PES Environmental, Inc.
Engineering & Environmental Services

January 16, 1995

131.0100.003

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

STID 435

Attention: Ms. Susan Hugo

UPGRADIENT WELL INSTALLATION AND
QUARTERLY GROUNDWATER MONITORING REPORT
NOVEMBER 1994 SAMPLING EVENT
EMERY BAY PLAZA
1650 65TH STREET
EMERYVILLE, CALIFORNIA

Dear Ms. Hugo:

This letter presents data collected by PES Environmental, Inc. (PES) during installation and development of a new onsite groundwater monitoring well on September 22, 1994 at Emery Bay Plaza, located at 1650 65th Street in Emeryville, California (Plate 1). This letter also summarizes PES' activities during the November 3, 1994 quarterly groundwater monitoring. PES has been retained by Emery Bay Plaza to conduct groundwater monitoring at the subject site.

The purpose of the upgradient well installation is to provide for an evaluation of upgradient water quality and to provide an additional upgradient point of introduction for an in-situ bioremediation pilot study. This study is described in the documents: *Workplan, Passive In-situ Bioremediation Pilot Study, Emery Bay Plaza, 1650 65th Street Property, Emeryville, California* dated December 21, 1993 and *Proposed Monitoring Revisions, Passive In-situ Bioremediation, Pilot Study, Emery Bay Plaza, 1650 65th Street Property, Emeryville, California* dated March 16, 1994. 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

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 its operation was begun in December 1990. Discharges of treated groundwater were conducted under the authority of an East Bay Municipal Utility District

wastewater discharge permit (Permit # 502-45131). Groundwater extraction was discontinued on October 25, 1993, pending start of a passive in-situ bioremediation pilot program on December 29, 1994. Pilot study activities will be ongoing and monitoring will be presented in future monitoring reports. The present sampling is the twenty-first consecutive sampling event since groundwater monitoring was initiated, and the thirteenth to be conducted by PES.

MONITORING WELL INSTALLATION AND DEVELOPMENT

On September 22, 1994 PES installed MW-8 near the eastern boundary of the subject property (Plate 2). The new well was developed on September 29, and the top of casing elevation surveyed on October 6, 1994. Groundwater samples were collected from this well during quarterly monitoring activities performed on November 3, 1994.

Soil Boring Methods

Soil boring and monitoring well installation activities were performed in accordance with a permit issued by the Alameda County Department of Environmental Health. Prior to initiating drilling activities, the boring location for MW-8 (B-8) was cleared using subsurface utility detection equipment. Boring B-8 was drilled using a Mobile Drill B-53 drill rig equipped with a 9-inch outside diameter (O.D.) hollow stem auger. The boring was drilled to a depth of 26 feet below ground surface (bgs). A PES engineer logged the boring for lithographic description of the soils in accordance with the United Soil Classification System (USCS). The USCS classification table and the lithographic log of boring B-8 are presented in Appendix A.

Boring B-8 was sampled at five-foot intervals using a percussion hammer to drive a 2 1/2-inch inside diameter (I.D.) split spoon sampler lined with stainless steel tubes through 18 inches of undisturbed soil below the cutting bit of the auger. Soil samples were field screened for the presence of volatile organic compounds (VOCs) using a photoionizing Organic Vapor Meter (OVM). Field screening results are recorded on the boring logs included in Appendix A.

Subsurface Conditions

During the first attempt to drill soil boring B-8, concrete was encountered at 4.5 feet bgs. The soil boring location was moved several feet northwest to its present location. Subsurface conditions encountered beneath the 4 ½-inch asphalt surface during soil boring activities consisted of brownish yellow sand, extending to approximately one foot bgs. This sandy material is underlain by sandy clay extending to approximately 24 feet bgs. Groundwater was encountered within the sandy clay at 9 feet bgs. Olive brown sand with clay was present from approximately 24 feet bgs to the bottom of the borehole at 26 feet bgs.

A hydrocarbon odor was noted in samples collected from depths between 5 and 11 feet bgs. No soil discoloration was observed.

Well Installation and Development Methods

Upon completion of drilling activities, well casing was installed in the borehole through the hollow stem of the auger. The well casing consisted of 6 feet of 2-inch diameter, Schedule 40 PVC pipe with flush-threaded connections and 20 ft of 2-inch diameter schedule 40 PVC Screen with 0.020-inch machined slots present from a depth of 6 feet bgs extending to the bottom of the borehole. The bottom of the well casing was fitted with a cap. A sand filter pack consisting of RMC Lonestar No. 3 sand was placed in the annular space from the bottom of the borehole to 2 feet above the screened interval. A 1-foot thick seal of bentonite pellets was placed above the sand filter pack. The seal was completed to 0.25 feet bgs with Portland cement, and the well completed in a traffic-rated utility vault. The top of the well casing was equipped with a locking expansion plug. Well completion details are provided in Appendix A.

Monitoring well MW-8 was developed by Blaine Tech Services (Blaine Tech) by surging to sort the filter pack and pumping to remove the fines from the well casing. Approximately 15 casing volumes of water were purged from MW-8 during development. Discharge water was monitored for temperature, pH, conductivity, and turbidity during development. A copy of the well development report is provided in Appendix B.

Well Survey

The elevation of MW-8 was surveyed by a California-licensed surveyor to allow the groundwater gradient and direction of flow to be evaluated relative to other wells onsite. Additionally, elevations of three existing wells were checked to verify prior survey results.

GROUNDWATER MEASUREMENTS

Water-Level Measurement Procedures

Quarterly groundwater monitoring activities were conducted on November 3, 1994. Prior to sampling, the groundwater level in each of the seven 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 Wells MW-3, MW-6, and MW-7, and have decreased or remained approximately the same in MW-2, MW-4, and MW-5. 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 November 3, 1994, groundwater flow direction at the site was calculated to be toward the southwest, with an approximate gradient of 0.004 to 0.02 foot per foot. This is generally consistent with historical groundwater flow direction and gradient.

Dissolved Oxygen Measurement Procedures

In preparation for initiating a passive in-situ bioremediation pilot study at the subject property, dissolved oxygen measurements were collected August 10 and during the November 1994 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.

Dissolved Oxygen Measurement Results

Total dissolved oxygen concentrations within onsite wells during the November monitoring ranged from 0.1 milligrams per liter (mg/L) to 0.4 mg/L. These initial measurements will be used for comparison with future measurements as an indication of the effectiveness of the oxygenation achieved during the pilot study. Dissolved oxygen concentrations for the November 1994 monitoring event are provided in the groundwater sampling report in Appendix C and are summarized in Table 3.

GROUNDWATER SAMPLING AND ANALYTICAL TESTING

Sampling Protocol

Groundwater samples were collected on November 3, 1994 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 C.

