.000	6.600	4.000	2.000	5.800	<0.050	NA
	18-Feb-93	PES	14.000	NA	2.300	0.810	0.670	1.400	NA	NA
	20-May-93	PES	43.000	NA	7.300	5.200	1.500	5.500	NA	NA
	19-Aug-93	PES	45.000	NA	4.900	3.700	1.300	3.400	NA	NA
	15-Nov-93	PES	97.000	NA	6.100	1.700	1.700	4.100	NA	NA
	14-Feb-94	PES	27.000	NA	5.000	0.830	1.200	3.100	NA	NA
	16-May-94	PES	77.000	NA	6.800	1.100	1.400	3.300	NA	NA
	10-Aug-94	PES	25	NA	5.600	0.750	1.400	1.700	NA	NA
	3-Nov-94	PES	24	NA	7.200	0.500	1.500	1.600	NA	NA
	9-Feb-95	**PES**	**12**	**NA**	**2.200**	**0.100**	**0.480**	**0.940**	**NA**	**NA**
MW-3	Nov-89	ES	0.13	NA	0.0022	ND	ND	0.003	ND	ND
	Feb-90	ES	ND	NA	0.0025	ND	ND	ND	NA	0.011
	May-90	ES	ND	ND	0.002	ND	ND	ND	ND	NA
	Aug-90	ES	ND	0.8	0.0044	0.0029	ND	0.0054	NA	NA
	Nov-90	ES	0.9	0.8	0.0034	ND	ND	ND	NA	NA
	Mar-91	ES	ND	ND	0.025	0.025	0.0053	0.32	NA	NA
	May-91	ES	ND	ND	0.0026	ND	ND	ND	NA	NA
	Aug-91	ES	ND	ND	0.0019	ND	ND	ND	NA	NA

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Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene MCL = 0.00	Toluene DAL = 0.1	Ethyl-Benzene MCL = 0.68	Total Xylenes MCL = 1.75	Purgeable Halocarbons	Lead MCL = 0.005
MW-3	29-Jan-92	PES	0.092	NA	0.0024	<0.0003	0.0006	<0.0003	NA	NA
Cont.	28-Feb-92	PES	0.160***	NA	0.0028	<0.0003	0.0007	0.0005	NA	NA
	28-May-92	PES	<0.050	NA	0.0025	<0.0005	<0.0005	<0.0005	NA	NA
	27-Aug-92	PES	0.370	NA	0.0040	<0.001	<0.0005	<0.0005	NA	NA
	10-Nov-92	PES	0.240	<0.100	0.0042	<0.0003	<0.0003	<0.0006	<0.0003	NA
	18-Feb-93	PES	0.140	NA	0.0018	<0.0005	<0.0005	<0.0005	NA	NA
	20-May-93	PES	0.072	NA	0.0031	<0.0005	<0.0005	<0.0005	NA	NA
	19-Aug-93	PES	<0.050	NA	0.0032	<0.0005	<0.0005	0.0007	NA	NA
	15-Nov-93	PES	0.070	NA	0.0023	0.0007	<0.0005	0.0015	NA	NA
	14-Feb-94	PES	0.120	NA	0.0053	0.0023	0.0012	0.0042	NA	NA
	16-May-94	PES	0.120	NA	0.0031	<0.0005	<0.0005	0.0017	NA	NA
	10-Aug-94	PES	0.1	NA	0.003	< 0.0005	<0.0005	<0.002	NA	NA
	3-Nov-94	PES	0.1	NA	0.003	< 0.0005	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**0.1**	**NA**	**0.002**	**<0.0005**	**<0.0005**	**<0.002**	**NA**	**NA**
MW-4	Nov-89	ES	0.2	NA	0.0023	ND	ND	ND	ND	ND
	Feb-90	ES	ND	NA	ND	ND	ND	ND	NA	0.006
	May-90	ES	ND	ND	0.001	ND	ND	ND	ND	NA
	Aug-90	ES	ND	0.8	0.0089	0.0071	ND	0.0094	NA	NA
	Nov-90	ES	ND	0.7	0.0027	ND	ND	ND	NA	NA
	Mar-91	ES	NA	ND	0.003	ND	ND	ND	NA	NA
	May-91	ES	NA	ND	0.0024	ND	ND	ND	NA	NA
	Aug-91	ES	NA	ND	0.0015	ND	ND	ND	NA	NA
	29-Jan-92	PES	<0.050	NA	0.0022	0.0004	<0.0003	0.0007	NA	NA
	28-Feb-92	PES	<0.050	NA	0.0016	<0.0003	<0.0003	0.0003	NA	NA
	28-May-92	PES	<0.050	NA	0.0015	<0.0005	<0.0005	<0.0005	NA	NA
	27-Aug-92	PES	0.080	NA	0.003	<0.001	<0.0005	0.0005	NA	NA
	10-Nov-92	PES	0.180	<0.100	0.060	0.0009	<0.0003	<0.0006	<0.0003	NA
	18-Feb-93	PES	0.060	NA	0.0017	<0.0005	<0.0005	<0.0005	NA	NA
	20-May-93	PES	<0.050	NA	0.0022	<0.0005	<0.0005	<0.0005	NA	NA
	19-Aug-93	PES	<0.050	NA	0.0020	0.0006	<0.0005	0.0005	NA	NA

