PES Environmental, Inc.
Engineering & Environmental Services

October 29, 1999

167.0201.006

STID 494

Wells Fargo Bank
c/o Leah S. Goldberg, Esq.
Hanson, Bridgett, Marcus, Vlahos & Rudy
333 Market Street, Suite 2300
San Francisco, California 94105-2173

QUARTERLY GROUNDWATER MONITORING AND REMEDIATION PROGRESS REPORT
APRIL 1999 QUARTERLY EVENT
FORMER COX CADILLAC FACILITY
230 BAY PLACE
OAKLAND, CALIFORNIA

Dear Ms. Goldberg:

1.0 INTRODUCTION

This report presents the results of groundwater monitoring conducted by PES Environmental, Inc. (PES) on April 13, 1999 at the former Bill Cox Cadillac facility at 230 Bay Place, Oakland, California. The work is being performed as part of response action to address releases from a former 10,000-gallon gasoline underground storage tank (UST) operated at the site by Bill Cox Cadillac. The location of the site is shown on Plate 1. The work was performed on behalf of Wells Fargo Bank (Wells Fargo), trustee for the property owner, and Hanson, Bridgett, Marcus, Vlahos and Rudy, legal counsel to Wells Fargo (Hanson, Bridgett) in accordance with the agreement with Bill Cox Cadillac, the former tenant.

Groundwater remediation and monitoring are being conducted at the site as part of interim soil and groundwater remedial actions in accordance with PES' *Revised Interim Remedial Action Plan* (IRAP) dated October 31, 1996 and *Addendum, Revised Interim Remedial Action Plan* dated November 26, 1996 (collectively referred to as Remedial Plan). The remedial work was requested by Alameda County Environmental Health Services (ACEHS) in a letter to Ms. Leah Goldberg of Hanson, Bridgett dated October 24, 1996. The ACEHS approved the Remedial Plan in a letter dated November 27, 1996.

The objective of the groundwater monitoring program at this site is to: (1) evaluate the presence of petroleum hydrocarbons in groundwater; and (2) provide data to assess the progress of the groundwater remedial program. The monitoring is performed in accordance

with California Regional Water Quality Control Board (RWQCB) guidelines and the Remedial Plan.

2.0 BACKGROUND INFORMATION

One groundwater monitoring well (Well MW-1) and seven temporary monitoring wells (Wells TW-1 through TW-7) were installed at the site by PES to investigate subsurface conditions following removal of a 3,000-gallon waste oil storage tank in December 1988. MW-1 was installed in February 1993 down gradient of the former waste oil tank and a groundwater sample collected from it in March 1993. Elevated concentrations of total petroleum hydrocarbons quantified as gasoline (TPHg) were detected in the sample analyzed from Well MW-1. Gasoline detected in groundwater was characterized as "fresh" and no waste oil constituents were detected. Temporary wells, Wells TW-1 through TW-7 were subsequently installed in March 1993 to investigate the degree and extent, and the likely source of the gasoline contamination in groundwater. Results of the additional investigation indicated that elevated TPHg and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected in four of the temporary wells and in Well MW-1. The highest concentrations of petroleum hydrocarbon constituents were detected in groundwater samples from two wells (TW-5 and TW-7) closest to a 10,000-gallon gasoline tank and product piping located to the west of the former waste oil tank. The results of the investigations were presented in PES' report, *Soil and Groundwater Investigation, Bill Cox Cadillac, 230 Bay Place, Oakland, California* dated December 23, 1993. The well locations and former waste oil tank location are shown on Plate 2.

The 10,000-gallon underground gasoline tank and product piping were removed by DECON Environmental Services of Hayward, California and observed and documented by Eisenberg, Olivieri & Associates (EOA) of Oakland, California in January 1994. During removal, a hole was observed in the product piping between the tank and dispenser. Floating free-phase product was observed on the groundwater surface in the tank excavation. EOA, on behalf of Bill Cox, subsequently performed limited investigations to evaluate the offsite extent of gasoline contamination. EOA performed quarterly groundwater monitoring on site between December 1994 and February 1996 using well MW-1, TW-2, TW-6 and TW-7.

Soil and groundwater remediation was subsequently requested by ACEHS in a letter to Hanson, Bridgett dated October 24, 1996. In the letter, ACEHS specified that soil remediation consisting of excavation of hydrocarbon-affected soil, and groundwater remediation consisting of oxygen introduction was required. The PES Remedial Plan was developed in response to that request. As part of the Remedial Plan, site characterization, additional well installation, soil remediation, baseline groundwater monitoring, and initial groundwater remediation were conducted by PES between June 1997 and April 1999. The results of work conducted between June 1997 and April 1999 were previously submitted to you

in PES' draft report, *Site Characterization and Interim Remedial Actions, Former Cox Cadillac, Oakland, California,* dated May 18, 1999.

A pilot program commenced in January 1999 to test remediation of groundwater by applying a combination of in-situ bioremediation methods to introduce oxygen and nutrients into groundwater at the site to enhance natural biodegradation rates of petroleum hydrocarbons. The methods include: (1) adding a nutrient- and hydrogen peroxide-enriched water (hereinafter referred to as enriched water); and (2) placement of Oxygen Releasing Compound (ORC) in selected wells at the site. The April 1999 monitoring is the first monitoring event since the groundwater remediation program was initiated by PES. The results of the April 1999 groundwater monitoring are presented below.

3.0 GROUNDWATER MONITORING ACTIVITIES

3.1 Depth to Groundwater Measurements

Water levels were measured by PES at monitoring wells MW-1, MW-2, TW-2, TW-4, TW-5, TW-6, and TW-7 on April 13, 1999. Depth-to-groundwater measurements were obtained using an electronic water-level indicator and recorded to the nearest 0.01-foot. The water-level indicator was cleaned with a solution of non-phosphate detergent and de-ionized water and then rinsed before each use. Groundwater elevation data are presented in Table 1 and groundwater elevation contours are presented on Plate 3. Prior to measuring groundwater levels, dissolved oxygen concentrations were measured in several wells. Dissolved oxygen measurement procedures and results are described below.

3.2 Groundwater Sampling and Analyses

Groundwater samples were collected from wells MW-1, MW-2, TW-2, TW-6, and TW-7 on April 13, 1999. After dissolved oxygen and water-level measurements were obtained, the wells were purged by bailing until approximately three well volumes of water were removed. During purging, the water was monitored for pH, temperature, conductivity, and turbidity. Purge water was collected in DOT-approved 55-gallon steel drums and stored on site. Following well purging, a groundwater sample was collected from each well using a disposable bailer. The sample was transferred to the appropriate laboratory sample containers using a bottom draining bailer stopcock. The sample containers were filled slowly to minimize sample volatilization and ensure that the sample was free of air bubbles. The sample containers were labeled with project site, well identification number, sample number, sampling date and time, and requested analyses, and placed in a thermally insulated chest for transportation to the project laboratory. Well sampling documentation is presented in Appendix A.