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

Consistent with historical monitoring data, TPH-gas was detected in Wells MW-2, MW-3, MW-5, MW-7, and EW-1. A low concentration of TPH-gas was also detected in Well MW-4, where none had been detected since the February 1993 monitoring events. 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, MW-7, and MW-8. No TPH-gas or BTEX was detected in MW-6. 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 D. The distribution of hydrocarbons in groundwater at the site on November 3, 1994 is presented on Plate 4.

SUMMARY

Groundwater elevations have generally increased or remained approximately the same since the August 10, 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. In addition to the standard monitoring activities, installation of a new monitoring well on the eastern property boundary of the site was performed and measurements of total dissolved oxygen concentrations within wells were collected during the recent monitoring event in preparation for beginning a passive in-situ bioremediation pilot study.

Concentrations of dissolved hydrocarbons in groundwater have not changed significantly since the prior quarterly monitoring event.

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

Attachments:

	Table 1	Summary of Groundwater Elevations Through November 1994
	Table 2	Summary of Analytical Results for Groundwater Samples Through November 1994
	Table 3	Summary of Total Dissolved Oxygen Through November 1994
	Plate 1	Site Location Map
	Plate 2	Well Location Map
	Plate 3	Groundwater Elevation Contours on November 3, 1994
	Plate 4	Dissolved Hydrocarbons in Groundwater on November 3, 1994
	Appendix A	United Soil Classification System Chart and Soil Boring Log
	Appendix B	Well Development Report
	Appendix C	Groundwater Sampling Report
	Appendix D	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 November 1994**
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**
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
	3-Nov-94	**PES**	**12.43**	**8.13**	**4.30**

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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-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**
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
	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**

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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-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**
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**
MW-8	**3-Nov-94**	**PES**	**15.01**	**11.06**	**3.95**

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 November 1994
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**
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	Toluene	Ethyl-Benzene	Total Xylenes	Purgeable Halocarbons	Lead
					MCL = 0.00	DAL = 0.1	MCL = 0.68	MCL = 1.75		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**
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

Table 2. Summary of Analytical Results for Groundwater Samples Through November 1994
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-4	10-Nov-92	PES	0.180	<0.100	0.060	0.0009	<0.0003	<0.0006	<0.0003	NA
Cont.	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
	15-Nov-93	PES	<0.050	NA	0.0020	0.0005	<0.0005	0.0009	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	0.0017	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**
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**

Table 2. Summary of Analytical Results for Groundwater Samples Through November 1994
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-6	May-90	ES	NA	ND	ND	ND	ND	ND	ND	ND**
	Aug-90	ES	NA	ND	NA	NA	NA	NA	NA	ND**
	Nov-90	ES	1.2	1.4	0.0012	ND	ND	ND	0.0012	NA
	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**
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

Table 2. Summary of Analytical Results for Groundwater Samples Through November 1994
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	10-Nov-92	PES	0.370	<0.100	0.031	0.0012	<0.0003	0.0012	<0.0003	NA
Cont.	18-Feb-93	PES	0.270	NA	0.077	0.0013	<0.0005	0.0014	NA	NA
	20-May-93	PES	0.300	NA	0.150	0.003	<0.002	0.003	NA	NA
	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**
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 November 1994
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**

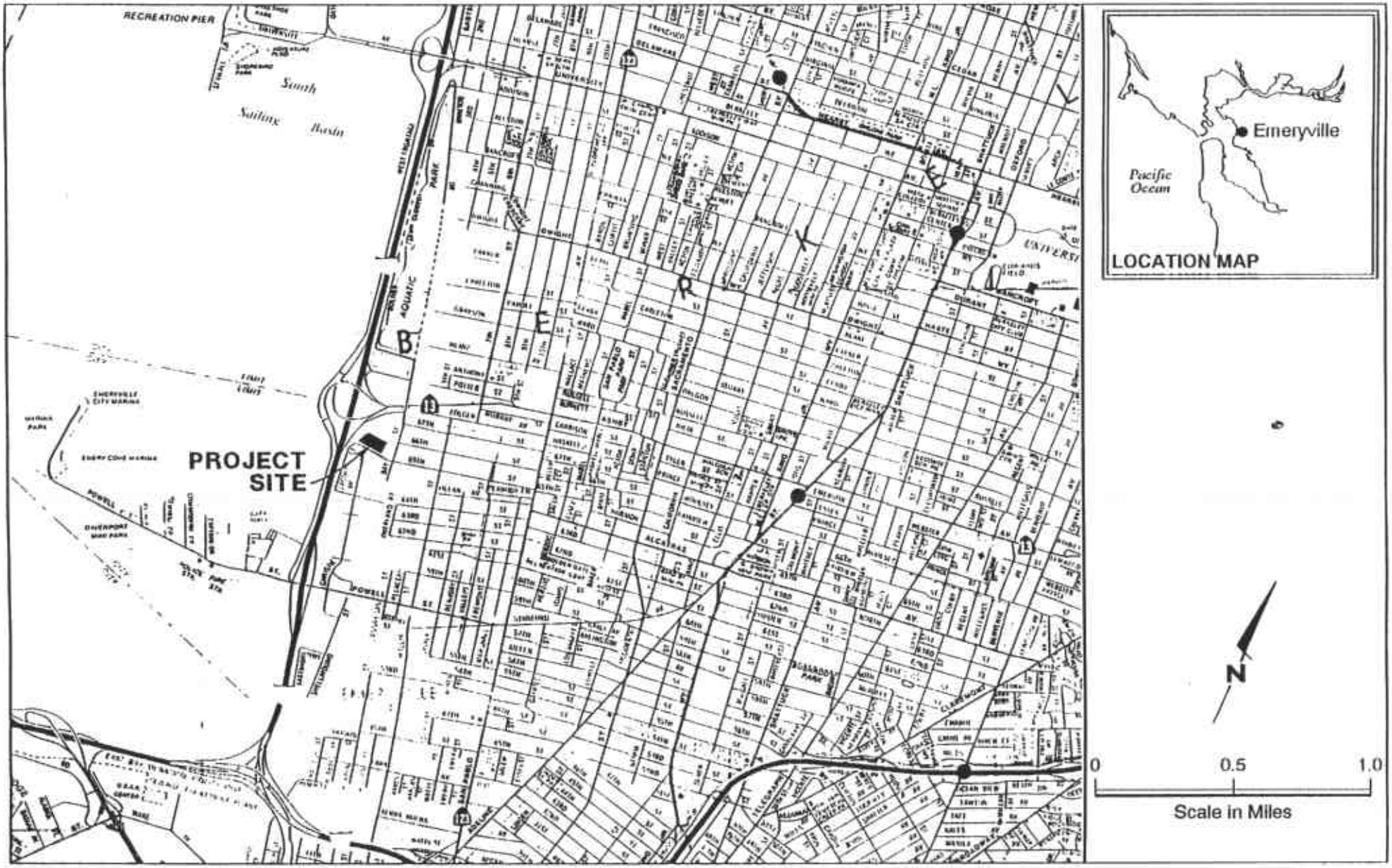
NOTES:

* = 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 November 1994**
Emery Bay Plaza
1650 65th Street, Emeryville, California

Well Number	Date	Measured by	Total Dissolved Oxygen (mg/L)
MW-2	10-Aug-94	PES	<0.1
	3-Nov-94	Blaine	0.2
MW-3	10-Aug-94	PES	<0.1
	3-Nov-94	Blaine	0.2
MW-4	10-Aug-94	PES	0.1
	3-Nov-94	Blaine	0.1
MW-5	10-Aug-94	PES	0.1-0.2
	3-Nov-94	Blaine	0.4
MW-6	10-Aug-94	PES	<0.1
	3-Nov-94	Blaine	0.4
MW-7	10-Aug-94	PES	<0.1
	3-Nov-94	Blaine	0.3
MW-8	10-Aug-94	PES	NM
	3-Nov-94	Blaine	0.3
EW-1	10-Aug-94	PES	<0.1
	3-Nov-94	Blaine	0.3

NOTES:
mg/L = milligrams per liter
PES = PES Environmental, Inc.
Blaine = Blaine Technical Services
NM = Not measured.
<0.1 = Below indicated equipment detection range.

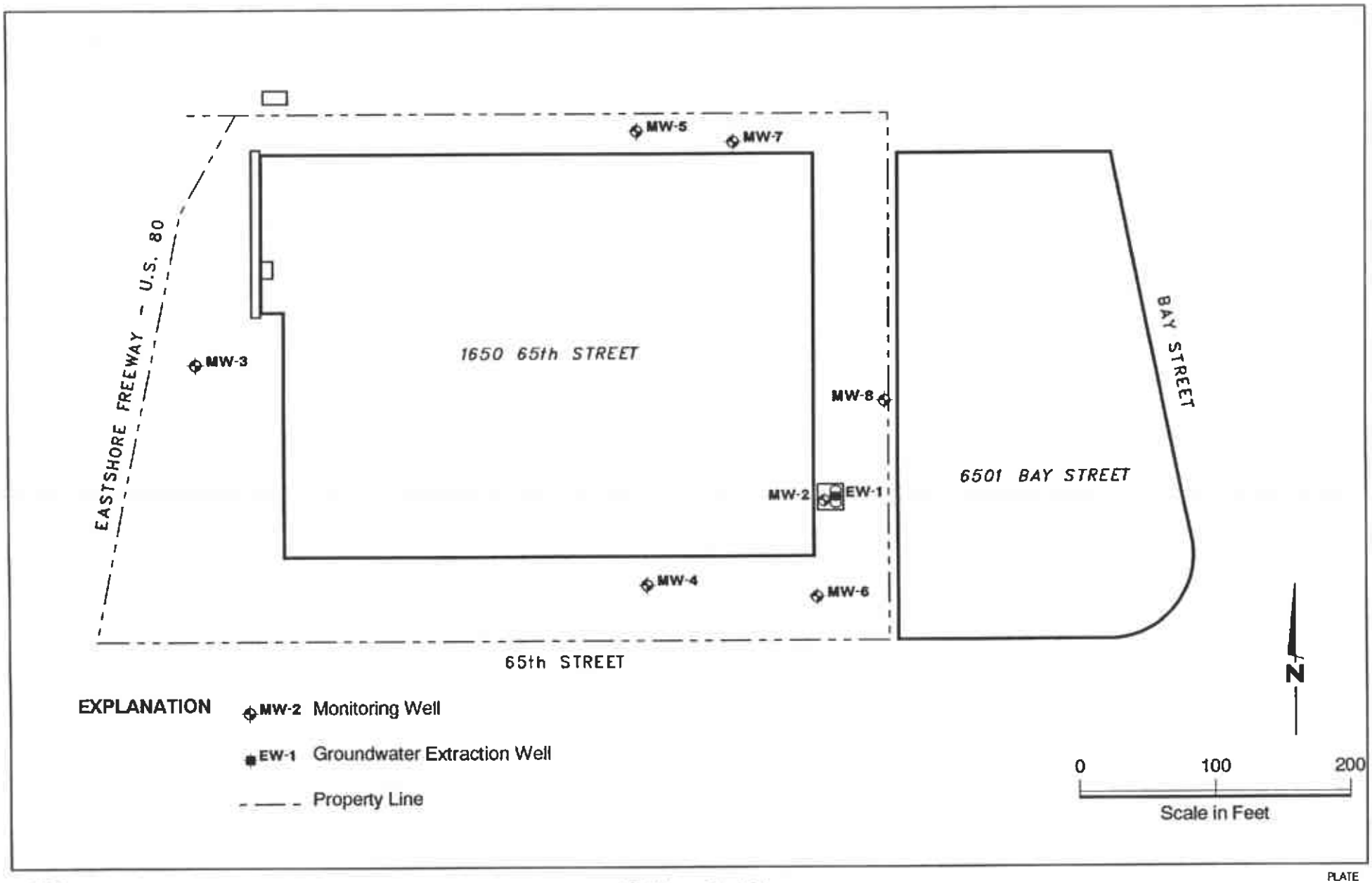


PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
1650 65th Street
Emeryville, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.01.003		12/94		