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Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene MCL = 0.00	Toluene DAL = 0.1	Ethyl-Benzene MCL = 0.68	Total Xylenes MCL = 1.75	Purgeable Halocarbons	Lead MCL = 0.005
MW-4	15-Nov-93	PES	<0.050	NA	0.0020	0.0005	<0.0005	0.0009	NA	NA
Cont.	14-Feb-94	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	16-May-94	PES	<0.050	NA	0.0017	0.0009	<0.0005	0.0011	NA	NA
	10-Aug-94	PES	<0.05	NA	0.002	<0.0005	<0.0005	<0.002	NA	NA
	3-Nov-94	PES	0.06	NA	0.002	<0.0005	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**0.06**	**NA**	**0.002**	**0.0006**	**<0.0005**	**<0.002**	**NA**	**NA**
MW-5	Nov-89	ES	ND	NA	0.074	ND	ND	0.0042	ND	ND
	Feb-90	ES	ND	NA	0.2	ND	ND	ND	NA	0.012
	May-90	ES	ND	ND	0.11	ND	ND	ND	ND	NA
	Aug-90	ES	ND	0.7	0.066	0.0022	ND	0.0038	NA	NA
	Nov-90	ES	0.6	0.9	0.069	ND	ND	ND	NA	NA
	Mar-91	ES	ND	1.1	0.066	0.0023	ND	ND	NA	NA
	May-91	ES	ND	ND	0.11	ND	ND	ND	NA	NA
	Aug-91	ES	ND	ND	0.078	0.0021	ND	ND	NA	NA
	29-Jan-92	PES	0.190	NA	0.090	0.0005	<0.0003	0.0006	NA	NA
	28-Feb-92	PES	0.230***	NA	0.110	0.0009	<0.0003	0.0005	NA	NA
	28-May-92	PES	0.130	NA	0.100	<0.0005	<0.0005	<0.0005	NA	NA
	27-Aug-92	PES	0.520	NA	0.083	0.002	<0.0005	<0.0005	NA	NA
	10-Nov-92	PES	0.240	<0.100	0.074	0.0010	<0.0003	<0.0006	<0.0003	NA
	18-Feb-93	PES	0.190	NA	0.056	0.0006	<0.0005	<0.0005	NA	NA
	20-May-93	PES	<0.200	NA	0.056	<0.002	<0.002	<0.002	NA	NA
	19-Aug-93	PES	0.170	NA	0.050	0.0007	<0.0005	<0.0005	NA	NA
	15-Nov-93	PES	0.220	NA	0.049	0.001	<0.001	<0.001	NA	NA
	14-Feb-94	PES	0.140	NA	0.062	<0.0005	<0.0005	<0.0005	NA	NA
	16-May-94	PES	0.310	NA	0.140	0.003	<0.003	<0.003	NA	NA
	12-Aug-94	PES	0.5	NA	0.095	0.034	0.004	0.014	NA	NA
	3-Nov-94	PES	0.4	NA	0.079	0.0006	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**0.3**	**NA**	**0.074**	**0.0008**	**<0.0005**	**<0.0002**	**NA**	**NA**
MW-6	May-90	ES	NA	ND	ND	ND	ND	ND	ND	ND**
	Aug-90	ES	NA	ND	NA	NA	NA	NA	NA	ND**

Table 2. **Summary of Analytical Results for Groundwater Samples Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	Purgeable Halocarbons	Lead
					MCL = 0.00	DAL = 0.1	MCL = 0.68	MCL = 1.75		MCL = 0.005
MW-6	Nov-90	ES	1.2	1.4	0.0012	ND	ND	ND	0.0012	NA
Cont.	Mar-91	ES	ND	ND	ND	ND	ND	ND	NA	NA
	May-91	ES	ND	ND	ND	ND	ND	ND	NA	NA
	Aug-91	ES	ND	ND	ND	ND	ND	ND	NA	NA
	29-Jan-92	PES	<0.050	NA	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA
	28-Feb-92	PES	<0.050	NA	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA
	28-May-92	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	27-Aug-92	PES	<0.050***	NA	<0.0005	<0.001	<0.0005	<0.0005	NA	NA
	10-Nov-92	PES	<0.050	<0.100	<0.0003	<0.0003	<0.0003	<0.0006	<0.0003	NA
	18-Feb-93	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	20-May-93	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	19-Aug-93	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	15-Nov-93	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	14-Feb-94	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	16-May-94	PES	<0.050	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA
	10-Aug-94	PES	<0.05	NA	<0.0005	<0.0005	<0.0005	<0.002	NA	NA
	3-Nov-94	PES	<0.05	NA	<0.0005	<0.0005	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**<0.05**	**NA**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	**NA**	**NA**
MW-7	May-90	ES	NA	0.6	0.24	ND	ND	ND	0.24	ND**
	Aug-90	ES	ND	ND	0.081	0.0018	ND	ND	0.0844	ND**
	Nov-90	ES	ND	0.8	0.054	ND	ND	ND	0.054	NA
	Mar-91	ES	ND	ND	0.1	0.0036	ND	ND	NA	NA
	May-91	ES	ND	ND	0.12	0.0027	ND	ND	NA	NA
	Aug-91	ES	ND	ND	0.074	0.0033	ND	ND	NA	NA
	29-Jan-92	PES	0.270	NA	0.025	0.0005	<0.0003	0.0008	NA	NA
	28-Feb-92	PES	0.100***	NA	0.033	0.0007	<0.0003	0.0007	NA	NA
	28-May-92	PES	0.150	NA	0.021	<0.0005	<0.0005	<0.0005	NA	NA
	27-Aug-92	PES	0.440	NA	0.011	0.001	<0.0005	<0.0005	NA	NA
	10-Nov-92	PES	0.370	<0.100	0.031	0.0012	<0.0003	0.0012	<0.0003	NA
	18-Feb-93	PES	0.270	NA	0.077	0.0013	<0.0005	0.0014	NA	NA