The groundwater samples were transported in a chilled, thermally insulated cooler under chain-of-custody protocol to Entech Analytical Labs, Inc. of Sunnyvale, California, a California Department of Health Services-certified laboratory. The groundwater samples were analyzed for TPHg using EPA Test Method 8015 modified, and MTBE and BTEX using EPA Test Method 8020. Groundwater sample analytical results are presented in Table 2 and shown on Plate 4. Copies of the laboratory reports and chain-of-custody documentation are presented in B.

3.3 Enriched Water Introduction

An oxygen source in the form of a solution of potable water, hydrogen peroxide, and a blend of nutrients (enriched water) was prepared and introduced to wells TW-4, TW-5, TW-6, TW-7, and MW-1 on April 13, 1999. Concentrated hydrogen peroxide was added to a mixing tank where it was combined with potable water and small quantities of nitrogen and phosphorus nutrients. A centrifugal pump, gate valves, flow meters, and pipeline delivery system were attached to the mixing tank to allow controlled addition of enriched water to the designated wells.

The enriched water was mixed at a concentration to maximize oxygen delivery and prevent accumulation of biomass in the immediate vicinity of the wells while reducing the potential for precipitation of inorganic carbonates. An approximate volume of 497 gallons of enriched water was introduced into the wells on April 13, 1999 at a concentration of 1,050 parts per million (ppm) hydrogen peroxide. A total of approximately 681 gallons of enriched water at a concentration of 1,050 ppm hydrogen peroxide has been introduced into the wells since March 1999. Enriched water introduction through April 13, 1999 is summarized in Table 3.

Following enriched water introduction, Oxygen Releasing Compound (ORC) was installed in each of the five designated wells. The ORC is manufactured by Regenesis Bioremediation Products of San Juan Capistrano, California. The ORC is a powder form of time release magnesium peroxide. The ORC is blended with an inert carrier matrix of sand and the blend is contained in an approximately two-inch diameter polyethylene webbed sock in one foot lengths (ORC Filter Sock). The ORC Filter Socks become saturated following insertion into groundwater, and begin releasing oxygen into the subsurface. The ORC Filter Socks provide continuous supply of oxygen between enriched water introductions. Enriched water introductions are conducted twice per quarter (every six weeks).

3.4 Dissolved Oxygen Measurements

Dissolved oxygen measurements were collected by PES twice on April 13,1999. Total dissolved oxygen was measured in monitoring wells MW-1, MW-2, TW-2, TW-4, TW-5, TW-6, and TW-7 at the start of the day prior to measuring groundwater levels and purging and sampling, and at the end of the day after introduction of enriched water. The measurements

were collected from each well within the middle portion of the water column using a YSI, Inc., Model 51B Dissolved Oxygen (DO) 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 solution of non-phosphate detergent and de-ionized water then rinsed with de-ionized water. Total dissolved oxygen measurements through April 13, 1999 are summarized in Table 4.

4.0 GROUNDWATER MONITORING RESULTS

4.1 Groundwater Elevation Measurements

Depth-to-groundwater data collected from wells MW-1, MW-2, TW-2, TW-4, TW-5, TW-6 and TW-7 on April 13, 1999 were converted to groundwater elevations referenced to site datum. Groundwater elevations ranged from 92.18 feet in well MW-2 to 98.00 feet in well MW-1. Groundwater flow direction at the site is to the southwest, at a hydraulic gradient of approximately 0.052-foot per foot. No floating free product or hydrocarbon sheen was observed in the wells. Petroleum hydrocarbon odors were observed in purge water from well MW-1 and TW-7. Groundwater elevation data are presented in Table 1 and elevation contours are presented on Plate 3.

4.2 Groundwater Sample Analytical Results

The analytical results of the groundwater samples collected on April 13, 1999 are presented in Table 2 and shown on Plate 4. TPHg was detected in the samples from wells MW-1 and TW-7 at concentrations of 29,000 μg/L and 54,000 μg/L, respectively. MTBE was detected in the samples from wells MW-1, MW-2, TW-6, and TW-7 at concentrations of 520 μg/L, 3,800 μg/L, 22 μg/L, and 1,200 μg/L, respectively. Benzene was detected in the samples from wells MW-1, MW-2, TW-6 and TW-7 at concentrations of 1,500 μg/L, 0.76 μg/L, 0.70 μg/L, and 4,500 μg/L, respectively. The highest concentrations of toluene, ethylbenzene and total xylenes were detected in the sample from well TW-7 at 1,800 μg/L, 180 μg/L, and 8,200 μg/L, respectively. Copies of the laboratory reports and chain-of-custody documentation are presented in Appendix B.

4.3 Dissolved Oxygen Measurement Results

Total dissolved oxygen concentrations measured in the seven wells on April 13, 1999, before enriched water introduction, ranged from 0.2 to 14.2 milligrams per liter (mg/L). Dissolved oxygen concentrations in the five wells following enriched water introduction (Wells TS-4, TS-5, TS-6, TS-7, and MW-1) were greater than (>) 15 mg/L, the maximum range of the dissolved oxygen meter used. Dissolved oxygen concentrations in the two wells that did not have enriched water introduced (Wells TW-2 and MW-2) were 5.8 and 0.6 mg/L,

respectively. Dissolved oxygen concentrations measured during the April 13, 1999 monitoring event are included with the well sampling documentation presented in Appendix A. Dissolved oxygen concentrations measured through April 13, 1999 are presented in Table 4.

Dissolved oxygen measurements are used as an indication of the effectiveness of the oxygenation achieved during groundwater remediation. Dissolved oxygen is an indirect indicator of hydrocarbon concentration. In areas of high hydrocarbon concentration, dissolved oxygen is consumed by the native bacteria and residual dissolved oxygen concentrations are expected to be low. Conversely, effective nutrient addition will be demonstrated by elevated concentrations of dissolved oxygen in the monitoring wells.

5.0 SUMMARY

Results of the April 1999 groundwater elevations indicate a general decrease since the January 1999 baseline sampling event. As with historical observations, the groundwater flow direction continues to be toward the southwest.

Concentrations of petroleum hydrocarbons detected in the wells in April 1999 indicate a general decrease compared to those detected during the baseline event in January 1999 with the exception of well TW-7. TPHg, MTBE, Toluene, and Total Xylene concentrations were higher in the groundwater sample from well TW-7 in April 1999 than in January 1999. A significant reduction of petroleum hydrocarbon concentrations was observed in the sample from Well TW-6 since January 1999. Consistent with historical findings, the highest concentrations were detected in the groundwater from wells nearest to the former gasoline UST and product piping, specifically Wells MW-1 and TW-7.

MTBE concentrations in well MW-2, located offsite and downgradient adjacent to several utility trenches, are significantly higher than in onsite wells. The high concentrations of MTBE detected in samples from well MW-2 are likely the result of groundwater being affected by elevated concentrations from offsite sources that are being conveyed toward the site via preferential flow as a result of utility trenches adjacent to the well. In 1993 PES performed sampling of groundwater from Wells MW-1, TW-4, TW-5, TW-6, and TW-7 for analyses by EPA Test Method 8260. No MTBE was detected in the samples at that time. Additionally, a utility location assessment was conducted by EOA in late 1995/early 1996. EOA identified numerous utility trenches and vaults along the downgradient property boundary and within Vernon Street, Bay Place, and Harrison Street surrounding the site. EOA interviews with utility providers indicated most utility trenches are backfilled with permeable materials including gravel and sand. The depth of many of these utility trenches is sufficient to intercept shallow groundwater flow in the site vicinity. The results of the EOA utility assessment were presented in a document titled *Corrective Action Plan Development Report, Phase I, Cox Cadillac, 230 Bay Place, Oakland, California*, dated April 1, 1996.