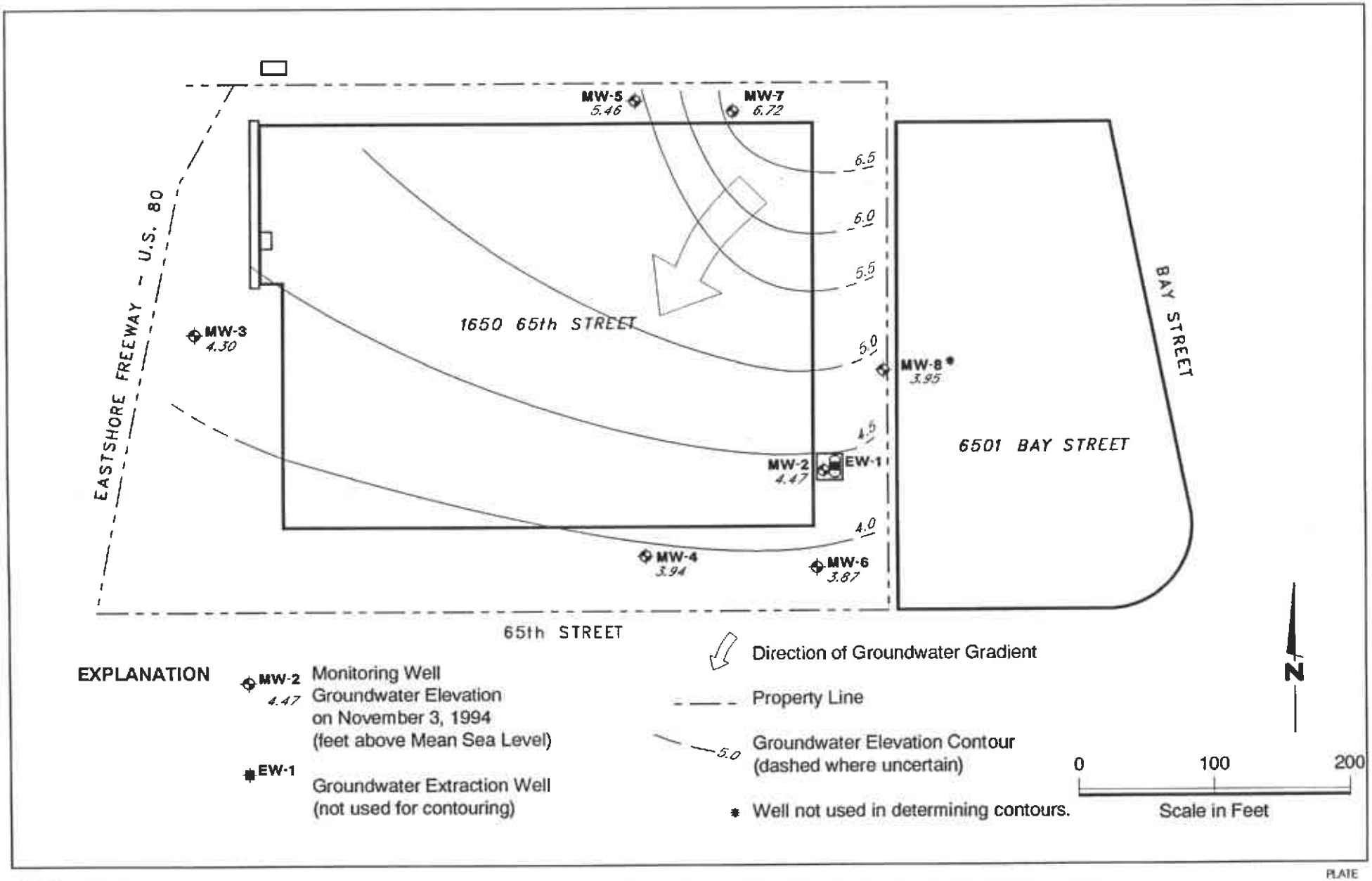


PES Environmental, Inc.
Engineering & Environmental Services

Well Location Map
1650 65th Street
Emeryville, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.01.003		12/94		

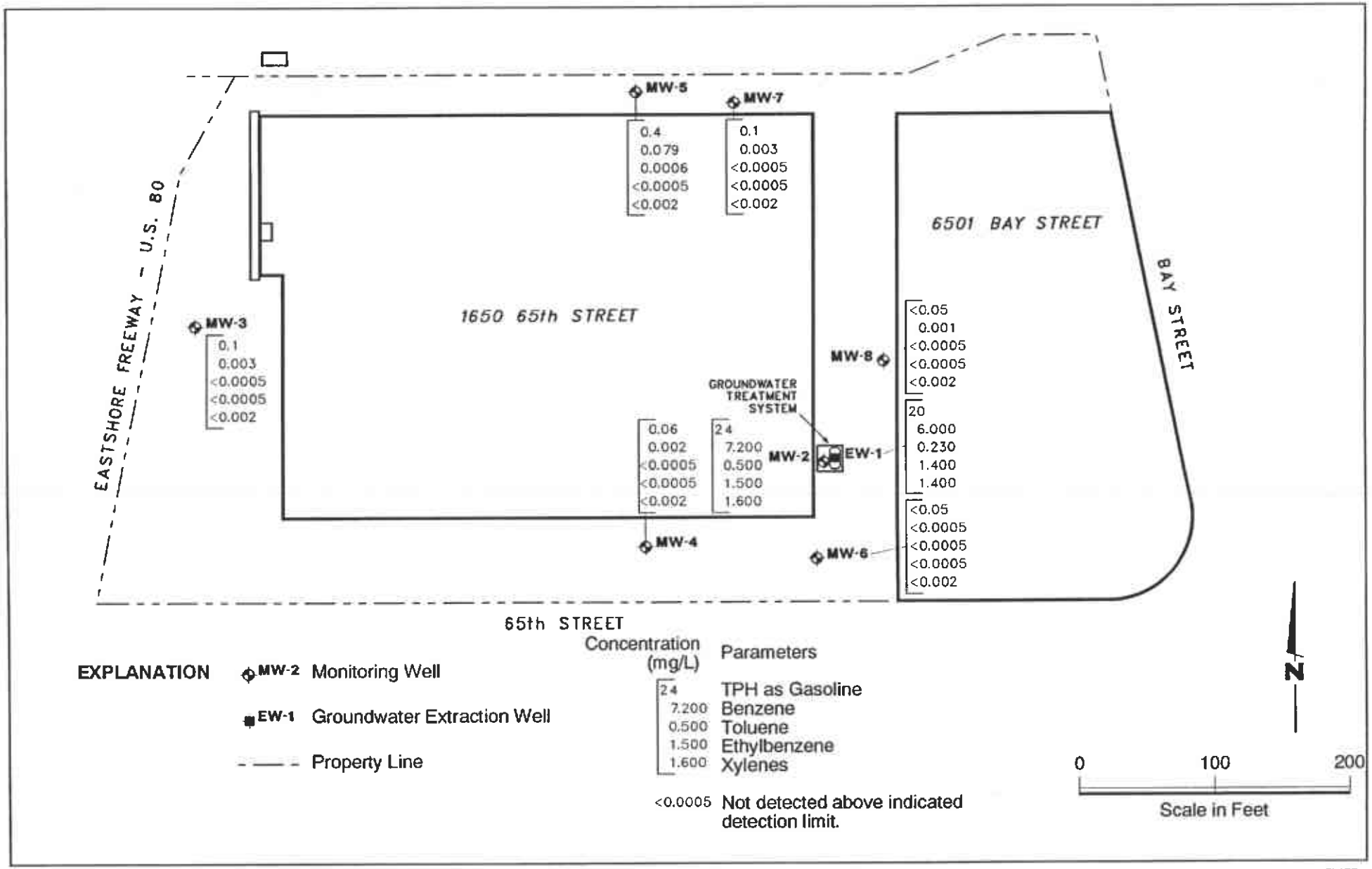


PES Environmental, Inc.
Engineering & Environmental Services

Groundwater Elevation Contours on November 3, 1994
1650 65th Street
Emeryville, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.03.001		12/94		



EXPLANATION

- MW-2 Monitoring Well
- EW-1 Groundwater Extraction Well
- Property Line

Concentration (mg/L)	Parameters
24	TPH as Gasoline
7.200	Benzene
0.500	Toluene
1.500	Ethylbenzene
1.600	Xylenes

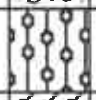
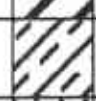
<0.0005 Not detected above indicated detection limit.