Table 2. **Summary of Analytical Results for Groundwater Samples Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	Purgeable Halocarbons	Lead
					MCL = 0.00	DAL = 0.1	MCL = 0.68	MCL = 1.75		MCL = 0.005
MW-7	20-May-93	PES	0.300	NA	0.150	0.003	<0.002	0.003	NA	NA
Cont.	19-Aug-93	PES	0.110	NA	0.040	0.0010	<0.0005	0.0011	NA	NA
	15-Nov-93	PES	0.120	NA	0.015	0.0006	<0.0005	0.0023	NA	NA
	14-Feb-94	PES	0.120	NA	0.038	<0.0005	<0.0005	<0.0005	NA	NA
	17-May-94	PES	<0.300	NA	0.061	<0.003	<0.003	<0.003	NA	NA
	10-Aug-94	PES	0.1	NA	0.009	<0.0005	<0.0005	<0.002	NA	NA
	3-Nov-94	PES	0.1	NA	0.003	<0.0005	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**0.2**	**NA**	**0.050**	**0.0006**	**<0.0005**	**<0.002**	**NA**	**NA**
MW-8	3-Nov-94	PES	<0.05	NA	0.001	<0.0005	<0.0005	<0.002	NA	NA
	9-Feb-95	**PES**	**<0.05**	**NA**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.002**	**NA**	**NA**
EW-1	May-90	ES	20	ND	7.5	4.5	1	6.3	0.068	ND**
	Aug-90	ES	NA	3.5	6	4.2	ND	4.6	0.016 *	ND**
	Nov-90	ES	47	3.1	6	3.4	1	4.7	NA	NA
	17-Dec-90	ES	NA	NA	11	7.9	2.2	10	NA	NA
	19-Dec-90	ES	NA	NA	3.7	2.5	ND	2.3	NA	NA
	21-Dec-90	ES	NA	NA	3.2	2.2	ND	1.7	NA	NA
	27-Dec-90	ES	NA	NA	2.9	2.1	0.16	1.5	NA	NA
	4-Jan-91	ES	NA	NA	3.2	2.8	ND	ND	NA	NA
	11-Jan-91	ES	NA	NA	3	2.4	0.2	1.8	NA	NA
	6-Feb-91	ES	NA	NA	0.47	0.23	0.011	0.39	NA	NA
	13-Feb-91	ES	NA	NA	1.2	0.28	ND	0.36	NA	NA
	15-Mar-91	ES	NA	NA	0.13	0.085	0.006	0.17	NA	NA
	3-Jul-91	ES	NA	NA	1.3	0.95	0.22	1.4	NA	NA
	1-Aug-91	ES	NA	NA	0.22	0.19	0.013	0.27	NA	NA
	16-Aug-91	ES	NA	NA	0.17	0.16	0.013	0.19	NA	NA
	13-Nov-91	ES	NA	NA	3.1	0.27	0.04	0.22	NA	NA
	29-Jan-92	PES	2.700	NA	0.570	0.150	0.0070	0.260	NA	NA
	26-Mar-92	PES	25.000	NA	3.600	2.600	0.530	2.600	NA	NA
	28-May-92	PES	16.000	NA	3.300	3.200	0.750	2.600	NA	NA
	29-Jun-92	PES	7.000	NA	2.200	3.100	0.270	1.400	NA	NA

Table 2. Summary of Analytical Results for Groundwater Samples Through February 1995
Emery Bay Plaza
1650 65th Street, Emeryville, California

Concentrations expressed in milligrams per liter (mg/l) - equivalent to parts per million (ppm)

Well Number	Sample Date	Sampled by	TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	Purgeable Halocarbons	Lead
					MCL = 0.00	DAL = 0.1	MCL = 0.68	MCL = 1.75		MCL = 0.005
EW-1	21-Jul-92	PES	1.600	NA	0.220	0.017	<0.0005	0.100	NA	NA
Cont.	27-Aug-92	PES	NS	NS	NS	NS	NS	NS	NS	NS
	23-Sep-92	PES	5.200	NA	1.100	0.590	0.100	1.000	NA	NA
	27-Oct-92	PES	1.300	NA	0.220	0.061	0.0053	0.110	NA	NA
	24-Nov-92	PES	7.100	NA	1.400	1.100	0.120	0.890	NA	NA
	18-Feb-93	PES	7.200	NA	1.400	0.930	0.210	1.000	NA	NA
	09-Mar-93	PES	4.600	NA	0.990	0.750	0.062	0.840	NA	NA
	21-Apr-93	PES	4.900	NA	0.270	0.180	0.020	0.190	NA	NA
	13-May-93	PES	2.600	NA	0.520	0.110	0.023	0.330	NA	NA
	28-Jun-93	PES	9.500	NA	1.900	0.460	0.230	1.000	NA	NA
	11-Aug-93	PES	1.300	NA	<0.002	<0.002	<0.002	0.400	NA	NA
	15-Nov-93	PES	46.000	NA	2.900	0.380	0.500	1.700	NA	NA
	14-Feb-94	PES	21.000	NA	4.500	0.860	1.000	2.800	NA	NA
	16-May-94	PES	19.000	NA	7.300	0.930	1.300	3.300	NA	NA
	10-Aug-94	PES	19	NA	4.200	0.490	1.100	1.500	NA	NA
	3-Nov-94	PES	20	NA	6.000	0.230	1.400	1.400	NA	NA
	9-Feb-95	**PES**	**8.7**	**NA**	**1.800**	**0.110**	**0.380**	**0.740**	**NA**	**NA**

NOTES:

* = 1,2-Dichlorethane concentration (only 1,2-Dichloroethane detected).
** = Organic Lead
*** = TPH quantified as gasoline but chromatogram pattern was not typical of gasoline.
ES = Engineering-Science, Inc.
PES = PES Environmental, Inc.
NA = Not analyzed
ND = Not detected above method detection limit.
NS = Not sampled.
<0.0005 = Not detected above indicated laboratory reporting limit.
MCL = California Maximum Contaminant level, current as of January 1991.
DAL = Department of Health Services Action Levels, current as of January 1991.
TPH = Total Petroleum Hydrocarbons

Table 3. **Summary of Total Dissolved Oxygen Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Well Number	Date	Measured by	Total Dissolved Oxygen (mg/L)	TPHg
MW-2	10-Aug-94	PES	<0.1	25
	3-Nov-94	Blaine	0.2	24
	29-Dec-94	PES	1.9	
	29-Dec-94	PES	>20	
	9-Feb-95	Blaine	0.9	12 ppm TPHg
MW-3	10-Aug-94	PES	<0.1	0.1
	3-Nov-94	Blaine	0.2	0.1
	29-Dec-94	PES	2.1	
	9-Feb-95	Blaine	0.8	0.1
MW-4	10-Aug-94	PES	0.1	NP
	3-Nov-94	Blaine	0.1	0.06
	29-Dec-94	PES	2	
	9-Feb-95	Blaine	0.6	0.06
MW-5	10-Aug-94	PES	0.1-0.2	0.5
	3-Nov-94	Blaine	0.4	0.4
	29-Dec-94	PES	2.1	
	9-Feb-95	Blaine	1.0	3.
MW-6	10-Aug-94	PES	<0.1	
	3-Nov-94	Blaine	0.4	
	29-Dec-94	PES	2.2	
	9-Feb-95	Blaine	1.0	
MW-7	10-Aug-94	PES	<0.1	
	3-Nov-94	Blaine	0.3	
	29-Dec-94	PES	2.2	
	9-Feb-95	Blaine	0.8	
MW-8	10-Aug-94	PES	NM	
	3-Nov-94	Blaine	0.3	
	29-Dec-94	PES	2.1	
	29-Dec-94	PES	>20	
	9-Feb-95	Blaine	0.8	
EW-1	10-Aug-94	PES	<0.1	
	3-Nov-94	Blaine	0.3	
	29-Dec-94	PES	2	
	29-Dec-94	PES	>20	
	9-Feb-95	Blaine	1.0	