Dissolved oxygen concentrations were elevated on April 13, 1999 as a result of oxygen enhancement following introduction of the enriched water solution as part of the bioremediation program.

In accordance with the Remedial Plan, PES will continue with quarterly groundwater monitoring and introduction of enriched water twice per quarter. Based on the results presented herein, no modifications to the remediation program are warranted at this time.

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

Yours very truly,

PES ENVIRONMENTAL, INC.

Christopher D. Rossitto
Project Geologist

Andrew A. Briefer, P. E.
Principal Engineer

Attachments:

	Table 1	Groundwater Elevation Data
	Table 2	Groundwater Sample Analytical Results
	Table 3	Summary of Enriched Water Introduction to Wells
	Table 4	Summary of Total Dissolved Oxygen Measurements
	Plate 1	Site Location Map
	Plate 2	Site Plan and Well Location Map
	Plate 3	Groundwater Elevation Contours on April 13, 1999
	Plate 4	Distribution of Dissolved Hydrocarbons in Groundwater - April 13, 1999
	Appendix A	Well Sampling Documentation
	Appendix B	Laboratory Analytical Reports and Chain of Custody Documentation

cc: Ms. Cheryl Howell – Greater Bay Trust Company
Mr. Thomas Peacock – Alameda County Environmental Health Services
Mr. Mark Owens – California UST Cleanup Fund

Table 1
Groundwater Elevation Data
Interim Remedial Actions
Former Cox Cadillac, 230 Bay Place
Oakland, California

Well Number	Date Measured	Top-of-Casing Reference Elevation (feet*)	Depth to Water (feet BTOC)	Groundwater Elevation (feet*)
MW-1	1/12/99	100.00	2.79	97.21
	4/13/99	100.00	2.00	98.00
MW-2	1/12/99	97.48	5.62	91.86
	4/13/99	97.48	5.30	92.18
TW-2	1/12/99	100.43	1.91	98.52
	4/13/99	100.43	2.51	97.92
TW-4	1/12/99	99.35	NM	NA
	4/13/99	99.35	1.82	97.53
TW-5	1/12/99	99.40	NM	NA
	4/13/99	99.40	1.96	97.44
TW-6	1/12/99	98.75	5.52	93.23
	4/13/99	98.75	4.91	93.84
TW-7	1/12/99	97.96	4.81	93.15
	4/13/99	97.96	4.73	93.23

Notes:

* = Referenced to site datum
BTOC = Below top of casing
NA = Data not available
NM = Depth to water not measured

Table 2
Groundwater Sample Analytical Results
Interim Remedial Actions
Former Cox Cadillac, 230 Bay Place
Oakland, California

Well Number	Sample Date	TPH as Gasoline (µg/L)	MTBE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)
MW-1	1/12/99	39,000	800	2,600	970	2,900	5,700
	4/13/99	29,000	520	1,500	500	<50	4,000
MW-2	1/12/99	<50	2,900	1.5	<0.50	<0.50	<0.50
	4/13/99	<50	3,800	0.76	<0.50	<0.50	<0.50
TW-2	1/12/99	<50	<5.0	<0.50	<0.50	<0.50	<0.50
	4/13/99	<50	<5.0	<0.50	<0.50	<0.50	<0.50
TW-6	1/12/99	29,000	210	9,900	4,100	1,000	4,000
	4/13/99	<50	22	0.70	<0.50	<0.50	0.62
TW-7	1/12/99	29,000	<100	7,300	670	2,700	960
	4/13/99	54,000	1,200	4,500	1,800	180	8,200

Notes:
TPH - Total Petroleum Hydrocarbons
MTBE - Methyl tert-butyl ether
µg/L = Micrograms per liter.
<0.50 = Not detected at or above indicated laboratory reporting limit.

Table 3
Summary of Enriched Water Introduction to Wells
Interim Remedial Actions
Former Cox Cadillac, 230 Bay Place
Oakland, California

Well Name	Date Introduced	Flow Rate (gpm)	Volume of Enriched Water Introduced (gallons)	Concentration of H_2O_2 (ppm)	Amount of O_2 Introduced (pounds)
MW-1	3/11/99	0.04	2.2	1,050	0.09
	3/17/99	0.33	70.2	1,050	2.75
	4/13/99	0.13	26.5	1,050	1.04
TW-4	3/11/99	0.05	3.0	1,050	0.12
	3/17/99	0.01	2.7	1,050	0.11
	4/13/99	0.12	23.8	1,050	0.93
TW-5	3/11/99	0.07	4.4	1,050	0.17
	3/17/99	0.05	10.3	1,050	0.40
	4/13/99	0.36	70.8	1,050	2.77
TW-6	3/11/99	0.29	17.3	1,050	0.68
	3/17/99	0.24	51.9	1,050	2.03
	4/13/99	1.63	322	1,050	12.62
TW-7	3/11/99	0.12	6.9	1,050	0.27
	3/17/99	0.07	15	1,050	0.59
	4/13/99	0.28	54.2	1,050	2.12
		TOTAL	681.2	TOTAL	26.70

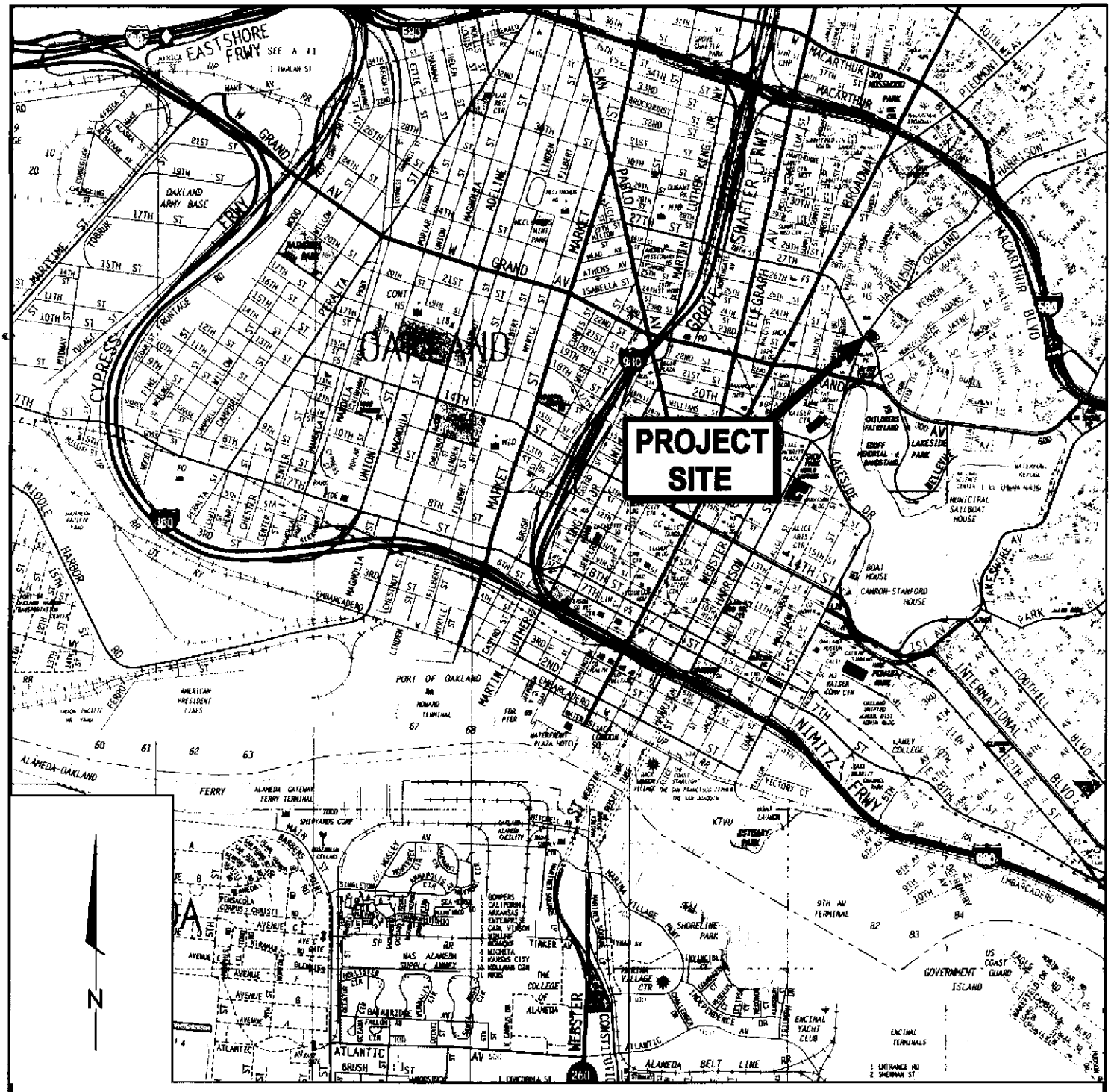
Notes:
gpm = gallons per minute
ppm = parts per million
Approximately 20 ppm of nitrogen as nitrate and 37 ppm of phosphate was present in solution.

Table 4
Summary of Total Dissolved Oxygen Measurements
Interim Remedial Actions
Former Cox Cadillac, 230 Bay Place
Oakland, California

Well Number	Date Measured	Time of Day	Total Dissolved Oxygen (mg/L)	Notes
MW-1	1/12/99	15:30	3.4	(1)
	3/11/99	15:46	0.72	(1)
	3/17/99	12:30	14.1	(2)
	3/17/99	18:13	>15.0	(3)
	4/13/99	9:44	8.9	(2)
		NA	NA	(3)
MW-2	1/12/99	12:30	3	(1)
	4/13/99	9:17	0.2	(2)
		19:11	0.6	(3)
TW-2	1/12/99	15:03	5.5	(1)
	4/13/99	9:10	2.6	(2)
		19:06	5.8	(3)
TW-4	3/11/99	15:20	3.4	(1)
	3/17/99	12:18	14.4	(2)
	3/17/99	17:54	12.6	(3)
	4/13/99	9:00	12.2	(2)
		19:03	>15.0	(3)
TW-5	1/12/99	16:40	1.7	(1)
	3/11/99	15:36	0.58	(1)
	3/17/99	12:20	14.3	(2)
	3/17/99	17:57	14.6	(3)
	4/13/99	9:39	3.8	(2)
		19:28	>15.0	(3)
TW-6	1/12/99	15:02	3.9	(1)
	3/11/99	15:39	0.62	(1)
	3/17/99	12:23	14.1	(2)
	3/17/99	18:06	>15.0	(3)
	4/13/99	9:35	14.2	(2)
		19:23	>15.0	(3)
TW-7	1/12/99	13:10	2.7	(1)
	3/11/99	15:42	0.74	(1)
	3/17/99	12:25	6.5	(2)
	3/17/99	18:12	14	(3)
	4/13/99	9:25	0.4	(2)
		19:16	>15.0	(3)

Notes:

>15 = Above indicated equipment quantification maximum.
(1) = Baseline measurement taken before initial introduction of enriched water
(2) = Measured prior to enriched water introduction
(3) = Measured after enriched water introduction
mg/L = milligrams per liter
An initial approximate 184 gallons of enriched water was introduced to wells MW-1, TW-4, TW-5, TW-6, and TW-7 in the late afternoon of March 11 and 17, 1999 during setup, testing, and refinement of the remediation system. March 17 measurements reflect the initial introduction of enriched water.



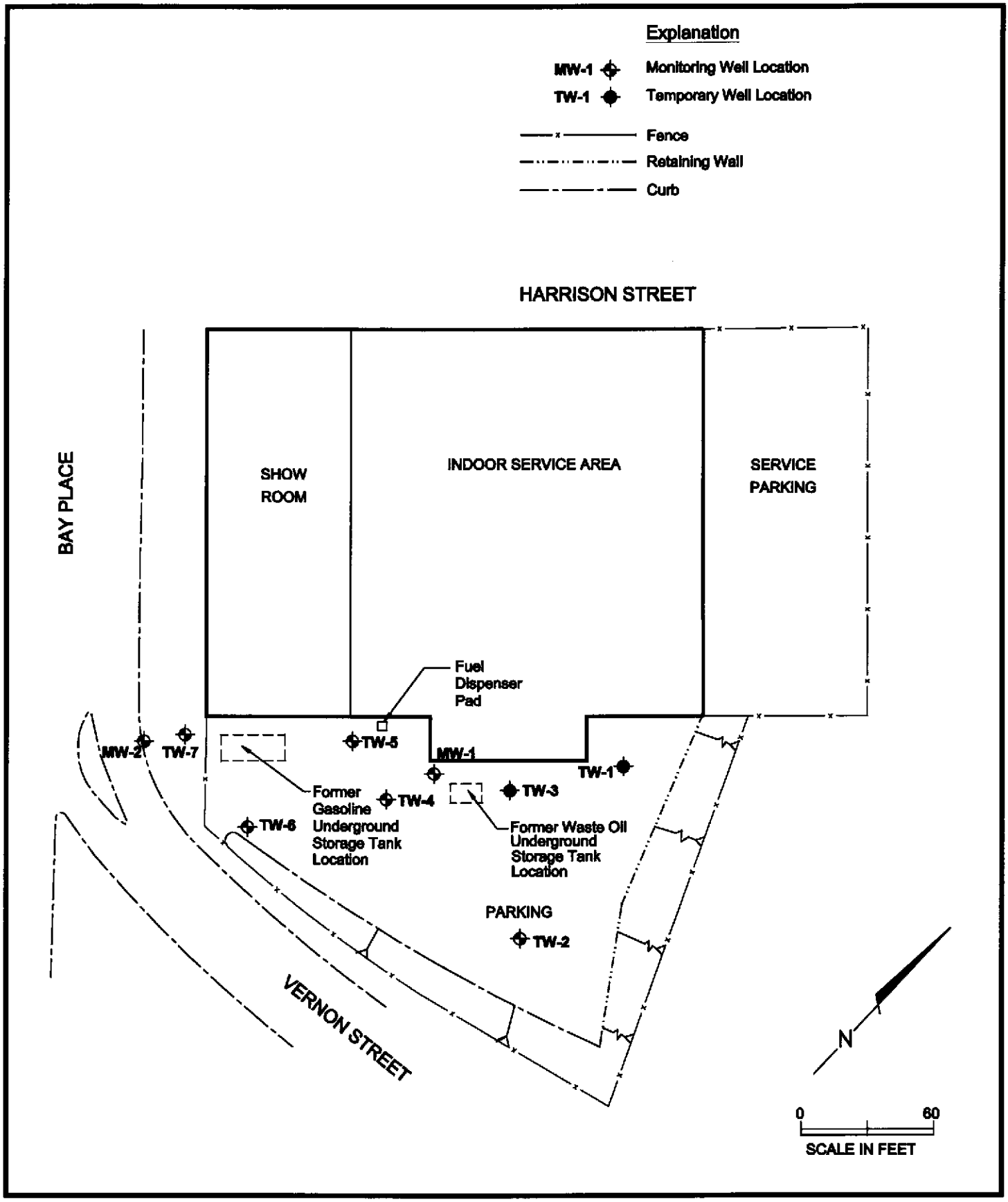
Ref: "The Thomas Guide- Alameda/Contra Costa Counties Street Guide and Directory" 1996 Edition

PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Quarterly Groundwater Monitoring
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE
1

167.0201.006	1670200006_QTR	CDR	10/99
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

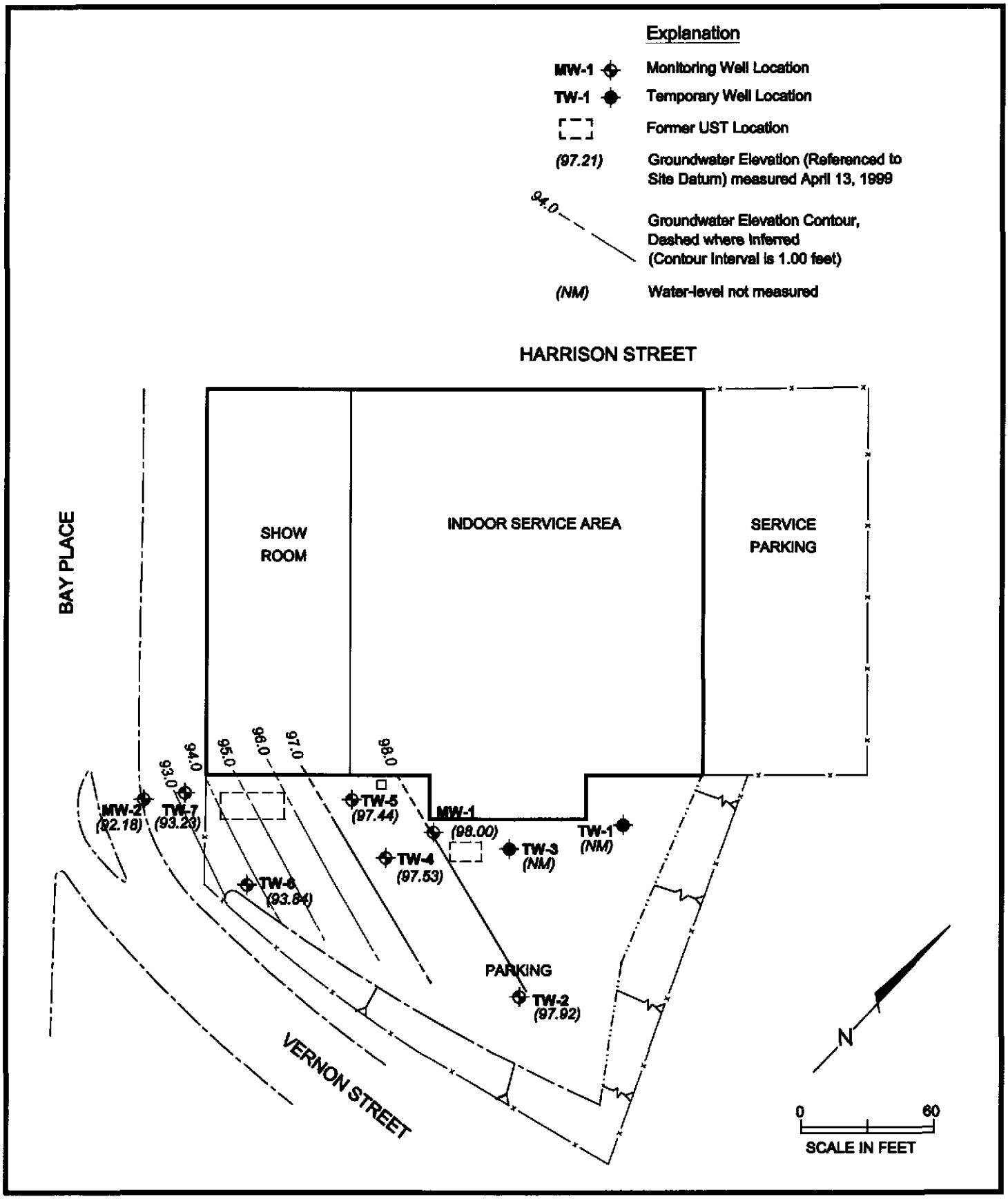


PES Environmental, Inc.
Engineering & Environmental Services

Site Plan and Well Location Map
Quarterly Groundwater Monitoring
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE
2

167.0201.006	1670200006_QTR	CDR	6/99
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE



PES Environmental, Inc.
Engineering & Environmental Services

Groundwater Elevation Contours on April 13, 1999
Quarterly Groundwater Monitoring
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE
3

167.0201.006	1670200006_QTR	CDR	6/99
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

Explanation

MW-1 ⊕ Monitoring Well Location

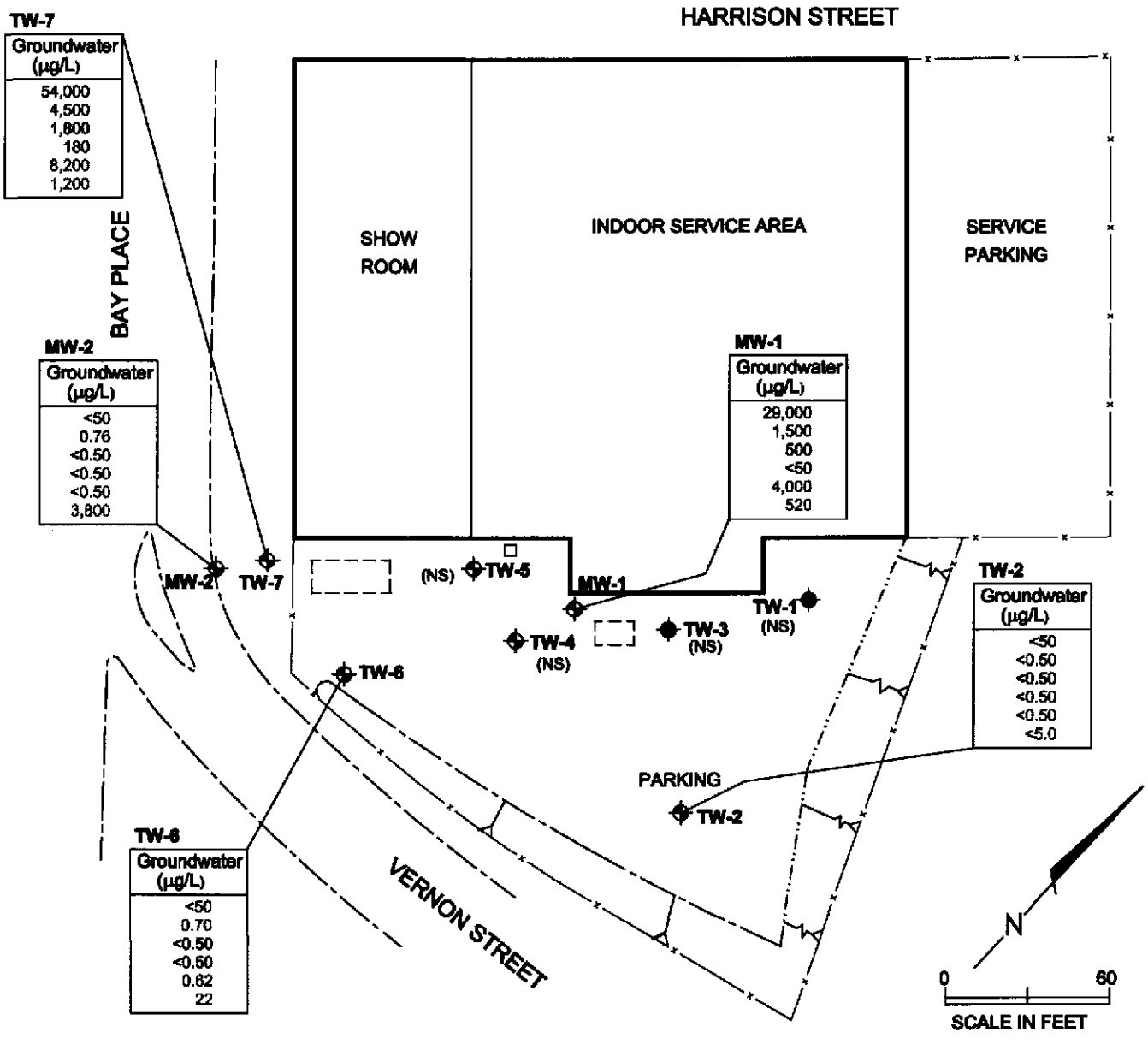
TW-1 ⊕ Temporary Well Location

[ ] Former UST Location

Concentrations of Dissolved Hydrocarbons
In Micrograms per liter (µg/l) in Groundwater

Groundwater (µg/L)
Total Petroleum Hydrocarbons as Gasoline
Benzene
Toluene
Ethylbenzene
Total Xylenes
Methyl Tert-Butyl Ether

<0.50 Not detected at or above indicated laboratory reporting limit



Distribution of Dissolved Hydrocarbons in Groundwater - April 13, 1999
Quarterly Groundwater Monitoring
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE 4

PES Environmental, Inc.
Engineering & Environmental Services

167.0201.006	1670200006_QTR	CDR	6/99
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE

APPENDIX A

WELL SAMPLING DOCUMENTATION

PES Environmental, Inc.
Engineering & Environmental Services

DATE: 4/13/99

WATER LEVEL DATA FORM

PROJECT: Cox Cadillac

JOB NO.: 167-002-01-004

FIELD PERSONNEL: CD

RECORDED BY: CD

MEASURING INSTRUMENT:

☐ STEEL TAPE

☑ ELECTRIC SOUNDER

☐ OTHER-TYPE INSTRUMENT SERIAL NO. ______

DATUM: ☐ MEAN SEA LEVEL

☐ OTHER - DESCRIBE ______

WELL I.D.	TIME	REFERENCE ELEVATION (feet)	DEPTH TO WATER (feet)			WATER LEVEL ELEVATION (feet)	COMMENTS (well condition, odor, presence of product, etc.)
			1st	2nd	3rd		
TW-4	8:16		1.82				
TW-2	8:30		2.51				
MW-2	8:33		5.30				
TW-7	8:34		4.73				
TW-6	8:37		4.91				
TW-5	8:38		1.96				
MW-1	8:39		2.00				

PES Environmental, Inc.
Engineering & Environmental Services

GROUNDWATER SAMPLING FORM

Page:	1 of 1
Date/Time:	4/13/99
Project Name:	Cox Cadillac
Job No.:	167-002-01-005
Recorded By:	Chris Delaney
Sampled By:	CJD

Well No.:	Well Type:	☑ Monitoring	☐ Extraction	☐ Other
MW-1	Well Material:	☐ PVC	☐ Stainless Steel	☐ Other

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches)

☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____

Total Depth of Casing (TD in feet below top of casing): 20.00

Water-Level Depth (WL in feet below top of casing): 2.00

PURGING METHOD

☑ Bailer - Type: Disposable

☐ Submersible ☐ Centrifugal ☐ Bladder

☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____

Depth in feet (BTOC): _____

Screen interval in feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATIONS:

(20.00 (Well Depth) - 2.00 (Depth to Water)) x 2² (Well Diameter) x 3 casing volumes x 0.0408 = 8.81 (Calculated Purge Volume) gallons

FIELD PARAMETER MEASUREMENT

START TIME 12:30

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Turbidity	Observations (color, well condition, odor, cloudiness, etc.)
12:34	2.0	7.10	2080	74.0	17.6	
12:40	4.0	7.11	2150	75.7	60.3	HC odor
12:45	6.0	6.99	2170	76.0	139.0	" "
12:51	8.0	6.95	2230	74.4	118.1	" "
12:56	9.0	6.89	2226	75.4	119.9	" "

STOP TIME 12:56 TOTAL GALLONS REMOVED 9.0

WELL SAMPLING

SAMPLING METHOD

Bailer - Type: Teflon Disposable

Well No.	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
MW-1	MW-1	1428	3 VOAs	8020, 8015 mod, MTBE	HCl	Entech

QUALITY CONTROL SAMPLES

Sample Type	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

PES Environmental, Inc.
Engineering & Environmental Services

GROUNDWATER SAMPLING FORM

Page: 1 of 1
Date/Time: 4/13/99
Project Name: Cox Cadillac
Job No.: 1607-002-01.004
Recorded By: CD
Sampled By: "

Well No.: MW-2
Well Type: ☑ Monitoring ☐ Extraction ☐ Other
Well Material: ☐ PVC ☐ Stainless Steel ☐ Other

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches)
☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____

Total Depth of Casing (TD in feet below top of casing): 20

Water-Level Depth (WL in feet below top of casing): 5.3

PURGING METHOD

☑ Bailer - Type: Disposable
☐ Submersible ☐ Centrifugal ☐ Bladder
☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____
Depth in feet (BTOC): _____
Screen interval in feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATIONS:

(20 (Well Depth) - 5.3 (Depth to Water)) x 2 (Well Diameter)^2 x 3 casing volumes x 0.0408 = 7.18 (Calculated Purge Volume) gallons

FIELD PARAMETER MEASUREMENT

START TIME 13:50

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Turbidity	Observations (color, well condition, odor, cloudiness, etc.)
13:55	2.0	6.45	3540	69.4	>200	
14:02	4.0	6.74	3490	68.9	>200	
14:09	6.0	6.71	3560	69.4	>200	
14:14	8.0	6.69	3520	69.2	>200	

STOP TIME 14:14 TOTAL GALLONS REMOVED 8.0

WELL SAMPLING

SAMPLING METHOD

Bailer - Type: Teflon Disposable

Well No.	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
MW-2	MW-2	14:42	3 VOAs	8020, 8015 mod. MTBE	HCl	Entech

QUALITY CONTROL SAMPLES

Sample Type	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

PES Environmental, Inc.
Engineering & Environmental Services

GROUNDWATER SAMPLING FORM

Page:	1 of 1
Date/Time:	4/13/99
Project Name:	Cox Cadillac
Job No.:	167-002-01-004
Recorded By:	Chris Delaney
Sampled By:	" "

Well No.:	Well Type:	☑ Monitoring	☐ Extraction	☐ Other
TW-2	Well Material:	☐ PVC	☐ Stainless Steel	☐ Other

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches)

☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____

Total Depth of Casing (TD in feet below top of casing): 7.63

Water-Level Depth (WL in feet below top of casing): 2.51

PURGING METHOD

☑ Bailer - Type: Teflon Disposable

☐ Submersible ☐ Centrifugal ☐ Bladder

☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____

Depth in feet (BTOC): _____

Screen interval in feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATIONS:

(7.63 (Well Depth) - 2.51 (Depth to Water)) x 2 (Well Diameter)^2 x 3 casing volumes x 0.0408 = 2.51 (Calculated Purge Volume) gallons

FIELD PARAMETER MEASUREMENT

----------> START TIME _____

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Turbidity	Observations (color, well condition, odor, cloudiness, etc.)
13:14	1.0	6.59	4140	72.2	542	
13:17	2.0	6.75	3870	72.5	183.1	
13:21	3.0	6.53	3920	71.3	181.2	Well is Dewatering

----------> STOP TIME 13:22 ----------> TOTAL GALLONS REMOVED 3.0

WELL SAMPLING

SAMPLING METHOD

Bailer - Type: Teflon Disposable

Well No.	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
TW-2	TW-2	1434	3 VOAs	8020, 8015 m/d, ATEX	HCl	Entech

QUALITY CONTROL SAMPLES

Sample Type	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

PES Environmental, Inc.
Engineering & Environmental Services

GROUNDWATER SAMPLING FORM

Page:	1 of 1
Date/Time:	4/13/99
Project Name:	Cox Cadillac
Job No.:	1607-002-01-004
Recorded By:	CD
Sampled By:	"

Well No.: TW-6	Well Type:	☑ Monitoring	☐ Extraction	☐ Other
	Well Material:	☐ PVC	☐ Stainless Steel	☐ Other

WELL PURGING

PURGE VOLUME

Casing Diameter (D in Inches)

☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____

Total Depth of Casing (TD in feet below top of casing): 7.6

Water-Level Depth (WL in feet below top of casing): 4.91

PURGING METHOD

☒ Bailer - Type: Teflon Disposable

☐ Submersible ☐ Centrifugal ☐ Bladder

☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____

Depth in feet (BTOC): _____

Screen Interval in feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATIONS:

(7.6 (Well Depth) - 4.91 (Depth to Water)) x 2 (Well Diameter)^2 x 3 casing volumes x 0.0408 = 1.31 (Calculated Purge Volume) gallons ✓

FIELD PARAMETER MEASUREMENT

——> START TIME 11:30

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Turbidity	Observations (color, well condition, odor, cloudiness, etc.)
11:33	0.33	8.25	1320	64.4	88.2	
11:34	0.66	8.09	1320	63.1	92.4	
11:37	1.0	7.94	1330	62.8	191.7	
11:41	1.5	7.89	1350	63.0	139.0	
	Well is Dewatering					

——> STOP TIME 11:43 ——> TOTAL GALLONS REMOVED 1.5

WELL SAMPLING

SAMPLING METHOD

Bailer - Type: Teflon Disposable

Well No.	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
TW-6	TW-6	14:15	3 VOAs	8020, 8015 mod, MTBE	HCl	Entech

QUALITY CONTROL SAMPLES

Sample Type	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

PES Environmental, Inc.
Engineering & Environmental Services

GROUNDWATER SAMPLING FORM

Page:	of
Date/Time:	4/13/99
Project Name:	Cox Cadillac
Job No.:	167-002-01-004
Recorded By:	CD
Sampled By:	"

Well No.:	Well Type:	☑ Monitoring	☐ Extraction	☐ Other
TW-7	Well Material:	☐ PVC	☐ Stainless Steel	☐ Other

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches)

☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____

Total Depth of Casing (TD in feet below top of casing): 9.9

Water-Level Depth (WL in feet below top of casing): 4.73

PURGING METHOD

☑ Baller - Type: Disposable

☐ Submersible ☐ Centrifugal ☐ Bladder

☐ Other - Type: _____

PUMP INTAKE SETTING

☐ Near Bottom ☐ Near Top ☐ Other _____

Depth in feet (BTOC): _____

Screen interval in feet (BTOC) from _____ to _____

PURGE VOLUME CALCULATIONS:

(9.9 (Well Depth) - 4.73 (Depth to Water)) x 2 (Well Diameter)^2 x 3 casing volumes x 0.0408 = 2.53 gallons (Calculated Purge Volume)

FIELD PARAMETER MEASUREMENT

----------> START TIME _____

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Turbidity	Observations (color, well condition, odor, cloudiness, etc.)
11:55	0.8	7.15	527	67.8	83.5	HC odor
11:59	1.6	6.85	481	64.7	85.6	" "
12:02	2.3	7.01	514	63.7	81.8	" "
12:08	3.0	6.87	572	63.3	84.3	" "

----------> STOP TIME 12:10 ----------> TOTAL GALLONS REMOVED 3.0

WELL SAMPLING

SAMPLING METHOD

Baller - Type: Teflon Disposable

Well No.	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
TW-7	TW-7	14:21	3 VOAs	8015 mod, 8020, ATBE	HCl	Entech

QUALITY CONTROL SAMPLES

Sample Type	Sample No.	Time	Volume Collected	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

PES Environmental, Inc.
Engineering & Environmental Services

PROJECT	OF
JOB NO.	107.0201.004
FILE NAME	
PROJECT Cox Cadillac	COMPUTED BY CO DATE 4/13/99
SUBJECT DO Measurements	CHECKED BY DATE

	Well Name	Time	DO (mg/L)
1st Round	TW-4	9:00	12.2
	TW-2	9:10	2.6
	MW-2	9:17	0.2
	TW-7	9:25	0.4
	TW-6	9:35	14.2
	TW-5	9.39	3.8
	MW-1	9:44	8.9
	Tank	9:50	>15.0
Final Round	TW-4	19:03	>15.0
	TW-2	19:06	5.8
	MW-2	19:11	0.6
	TW-7	19:16	>15.0
	TW-6	19:23	>15.0
	TW-5	19:28	>15.0
	MW-1	19:34	>15.0

APPENDIX B

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Entech Analytical Labs, Inc.

RECEIVED APR 2 7 1999
CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

PES Environmental, Inc.
1682 Novato Boulevard, Suite 100
Novato, CA 94947
Attn: Will Mast

Date: 4/21/99
Date Received: 4/13/99
Project: 167.0201.004
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	TW-6			TW-7			MW-1				
Sample Date	4/13/99			4/13/99			4/13/99				
Sample Time	14:15			14:21			14:28				
Lab #	G9211			G9212			G9213				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	4/16/99			4/16/99			4/16/99				
TPH-Gas	**ND**	1.0	50	**54,000**	100	5000	**29,000**	100	5000	50	8015M
MTBE	**22**	1.0	5.0	**1,200**	100	500	**520**	100	500	5.0	8020
Benzene	**0.70**	1.0	0.50	**4,500**	100	50	**1,500**	100	50	0.50	8020
Toluene	**ND**	1.0	0.50	**1,800**	100	50	**500**	100	50	0.50	8020
Ethyl Benzene	**ND**	1.0	0.50	**180**	100	50	**ND**	100	50	0.50	8020
Xylenes (total)	**0.62**	1.0	0.50	**8,200**	100	50	**4,000**	100	50	0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

PES Environmental, Inc.
1682 Novato Boulevard, Suite 100
Novato, CA 94947
Attn: Will Mast

Date: 4/21/99
Date Received: 4/13/99
Project: 167.0201.004
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	TW-2			MW-2							
Sample Date	4/13/99			4/13/99							
Sample Time	14:34			14:42							
Lab #	G9214			G9215							
	Result	DF	DLR	Result	DF	DLR				PQL	Method
Results in µg/Liter:											
Analysis Date	4/17/99			4/17-4/19/99							
TPH-Gas	**ND**	1.0	50	**ND**	1.0	50				50	8015M
MTBE	**ND**	1.0	5.0	**3,800**	100	500				5.0	8020
Benzene	**ND**	1.0	0.50	**0.76**	1.0	0.50				0.50	8020
Toluene	**ND**	1.0	0.50	**ND**	1.0	0.50				0.50	8020
Ethyl Benzene	**ND**	1.0	0.50	**ND**	1.0	0.50				0.50	8020
Xylenes (total)	**ND**	1.0	0.50	**ND**	1.0	0.50				0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4990416
Matrix: Water
Units: µg/L

Date Analyzed: 04/16/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	**SP % R**	SPD µg/L	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	40	ND	40	**99**	40	**101**	1.6	25	83-108
Toluene	8020	<0.50	40	ND	39	**98**	45	**114**	14.7	25	68-116
Ethyl Benzene	8020	<0.50	40	ND	40	**99**	45	**112**	11.6	25	88-115
Xylenes	8020	<0.50	120	ND	118	**98**	125	**104**	6	25	84-109
Gasoline	8015	<50.0	500	ND	593	**119**	523	**105**	12.6	25	73-129

Note: LCS and LCSD results reported for the following Parameters:
All

Definition of Terms:

na: Not Analyzed in QC batch
MB: Method Blank
SA: Spike Added
SR: Sample Result
RPD(%): Duplicate Analysis - Relative Percent Difference
SP: Spike Result
SP (%R): Spike % Recovery
SPD: Spike Duplicate Result
SPD (%R): Spike % Recovery
NC: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4990419
Matrix: Water
Units: µg/L

Date Analyzed: 04/19/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	40	ND	38	**96**	40	**100**	4.2	25	83-108
Toluene	8020	<0.50	40	ND	39	**97**	39	**98**	1.1	25	65-112
Ethyl Benzene	8020	<0.50	40	ND	38	**95**	40	**99**	3.8	25	83-110
Xylenes	8020	<0.50	120	ND	116	**96**	120	**100**	4	25	84-109
Gasoline	8015	<50.0	500	ND	526	**105**	539	**108**	2.6	25	73-129

Note: LCS and LCSD results reported for the following Parameters:
All

Definition of Terms:

na: Not Analyzed in QC batch
MB: Method Blank
SA: Spike Added
SR: Sample Result
RPD(%): Duplicate Analysis - Relative Percent Difference
SP: Spike Result
SP (%R): Spike % Recovery
SPD: Spike Duplicate Result
SPD (%R): Spike % Recovery
NC: Not Calculated

PES ENVIRONMENTAL, Inc.
Engineering & Environmental Services

1682 NOVATO BOULEVARD, SUITE 100
NOVATO, CALIFORNIA 94947
(415) 899-1600 FAX (415) 899-1601

CHAIN OF CUSTODY RECORD

JOB NUMBER: 167.0201.004

NAME / LOCATION: Cox Cadillac

PROJECT MANAGER: Will mast

SAMPLERS: Chris Delaney

RECORDER: " "

YR	MO	DY	TIME	SAMPLE NUMBER / DESIGNATION	SOURCE CODE	MATRIX: Water	Sedim't	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	Filtered	Ice	DEPTH IN FEET	COL MTD CD	QA CODE	EPA 601 / 8010	EPA 602 / 8020 (BTEX)	EPA 624 / 8240	EPA 625 / 8270	TPHg by 5030 / 8015 (mod)	TPHd by 3550 / 8015 (mod)	MTBE	
99	04	13	1415	TW-6		X									3 Voas					X			X		X	G9211
99	04	13	1421	TW-7		↓									↓					↓			↓		↓	G9212
99	04	13	1428	MW-1		↓									↓					↓			↓		↓	G9213
99	04	13	1434	TW-2		↓									↓					↓			↓		↓	G9214
99	04	13	1442	MW-2		↓									↓					↓			↓		↓	G9215

NOTE

Standar TA

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE	TIME
Chris Delaney	OBIE BANAWIS 980	4-13-99	1542
OBIE 980 WC			

DISPATCHED BY: (Signature)	DATE	TIME	RECEIVED FOR LAB BY: (Signature)	DATE	TIME
			[illegible signature]	4/13/99	4:30p

METHOD OF SHIPMENT:

WHITE–Laboratory COPY YELLOW–Project Office Copy PINK–Field or Office Copy