PES Environmental, Inc.
Engineering & Environmental Services

Dissolved Hydrocarbons in Groundwater on November 3, 1994
1650 65th Street
Emeryville, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
131.0100.003		12/94		

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF GOARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF GOARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEYSANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SAND AND GRAVEL
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

PID (PPM) -Photo Ionization Detector readings in parts per million from field headspace sample screening.

BLOWS/6" -Blows required to drive sampler 6 inches as indicated on the logs using sample drive hammer weight of 140 pounds falling 30 inches.

2.5YR 6/2 -Soil Color according to Munsell Soil Color Charts (1994 Revised Edition)

feet MSL -feet above Mean Sea Level

feet BGS -feet below ground surface

- ☐ - No Soil Sample Recovered
- ⧄ - Partial Soil Sample Recovered
- ☒ - Undisturbed Soil Sample Recovered
- ■ - Soil Sample Submitted for Laboratory Analysis
- ▽ - First Encountered Groundwater Level

PES Environmental, Inc.
Engineering & Environmental Services

Unified Soil Classification System Chart
P.O. Partners
Emery Bay Plaza
Emeryville, California

PLATE
A-1

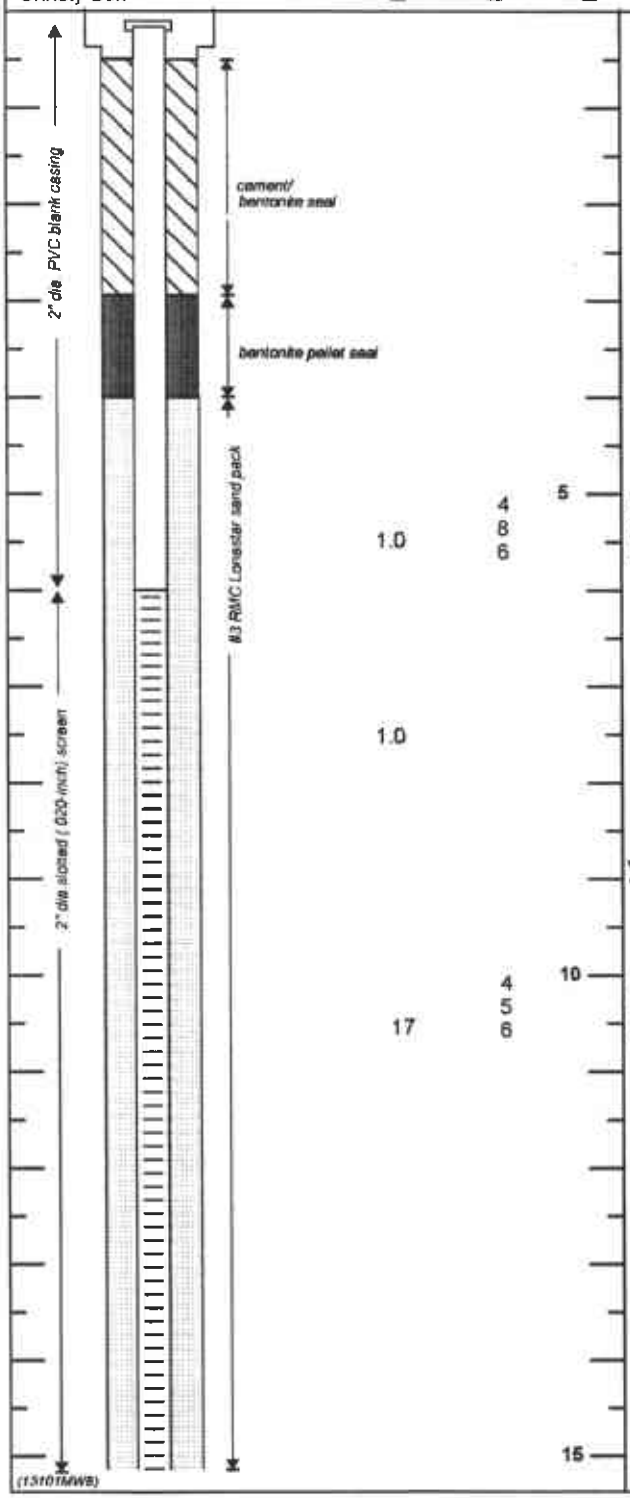
131.0100.005	13101MW*.CDR		1/95
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