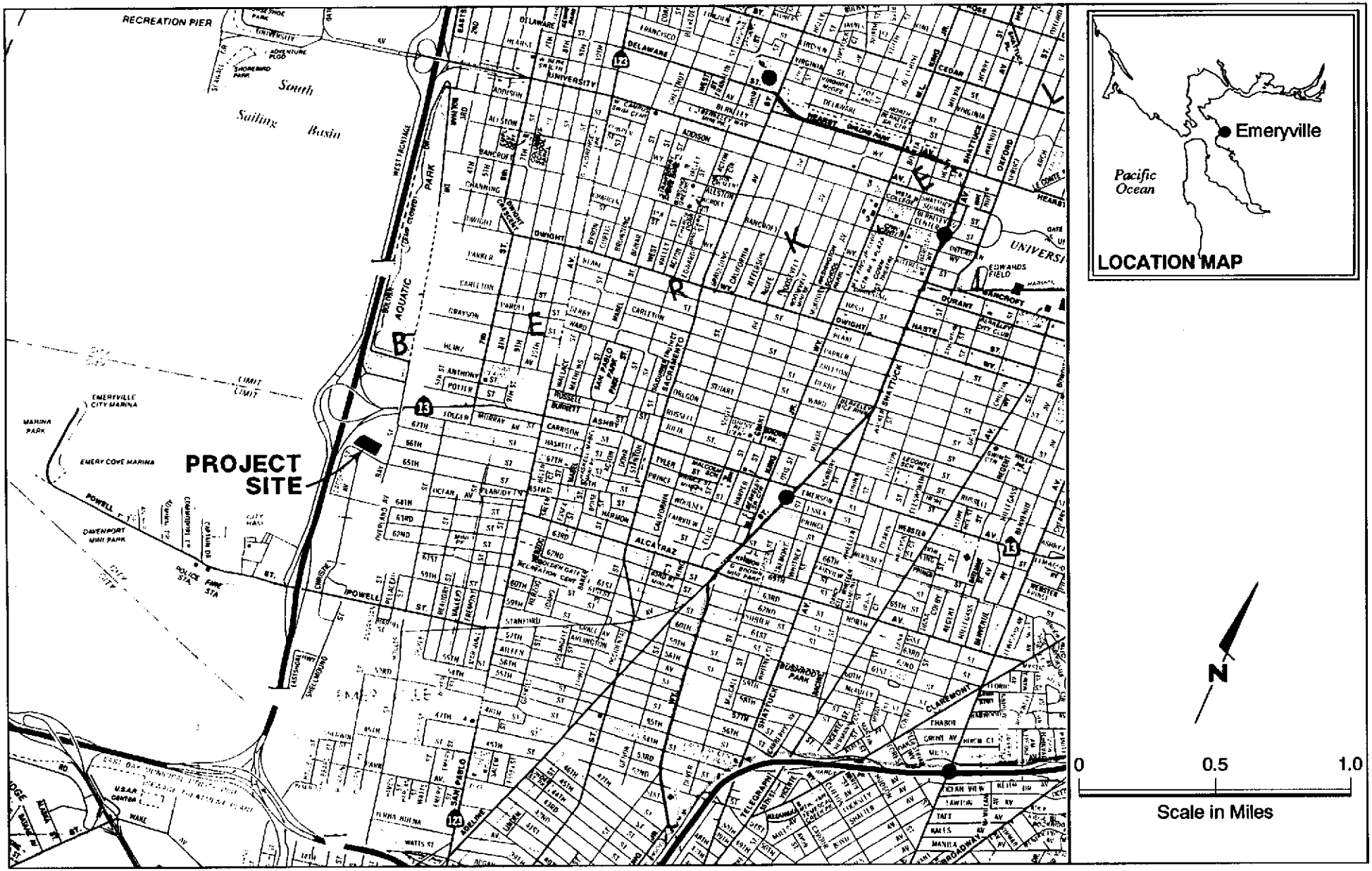
NOTES:

PES = PES Environmental, Inc.
Blaine = Blaine Technical Services
NM = Not measured.
mg/L = milligrams per liter
>20 = Above indicated equipment quantification maximum.
<0.1 = Below indicated equipment quantification minimum.

Table 4. **Summary of Nutrient Introduction Through February 1995**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Well Name	Date Introduced	Flow Rate (gpm)	Volume of H_2O_2 Introduced (gallons)	Concentration of H_2O_2 (ppm)	Amount of O_2 Introduced (pounds)
EW-1	12/29/94	1.2 to 1.4	265	10,000	10.39
MW-2	12/29/94	2.8 to 4.3	201	10,000	7.88
MW-8	12/29/94	0.5 to 0.6	35	10,000	1.37
		TOTAL	501		19.63

Notes:
gpm: gallons per minute
ppm: parts per million
Approximately 20 ppm of nitrogen as nitrate and 37 ppm of phosphate was present in solution.

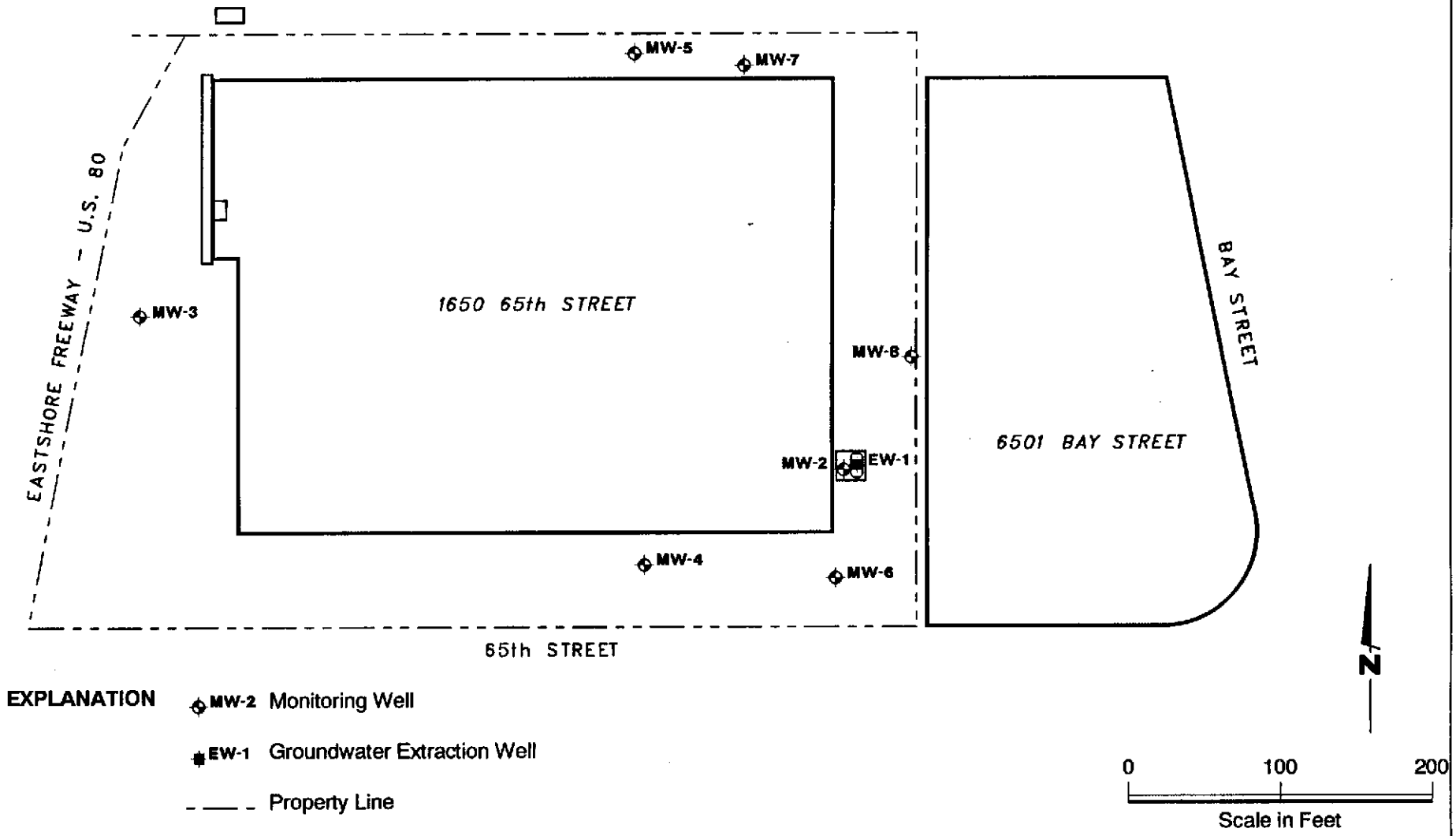


PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
1650 65th Street
Emeryville, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.01.003	JY	9/92		

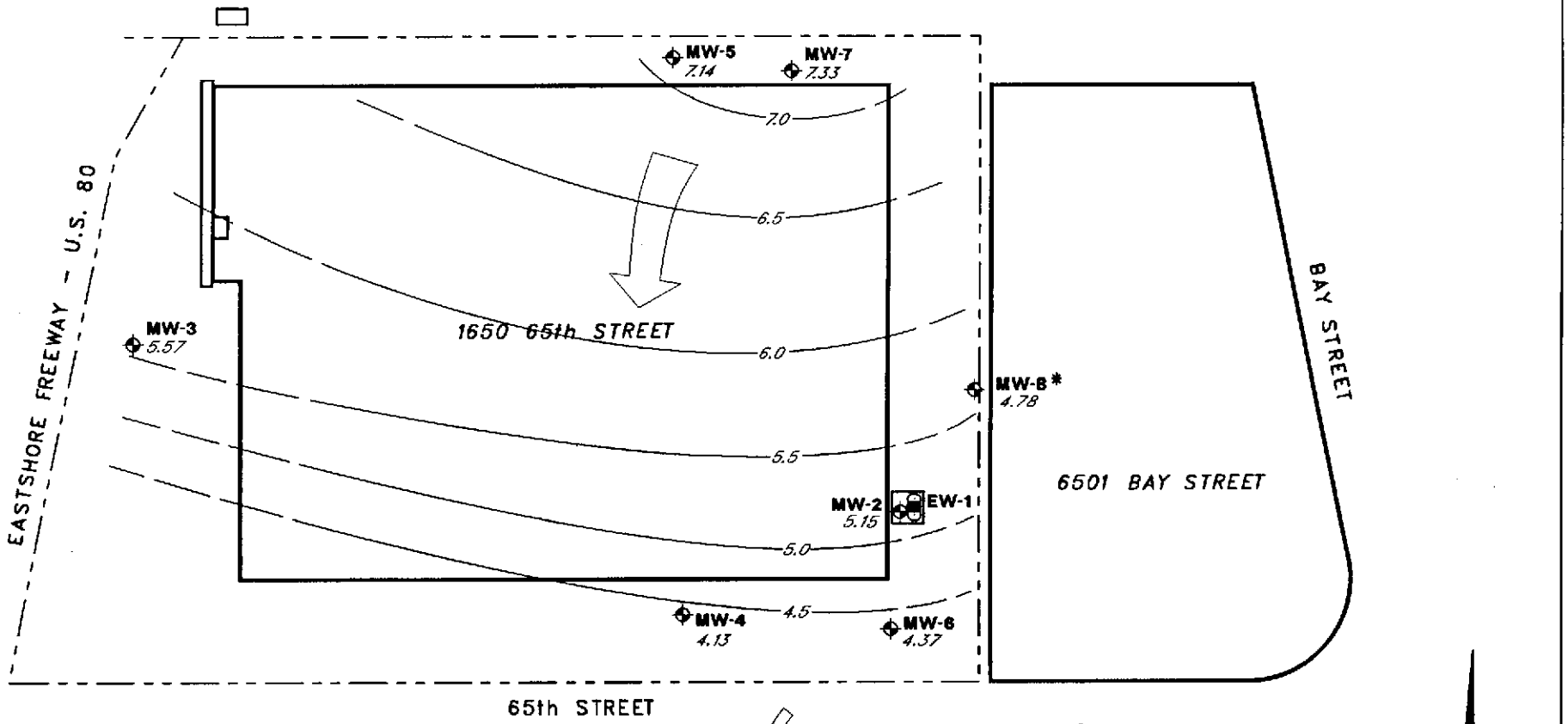


PES Environmental, Inc.
Engineering & Environmental Services

Well Location Map
1650 65th Street
Emeryville, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0100.003		3/95		