PES Environmental, Inc.
Engineering & Environmental Services

LOG OF MW-8

WELL CONSTRUCTION DETAIL

Christy Box



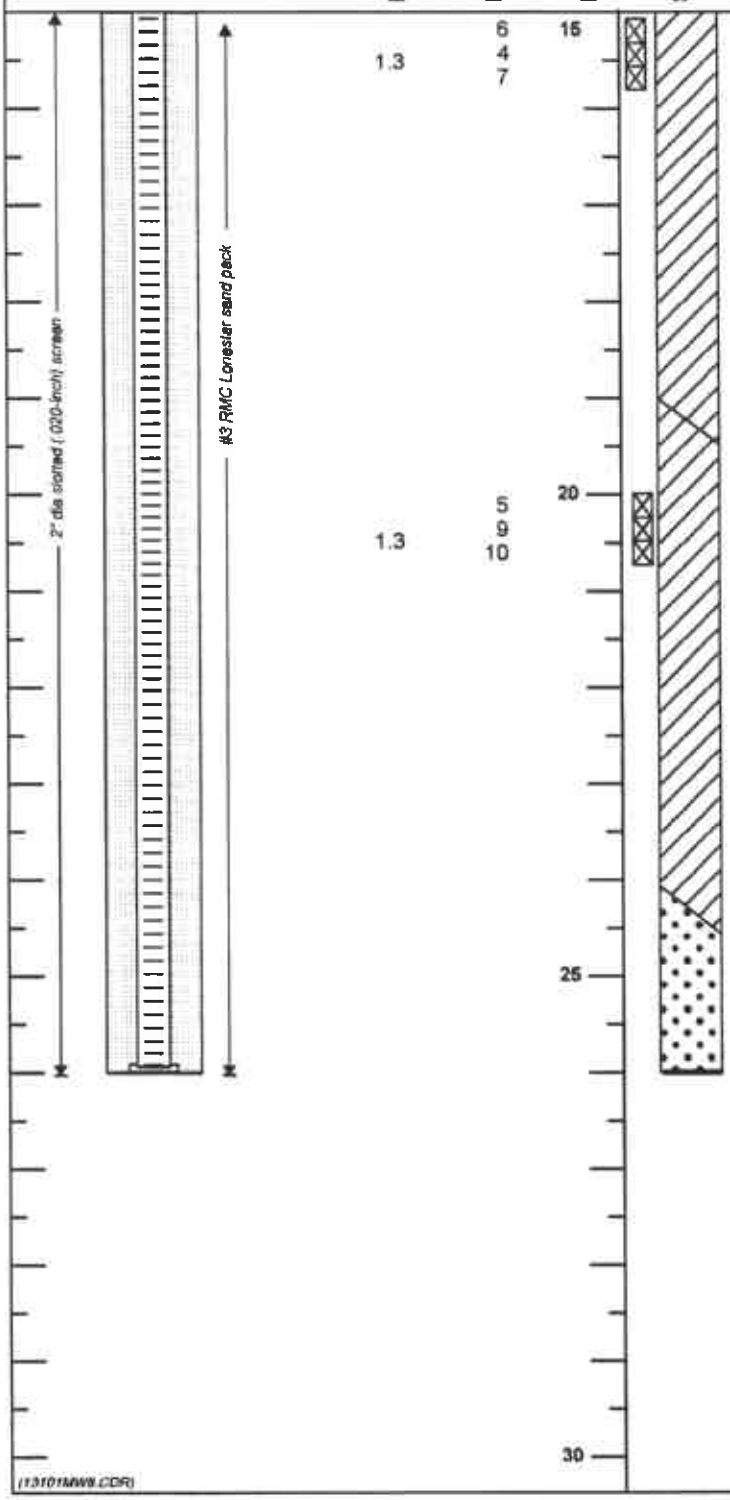
PID (PPM)	BLOWS/6 IN	DEPTH (FT)	MATERIALS DESCRIPTION
			ASPHALT
			BROWNISH YELLOW SAND (SW) 10YR 6/8, damp, fine-grained to medium-grained sand.
			VERY DARK GRAYISH BROWN SANDY CLAY (CL) 10YR 3/2, damp, ~25% sand, ~15% subangular, 1/4 to 1-inch gravel.
1.0	4 6 6	5	GREENISH GRAY SANDY CLAY (CL) WITH GRAVEL 5G 5/1, moist, ~20% fine to medium-grained sand, ~5% subangular up to 2-inch gravel, hydrocarbon odor.
1.0			VERY DARK GRAYISH BROWN SANDY CLAY (CL) 2.5Y 3/2, medium stiff, moist, 25-30% fine to medium-grained sand, hydrocarbon odor.
17	4 5 6	10	BLACK SANDY CLAY (CL) 2.5y 2.5/1, medium stiff, wet, ~50% fine to medium-grained sand, hydrocarbon odor.
		15	*(Continued)*

CLIENT	P.O. Partners	DIAMETER OF HOLE	9 inches
LOCATION	Emeryville, California	TOTAL DEPTH OF HOLE	26 feet bgs
JOB NUMBER	131.0100.005	TOP OF CASING ELEVATION	0 feet bgs
GEOLOGIST/ENGINEER	Brian Smith	DATE STARTED	9/22/94
DRILL RIG	Mobile Drill B-53	DATE COMPLETED	9/22/94

PLATE **A-2a**

PES Environmental, Inc.
Engineering & Environmental Services

LOG OF MW-8



CLIENT	P.O. Partners	DIAMETER OF HOLE	9 inches
LOCATION	Emeryville, California	TOTAL DEPTH OF HOLE	26 feet bgs
JOB NUMBER	131.0100.005	TOP OF CASING ELEVATION	0 feet bgs
GEOLOGIST/ENGINEER	Brian Smith	DATE STARTED	9/22/94
DRILL RIG	Mobile Drill B-53	DATE COMPLETED	9/22/94

PLATE
A-2b

BLAINE
TECH SERVICES INC.

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

October 7, 1994

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

Attention: Alicia Andrews

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

PROJECT:
Well Development

PROJECT INITIATED ON:
September 29, 1994

WELL DEVELOPMENT REPORT 940929-K-1

Blaine Tech Services, Inc. performs 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. The interpretation of results should be performed by representatives of the interested regulatory agencies and those certified professionals who are engaged as paid consultants in the business of providing professional opinions along with recommendations and proposals for further investigative or remedial activities.

As an independent third party, Blaine Tech Services, Inc. routinely performs evacuation and sampling of groundwater wells. In addition, we are frequently asked to provide specialized personnel, instruments and equipment for well development work. Similar standards of care and cleanliness are required in all these activities and our personnel are accustomed to the safety measures that must be taken.

Scope of Requested Services

Blaine Tech Services, Inc. was asked to provide specialized equipment, instruments and personnel for a well development project being overseen by PES Environmental, Inc..

Execution of the Recent Work

Our personnel arrived at the site on Thursday, September 29, 1994 and developed one well in accordance with our client's specifications communicated to us by Ms. Alicia Andrews. A summary of the well development actions is presented in the tables of field data which follow.

MW-8 WELL DEVELOPMENT LOG

Well Designation	Well Diameter (inches)	Well Depth (feet)	Initial Depth to Water (feet)	Volume of single case (gallons)
MW-8	2	24.53	10.99	2.2

Equipment Used: Middleburg

Data collection during well development:

Date	Time	Gallons Removed	Temp. (F)	pH	EC (micromhos)	Turbidity (NTU)	Notes
09/29/94	09:17	--	63.9	7.0	>10,000	>200	
	09:19	3.0	64.4	7.1	>10,000	>200	
	09:21	5.0	64.3	7.2	>10,000	>200	
	09:25	8.0	63.8	7.2	>10,000	>200	
	09:29	10.5	63.6	7.2	>10,000	>200	
	09:32	13.0	63.6	7.3	>10,000	>200	
	09:36	15.5	63.4	7.4	>10,000	>200	
	09:43	18.0	63.2	7.3	>10,000	>200	
	09:48	20.5	63.1	7.3	>10,000	>200	
	09:56	23.0	63.4	7.3	>10,000	>200	
	10:05	25.5	63.4	7.3	>10,000	>200	
	10:11	28.0	63.4	7.3	>10,000	>200	
	10:18	30.5	63.2	7.3	>10,000	>200	
	10:27	33.0	63.3	7.3	>10,000	>200	Total well depth @ 24.94'.
	10:27	End log.					

Note: This is a very silty well. It was drilled in clay matrix. Well was not swabbed for this reason. Well bottom was solid but according to record was not reached. Well was clearing up, therefore purging was stopped as per PES instructions.

STANDARD PROCEDURES

Overview

Because formations vary in their geologic composition, transmissivity and water production capability, well development cannot be reduced to a set of fixed procedures that will always produce a complete and satisfactory result if just repeated for a predetermined period of time. Instead, well development is accomplished by selecting procedures that (a.) repair that portion of the native formation that was disrupted by the cutting action of the well drilling tool, and (b.) promote the flow of water out of the native formation into the newly installed well (through the granular filter pack and well screen). Execution of development actions that are not appropriate to the native formation will be inefficient and in some cases even deleterious.