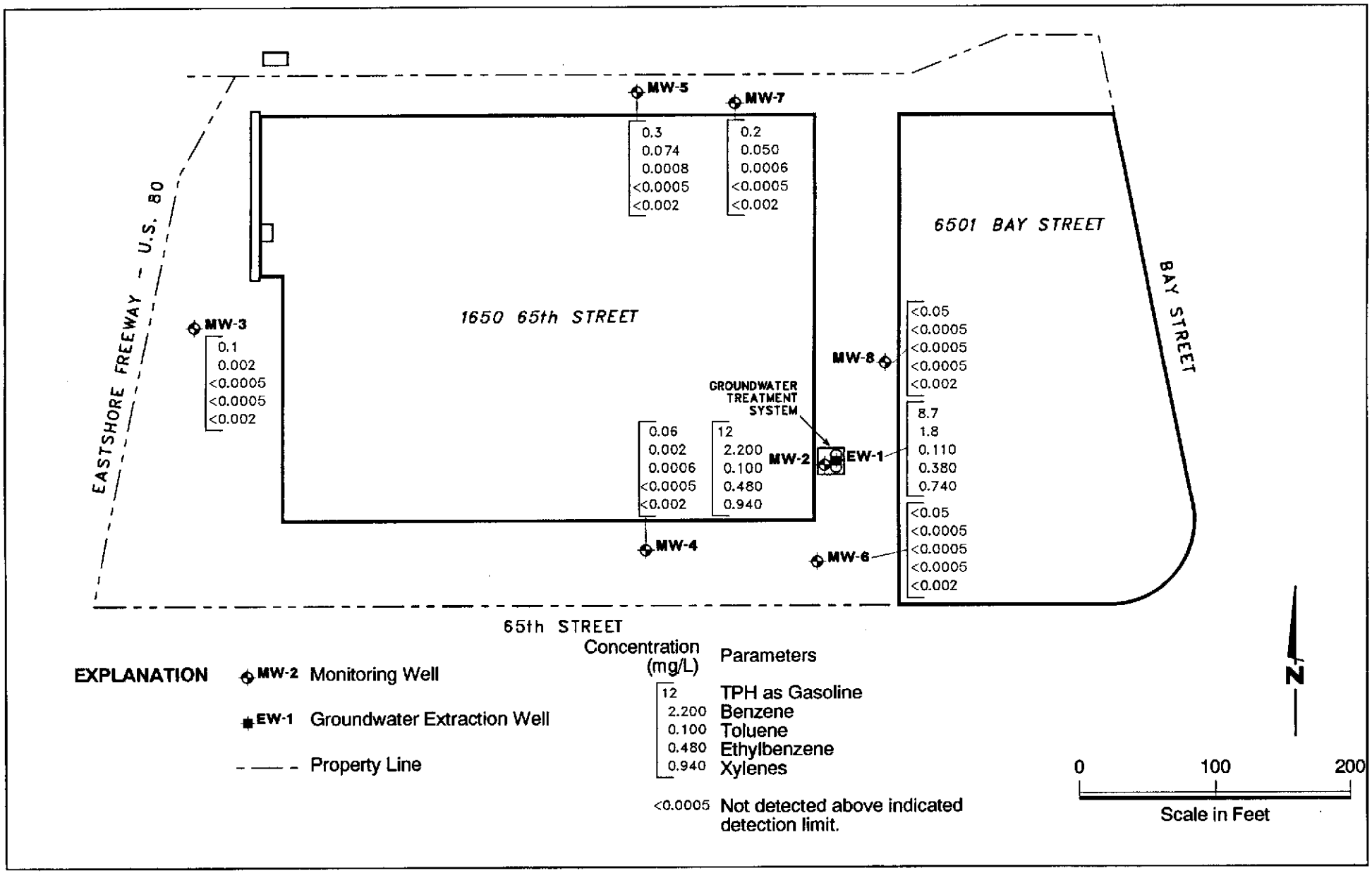


PES Environmental, Inc.
Engineering & Environmental Services

Groundwater Elevation Contours on February 9, 1995
1650 65th Street
Emeryville, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0100.003		3/95		



PES Environmental, Inc.
Engineering & Environmental Services

Dissolved Hydrocarbons in Groundwater on February 9, 1995
1650 65th Street
Emeryville, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0100.003		3/95		

BLAINE
TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

February 20, 1995

PES Environmental, Inc.
1682 Novato Blvd., Suite 100
Novato, CA 94947

Attn: Mary Williams

SITE:
P.O. Partners
1650 65th Street
Emeryville, California

PES PROJECT NUMBER:
131.0100.003

DATE:
February 9, 1995

GROUNDWATER SAMPLING REPORT 950209-E-1

Blaine Tech Services, Inc. perform specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. does not participate in the interpretation of analytical results or become involved with the marketing or installation of remedial systems.

This report deals with the groundwater well sampling performed by our firm on November 3, 1994, in response to your request. Data collected in the course of our work at the site are presented in the TABLE OF WELL MONITORING DATA. This information was collected during our inspection, well evacuation, and sample collection. Measurements include the total depth of the well and depth to water. Total dissolved oxygen readings were taken prior to purging each well. Water surfaces were further inspected for the presence of immiscibles. A series of electrical conductivity, pH, and temperature readings were obtained during well evacuation and at the time of sample collection.

TABLE OF WELL MONITORING DATA

Well I.D.	EW-1			MW-2			MW-3			MW-4		
Date Sampled	02/09/95			02/09/95			02/09/95			02/09/95		
Well Diameter (in.)	4			2			4			4		
Total Well Depth (ft.)	28.91			25.60			18.30			14.98		
Depth To Water (ft.)	10.61			10.64			6.86			8.11		
Free Product (in.)	NONE			NONE			NONE			NONE		
Reason If Not Sampled	--			--			--			--		
1 Case Volume (gal.)	11.9			2.4			7.4			4.5		
Did Well Dewater?	NO			NO			NO			NO		
Gallons Actually Evacuated	36.0			7.5			23.0			15.0		
Purging Device	ELECTRIC SUBMERSIBLE			BAILER			ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE		
Sampling Device	BAILER			BAILER			BAILER			BAILER		
Time	14:11	14:13	14:16	14:31	14:35	14:41	12:05	12:06	12:08	11:41	11:42	11:43
Temperature (Fahrenheit)	66.5	65.8	66.0	66.7	63.7	62.7	63.6	63.0	63.3	67.8	67.1	66.3
pH	7.4	7.5	7.4	7.3	7.5	7.4	8.38	8.3	8.22	7.2	7.9	8.0
Conductivity (micromhos/cm)	>20000	5980	5300	7070	3030	2580	4170	4020	4120	20000	10660	9840
Total Dissolved Oxygen (mg/l)	1.0			0.9			0.8			0.6		
BTS Chain of Custody	950209-E-1			950209-E-1			950209-E-1			950209-E-1		
BTS Sample I.D.	EW-1			MW-2			MW-3			MW-4		
DHS HMTL Laboratory	AEN			AEN			AEN			AEN		
Analysis	TPH (GAS), BTEX			TPH (GAS), BTEX			TPH (GAS), BTEX			TPH (GAS), BTEX		

TABLE OF WELL MONITORING DATA

Well I.D.	MW-5			MW-6			MW-7			MW-8		
Date Sampled	02/09/95			02/09/95			02/09/95			02/09/95		
Well Diameter (in.)	4			4			4			2		
Total Well Depth (ft.)	18.06			18.86			18.81			24.99		
Depth To Water (ft.)	5.68			7.66			5.57			10.23		
Free Product (in.)	NONE			NONE			NONE			NONE		
Reason If Not Sampled	--			--			--			--		
1 Case Volume (gal.)	8.0			7.15			8.6			2.4		
Did Well Dewater?	NO			NO			NO			NO		
Gallons Actually Evacuated	25.0			22.0			26.0			7.25		
Purging Device	ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE			BAILER		
Sampling Device	BAILER			BAILER			BAILER			BAILER		
Time	12:48	12:50	12:52	11:18	11:20	11:22	12:26	12:28	12:30	13:40	13:44	13:49
Temperature (Fahrenheit)	61.3	60.7	61.0	65.1	65.3	65.6	62.4	61.5	61.8	61.8	62.0	62.2
pH	7.8	7.7	7.6	6.5	6.6	6.6	8.5	8.4	8.3	7.2	7.1	7.2
Conductivity (micromhos/cm)	3400	2660	3460	20000	20000	20000	1764	1743	1720	>20000	>20000	>20000
Total Dissolved Oxygen (mg/l)	1.0			1.0			0.8			0.8		
BTS Chain of Custody	950209-E-1			950209-E-1			950209-E-1			950209-E-1		
BTS Sample I.D.	MW-5			MW-6			MW-7			MW-8		
DHS HMTL Laboratory	AEN			AEN			AEN			AEN		
Analysis	TPH (GAS), BTEX			TPH (GAS), BTEX			TPH (GAS), BTEX			TPH (GAS), BTEX		

Evacuation and Sampling Equipment

As shown in the TABLE OF MONITORING DATA the wells at this site were evacuated according to a protocol requirement for three case volumes. The wells were evacuated using bailers and electric submersible pumps.

Samples were collected using stainless steel bailers.

Bailers: A bailer, in its simplest form, is a hollow tube which has been fitted with a check valve at the lower end. The device can be lowered into a well by means of a cord. When the bailer enters the water, the check valve opens and liquid flows into the interior of the bailer. The bottom check valve prevents water from escaping when the bailer is drawn up out of the well.

Two types of bailers are used in groundwater wells at sites where fuel hydrocarbons are of concern. The first type of bailer is made of a clear material such as acrylic plastic and is used to obtain a sample of the surface and the near surface liquids in order to detect the presence of visible or measurable fuel hydrocarbon floating on the surface. The second type of bailer is made of Teflon or stainless steel and is used as an evacuation and/or sampling device.

Bailers are inexpensive and relatively easy to clean. Because they are manually operated, variations in operator technique may have a greater influence than would be found with more automated sampling equipment. Also where fuel hydrocarbons are involved, the bailer may include near surface contaminants that are not representative of water deeper in the well.

Electric Submersible Pumps: Electric submersible pumps are appropriate for the high volume evacuation of wells of any depth provided the well diameter is large enough to admit the pump. Four inch and three inch diameter wells will readily accept electric submersible pumps, while two inch wells do not. In operation, the pump is lowered into the well with a pipe train above it. A checkvalve immediately above the pump and below the first section of pipe prevents water that has entered the pipe from flowing back into the well. Electricity is provided to the pump via an electrical cable and the action of the pump is to push water up out of the well.

Electric submersible pumps are often used as well evacuation devices, which are then supplanted with a more specialized sample collection device (such as a bailer) at the time of sampling. An alternative is to use the pump for both evacuation and sampling. When a bailer is used to collect the sample, interpretation of results by the consultant should allow for variations attributable to near surface contamination entering the bailer. When the electric submersible is, itself, used for sample collection it should be operated with the output restricted to a point where the loss of volatiles becomes indistinguishable from the level obtained with true sampling pumps.

It should be noted that when the pump is used for both evacuation and sample collection that it is possible to perform these operation as an uninterrupted continuum. This contrasts with the variations in elapsed time between evacuation and sample collection that occur when field personnel cease one mode of operation and must bring other apparatus into use.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site.

Effluent Materials

The evacuation process creates a volume of effluent water which must be contained. Purge water from this sampling event was discharged through the carbon filtration system on site.

Sampling Methodology

Samples were obtained by standardized sampling procedures that follow an evacuation and sample collection protocol. The sampling methodology conforms both State and Regional Water Quality Control Board standards and specifically adheres to EPA requirements for apparatus, sample containers and sample handling as specified in publication SW 846 and the T.E.G.D. which is published separately.

Sample Containers

Sample containers are supplied by the laboratory performing the analyses.

Sample Handling Procedures

Following collection, samples are promptly placed in an ice chest containing prefrozen blocks of an inert ice substitute such as Blue Ice or Super Ice.

Sample Designations

All sample containers are identified with both a sampling event number and a discrete sample identification number. Please note that the sampling event number is the number that appears on our chain of custody. It is roughly equivalent to a job number, but applies only to work done on a particular day of the year rather than spanning several days as jobs and projects often do.

Chain of Custody

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under our standard chain of custody. If the

samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

Hazardous Materials Testing Laboratory

The samples obtained at this site were delivered to American Environemental Network in Pleasant Hill, California. American Environmental Network is certified by the California Department of Health Services as a Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1172.