Time constraints usually prevent a precise classification of the saturated zone materials by analysis of soil samples for physical characteristics at a laboratory equipped to do physical testing. Physical tests cannot usually be completed during the brief timespan of a project that combines exploration, design, and well installation into a one day effort. Instead, the subjective judgments of the field geologist are recorded in the boring log and well installation log. The field geologist must quickly evaluate soil types by their appearance and observable characteristics and record his or her estimation of the material in the log according to the categorical definitions provided by the Unified Soil Classification System. These categorical judgments are also the basis for determining the final construction specifications of the well.

The well's total depth, the length of the screened interval, the slot size, and the size of the sand used in the filter pack are all decided on the *appearance* of soil cuttings and whatever quick tests the field geologist can perform. Because the physical specifications for the well are set at that moment and cannot be corrected later, any misclassification of soil that results in a mismatching of the well to the native formation will have to be addressed and corrected (to whatever extent is possible) with well development actions, alone.

Well development work can be directed in two ways:

> First, specific well development actions can be called for by the geologist who installed the wells or by another professional reviewing that installation work. Typically, consultants specify the use of certain equipment and techniques.
>
> Second, the consultant or client can define the goal which is being sought and place limits on the amount of effort which should be taken to achieve the goal.

Of the two types of direction, the second is far more common and also more important. Defining the extent of effort which can be expended is vital to controlling costs on a project and scheduling personnel and equipment to complete the work. Moreover, it is possible to undertake and complete work without the added and frequently unnecessary effort of working out very detailed specification which may be impractical or unwarranted.

This does not mean that our personnel cannot make use of well installation logs when they are available or are not receptive to very specific directions from the consultant. It does, however, mean that when very detailed directions are given, rapid communications between our personnel and the geologist become very important. This is especially true of sites where multiple wells have been installed, because wells even a short distance apart may demonstrate quite different characteristics which may require a rapid reevaluation of what well development procedures are appropriate in light of the hydrologic condition presented by the native formation at that location on the site.

In most cases, tightly controlled action sequences are less productive than more general directions combined with plain statements of what evaluation criteria should be used for judging the progress and completeness of the well development work. The most common standards are volumetric (removal of set volumes of water), recharge rate, and water clarity (measured as nephelometric turbidity units). Given these goals and limitations, our personnel can work independently of the project geologist. In most cases, our personnel can proceed with the work without supervision or direction by relying on empirical information obtained directly from the water in the well.

Selection of Development Equipment

Each Blaine Tech Services, Inc. vehicle provided for a well development project will have a wide assortment of development tools including stainless steel surgeblocks and swabs, several types of pumps, and complete instrumentation for determining standard parameters. Special equipment which includes certain types of winches, jetting heads, and drop surging pumps can be provided.

General Policy

Truly difficult conditions which can only be resolved by the application of massive force or large volumes of high pressure air should be addressed by a drilling or pump installation contractor. Blaine Tech Services, Inc. is not in the heavy salvage business and has a general policy against the use of tools or techniques which provide enough mechanical advantage to pose a serious risk of damaging the well. The same policy prohibits introducing foreign materials into a well which could carry contaminants into the groundwater. In keeping with this policy, our personnel avoid surging with slugs of effluent water, or jetting with unfiltered air unless these actions are specifically requested by a registered professional who is cognizant of the problems and hazards that accompany the action. In a similar vein, our personnel will, whenever possible, avoid development actions that are likely to seal clay formations or promote bridging, and make every attempt to call obvious indications of such conditions to the attention of the project geologist so that a different regimen can be selected.

Effluent Materials

Groundwater well sampling protocols call for the evacuation of a sufficient volume of water from the well to insure that the sample is collected from water that has been newly drawn into the well from the surrounding geologic formation.

Well development routinely generates as much or more effluent water as does routine evacuation prior to monitoring. In some cases very large amounts of water must be removed from the well before a satisfactory level of development has been achieved. The effluent water from these development actions must be contained. Blaine Tech Services, Inc. will place this water in appropriate containers of the client's choice or bring new DOT 17 E drums to the site which are appropriate for the containment of the effluent materials. The determination of how to properly dispose of the effluent water must usually await the results of laboratory analyses of subsequent samples collected from each individual groundwater well. If those individual samples do not establish whether or not the effluent water is contaminated, or if effluent from more than one source has been combined in the same container, it may be necessary to conduct additional analyses on the effluent material.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment will be decontaminated after use in each well and before leaving the site. Decontamination consits of complete disassembly of the device to a point where a jet of steam cleaner water can be directed onto all the internal surfaces. Blaine Tech Services, Inc. frequently modifies apparatus to allow complete disassembly and proper cleaning.

Personnel

All Blaine Tech Services, Inc. personnel receive 29 CFR 1910.120 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.

Richard C. Blaine

RCB/lp

BLAINE
TECH SERVICES INC.

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

November 10, 1994

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

Attn: Mary Williams

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

DATE:
November 3, 1994

GROUNDWATER SAMPLING REPORT 941103-Z-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	11/03/94			11/03/94			11/03/94			11/03/94		
Well Diameter (in.)	4			2			4			4		
Total Well Depth (ft.)	26.94			25.83			18.27			14.97		
Depth To Water (ft.)	11.29			11.32			8.13			8.30		
Free Product (in.)	NONE			NONE			NONE			NONE		
Reason If Not Sampled	--			--			--			--		
1 Case Volume (gal.)	10.2			2.3			6.5			4.3		
Did Well Dewater?	NO			NO			NO			NO		
Gallons Actually Evacuated	31.0			7.0			20.0			13.0		
Purging Device	ELECTRIC SUBMERSIBLE			MIDDLEBURG			ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE		
Sampling Device	BAILER			BAILER			BAILER			BAILER		
Time	11:50	11:52	11:54	12:03	12:05	12:07	10:03	10:04	10:05	09:24	09:25	09:26
Temperature (Fahrenheit)	67.3	67.8	67.8	66.9	66.9	66.8	68.3	68.1	68.1	73.2	72.8	72.8
pH	8.3	8.2	8.2	8.3	8.3	8.3	8.1	8.5	8.5	7.4	7.8	7.8
Conductivity (micromhos/cm)	420	420	430	860	350	350	450	420	420	970	930	930
Nephelometric Turbidity Units	23.8	24.4	30.1	34.5	20.1	19.8	10.8	6.8	6.1	12.8	13.0	12.8
Total Dissolved Oxygen (mg/l)	0.3			0.2			0.2			0.1		
BTS Chain of Custody	941103-Z-1			941103-Z-1			941103-Z-1			941103-Z-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	11/03/94			11/03/94			11/03/94			11/03/94	
Well Diameter (in.)	4			4			4			2	
Total Well Depth (ft.)	18.04			18.83			18.50			25.14	
Depth To Water (ft.)	7.36			8.16			6.18			11.06	
Free Product (in.)	NONE			NONE			NONE			NONE	
Reason If Not Sampled	--			--			--			--	
1 Case Volume (gal.)	6.9			6.9			8.2			2.3	
Did Well Dewater?	NO			NO			NO			NO	
Gallons Actually Evacuated	21.0			21.0			25.0			7.0	
Purging Device	ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE			ELECTRIC SUBMERSIBLE			MIDDLEBURG	
Sampling Device	BAILER			BAILER			BAILER			BAILER	
Time	10:47	10:48	10:50	09:42	09:43	09:45	10:25	10:27	10:28	11:20	11:22	11:25
Temperature (Fahrenheit)	66.2	66.0	66.0	69.3	70.4	69.2	65.1	65.5	65.5	64.6	64.3	64.3
pH	8.2	8.1	8.1	7.5	7.4	7.4	8.5	8.4	8.4	7.9	7.9	7.8
Conductivity (micromhos/cm)	320	330	330	640	700	700	210	190	190	810	930	930
Nephelometric Turbidity Units	7.9	7.7	7.6	73.0	38.8	38.1	5.5	10.6	11.1	>200	>200	>200
Total Dissolved Oxygen (mg/l)	0.4			0.4			0.3			0.3	
BTS Chain of Custody	941103-Z-1			941103-Z-1			941103-Z-1			941103-Z-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 either middleburg pumps or 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.

USGS/Middleburg Positive Displacement Sampling Pumps: USGS/Middleburg positive displacement sampling pumps are EPA approved pumps appropriate for use in wells down to two inches in diameter and depths up to several hundred feet. The pump contains a flexible Teflon bladder which is alternately allowed to fill with well water and then collapsed. Actuation of the pump is accomplished with compressed air supplied by a single hose to one side of the Teflon membrane. Water on the other side of the membrane is squeezed out of the pump and up a Teflon conductor pipe to the surface. Evacuation and sampling are accomplished as a continuum. The rate of water removal is relatively slow and loss of volatiles almost non-existent. There is only positive pressure on the water being sampled and there is no impeller cavitation or suction. The pumps can be placed at any location within the well, can draw water from the very bottom of the well case, and are virtually immune to the erosive effects of silt or lack of water which destroy other types of pumps.

Disadvantages associated with Middleburg pumps include their high cost, low flow rate, temperamental operation, and cleaning requirements which are both elaborate and time consuming.

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.

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 941103-Z1

CLIENT PES Environmental

SITE P.O. Partners
1650 65th St
Emeryville, CA

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT: TPH/BTEX 8015/8020

LAB KAEN DHS #

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

☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS
Invoice & Report to PES
Attn: Mary Williams
PES Job# 131.0100.003

SAMPLE I.D.			MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	CONTAINERS 40 ML VOAs	C	TPH/BTEX 8015/8020	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
EW-1	11/3/94	1200	W	3			X				
MW-2	"	1215	W	3			X				
MW-3	"	1010	W	3			X				
MW-4	"	930	W	3			X				
MW-5	"	1055	W	3			X				
MW-6	"	950	W	3			X				
MW-7	"	1035	W	3			X				
MW-8	"	1135	W	2			X				
TB	"	-	W								

SAMPLING COMPLETED DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN
11/3/94	1248	BRETT BLEAN	Standard TAT

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
	11/4/94	1520		11-4-94	13:30
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: 131.0100.003
CLIENT PROJ. NAME: P.O. PARTNERS

REPORT DATE: 11/21/94

DATE(S) SAMPLED: 11/03/94

DATE RECEIVED: 11/04/94

AEN WORK ORDER: 9411064

PROJECT SUMMARY:

On November 4, 1994, this laboratory received 9 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.

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: 9411064-01
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	6,000 *	10	ug/L	11/15/94
Toluene	108-88-3	230 *	10	ug/L	11/10/94
Ethylbenzene	100-41-4	1,400 *	10	ug/L	11/10/94
Xylenes, Total	1330-20-7	1,400 *	40	ug/L	11/10/94
Purgeable HCs as Gasoline	5030/GCFID	20 *	1	mg/L	11/10/94

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

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-2
AEN LAB NO: 9411064-02
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	7,200 *	10	ug/L	11/14/94
Toluene	108-88-3	500 *	10	ug/L	11/11/94
Ethylbenzene	100-41-4	1,500 *	10	ug/L	11/11/94
Xylenes, Total	1330-20-7	1,600 *	40	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	24 *	1	mg/L	11/11/94

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

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-3
AEN LAB NO: 9411064-03
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	3 *	0.5	ug/L	11/11/94
Toluene	108-88-3	ND	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	0.1 *	0.05	mg/L	11/11/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-4
AEN LAB NO: 9411064-04
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	2 *	0.5	ug/L	11/10/94
Toluene	108-88-3	ND	0.5	ug/L	11/10/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/10/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/10/94
Purgeable HCs as Gasoline	5030/GCFID	0.06 *	0.05	mg/L	11/10/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-5
AEN LAB NO: 9411064-05
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	79 *	0.5	ug/L	11/11/94
Toluene	108-88-3	0.6 *	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	0.4 *	0.05	mg/L	11/11/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-6
AEN LAB NO: 9411064-06
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	11/11/94
Toluene	108-88-3	ND	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	11/11/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-7
AEN LAB NO: 9411064-07
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	3 *	0.5	ug/L	11/11/94
Toluene	108-88-3	ND	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	0.1 *	0.05	mg/L	11/11/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: MW-8
AEN LAB NO: 9411064-08
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	1 *	0.5	ug/L	11/11/94
Toluene	108-88-3	ND	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	11/11/94

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

PES ENVIRONMENTAL, INC.

SAMPLE ID: TB
AEN LAB NO: 9411064-09
AEN WORK ORDER: 9411064
CLIENT PROJ. ID: 131.0100.003

DATE SAMPLED: 11/03/94
DATE RECEIVED: 11/04/94
REPORT DATE: 11/21/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	11/11/94
Toluene	108-88-3	ND	0.5	ug/L	11/11/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	11/11/94
Xylenes, Total	1330-20-7	ND	2	ug/L	11/11/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	11/11/94

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9411064

CLIENT PROJECT ID: 131.0100.003

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: 9411064
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
11/10/94	EW-1	01	97
11/11/94	MW-2	02	97
11/11/94	MW-3	03	101
11/10/94	MW-4	04	103
11/11/94	MW-5	05	97
11/11/94	MW-6	06	102
11/11/94	MW-7	07	102
11/11/94	MW-8	08	102
11/11/94	TB	09	100
QC Limits:			86-110

DATE ANALYZED: 11/10/94
SAMPLE SPIKED: 9411045-01
INSTRUMENT: F

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	17.5	103	<1	82-125	15
Toluene	47.6	102	1	75-126	17
Hydrocarbons as Gasoline	500	103	2	75-132	16

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

*** END OF REPORT ***