Personnel

All Blaine Tech Services, Inc. personnel receive 29 CFR 1910.120(e)(2) training as soon after being hired as is practical. In addition, many of our personnel have additional certifications that include specialized training in level B supplied air apparatus and the supervision of employees working on hazardous materials sites. Employees are not sent to a site unless we are confident they can adhere to any site safety provisions in force at the site and unless we know that they can follow the written provisions of an SSP and the verbal directions of an SSO.

In general, employees sent to a site to perform groundwater well sampling will assume an OSHA level D (wet) environment exists unless otherwise informed. The use of gloves and double glove protocols protects both our employees and the integrity of the samples being collected. Additional protective gear and procedures for higher OSHA levels of protection are available.

Please call if we can be of any further assistance.

James C. Blaine Jr.

Richard C. Blaine

RCB/lp

attachments: chain of custody

BLAINE TECH SERVICES INC

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

CHAIN OF CUSTODY 950209-E1

CLIENT PES / P.O. Partners

SITE 1650 65th St.
Emeryville
CA.

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT

LAB AEN DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
Contact
Mary Williams at PES
(415) 899-1600

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL		8015 mod. for TPH/Gasoline	8020 for BTEX							ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
EW-1	1435	2-9-95	W	3		X	X										
MW-2	1445		W	3		X	X										
MW-3	1215		W	3		X	X										
MW-4	1150		W	3		X	X										
MW-5	1255		W	3		X	X										
MW-6	1125		W	3		X	X										
MW-7	1235		W	3		X	X										
MW-8	1355	↓	W	3		X	X										

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN
	2-9-95	1445	Kent Brown	

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Kent Brown	2-10-95	10:40	(AEN)	2-10-95	10:40
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #	

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

PES ENVIRONMENTAL, INC.
1682 NOVATO BLVD.
SUITE 100
NOVATO, CA 94947

ATTN: MARY WILLIAMS
CLIENT PROJ. ID: 950209-E1

REPORT DATE: 02/28/95

DATE(S) SAMPLED: 02/09/95

DATE RECEIVED: 02/10/95

AEN WORK ORDER: 9502133

PROJECT SUMMARY:

On February 10, 1995, this laboratory received 8 water sample(s).

Client requested sample(s) be analyzed for organic 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.

Larry Klein
Laboratory Director

PES ENVIRONMENTAL, INC.

SAMPLE ID: EW-1
AEN LAB NO: 9502133-01
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	1,800 *	20	ug/L	02/16/95
Toluene	108-88-3	110 *	20	ug/L	02/16/95
Ethylbenzene	100-41-4	380 *	20	ug/L	02/16/95
Xylenes, Total	1330-20-7	740 *	80	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	8.7 *	2	mg/L	02/16/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-2
AEN LAB NO: 9502133-02
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	2,200 *	20	ug/L	02/16/95
Toluene	108-88-3	100 *	20	ug/L	02/16/95
Ethylbenzene	100-41-4	480 *	20	ug/L	02/16/95
Xylenes, Total	1330-20-7	940 *	80	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	12 *	2	mg/L	02/16/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-3
AEN LAB NO: 9502133-03
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	2 *	0.5	ug/L	02/16/95
Toluene	108-88-3	ND	0.5	ug/L	02/16/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/16/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	0.1 *	0.05	mg/L	02/16/95

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-4
AEN LAB NO: 9502133-04
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	2 *	0.5	ug/L	02/16/95
Toluene	108-88-3	0.6 *	0.5	ug/L	02/16/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/16/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	0.06 *	0.05	mg/L	02/16/95

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-5
AEN LAB NO: 9502133-05
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	74 *	0.5	ug/L	02/16/95
Toluene	108-88-3	0.8 *	0.5	ug/L	02/16/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/16/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	0.3 *	0.05	mg/L	02/16/95

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-6
AEN LAB NO: 9502133-06
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	02/14/95
Toluene	108-88-3	ND	0.5	ug/L	02/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/14/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	02/14/95

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-7
AEN LAB NO: 9502133-07
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	50 *	0.5	ug/L	02/14/95
Toluene	108-88-3	0.6 *	0.5	ug/L	02/14/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/14/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/14/95
Purgeable HCs as Gasoline	5030/GCFID	0.2 *	0.05	mg/L	02/14/95

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-8
AEN LAB NO: 9502133-08
AEN WORK ORDER: 9502133
CLIENT PROJ. ID: 950209-E1

DATE SAMPLED: 02/09/95
DATE RECEIVED: 02/10/95
REPORT DATE: 02/28/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	02/16/95
Toluene	108-88-3	ND	0.5	ug/L	02/16/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/16/95
Xylenes, Total	1330-20-7	ND	2	ug/L	02/16/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	02/16/95

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9502133

CLIENT PROJECT ID: 950209-E1

Quality Control and Project Summary

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

Definitions

Laboratory Control Sample (LCS)/Method Spike(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 analysis.

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 behavior, 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 instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9502133
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
02/16/95	EW-1	01	100
02/16/95	MW-2	02	100
02/16/95	MW-3	03	100
02/16/95	MW-4	04	100
02/16/95	MW-5	05	101
02/14/95	MW-6	06	100
02/14/95	MW-7	07	101
02/16/95	MW-8	08	101
QC Limits:			92-109

DATE ANALYZED: 02/15/95
SAMPLE SPIKED: 9502164-02
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	18.2	104	8	85-109	17
Toluene	52.8	99	9	87-111	16
Hydrocarbons as Gasoline	500	84	10	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

9502133

BLAINE TECH SERVICES INC

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

CHAIN OF CUSTODY 950209-E1

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SITE 1650 65th St.
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CA.

LAB AEN DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION _____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
Contact Mary Williams at PES (415) 899-1600

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C	8015 mod. for MH-Gasoline	8020 for BTEX	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
EW-1	1425	2-9-95	W	3		X	X				01A-C
MW-2	1445		W	3		X	X				02A-C
MW-3	1215		W	3		X	X				03A-C
MW-4	1150		W	3		X	X				04A-C
MW-5	1255		W	3		X	X				05A-C
MW-6	1125		W	3		X	X				06A-C
MW-7	1235		W	3		X	X				07A-C
MW-8	1355		W	3		X	X				08A-C

SAMPLING COMPLETED	DATE	TIME
	1445	2-9-95

SAMPLING PERFORMED BY Kent Brown

RESULTS NEEDED NO LATER THAN

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Kent Brown	2-10-95	10:40	(AEN)	2-10-95	10:40
	2-10-95	11:30	Kevin Gillespie	2-10-95	1130

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #