PACIFIC
ENVIRONMENTAL
GROUP, INC.

March 6, 1996
Project 330-084.2B

Mr. Michael Whelan
ARCO Products Company
P.O. Box 612530
San Jose, California 95161

Re: Quarterly Report - Fourth Quarter 1995
Remedial System Performance Evaluation
ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Dear Mr. Whelan:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of ARCO Products Company (ARCO), presents the results of the fourth quarter 1995 groundwater monitoring and performance evaluation of the remedial system at the site referenced above. In addition, a summary of work performed and anticipated at the site is included.

QUARTERLY GROUNDWATER MONITORING RESULTS

Groundwater samples were collected by PACIFIC on November 2, 1995, and analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline (TPPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). A groundwater sampling schedule is presented in Table 1. Certified analytical reports, chain-of-custody documentation, and field data sheets are presented as Attachment A. Field and laboratory procedures are presented as Attachment B.

Depth to water data collected during the November 1995 sampling event indicate that changes to groundwater elevations on average have decreased approximately 0.41 foot since August 7, 1995. Groundwater flow is to the southwest with an approximate gradient of 0.03. This flow direction and gradient are consistent with historical data. Groundwater elevation data are presented in Table 2. A liquid surface elevation contour map based on the November 1995 sampling data is shown on Figure 1.

Results of groundwater monitoring this quarter are generally consistent with previous results. TPPH-g and benzene were below detection limits in Wells MW-2, MW-4, MW-5, and MW-6. TPPH-g was below detection limits in Wells MW-1 and MW-3. Benzene concentrations in Wells MW-1 and MW-3 were 3.6 and 2.3 parts per billion (ppb), respectively. Separate-phase hydrocarbons were not observed in any site well this quarter or during any sampling event since December 1991. Groundwater analytical data are presented in Tables 3 and 4. A TPPH-g and benzene concentration map is shown on Figure 2.

REMEDIAL PERFORMANCE EVALUATION

Remedial action consisting of GWE was initiated at this site on December 21, 1993. An in-situ groundwater bioremediation enhancement program at the off-site groundwater Monitoring Well MW-3 was initiated at this site on November 14, 1995.

Remedial objectives for the site include: (1) migration control of the impacted groundwater plume, and (2) petroleum hydrocarbon mass reduction. To evaluate GWE system performance, PACIFIC monitors groundwater levels, instantaneous and average flow rates, and evaluates and analyzes samples of system influent and effluent for TPPH-g and BTEX compounds. To evaluate the bioremediation enhancement program, PACIFIC will compare the concentrations of benzene, nitrates, nitrites, and dissolved oxygen in Well MW-3 collected prior to the implementation of the program with concentration data collected during the program.

Below is a brief description of the GWE system and the bioremediation enhancement program, and an evaluation of their performance between September 18 and December 31, 1995.

GROUNDWATER EXTRACTION SYSTEM

System Description

The GWE system utilizes a pneumatic pump in Well W-2, and three 200-pound granular activated carbon (GAC) vessels arranged in series to treat the extracted groundwater. The carbon vessels are connected and valved so that the vessel order can be rotated following a GAC vessel change-out. Sample ports are located at the treatment system influent, between the GAC vessels, at the effluent, and at the extraction well head. GWE system effluent is discharged into the sanitary sewer system under an East Bay Municipal Utility District (EBMUD) sewer discharge Permit No. 502-85611, which expires December 31, 1997.

Migration Control

Progress toward meeting the migration control objective is evaluated by comparison of the groundwater elevation contour map (Figure 1) and TPPH-g and benzene concentration maps (Figure 2) from previous and current groundwater monitoring events.

The GWE system was not operational during the fourth quarter 1995 monitoring event; therefore, groundwater depression in response to GWE was not observed (Figure 1). However, TPPH-g and benzene concentrations in downgradient groundwater monitoring wells were either below detection limits, decreased, or remained unchanged compared to previous quarters (Figure 2).

Mass Reduction

Progress toward meeting the mass reduction objective is determined by evaluating the GWE system mass removal data and the TPPH-g concentration trends in associated groundwater monitoring wells. GWE system operational data are collected monthly. The system flow and influent sample analysis data are used to estimate TPPH-g mass removal values. During the reporting period, GWE removed approximately 0.02 pound (<0.01 gallon) of TPPH-g and an undetectable amount of benzene from impacted groundwater beneath the site. To date, GWE has removed approximately 2.61 pounds (0.43 gallon) of TPPH-g and 0.38 pound (0.05 gallon) of benzene from impacted groundwater beneath the site. GWE system performance data are presented in Table 5. The GWE system TPPH-g and benzene mass removal trend and concentration data are graphically shown on Figure 3 and 4, respectively. Treatment system certified analytical reports and chain-of-custody documentation are presented as Attachment C. Progress toward site remediation is presented in the following table.

	Mass Removed			
	09/18/95 to 12/31/95		Cumulative	
Analyte	(lbs)	(gal)	(lbs)	(gal)
Groundwater Extraction				
TPPH-g	0.02	<0.01	2.61	0.43
Benzene	0.00	0.00	0.38	0.05

lbs = Pounds
gal = Gallons
TPPH-g = Total purgeable petroleum hydrocarbons calculated as gasoline

Groundwater Extraction System Operational Data

The GWE system was deactivated on October 13, 1995, due to low TPPH-g and benzene mass removal rates. Between September 18 and October 13, 1995, the GWE system was 100 percent operational and discharged treated groundwater at an average flow rate of approximately 0.07 gallon per minute (gpm) for a period discharge of

2,457 gallons. Concentrations for TPPH-g in Well W-2 ranged from 600 to 790 ppb. Benzene concentrations ranged from 10 to 52 ppb.

GAC loading is currently estimated at approximately 3.3 percent by weight (assumes an 8-percent isotherm). During this quarter, the GWE system was in compliance with all conditions stipulated in the discharge permit. GWE system analytical data are presented in Table 6. On the certified analytical reports, data have been labeled by sample port numbers which correspond to the following process points: SP-105 is the influent, SP-106 is between the first and second GAC vessels, SP-107 is between the second and third GAC vessels, and SP-108 is the effluent. Operation and maintenance field data sheets are presented as Attachment C.

BIOREMEDIATION ENHANCEMENT PROGRAM

At the request of ARCO, the bioremediation enhancement program, utilizing oxygen releasing compound (ORC) manufactured by Regenesis Bioremediation Products, was initiated in Well MW-3 on November 14, 1995. Twelve 2-inch diameter ORC socks were installed below the groundwater surface in Well MW-3. ORC is a formulation of very fine, insoluble magnesium peroxide that releases oxygen at a slow, controlled rate when hydrated. ORC product literature is presented as Attachment D.

To evaluate the program, baseline concentrations of dissolved oxygen, nitrates, and nitrites in groundwater at Well MW-3 were obtained prior to installation of ORC (Table 7). The aforementioned parameters will be monitored during future groundwater monitoring events. Initial program evaluation results will be presented in PACIFIC's first quarter 1996 report.

CONCLUSIONS

During a meeting attended by PACIFIC, ARCO, and the Alameda County Health Care Services Agency (ACHCSA) on October 5, 1995, it was agreed that the operation of the GWE system was no longer required unless quarterly groundwater monitoring indicates a plume migration during the verification monitoring period, at which point GWE will be resumed. Furthermore, it was agreed that future groundwater monitoring at the site will be conducted in accordance with the following schedule: Wells MW-3, MW-4, and MW-5 will be monitored on a quarterly basis, and Wells MW-1, MW-2, and MW-6 will be monitored annually.

SUMMARY OF WORK

Work Performed Fourth Quarter 1995

- Deactivated GWE system and continued groundwater monitoring during the verification monitoring period.
- Attended meeting with the ACHCSA to discuss site closure requirements.
- Prepared and submitted meeting minutes.
- Prepared and submitted third quarter 1995 groundwater monitoring and remedial system performance evaluation.
- Sampled site wells for fourth quarter 1995 groundwater monitoring program. Sampling performed by PACIFIC.
- Prepared fourth quarter 1995 groundwater monitoring and remedial system performance evaluation.
- Issued quarterly self-monitoring report to the EBMUD.
- Initiated bioremediation enhancement program for Well MW-3.
- Initiated product line and dispenser replacement activities.

Work Anticipated First Quarter 1996

- Prepare and submit fourth quarter 1995 groundwater monitoring and remedial system performance evaluation report.
- Sample site wells for first quarter 1996 groundwater monitoring and bioremediation enhancement programs. Sampling to be performed by PACIFIC.
- Prepare first quarter 1996 groundwater monitoring and remedial system performance evaluation report.

If there are any questions regarding the contents of this letter, please call.

Sincerely,

Pacific Environmental Group, Inc.

Shaw Garakani
Project Engineer

R. Lee Dooley
Senior Geologist
CEG 1006

REGISTERED GEOLOGIST
R.L. DOOLEY
No. 1006
Certified Engineering
GEOLOGIST
STATE OF CALIFORNIA

Attachments:
- Table 1 - Groundwater Sampling Schedule
- Table 2 - Liquid Surface Elevation Data
- Table 3 - Groundwater Analytical Data - Total Purgeable Petroleum Hydrocarbons (TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Oil and Grease)
- Table 4 - Groundwater Analytical Data - Total Methyl t-butyl Ether
- Table 5 - Groundwater Extraction System Performance Data
- Table 6 - Groundwater Extraction System Analytical Data - Total Purgeable Petroleum Hydrocarbons (TPPH as Gasoline and BTEX Compounds)
- Table 7 - Groundwater Biodegradation Study Field and Laboratory Data
- Figure 1 - Liquid Surface Elevation Contour Map
- Figure 2 - TPPH-g/Benzene Concentration Map
- Figure 3 - Groundwater Extraction System Mass Removal Trend
- Figure 4 - Groundwater Extraction System Hydrocarbon Concentrations
- Attachment A - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment B - Field and Laboratory Procedures
- Attachment C - Treatment System Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment D - ORC Product Literature

cc: Ms. Susan Hugo, Alameda County Health Care Services Agency
Mr. Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region

Table 1
Groundwater Sampling Schedule

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Sampling Frequency
MW-1			a		Annually
MW-2			a		Annually
MW-3	a	a	a	a	Quarterly
MW-4	a	a	a	a	Quarterly
MW-5	a	a	a	a	Quarterly
MW-6			a		Annually

a. Samples analyzed for TPPH-g and BTEX compounds according to EPA Methods 8015 (modified) and 8020.

Table 2
Liquid Surface Elevation Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-1	07/20/89	159.44	8.04	--	151.40
	08/30/89		8.47	--	150.97
	10/04/89		8.50	--	150.94
	01/10/90		6.74	--	152.70
	08/07/90		6.87	--	152.57
	12/06/90		7.35	--	152.09
	12/19/90		7.22	--	152.22
	01/29/91		8.28	--	151.16
	02/20/91		7.98	--	151.46
	04/25/91		6.89	--	152.55
	05/31/91		7.64	--	151.80
	07/08/91		8.17	--	151.27
	08/09/91		8.58	--	150.86
	09/25/91		8.82	--	150.62
	10/17/91		8.96	--	150.48
	11/20/91		8.60	--	150.84
	12/27/91		8.71	--	150.73
	01/19/92		7.83	--	151.61
	02/19/92		6.68	--	152.76
	03/09/92		4.47	--	154.97
	04/15/92	158.91	6.44	--	152.47
	05/12/92		7.31	--	151.60
	06/16/92		7.97	--	150.94
	07/14/92		8.22	--	150.69
	08/07/92		8.46	--	150.45
	09/22/92		6.76	--	152.15
	10/12/92		7.13	--	151.78
	11/23/92		7.24	--	151.67
	12/16/92		6.44	--	152.47
	01/21/93		5.03	--	153.88
	02/22/93		4.93	--	153.98
	03/25/93		5.13	--	153.78
	04/27/93		5.68	--	153.23
	08/04/93		7.91	--	151.00
	10/13/93		8.81	--	150.10
	02/03/94		7.51	--	151.40
	04/29/94		7.20	--	151.71
	08/02/94		8.02	--	150.89
	11/12/94		6.70	--	152.21
	02/23/95		7.77	--	151.14
	05/09/95		7.82	--	151.09
	08/07/95		7.45	--	151.46
	11/02/95		8.26	--	150.65
MW-2	07/20/89	158.46	8.15	--	150.31
	08/30/89		8.42	--	150.04
	10/04/89		8.40	--	150.06
	01/10/90		6.12	--	152.34
	08/07/90		6.35	--	152.11
	12/06/90		7.15	--	151.31
	12/19/90		7.38	--	151.08
	01/29/91		8.41	--	150.05
	02/20/91		8.26	--	150.20
	04/25/91		7.70	--	150.76
	05/31/91		8.10	--	150.36
	07/08/91		8.34	--	150.12

Table 2 (continued)
Liquid Surface Elevation Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-2	08/09/91		8.51	--	149.95
(cont.)	09/25/91		8.66	--	149.80
	10/17/91		8.80	--	149.66
	11/20/91		8.66	--	149.80
	12/27/91		8.57	Sheen	149.89
	01/19/92		8.25	--	150.21
	02/19/92		7.50	--	150.96
	03/09/92		7.40	--	151.06
	04/15/92	157.92	7.72	--	150.20
	05/12/92		8.01	--	149.91
	06/16/92		8.25	--	149.67
	07/14/92		8.33	--	149.59
	08/07/92		8.42	--	149.50
	09/22/92		6.13	--	151.79
	10/12/92		6.80	--	151.12
	11/23/92		7.15	--	150.77
	12/16/92		6.66	--	151.26
	01/21/93		5.93	--	151.99
	02/22/93		6.01	--	151.91
	03/25/93		5.91	--	152.01
	04/27/93		6.63	--	151.29
	08/04/93		8.02	--	149.90
	10/13/93		8.64	--	149.28
	02/03/94		8.08	--	149.84
	04/29/94		8.14	--	149.78
	08/02/94		8.31	--	149.61
	11/12/94		7.74	--	150.18
	02/23/95		7.53	--	150.39
	05/09/95		7.57	--	150.35
	08/07/95		8.15	--	149.77
	11/02/95		8.50	--	149.42
MW-3	07/20/89	154.18	7.58	--	146.60
	08/30/89		8.00	--	146.18
	10/04/89		7.73	Emulsion	146.45
	01/10/90		7.78	--	146.40
	08/07/90		7.66	--	146.52
	12/06/90		7.75	--	146.43
	12/19/90		7.58	--	146.60
	01/29/91		7.60	--	146.58
	02/20/91		7.51	--	146.67
	04/25/91		6.37	--	147.81
	05/31/91		7.19	--	146.99
	07/08/91		7.60	--	146.58
	08/09/91		7.94	--	146.24
	09/25/91		8.23	--	145.95
	10/17/91		8.44	--	145.74
	11/20/91		8.78	--	145.40
	12/27/91		8.05	Sheen	146.13
	01/19/92		7.65	--	146.53
	02/19/92		6.48	--	147.70
	03/09/92		5.45	--	148.73
	04/15/92	153.64	7.75	--	145.89
	05/12/92		7.45	--	146.19
	06/16/92		7.51	--	146.13
	07/14/92		7.60	--	146.04

Table 2 (continued)
Liquid Surface Elevation Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-3	08/07/92		7.85	--	145.79
(cont.)	09/22/92		7.73	--	145.91
	10/12/92		7.83	--	145.81
	11/23/92		6.98	--	146.66
	12/16/92		5.96	--	147.68
	01/21/93		4.62	--	149.02
	02/22/93		5.15	--	148.49
	03/25/93		5.45	--	148.19
	04/27/93		5.79	--	147.85
	08/04/93		7.24	--	146.40
	10/13/93		8.03	--	145.61
	02/03/94		6.66	--	146.98
	04/29/94		7.70	--	145.94
	08/02/94		7.47	--	146.17
	11/12/94		5.91	--	147.73
	02/23/95		7.18	--	146.46
	05/09/95		5.96	--	147.68
	08/07/95		7.83	--	145.81
	11/02/95		7.83	--	145.81
MW-4	07/20/89	157.08	8.09	--	148.99
	08/30/89		8.45	Sheen	148.63
	10/04/89		8.57	Sheen	148.51
	01/10/90		7.26	--	149.82
	08/07/90		6.87	--	150.21
	12/06/90		8.02	Sheen	149.06
	12/19/90		7.69	--	149.39
	01/29/91		8.39	Sheen	148.69
	02/20/91		8.16	--	148.92
	04/25/91		7.14	--	149.94
	05/31/91		7.64	--	149.44
	07/08/91		8.34	--	148.74
	08/09/91		8.60	--	148.48
	09/25/91		8.80	--	148.28
	10/17/91		8.98	--	148.10
	11/20/91		8.78	--	148.30
	12/27/91		8.82	--	148.26
	01/19/92		8.18	--	148.90
	02/19/92		7.62	--	149.46
	03/09/92		6.68	--	150.40
	04/15/92	156.53	6.96	--	149.57
	05/12/92		7.45	--	149.08
	06/16/92		7.94	--	148.59
	07/14/92		8.21	--	148.32
	08/07/92		8.41	--	148.12
	09/22/92		6.14	--	150.39
	10/12/92		6.45	--	150.08
	11/23/92		7.48	--	149.05
	12/16/92		6.95	--	149.58
	01/21/93		5.53	--	151.00
	02/22/93		5.83	--	150.70
	03/25/93		5.96	--	150.57
	04/27/93		6.30	--	150.23
	08/04/93		7.71	--	148.82
	10/13/93		8.53	--	148.00
	02/03/94		9.27	--	147.26

Table 2 (continued)
Liquid Surface Elevation Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-4	04/29/94		9.50	--	147.03
(cont.)	08/02/94		8.69	--	147.84
	11/12/94		6.88	--	149.65
	02/23/95		9.38	--	147.15
	05/09/95		9.00	--	147.53
	08/07/95		9.55	--	146.98
	11/02/95		9.58	--	146.95
MW-5	04/15/92	151.33	8.05	--	143.28
	05/12/92		8.44	--	142.89
	06/16/92		8.74	--	142.59
	07/14/92		9.70	--	141.63
	08/07/92		9.10	--	142.23
	09/22/92		9.26	--	142.07
	10/25/92		9.24	--	142.09
	11/23/92		---------- Well Inaccessible ----------		
	12/16/92		8.20	--	143.13
	01/21/93		7.89	--	143.44
	02/22/93		7.29	--	144.04
	03/25/93		7.51	--	143.82
	04/27/93		7.72	--	143.61
	08/05/93		8.66	--	142.67
	10/13/93		9.00	--	142.33
	02/03/94		9.38	--	141.95
	04/29/94		---------- Well Inaccessible ----------		
	08/02/94		8.71	--	142.62
	11/12/94		8.65	--	142.68
	02/23/95		9.23	--	142.10
	05/09/95		7.65	--	143.68
	08/07/95		8.25	--	143.08
	11/02/95		8.60	--	142.73
MW-6	04/15/92	153.84	4.55	--	149.29
	05/12/92		5.32	--	148.52
	06/16/92		5.91	--	147.93
	07/14/92		6.08	--	147.76
	08/07/92		6.36	--	147.48
	09/22/92		6.53	--	147.31
	10/25/92		6.54	--	147.30
	11/23/92		5.75	--	148.09
	12/16/92		4.69	--	149.15
	01/21/93		3.82	--	150.02
	02/22/93		3.78	--	150.06
	03/25/93		3.93	--	149.91
	04/27/93		4.30	--	149.54
	08/05/93		5.39	--	148.45
	10/13/93		7.12	--	146.72
	02/03/94		5.17	--	148.67
	04/29/94		4.66	--	149.18
	08/02/94		5.64	--	148.20
	11/12/94		6.32	--	147.52
	02/23/95		5.60	--	148.24
	05/09/95		5.21	--	148.63

Table 2 (continued)
Liquid Surface Elevation Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-6	08/07/95		5.68	--	148.16
(cont.)	11/02/95		6.60	--	147.24

SPH = Separate-phase hydrocarbons
MSL = Mean sea level
TOC = Top of casing

Table 3
Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Oil and Grease)

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Sampled		TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Oil and Grease (ppb)
MW-1	07/21/89		33	0.77	1.6	15	5	NA	NA
	08/30/89		<20	<0.50	<0.50	<0.50	<0.50	NA	NA
	10/04/89		<20	<0.50	<0.50	<0.50	<0.50	NA	NA
	01/10/90		<20	<0.50	<0.50	<0.50	<0.50	NA	NA
	08/07/90		<20	<0.50	<0.50	<0.50	<0.50	NA	NA
	12/06/90		<50	3.6	2.7	0.60	5.8	NA	NA
	02/20/91		<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	07/08/91		<30	<0.30	<0.30	<0.30	<0.30	NA	NA
	09/25/91		<30	57	57	54	1.7	NA	NA
	11/20/91		57	9.2	3.7	0.63	25	NA	NA
	03/09/92		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	04/15/92		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	07/14/92		<50	<0.5	0.7	<0.5	1.3	NA	NA
	10/12/92		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	01/21/93		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	04/27/93		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	08/04/93		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	10/13/93		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/03/94		<50	1.4	2.1	<0.5	2	NA	NA
	04/29/94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	08/02/94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	11/12/94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/23/95		<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	05/09/95		<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	08/07/95	a	<500	<5.0	<5.0	<5.0	<5.0	NA	NA
	11/02/95		<50	3.6	<0.50	<0.50	<0.50	NA	NA
MW-2	07/21/89		4,200	280	210	38	24	NA	NA
	08/30/89		4,200	160	260	45	240	NA	NA
	10/04/89		4,300	860	300	29	330	NA	NA
	01/10/90		8,000	890	710	120	760	NA	NA
	08/07/90		6,000	880	76	25	80	NA	NA
	12/06/90		1,600	330	69	18	63	NA	NA
	02/20/91		1,300	160	46	13	48	NA	NA
	07/08/91		310	76	18	7.7	24	NA	NA
	09/25/91		83	17	0.69	2.2	4.1	NA	NA
	11/20/91		180	46	6.1	3	8.7	NA	NA
	03/09/92		690	170	25	21	58	NA	NA
	04/15/92		86	20	2.3	3.8	85	NA	NA
	07/14/92		160	46	1.4	1.2	35	NA	NA
	10/12/92		230	59	7	55	11	NA	NA
	01/21/93		450	70	6.6	22	54	NA	NA
	04/27/93		<50	6.6	<0.5	0.7	1.1	NA	NA
	08/04/93		<50	2.1	<0.5	<0.5	<0.5	NA	NA
	10/13/93		<50	14	<0.5	<0.5	<0.5	NA	NA
	02/03/94		<50	4.4	<0.5	<0 5	0.8	NA	NA
	04/29/94		150	38	0.7	4.3	4.8	NA	NA
	08/02/94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	11/12/94		95	28	0.7	2.5	7.5	NA	NA

Table 3 (continued)
Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Oil and Grease)

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Oil and Grease (ppb)
MW-2	02/23/95	<50	1.8	<0.50	<0.50	<0.50	NA	NA
(cont.)	05/09/95	<50	1.9	<0.50	<0.50	<0.50	NA	NA
	08/07/95	<50	0.66	<0.50	<0.50	<0.50	NA	NA
	11/02/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-3	07/21/89	430	9	4.8	<0.50	50	NA	NA
	08/30/89	1,200	85	46	84	55	NA	NA
	10/04/89	7,000	580	900	120	670	NA	NA
	01/10/90	940	130	59	21	73	NA	NA
	08/07/90	2,300	180	64	59	120	NA	NA
	12/06/90	460	52	55	14	39	350	NA
	02/20/91	470	36	30	9.3	31	<100	<5,000
	07/08/91	2500	240	470	74	320	NA	NA
	09/25/91	1,100	120	110	34	120	NA	NA
	11/20/91	1,000	180	140	43	140	NA	NA
	03/10/92	1,200	200	110	53	130	NA	NA
	04/15/92	1,600	200	13	110	81	NA	NA
	07/14/92	5,200	620	44	310	250	NA	NA
	10/12/92	850	150	5.2	55	46	NA	NA
	01/21/93	620	100	12	35	35	NA	NA
	04/27/93	1,700	180	83	64	100	NA	NA
	08/04/93	380	70	12	29	41	NA	NA
	10/13/93	780	90	6	40	31	NA	NA
	02/03/94	340	42	8.7	9.2	28	NA	NA
	04/29/94	830	150	38	27	48	NA	NA
	08/02/94	220	25	1.7	7.6	8.3	NA	NA
	11/12/94	160	6.0	<0.5	3.2	4.1	NA	NA
	02/23/95	120	1.3	<0.50	1.1	1.6	NA	NA
	05/09/95	190	20	6.6	8.9	20	NA	NA
	08/07/95	<50	2.3	0.51	0.51	0.57	NA	NA
	11/02/95	<50	2.3	<0.50	<0.50	0.94	NA	NA
MW-4	07/21/89	8,700	720	360	120	640	NA	NA
	08/30/89	7,300	630	220	N/A	320	NA	NA
	10/04/89	21,000	2,300	1,300	280	1,300	NA	NA
	01/10/90	4,300	470	250	63	430	NA	NA
	08/07/90	69,000	8,700	4,200	540	4,600	28,000	<5,000
	12/06/90	---------- Separate-Phase Hydrocarbon Sheen ----------						
	02/20/91	5,200	690	200	95	580	<100	<5,000
	07/08/91	1,700	280	68	37	170	NA	NA
	09/25/91	6,300	2,100	290	210	590	NA	NA
	11/20/91	2,700	1,200	200	110	320	NA	NA
	03/10/92	690	180	80	18	43	NA	NA
	04/15/92	8,500	2,100	750	280	1,000	NA	NA
	07/14/92	10,000	2,900	530	290	930	NA	NA
	10/12/92	19,000	5,200	1,600	490	1,800	690	NA
	01/21/93	22,000	4,400	1,300	580	2,200	1,400	NA
	04/27/93	21,000	4,800	1,200	630	2,400	1,100	NA
	08/04/93	23,000	6,600	1,700	770	2,600	1500	NA

Table 3 (continued)
Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Oil and Grease)

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Oil and Grease (ppb)
MW-4	10/13/93	16,000	3,500	800	470	1,800	670	NA
(cont.)	02/03/94	850	140	84	7.9	59	59	NA
	04/29/94	68	1.1	<0.5	<0.5	1.7	<50	NA
	08/02/94	52	5.7	<0.5	1.2	1.9	<50	NA
	11/12/94	1,600	230	51	81	190	90	NA
	02/23/95	1,700	340	81	52	130	NA	NA
	05/09/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	08/07/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	11/02/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-5	04/15/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	10/25/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	01/21/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	04/27/93	<50	0.5	1	<0.5	0.8	NA	NA
	08/05/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/03/94	<50	0.8	1.7	<0.5	15	NA	NA
	04/29/94	Well inaccessible						
	08/02/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	11/12/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/23/95	<50	<0.50	0.56	<0.50	0.50	NA	NA
	05/09/95	<50	<0.50	0.56	<0.50	0.50	NA	NA
	08/07/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	11/02/95	<50	<0.50	1.8	<0.50	<0.50	NA	NA
MW-6	04/15/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	07/15/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	10/25/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	01/21/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	04/27/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	08/05/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	10/13/93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/03/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	04/29/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	08/02/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	11/12/94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
	02/23/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	05/09/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	08/07/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
	11/02/95	<50	<0.50	<0.50	<0.50	<0.50	NA	NA

TEPH = Total extractable petroleum hydrocarbons
ppb = Parts per billion
NA = Not analyzed
a. Detection limits were raised due to analysis for MTBE
Prior to June 1995, TPPH as gasoline and TEPH as diesel were reported as TPH as gasoline and diesel, respectively.

Table 4
Groundwater Analytical Data
Total Methyl t-Butyl Ether

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Sampled	Methyl t-Butyl Ether (ppb)
MW-1	08/07/95	510
MW-2	08/07/95	37
MW-3	08/07/95	<2.5
MW-4	08/07/95	<2.5
MW-5	08/07/95	<2.5
MW-6	08/07/95	160

ppb = Parts per billion
See certified analytical report for detection limit.

Table 5
Groundwater Extraction System Performance Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Sample I.D.	Date Sampled		Totalizer Reading (gallons)	Net Volume (gallons)	Average Flow Rate (gpm)	TPPH Influent Concentration (µg/L)	TPPH Net Removed (lbs)	TPPH Removed to Date (lbs)	Benzene Influent Concentration (µg/L)	Benzene Net Removed (lbs)	Benzene Removed to Date (lbs)	Primary Carbon Loading (percent)
INFL	12/21/93	a	22	22	0.21	NS	0.000	0.00	NS	0.000	0.00	0.0
INFL	12/23/93	a	4,855	4,833	1.6	9,300	0.380	0.38	1,200	0.024	0.02	0.5
INFL	12/27/93	a	6,871	2,016	0.36	5,700	0.130	0.51	820	0.017	0.04	0.6
INFL	12/29/93	a	7,192	321	0.13	5,800	0.016	0.53	950	0.002	0.04	0.7
INFL	01/03/94	a	7,925	733	0.10	6,500	0.010	0.54	860	0.006	0.05	0.7
INFL	01/05/94	a	8,162	237	0.08	5,200	0.010	0.55	970	0.002	0.05	0.7
INFL	01/11/94	a	8,907	745	0.08	6,300	0.030	0.58	900	0.006	0.06	0.7
INFL	01/13/94	a	9,175	268	0.09	8,600	0.019	0.60	950	0.002	0.06	0.7
INFL	01/24/94	a	9,306	131	0.08	NS	0.007	0.60	NS	0.001	0.06	0.8
INFL	02/24/94	a	14,555	5,249	0.21	4,200	0.280	0.88	520	0.011	0.07	1.1
INFL	03/24/94	a	23,723	9,168	0.24	6,200	0.400	1.40	1,100	0.062	0.13	1.8
INFL	04/26/94	b	29,543	5,820	0.12	6,400	0.150	1.55	1,400	0.061	0.19	1.9
INFL	05/24/94	c	35,082	5,539	0.14	NS	0.196	1.75	NS	0.043	0.24	2.2
INFL	11/17/94	d,e	35,507	425	N/A	2,100	0.004	1.75	460	0.001	0.24	2.2
INFL	01/10/95	f	36,493	986	0.01	1,100	0.013	1.76	180	0.003	0.24	2.2
INFL	02/07/95	g	41,399	4,906	0.12	3,500	0.094	1.86	370	0.011	0.25	2.3
INFL	03/03/95	h	53,290	11,891	0.34	NS	0.220	2.08	NS	0.035	0.29	2.6
INFL	04/03/95		62,582	9,292	0.21	5,000	0.194	2.27	1,000	0.039	0.32	2.8
INFL	05/01/95		69,809	7,227	0.18	580	0.168	2.44	40	0.031	0.36	3.0
INFL	06/09/95		75,254	5,445	0.10	1,400	0.045	2.48	420	0.010	0.37	3.1
INFL	07/05/95		81,540	6,286	0.17	750	0.056	2.54	41	0.012	0.38	3.2
INFL	08/10/95		86,868	5,328	0.10	610	0.030	2.57	29	0.002	0.38	3.2
INFL	09/18/95		91,532	4,664	0.08	600	0.024	2.59	10	0.001	0.38	3.2
INFL	10/02/95		92,918	1,386	0.07	790	0.008	2.60	52	0.000	0.38	3.3
INFL	10/13/95	l,h	93,989	1,071	0.07	NS	0.006	2.61	NS	0.000	0.38	3.3

REPORTING PERIOD: 09/18/95 - 12/31/95 (i)					
TOTAL POUNDS REMOVED:			**2.61**		**0.38**
TOTAL GALLONS REMOVED:			**0.43**		**0.05**
PERIOD POUNDS REMOVED:		**0.014**		**0.00**	
PERIOD GALLONS REMOVED:		**0.002**		**0.00**	
TOTAL GALLONS EXTRACTED:	**93,989**				
PERIOD GALLONS EXTRACTED:	**2,467**				
PERIOD AVERAGE FLOW RATE (gpm):	**0.07**				
PRIMARY BED CAPACITY REMAINING:	**96.7%**				

TPPH = Total purgeable petroleum hydrocarbons
gpm = Gallons per minute
µg/L = Micrograms per liter
lbs = Pounds
NS = Not sampled (prior concentrations assumed)
N/A = Not available or not applicable

a. All data prior to 9/1/94 provided by prior consultant.
b. Samples taken 4/21/94; totalizer reading from 4/26/94.
c. Last site visit by RESNA on 5/24/94.
d. Pacific Environmental Group, Inc. became consultant for the site 9/1/94.
e. System operated for two days in 4th quarter 1994; system down due to extensive repairs required for system and compound.
f. System started on January 10, 1995.
g. System auto shutdown 2/14/95; shut down 3/3/95 for repairs.
h. TPPH/benzene pounds removed estimated from previous data.
i. GWE system temporarily shut down 10/13/95.

System operation began December 21, 1993, under RESNA Industries, Inc.; system shut down 4/27/94 - 11/17/94.
Pounds of hydrocarbons removed to date through March 24, 1994 provided by prior consultant.
Benzene mass removal from 12/21/93 through 4/27/94 estimated from data provided by prior consultant.
Prior to June 1995, TPPH was reported as "TPH calculated as Gasoline".
Mass removed is an approximation calculated using averaged concentrations.
Carbon loading assumes an 8 percent isotherm. See certified analytical reports for detection limits.

Table 6
Groundwater Extraction System Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Sample I.D.	Date Sampled	TPPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)
Influent Samples						
SP-105	01/10/94	1,100	180	2.7	26	51
SP-105	02/07/94	3,500	370	120	67	230
SP-105	04/03/95	5,000	1,000	41	88	300
INFL	05/01/95	580	40	ND	1.2	17
SP-105	06/09/95	1,400	420	7	10	20
SP-105	07/05/95	750	41	ND	2.8	17
SP-105	08/10/95	610	29	0.64	3.4	16
SP-105	09/18/95	600	10	ND	ND	20
105	10/02/95	790	52	ND	8.4	67
Midpoint-1 Samples						
SP-106	01/10/94	ND	ND	ND	ND	ND
SP-106	02/07/94	ND	ND	ND	ND	ND
SP-106	04/03/95	ND	ND	ND	ND	ND
MID-1	05/01/95	ND	ND	ND	ND	ND
SP-106	06/09/95	ND	ND	ND	ND	ND
SP-106	07/05/95	ND	ND	ND	ND	ND
SP-106	08/10/95	ND	ND	ND	ND	ND
SP-106	09/18/95	ND	ND	ND	ND	ND
106	10/02/95	ND	ND	ND	ND	ND
Midpoint-2 Samples						
MID-2	11/17/94	ND	ND	ND	ND	ND
SP-107	01/10/94	ND	ND	ND	ND	ND
SP-107	02/07/94	ND	ND	ND	ND	ND
SP-107	04/03/95	ND	ND	ND	ND	ND
SP-107	06/09/94	ND	ND	ND	ND	ND
SP-107	09/18/95	ND	ND	ND	ND	ND
Effluent Samples						
SP-108	01/10/94	ND	ND	ND	ND	ND
SP-108	02/07/94	ND	ND	ND	ND	ND
SP-108	04/03/95	ND	ND	ND	ND	ND
EFFL	05/01/95	ND	ND	ND	ND	ND
SP-108	06/09/95	79	ND	ND	ND	ND
SP-108	07/05/95	ND	ND	ND	ND	ND
SP-108	08/10/95	ND	ND	ND	ND	ND
SP-108	09/18/95	ND	ND	ND	ND	ND
108	10/02/95	ND	ND	ND	ND	ND

µg/L = Micrograms per liter
ND = Not detected above detection limits
System startup on 12/21/93 by RESNA Industries, Inc.
Pacific Environmental Group, Inc. (PACIFIC) became consultant 9/01/94.
PACIFIC restarted system on 11/17/94.
See certified analytical reports for individual detection limits.

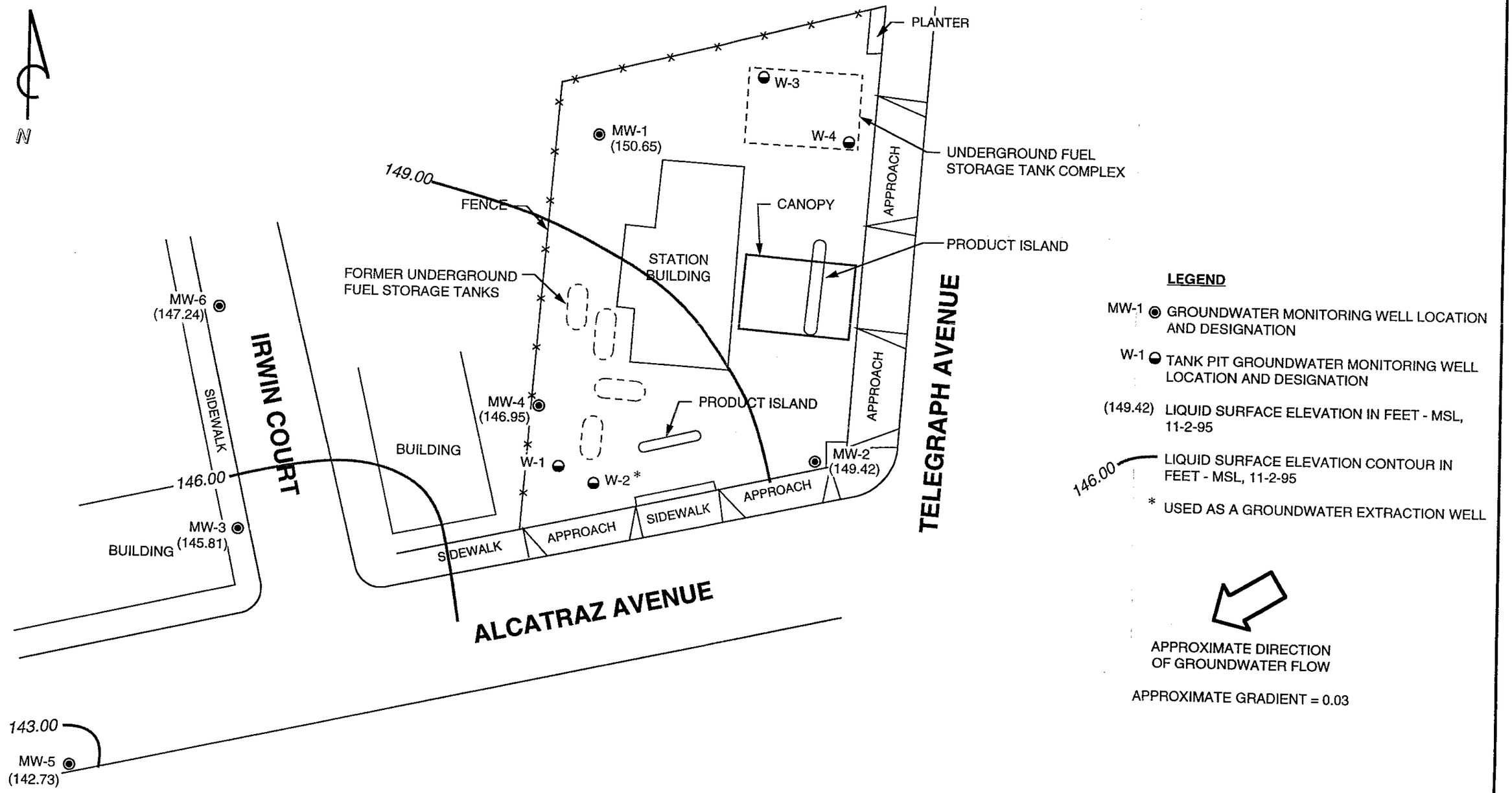
Table 7
Groundwater Biodegradation Study Field and Laboratory Data

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

		Field Analyses				Laboratory Analyses	
Well	Date Sampled	Groundwater Temperature (deg F)	pH (units)	Conductivity (µmhos)	DO (mg/L)	Nitrite as Nitrite (mg/L)	Nitrate as Nitrate (mg/L)
MW-3	11/14/95	65.5*	6.76*	508*	7.17†	<1.0	6.6

DO = Dissolved oxygen
deg F = Degrees Fahrenheit
µmhos = Micromhos
mg/L = Milligrams per liter

* = Field measurements collected on November 2, 1995.
† = DO measurement taken in office.



LEGEND

MW-1 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

W-1 ◒ TANK PIT GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

(149.42) LIQUID SURFACE ELEVATION IN FEET - MSL, 11-2-95

146.00 LIQUID SURFACE ELEVATION CONTOUR IN FEET - MSL, 11-2-95

* USED AS A GROUNDWATER EXTRACTION WELL

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE GRADIENT = 0.03

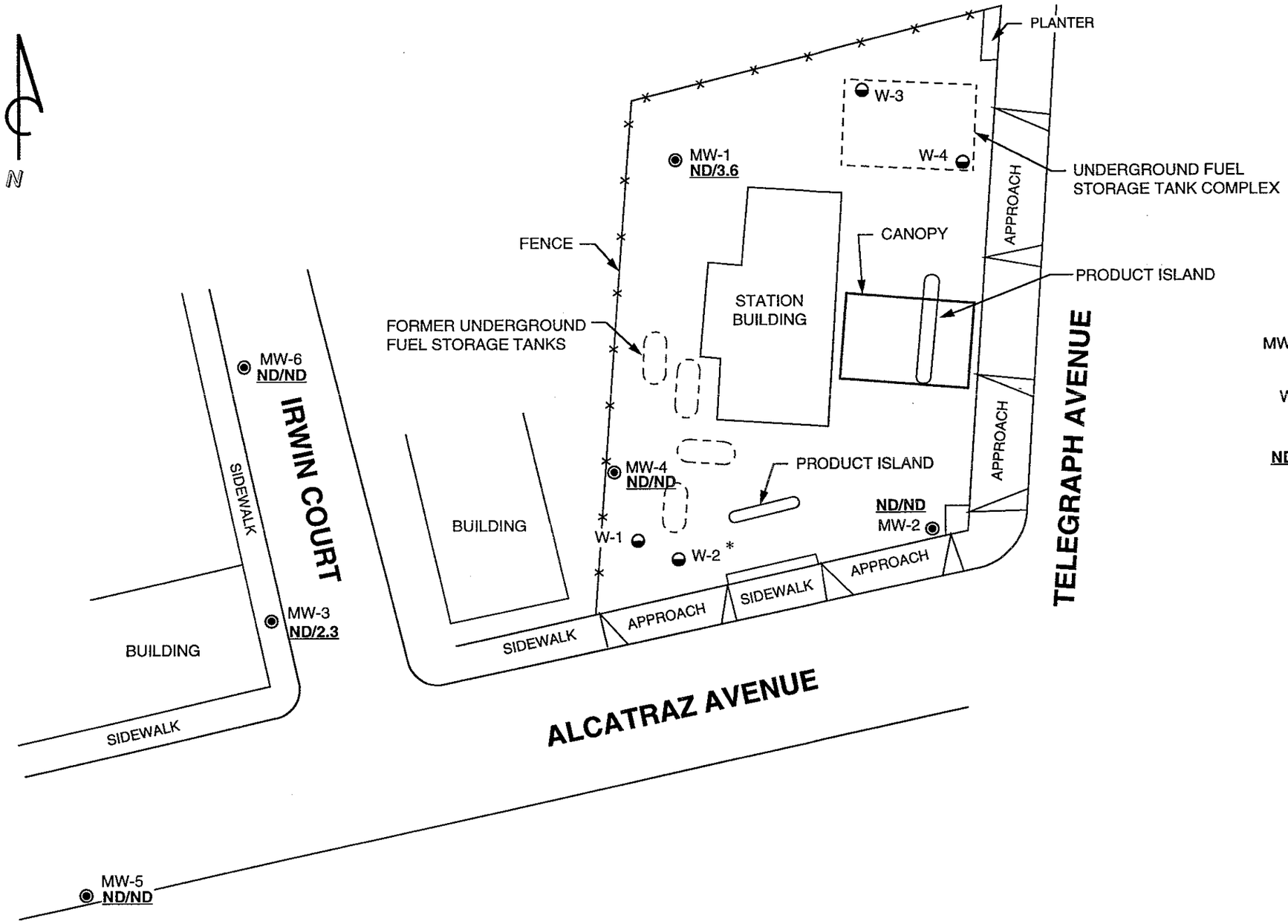
PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

ARCO SERVICE STATION 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

LIQUID SURFACE ELEVATION CONTOUR MAP

FIGURE:
1
PROJECT:
330-084.2B



LEGEND

MW-1 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

W-1 ◒ TANK PIT GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

ND/2.3 TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 11-2-95

ND NOT DETECTED

* USED AS A GROUNDWATER EXTRACTION WELL

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

ARCO SERVICE STATION 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

TPPH-g/BENZENE CONCENTRATION MAP

FIGURE:
2
PROJECT:
330-084.2B

Figure 3
Groundwater Extraction System Mass Removal Trend

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

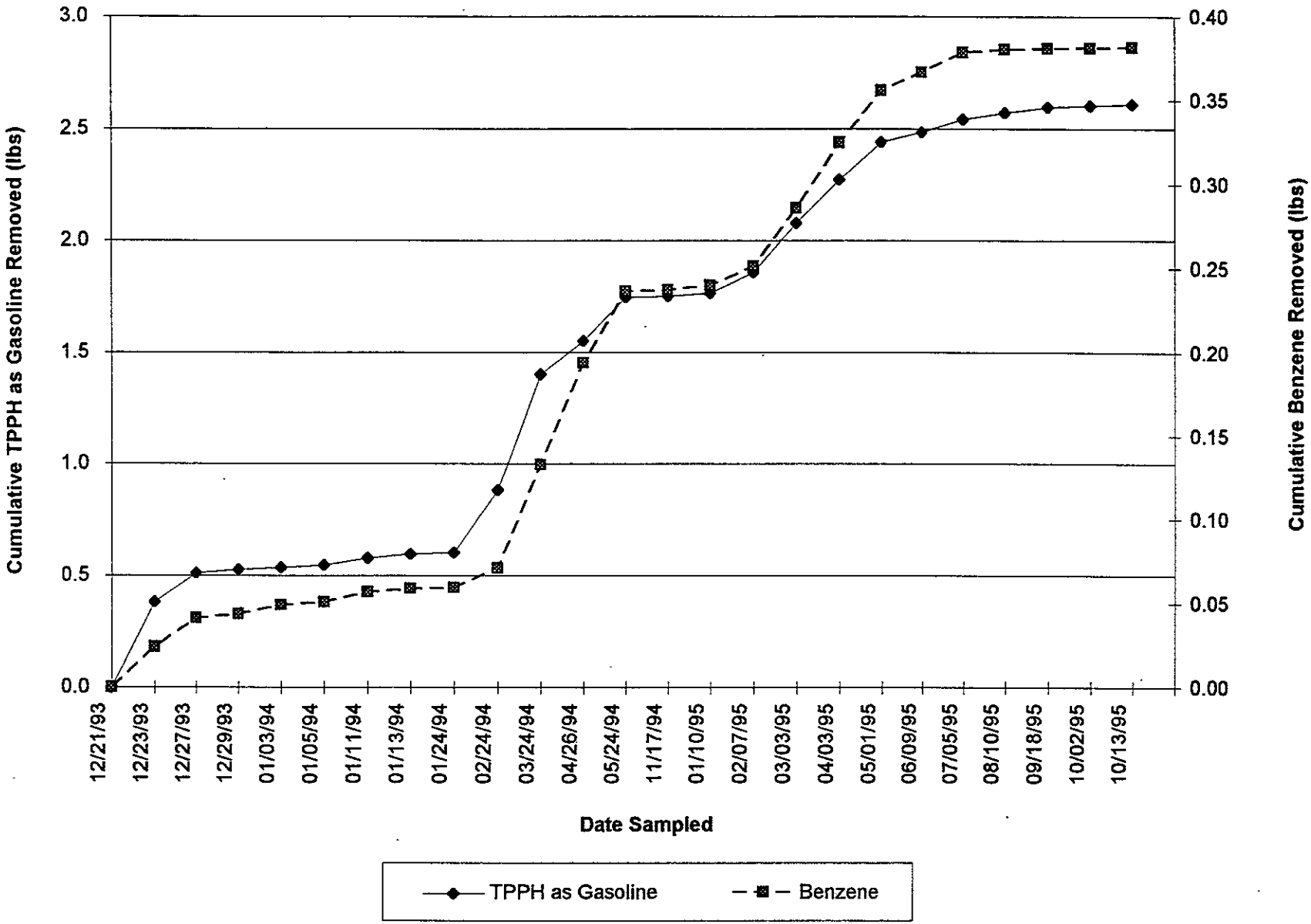
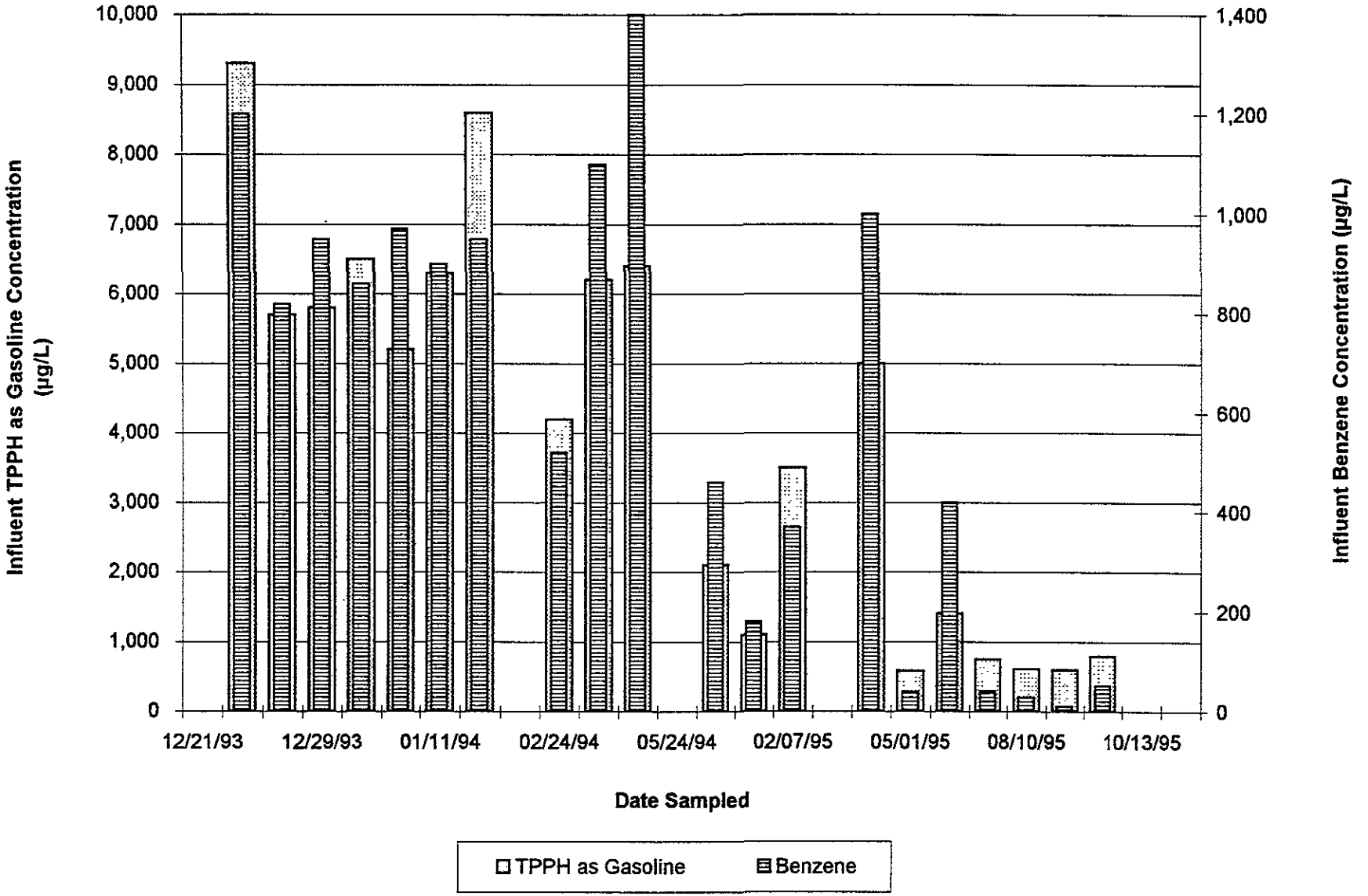


Figure 4
Groundwater Extraction System Hydrocarbon Concentrations

ARCO Service Station 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California



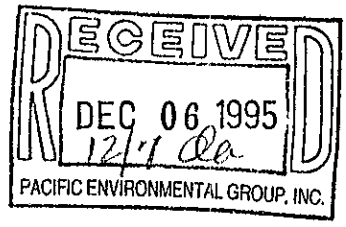
ATTACHMENT A

CERTIFIED ANALYTICAL REPORTS, CHAIN-OF-CUSTODY DOCUMENTATION, AND FIELD DATA SHEETS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

1247 KBV



Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Project: 330-084.2G/0374,Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 3, 1995. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9511287 -01	LIQUID, MW-1	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -02	LIQUID, MW-2	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -03	LIQUID, MW-3	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -04	LIQUID, MW-4	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -05	LIQUID, MW-5	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -06	LIQUID, MW-6	11/02/95	TPHGBW Purgeable TPH/BTEX
9511287 -07	LIQUID, TB-1	11/02/95	TPHGBW Purgeable TPH/BTEX

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-084.2G/0374,Oakland
Sample Descript: MW-1
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511287-01

Sampled: 11/02/95
Received: 11/03/95

Analyzed: 11/07/95
Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	**0.50**	**3.6**
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.2G/0374,Oakland	Sampled: 11/02/95
2025 Gateway Place, Suite 440	Sample Descript: MW-2	Received: 11/03/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511287-02	Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.2G/0374,Oakland	Sampled: 11/02/95
2025 Gateway Place, Suite 440	Sample Descript: MW-3	Received: 11/03/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511287-03	Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	**0.50**	**2.3**
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	**0.50**	**0.94**
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.2G/0374,Oakland	Sampled: 11/02/95
2025 Gateway Place, Suite 440	Sample Descript: MW-4	Received: 11/03/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511287-04	Reported: 11/16/95

QC Batch Number: GC110795BTEX02A
Instrument ID: GCHP02

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	87

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-084.2G/0374,Oakland
Sample Descript: MW-5
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511287-05

Sampled: 11/02/95
Received: 11/03/95

Analyzed: 11/07/95
Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	**0.50**	**1.8**
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	99

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-084.2G/0374,Oakland
Sample Descript: MW-6
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511287-06

Sampled: 11/02/95
Received: 11/03/95

Analyzed: 11/07/95
Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	91

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.2G/0374,Oakland	Sampled: 11/02/95
2025 Gateway Place, Suite 440	Sample Descript: TB-1	Received: 11/03/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511287-07	Reported: 11/16/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	95

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-084.2G/0374, Oakland
Matrix: LIQUID
Work Order #: 9511287 01-03, 05-07

Reported: Nov 17, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110795BTEX21A	GC110795BTEX21A	GC110795BTEX21A	GC110795BTEX21A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	9510L3207	9510L3207	9510L3207	9510L3207
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.9	9.8	9.5	27
MS % Recovery:	99	98	95	90
Dup. Result:	10	11	10	31
MSD % Recov.:	100	110	100	103
RPD:	1.0	12	5.1	14
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK102695	BLK102695	BLK102695	BLK102695
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.1	8.8	8.6	26
LCS % Recov.:	91	88	86	87
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-084.2G/0374, Oakland
Matrix: LIQUID
Work Order #: 9511287 04

Reported: Nov 17, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110795BTEX02A	GC110795BTEX02A	GC110795BTEX02A	GC110795BTEX02A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	3510L3207	3510L3207	3510L3207	3510L3207
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.0	9.1	9.1	26
MS % Recovery:	90	91	91	87
Dup. Result:	8.8	8.9	8.8	25
MSD % Recov.:	88	89	88	83
RPD:	2.2	2.2	3.4	3.9
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK102795	BLK102795	BLK102795	BLK102795
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.7	9.5	9.6	29
LCS % Recov.:	97	95	96	97
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: PEG / Arco
REC. BY (PRINT): RI

WORKORDER: 9511287
DATE OF LOG-IN: 11/4/95

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / (Absent)
   Intact / Broken*
2. Custody Seal Nos.: Put in Remarks Section
3. Chain-of-Custody Records: (Present) / Absent*
4. Traffic Reports or Packing List: Present / (Absent)
5. Airbill: Airbill / Sticker Present / (Absent)
6. Airbill No.:
7. Sample Tags: (Present) / Absent*
   Sample Tag Nos.: (Listed) / Not Listed on Chain-of-Custody
8. Sample Condition: (Intact) / Broken* / Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*
10. Proper preservatives used: (Yes) / No*
11. Date Rec. at Lab: 11/3/95
12. Temp. Rec. at Lab: 13°C
13. Time Rec. at Lab: 1717

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
1	A-C	MW-1	3 VOA's	Liq	11/2/95	
2		-2				
3		-3				
4		-4				
5		-5				
6		-6				
7	A, B	TB-1	2 VOA's			

11/3/95

* if Circled, contact Project manager and attach record of resolution

ARCO Products Company
Division of AtlanticRichfieldCompany

330-084.26 **Task Order No.** 170760D

Chain of Custody

ARCO Facility no. 0374	City (Facility) 6407 Telegraph Ave ~~Berkeley~~ Oakland	Project manager (Consultant) Kelly Brown	Laboratory name SEQUOIA
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441-7500	Fax no. (Consultant) (408) 441-9102
Consultant name Pacific Environmental Group	Address (Consultant) 2025 GATEWAY PL #440		Contract number 170760D

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH G 8015 EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1	1	3		✓			HCL	11-2-95	945		✓											
MW-2	2			✓					1105		✓											
MW-3	3			✓					1235		✓											
MW-4	4			✓					1020		✓											
MW-5	5			✓					1145		✓											
MW-6	6			✓					1255		✓											
TB-1	7	2		✓					—		✓											

Special detection Limit/reporting

Special QA/QC

Remarks

CT = 5 16

Lab number 9511287

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	11-2-95	1600	Received by	11/2/95	1600
Relinquished by	11/3/95	1435	Received by	11/3/95	235
Relinquished by	11/3/95		Received by laboratory	11/3/95	1711

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APC-3292 (2-91)

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330-084.26 LOCATION: 6407 Telegraph Ave Berkeley DATE: 11-2-95

CLIENT/STATION NO.: 0374 FIELD TECHNICIAN: Chuck Graves DAY OF WEEK: Thursday

PROBE TYPE/ID No.
- ☐ Oil/Water IF/ _____
- ☒ H_2O level indicator _____
- ☐ Other: _____

Dtw Order	Well ID	Time	Surface Seal	Lid Secure	Gasket	Lock	Expanding Cap	Total Depth (feet)	First Depth to Water (feet) TOB/TOC	Second Depth to Water (feet) TOB/TOC	SERARATE-PHASE HYDROCARBONS (SPH) SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	COLOR: Fresh	COLOR: Weathered	COLOR: Gas	COLOR: Oil	VISCOSITY: Lite	VISCOSITY: Medium	VISCOSITY: Heavy	LIQUID REMOVED (gallons) SPH / H_2O
	MW 1	9:05	✓	✓	✓	✓	✓	26.58	8.26 / 8.26	8.45 / 8.45										
	MW 2	9:09	✓	✓	✓	✓	✓	26.21	8.50 / 8.50	8.77 / 8.77										
	MW 3	9:20	✓	✓	✓	✓	✓	26.67	7.83 / 7.83	8.10 / 8.10										
	MW 4	9:00	✓	✓	✓	✓	✓	26.90	9.58 / 9.58	10.47 / 10.47										
	MW 5	9:26	✓	✓	✓	✓	✓	23.00	8.60 / 8.60	9.00 / 9.00										
	MW 6	9:24	✓	✓	✓	✓	✓	14.55	6.60 / 6.60	7.05 / 7.05										

Comments: _____

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-0842.6 LOCATION: 6407 Telegraph Ave Berkeley WELL ID #: MW1

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☒ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☒	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 26.58 - DTW 8.26 = 18.32 x Gal/Linear Foot .66 = 12.09 x Number of Casings 3 = Calculated Purge 36.27

DATE PURGED: 11-2-95 START: 9:30 END (2400 hr): 940 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 945 END (2400 hr): 945 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
934	12.25	6.69	1,632	66.4	Clear	9.22	NO
937	24.50	6.54	1,718	66.0	Clear	8.36	NO
940	36.75	6.51	1,721	65.6	Clear	8.11	NO

Pumped dry Yes / (No)

Cobalt 0-100, Clear, Cloudy, Yellow, Brown | NTU 0-200, Heavy, Moderate, Light, Trace | Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC _____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☒ Centrifugal Pump: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____
- ☐ Other: _____

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-1
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW 1	11-2-95	945	3	40ml	VOA	HCL	GAS, BTXE

REMARKS:

11/01/95

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-0842G LOCATION: 6407 Telegraph Ave Berkeley WELL ID #: MW2

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck GRAVES

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☒ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER	GAL/ LINEAR FT.
☐ 2	0.17
☐ 3	0.38
☒ 4	0.66
☐ 4.5	0.83
☐ 5	1.02
☐ 6	1.5
☐ 8	2.6

SAMPLE TYPE
- ☑ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 26.21 - DTW 8.50 = 17.71 x Gal/Linear Foot .66 = 11.69 x Number of Casings 3 = Calculated Purge 35.07

DATE PURGED: 11-2-95 START: 10:30 END (2400 hr): 1100 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 1105 END (2400 hr): 1105 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
1050	12	7.30	466	66.4	Brown	>200	NO
1055	24	7.30	493	68.2	Clear	18.4	NO
1100	36	7.29	509	68.1	Clear	7.26	NO

Pumped dry Yes / (No)

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC _____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☒ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

SAMPLING EQUIPMENT/I.D. #
- ☑ Bailer: 29-3
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW2	11/2	1105	3	40ml	VOA	HCL	gas, BTXE

REMARKS: _____

SIGNATURE _____

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-084.26 LOCATION: 6407 Telegraph Berkeley WELL ID #: MW3

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☒ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☒	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 26.67 - DTW 7.83 = 18.84 x Gal/Linear Foot 0.66 = 12.43 x Number of Casings 3 = Calculated Purge 37.30

DATE PURGED: 11-2-95 START: 1215 END (2400 hr): 1229 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 1235 END (2400 hr): 1235 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
1217	12.5	6.97	459	65.2	Clear	5.67	MOD
1223	25.0	6.81	506	65.7	Clear	6.26	MOD
1229	37.5	6.76	508	65.5	Clear	28.8	MOD

Pumped dry Yes / (No)

Cobalt 0-100 Clear Cloudy Yellow Brown | NTU 0-200 Heavy Moderate Light Trace | Strong Moderate Faint None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC _____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☒ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-6
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW 3	11-2-	1235	3	40mL	VOA	HCL	Gas, BTEX

REMARKS:

nd Nov 9

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-084.26 LOCATION: 6407 Telegraph Ave Berkeley WELL ID #: MW4

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☑ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☑	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☑ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 26.90 - DTW 9.58 = 17.32 x Gal/Linear Foot 0.66 = 11.43 x Number of Casings 3 = Calculated Purge 34.29

DATE PURGED: 11-2-95 START: 10:05 END (2400 hr): 10:15 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 10:20 END (2400 hr): 10:20 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
10:08	11.5	7.36	557	67.2	Clear	28.8	NO
10:11	23.0	7.22	514	68.2	Clear	21.1	NO
10:15	34.50	7.18	504	67.7	Clear	18.2	NO

Pumped dry Yes / (No)

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC _____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☑ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

SAMPLING EQUIPMENT/I.D. #
- ☑ Bailer: 29-2
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW4	11/2	1020	3	40ml	VOA	HCl	gas, BTXE

REMARKS: _____

11.2.95

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-084.26 LOCATION: 6407 Telegraph ave Berkeley WELL ID #: MW-5

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck GRAVES

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☑ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☑	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☑ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 23.00 - DTW 8.60 = 14.4 x Gal/Linear Foot 0.66 = 9.50 x Number of Casings 3 = Calculated Purge 28.5

DATE PURGED: 11-2-95 START: 1129 END (2400 hr): 1140 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 1145 END (2400 hr): 1145 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
1134	9.5	7.36	468	67.1	Clear	14.22	NO
1136	19.0	7.20	499	67.5	Clear	11.88	NO
1140	28.5	7.18	497	67.7	Clear	8.29	NO

Pumped dry Yes / (No)

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☑ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

SAMPLING EQUIPMENT/I.D. #
- ☑ Bailer: 29-4
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW5	11-2-95	1145	3	40mL	VOA	HCL	Gas, BTXE

REMARKS:

AR Nov 91

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-084.26 LOCATION: 6407 Telegraph Ave Berkeley WELL ID #: MW6

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck Gemma

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ Time (2400): _____

Probe Type and I.D. #
- ☐ Oil/Water interface _____
- ☒ Electronic indicator _____
- ☐ Other; _____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☒	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; _____

TD 14.55 - DTW 6.60 = 7.95 x Gal/Linear Foot 0.66 = 5.25 x Number of Casings 3 = Calculated Purge 15.75

DATE PURGED: 11-2-95 START: 1240 END (2400 hr): 1249 PURGED BY: CG

DATE SAMPLED: 11-2-95 START: 1255 END (2400 hr): 1255 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
1242	5.25	7.28	400	65.5	Clear	8.18	NO
1246	10.50	7.11	408	66.3	Clear	8.84	NO
1249	15.75	7.09	431	67.0	Cloudy	30.2	NO

Pumped dry Yes / (No)

Color: Cobalt 0-100, Clear, Cloudy, Yellow, Brown
Turbidity: NTU 0-200, Heavy, Moderate, Light, Trace
Odor: Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: _____ TOB/TOC _____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: _____
- ☒ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-5
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW6	11-2-95	1255	3	40ml	VOA	HCl	gas, BTEX

REMARKS: _____

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-0841.26 LOCATION: 6407 Telegraph ave Berkeley WELL ID #: TB-1

CLIENT/STATION No.: 0374 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid:_____TOB_____TOC
Depth to water:_____TOB_____TOC
Total depth:_____TOB_____TOC
Date:_____Time (2400):_____

Probe Type and I.D. #
- ☐ Oil/Water interface_____
- ☑ Electronic indicator_____
- ☐ Other;_____

CASING DIAMETER	GAL/ LINEAR FT.
☐ 2	0.17
☐ 3	0.38
☐ 4	0.66
☐ 4.5	0.83
☐ 5	1.02
☐ 6	1.5
☐ 8	2.6

SAMPLE TYPE
- ☐ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☑ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other;_____

TD_____ - DTW _____ = _____ x Gal/Linear Foot _____ = _____ x Number of Casings _____ = Calculated Purge_____

DATE PURGED:_____START:_____END (2400 hr):_____PURGED BY:_____

DATE SAMPLED:_____START:_____END (2400 hr):_____SAMPLED BY:_____

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
			Trip Blank				

Pumped dry Yes / No

Cobalt 0-100, Clear, Cloudy, Yellow, Brown | NTU 0-200, Heavy, Moderate, Light, Trace | Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW:_____TOB/TOC

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:_____
- ☐ Airlift Pump:_____
- ☐ Centrifugal Pump:_____
- ☐ Dedicated:_____
- ☐ Other:_____

SAMPLING EQUIPMENT/I.D. #
- ☐ Bailer:_____
- ☐ Dedicated:_____
- ☐ Other:_____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
TB-1	11-2	—	2	40ml	VOA	HCL	gas, BTXE

REMARKS:

n20691

PACIFIC

ATTACHMENT B

FIELD AND LABORATORY PROCEDURES

ATTACHMENT B
FIELD AND LABORATORY PROCEDURES

Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and checking for the presence of separate-phase hydrocarbons (SPH), using either an electronic indicator and a clear Teflon® bailer or an oil-water interface probe. Wells not containing SPH are then purged of approximately four casing volumes of water (or to dryness) using a centrifugal pump, gas displacement pump, or bailer. Equipment used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored in order to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially recover. Groundwater samples are collected using a Teflon® bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to a California State-certified laboratory.

Laboratory Procedures

The groundwater samples were analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline, benzene, toluene, ethylbenzene, and xylenes. The analyses were performed according to EPA Methods 8015 (modified), 8020, and 5030 utilizing a purge-and-trap extraction technique. Final detection was by gas chromatography using flame- and photo-ionization detectors. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment A.

ATTACHMENT C

TREATMENT SYSTEM
CERTIFIED ANALYTICAL REPORTS,
CHAIN-OF-CUSTODY DOCUMENTATION,
AND FIELD DATA SHEETS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Project: 330-084.5B/0374,Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 15, 1995.. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9511A80 -01	LIQUID, MW3	11/14/95	Nitrite as Nitrite
9511A80 -01	LIQUID, MW3	11/14/95	Nitrate as Nitrate

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher

Claudia Hinton

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-084.5B/0374,Oakland
Lab Proj. ID: 9511A80

Sampled: 11/14/95
Received: 11/15/95
Analyzed: see below

Reported: 11/21/95

LABORATORY ANALYSIS

Analyte	Units	Date Analyzed	Detection Limit	Sample Results
Lab No: 9511A80-01				
Sample Desc : LIQUID,MW3				
Nitrate as Nitrate	mg/L	11/16/95	1.0	6.6
Nitrite as Nitrite	mg/L	11/16/95	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-084.5B/0374, Oakland
Matrix: LIQUID
Work Order #: 9511A80 01

Reported: Nov 22, 199

QUALITY CONTROL DATA REPORT

Analyte:	Nitrite	Nitrate
QC Batch#:	IN1116953000ACB	IN1116953000ACB
Analy. Method:	EPA 300.0	EPA 300.0
Prep. Method:	N.A.	N.A.
Analyst:	S. Flynn	S. Flynn
MS/MSD #:	9511B2203	9511B2203
Sample Conc.:	N.D.	N.D.
Prepared Date:	11/16/95	11/16/95
Analyzed Date:	11/16/95	11/16/95
Instrument I.D.#:	INIC1	INIC1
Conc. Spiked:	10 mg/L	10 mg/L
Result:	7.0	11
MS % Recovery:	70	110
Dup. Result:	8.0	11
MSD % Recov.:	80	110
RPD:	13	0.0
RPD Limit:	0-30	0-30
LCS #:		
Prepared Date:		
Analyzed Date:		
Instrument I.D.#:		
Conc. Spiked:		
LCS Result:		
LCS % Recov.:		
MS/MSD LCS Control Limits	70-130	70-130

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

MW

RECEIVED
OCT 18 1995
PACIFIC ENVIRONMENTAL GROUP, INC.

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Project: 330-084.5B/0374,Alameda

Enclosed are the results from samples received at Sequoia Analytical on October 4, 1995. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9510025 -01	LIQUID, 108 EFFL	10/02/95	TPHGBW Purgeable TPH/BTEX
9510025 -02	LIQUID, 106 MID-1	10/02/95	TPHGBW Purgeable TPH/BTEX
9510025 -03	LIQUID, 105 INFL	10/02/95	TPHGBW Purgeable TPH/BTEX

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-084.5B/0374,Alameda
Sample Descript: 108
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9510025-01

Sampled: 10/02/95
Received: 10/04/95

Analyzed: 10/09/95
Reported: 10/13/95

QC Batch Number: GC100995BTEX06A
Instrument ID: GCHP06

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	72

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

B ie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.5B/0374,Alameda	Sampled: 10/02/95
2025 Gateway Place, Suite 440	Sample Descript: 106	Received: 10/04/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 10/09/95
Attention: Maree Doden	Lab Number: 9510025-02	Reported: 10/13/95

QC Batch Number: GC100995BTEX06A
Instrument ID: GCHP06

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	70

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Edie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-084.5B/0374,Alameda	Sampled: 10/02/95
2025 Gateway Place, Suite 440	Sample Descript: 105	Received: 10/04/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 10/09/95
Attention: Maree Doden	Lab Number: 9510025-03	Reported: 10/13/95

QC Batch Number: GC100995BTEX06A
Instrument ID: GCHP06

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**500**	**790**
Benzene	**5.0**	**52**
Toluene	5.0	N.D.
Ethyl Benzene	**5.0**	**8.4**
Xylenes (Total)	**5.0**	**67**
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	70

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

B ie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-084.5B/0374, Alameda
Matrix: LIQUID
Work Order #: 9510025 01-03

Reported: Oct 16, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC100995BTEX06A	GC100995BTEX06A	GC100995BTEX06A	GC100995BTEX06A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	G. Garcia	G. Garcia	G. Garcia	G. Garcia
MS/MSD #:	9509J5001	9509J5001	9509J5001	9509J5001
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/9/95	10/9/95	10/9/95	10/9/95
Analyzed Date:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument I.D.#:	GCHP6	GCHP6	GCHP6	GCHP6
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.3	9.3	9.4	28
MS % Recovery:	93	93	94	93
Dup. Result:	7.9	7.9	8.0	24
MSD % Recov.:	79	79	80	80
RPD:	16	16	16	15
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK100995	BLK100995	BLK100995	BLK100995
Prepared Date:	10/9/95	10/9/95	10/9/95	10/9/95
Analyzed Date:	10/9/95	10/9/95	10/9/95	10/9/95
Instrument I.D.#:	GCHP6	GCHP6	GCHP6	GCHP6
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	7.9	7.8	7.9	23
LCS % Recov.:	79	78	79	77
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

FIELD SERVICES / O&M REQUEST

Work Order # 4999

SITE INFORMATION FORM

Identification

Project # 330084.5B

Station # 0374

Site Address: 6407 TELEGRAPH AVE., OAKLAND CA

County:

Project Manager: S.G.

Requestor: D.N.

Client: ARCO

Project Type

- ☐ 1st Time Visit
- ☐ Quarterly ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☐ Monthly — Initials — Date
- ☐ Semi-Monthly F/S — RY — 11/15/95
- ☐ Weekly Copy/Dist. — RY — ↓
- ☒ One time event
- ☐ Other:

Client P.O.C.:

Date of Request 11/2 PM

Ideal field date(s): 11/4, 5, & 6

1701800

Check Appropriate Category

Budget Hrs. 4

Actual Hrs. 2.0

Mob de Mob 2.0

Field Tasks: For General Description

circle one:

Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

OBJECTIVE: INSTALL A STRAND OF 12 2"ϕ ORC'S IN WELL MW-3

PROCEDURE: (1) READ ORC INSTALLATION INSTRUCTIONS (2) TEST FOR WELL DEVIATION BY LOWERING A 5' SECTION OF PIPE ½" SMALLER THAN A 4" DIAM SCH 80 PVC PIPES INSIDE DIAMETER DOWN WELL AND 3. SECTION OF PIPE SHOULD LOWER ALL THE WAY TO BOTTOM AND BE PULLED OUT WITHOUT TROUBLE (3) COVER 12 2" SOCKS WITH STIFFNER SLEEVES (4) LACE TOGETHER PER INSTRUCTIONS (ATTACHED) (5) LOWER DOWN WELL PER INSTRUCTIONS AND SUSPEND FROM A ⅜" DIAM, 6" LONG EYE BOLT IN WELL CAP. (6) MAKE SURE TOP SOCK IS 6" ABOVE WATER AND THAT THERE ARE NO BENDS IN ANY SOCKS.

- NEED A TOTALIZER AND HOURMETER READING
- CALL ENGINEER AFTER INSTALLING
- BEFORE INSTALLING SOCKS OBTAIN DISSOLVED OXYGEN MEASUREMENT FROM WELL PER ATTACHED DATA SHEET. (FROM OBTAIN METER FROM DAVID)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

- SYSTEM TOTALIZER = 00093,989 GAL
  HRS = NA - NOT METERED
- NITRATES SAMPLE TAKEN PER SHAW
- NOTE DTW - SHALLOW WELL - INSTALLED TWO STRINGS OF 6-2"ϕ ORC'S SIDE BY SIDE

☒ Samples taken ☒ ~~Samples not required~~ ☐ Soil Vapor ☐ Groundwater

☐ Weekly ☐ Semi-Monthly ☐ Monthly ☐ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: JOHN MACK Date: 11.14.95

Checked by:

Oxygen Enhancement Program
ARCO Service Station 0374
6407 Telegraph Ave., Oakland
3300845B

OBJECTIVES:

1) MEASURE DO IN WELL MW-3

PROCEDURE:

1) REMOVE ORC'S AS DESCRIBED IN THE ORC FILTER SOCK INSTALLATION INSTRUCTIONS (ATTACHED).
2) MEASURE DISSOLVED OXYGEN IN WELL MW-3 USING THE YSI MODEL 50B DISSOLVED OXYGEN METER AND COMPLETE THE ATTACHED DATA SHEET. MEASURE DISSOLVED OXYGEN USING A DISSOVED OXYGEN VACCUM TUBE AS WELL. RECORD ON DATA SHEET.
3) RE-INSTALL ORC STRAND IN WELL AND SECURE.

MATERIALS CHECK LIST (to be completed prior to field date)

YSI DO METER	_____	PROBE AND REEL	_____
CALIBRATION BOTTLE	_____	KCL SOLUTION	_____
SPARE MEMBRANES	_____	6 SPARE D BATTERIES	_____
BUCKET	_____	PAPER TOWELS	_____
INSTRUCTION BINDER	_____	SPARE O-RINGS	_____
SCISSORS	_____	SPARE DATA SHEETS	_____
ALCONOX	_____	PROBE TIP PURGE STICK	_____
WATER BOTTLES	_____	WATER LEVEL INDICATOR	_____
SAFETY EQUIPMENT	_____		

Oxygen Enhancement Program
ARCO Service Station 0374
6407 Telegraph Ave., Oakland
3300845B

BEFORE MEASUREMENTS

1. Membrane intact and no 1/8" bubbles?	YES	2. Warmed up unit for 20 minutes?	YES
3. Measured and recorded *depth to water and *total depth from well MW-3? YES	*INSERT THESE VALUES UNDER THE APPROPRIATE BOX		

4. DO METER CALIBRATION (REFER TO PART 4 OF D.O. METER INSTRUCTIONS)

4a. CALIBRATION TEMPERATURE (C)	22.4 °C	4b. CALIBRATION DO READING (mg/L)	8.67 mg/L
4c. TABLE VALUES? (PAGE 22 IN INSTRUCTION BINDER) DOES 4b FALL BETWEEN THE TWO TABLE VALUES?	22.0°C = 8.74 23.0°C = 8.58 GOOD	4d. CALIBRATION BOTTLE D.O. READING (mg/L)	8.67 mg/L

5. FIELD MEASUREMENTS

WELL MW-3

5a. CALIBRATION BOTTLE VALUE WITHIN 0.02 mg/l? If not recallibrate using above procedure.	YES	5b. METER RECALIBRATED?	YES
*DTW (tob)	7.30	*DTB (tob)	15.04

5c. DISSOLVED OXYGEN (mg/L)

	30 seconds	60 seconds		30 seconds	60 seconds		30 seconds	60 seconds
1'from TOP	7.24	7.09	MIDDLE			1'from BOTTOM		
PROBE & CORD RINSED?	YES							

TOP ONLY TAKEN - MEASUREMENT TAKEN BACK AT OFFICE

Work Order # 953782

FIELD SERVICES / ROUTINE O&M REQUEST

Identification

Project #	330-084.5B
Station #	0374
Site Address:	6407 Telegraph Avenue @ Alcatraz Avenue
County:	Alameda
Project Manager:	Shaw Garakani
Requestor:	Steve Johnston
Client:	ARCO
Client P.O.C.:	Mike Whelan
Revision Date:	June 1, 1995
Laboratory:	Sequoia Analytical

Request Frequency: Monthly

	Initials	Date
F/S	RH	10-5-95
Copy/Dist.	RH	↓

Site Remedial Technologies:

Groundwater Extration (GWE) [X]

Complete attached Data Sheets as prescribed in the following table:

Scheduling Table

Data Sheet Section(s) / Part(s)	To be Completed	Budgeted Hrs	Actual Hrs	Mob-de Mob	Completed
GWE(A, B, C, D, F)	monthly †		7.5	1.5	X
GWE(A,B,C,D,E,F,G)	quarterly †				

† = sampling to be performed

Definition of frequencies:

weekly = N/A
semi-monthly = N/A
monthly = once every month on week 1
quarterly = once every quarter in months 3, 6, 9,12 on week 1
semi-annually = N/A

Field Technician Response:

Completed by: PJP Date: 10-2-95
Arrival time: 11:00 Departure time: 1:30
Sample this visit?: yes Engineer contacted?

Date: 10-2-95

Groundwater Extraction & Treatment System
ARCO Service Station 0374
6407 Telegraph Avenue
330-084.5B
June 1, 1995

System Description:

Groundwater Pumps

Well	Type	Size	Control	Set Depth (TOB)
W-2	pneumatic	4"		26'

Carbon Vessels: Three SunAg GAC Transfer Pump: ORCA
Filter: 6-18-1P-1-150-CBNB, PE-25 P85

PART A: SYSTEM DATA

System on upon arrival? Yes (if no, specify reason in comments)

ELECTRIC METER READING (kw hrs)	03326	AIR COMPRESSOR HOURS (hrs)	307

MEASUREMENT	ON ARRIVAL	ON DEPARTURE
TOTALIZER (gallons)	92887	92918
FILTER INLET PRESSURE (psig)	8	(ideal range 8 psig) 8
CARBON #1 INLET PRESSURE (psig)	3.5	(ideal range 7 to 8 psig) 3.5
CARBON #2 INLET PRESSURE (psig)	1	(ideal range 3 to 5 psig) 1
CARBON #3 INLET PRESSURE (psig)	0	(ideal range 1 to 3 psig) 0
~~DISCHARGE~~ PRESSURE (psig)	No Sample ~~NA~~ NA ~~NA~~	(ideal range 0 to 1 psig)
TRANSFER PUMP FLOWRATE (gpm)	5	(ideal range 4 to 5 gpm) 5

PART B: COMMENTS

PART C: WELL DATA

*** ALLOW SYSTEM TO RUN 1 HOUR BEFORE OBTAINING DTW READINGS**

EXTRACTION WELL	DTW (TOB)	REGULATOR PRESSURE
W-2	1160	60

WELL	DTW (TOB)	WELL	DTW (TOB)	WELL	DTW (TOB)
W-1		MW-2		MW-4	1058

PART D: SAMPLING I

SAMPLE	ANALYSIS	COMPLETED
SP 105 (Influent)	TPH-gasoline/BTEX compounds	X
SP 108 (Effluent)	TPH-gasoline/BTEX compounds	X
SP 106 (Mid 1)	TPH-gasoline/BTEX compounds	X

PART E: SAMPLING & READINGS II

SAMPLE	ANALYSIS	COMPLETED
SP 107 (Mid 2)	TPH-gasoline, BTEX compounds	

PART F: SYSTEM MAINTENANCE I

NUMBER OF SPARE FILTERS ON SITE?	12	CHANGE FILTERS? (if necessary)	ok
TEST IRRIGATION SYSTEM	ok	ADD CHLORINE TO HOLDING TANK	ok
INSPECT HOLDING TANK	ok	WATER POTTED PLANTS MANUALLY	H_2O Shut off
TEST PARAFAX	ok		

PART G: SYSTEM MAINTENANCE II

TEST ALARM SWITCHES		CLEAN HOLDING TANK	
BACKFLUSH CARBON VESSELS		CHANGE COMPRESSOR OIL	
PULL PUMP AND CLEAN/INSPECT			

ARCO Products Company ◆ Division of AtlanticRichfieldCompany — 330-0845.B **Task Order No.** 1701800 — **Chain of Custody**

ARCO Facility no. 0374	City (Facility) Alameda CA	Project manager (Consultant) Shaw Gackari	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408)441-7500	Fax no. (Consultant) 441 7539
Consultant name Pacific Environmental Group	Address (Consultant) 2025 Gateway Place Suite 440 San Jose CA 95110		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
108		3		X		X	X	10-2-95	1250		X									
106		3		X		X	X	↓	1255		X									
105		3		X		X	Y	↓	100		X									

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Condition of sample:

Temperature received:

Relinquished by sampler: Paul Priebe	Date 10-4-95	Time 9:45
Relinquished by	Date	Time
Relinquished by	Date	Time

Received by		
Received by		
Received by laboratory	Date	Time

Distribution: White / — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consu...

APC-3292 (2-91)

ATTACHMENT D

ORC PRODUCT LITERATURE

OXYGEN RELEASE COMPOUND (ORC®)

BIOREMEDIATION – A NATURAL PROCESS

Bioremediation is a process by which microorganisms degrade certain hazardous substances. **REGENESIS** products enhance the supply of oxygen to naturally occurring microbes which metabolically transform toxic organic compounds into harmless by-products. This carefully designed process can help to cleanup sites and inhibit the flow of polluted groundwater by creating permeable oxygen barriers.

A bioremediation system offers several advantages over other technologies. Other remediation methods may simply transfer the contaminants to another medium which requires removal, transportation, and possibly additional clean up. Bioremediation degrades contaminants on-site and has been shown to be more cost effective than other treatment technologies. The EPA actively promotes bioremediation as an ecologically sound, natural process.

Oxygen is often the limiting factor in aerobic bioremediation. Moisture and nutrients (such as phosphorus and nitrogen) are generally present in sufficient quantities, however, oxygen is rapidly consumed by microbes which thrive in an oxygen rich environment. Without adequate oxygen, contaminant degradation will either cease or may proceed by highly inefficient anaerobic processes. Thus, additional oxygen is needed to stimulate further aerobic microbial growth and activity.

OXYGEN RELEASE COMPOUND, ORC®

Oxygen Release Compound (ORC®) and methods of its application are innovative technologies which enhance bioremediation. ORC is a patented formulation of a very fine, insoluble peroxygen that releases oxygen at a slow, controlled rate when hydrated. Its use has been demonstrated to increase the remediation of hydrocarbon contamination in soil and groundwater.

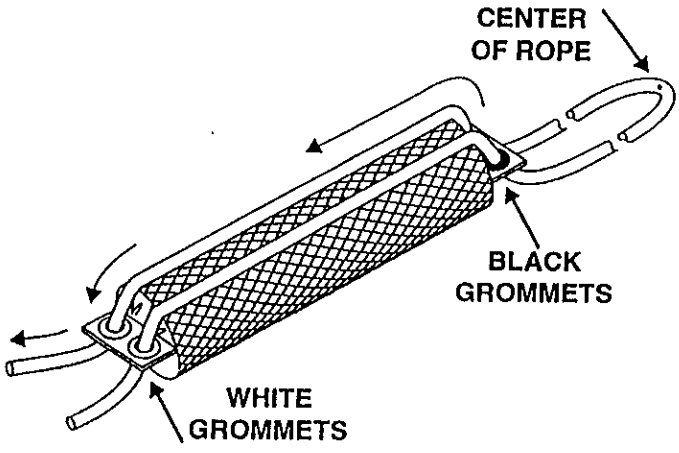
FEATURES

- Magnesium peroxide compound is activated by moisture
- Patented technology controls and prolongs the release of oxygen
- Moderate pH levels are maintained
- Fine particle size has stable, long shelf life
- No external coating of product is required to control rate of oxygen release
- Generates higher dissolved oxygen levels than possible with air

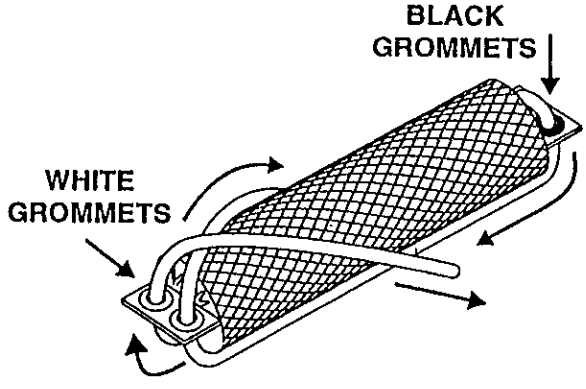
BENEFITS

- Provides a passive, cost-effective, long-term oxygen source
- Does not generate harmful residue; environmentally safe
- Ideal for *in-situ* remediation where other methods are impractical
- Will not disturb the flow pattern of the contaminated plume
- Does not volatilize pollutants
- Can be used as a redox control agent

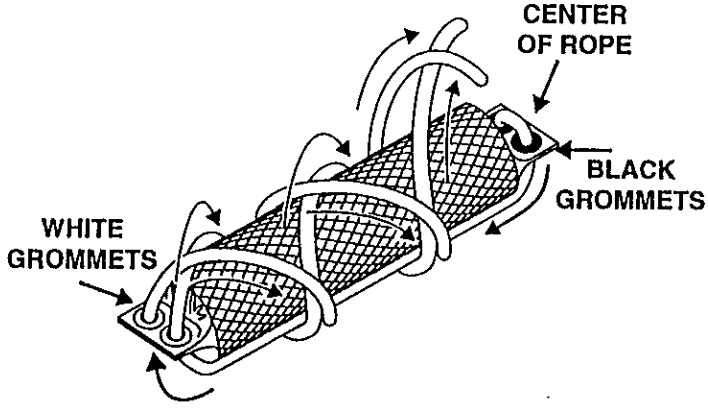
4 INCH AND 6 INCH LACING DIAGRAM



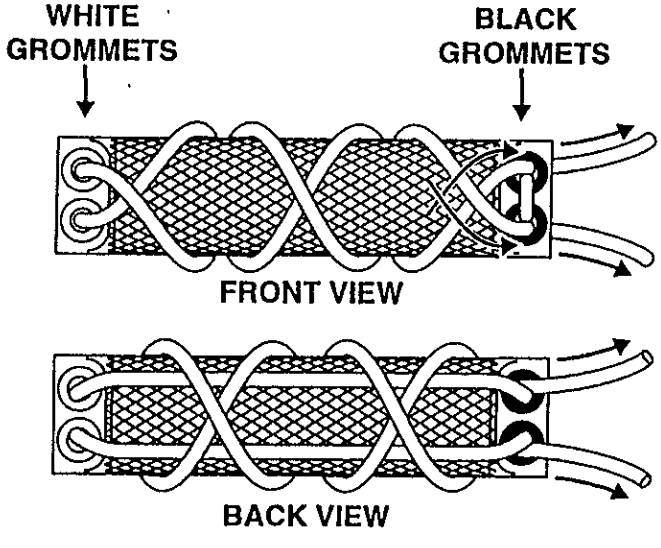
1) Find the center of the rope. Begin lacing the ORC Socks by threading the two ends of the installation rope through the black grommets and then through the white grommets at the bottom of the same side of the bottom sock.



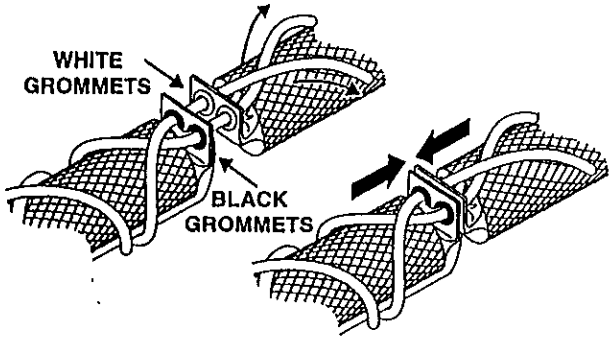
2) Pull the rope through the bottom sock, making sure the center of the rope is between the black grommets. Cross the ropes over each other.



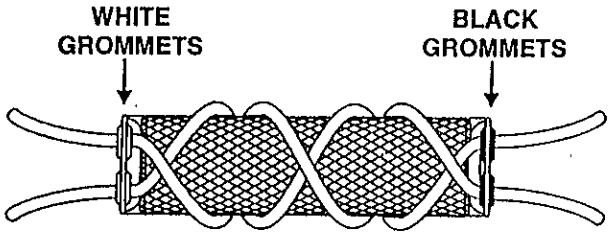
3) Loop the ends of the rope around the back of the sock and cross them. Repeat this step once again, so the rope is wrapped around the sock with two full turns.



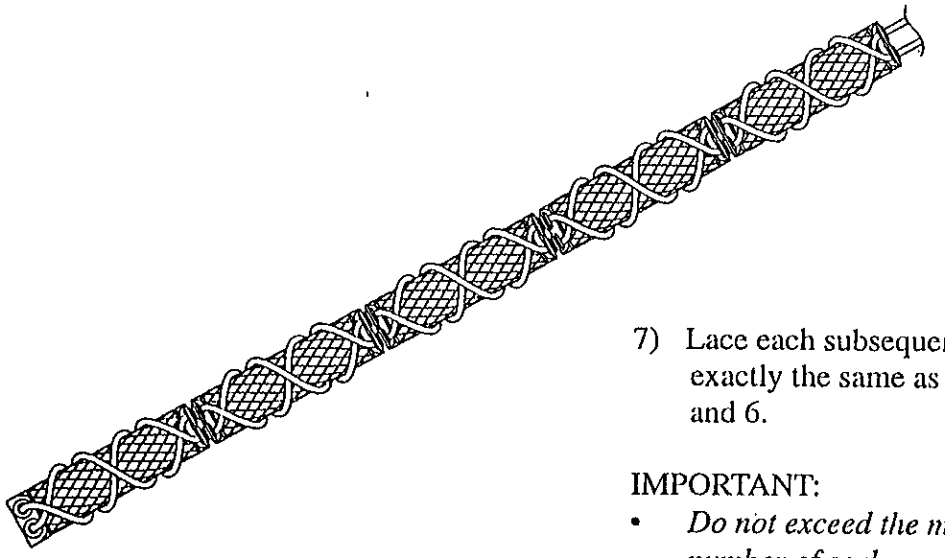
4) Bring the ends of the rope around from the back, cross them, and thread them into the black grommets. The rope ends should be inserted into the black grommets diagonally from the white ones they started from. Threading the black grommets will be tight only on the bottom sock due to the unique lacing pattern.



5) To avoid the ORC Socks slipping past each other, the socks must be laced with the grommet flaps of the bottom sock and second sock butting against each other (as shown).



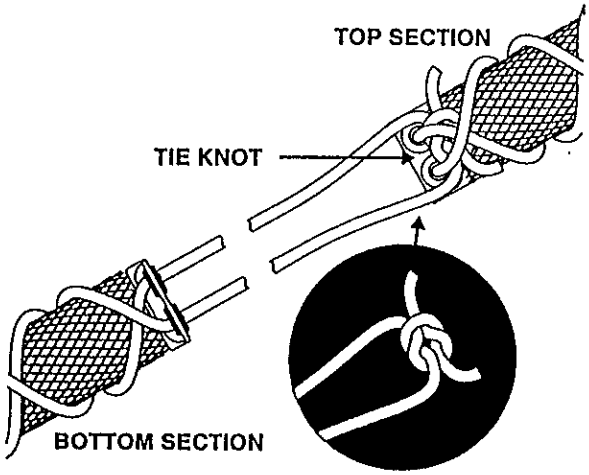
6) The remaining socks on the rope section are laced up according to Figure 6. Make sure that the rope is turned around the sock two full turns, with the grommets of each sock butting up against the next sock as shown in Figure 5.



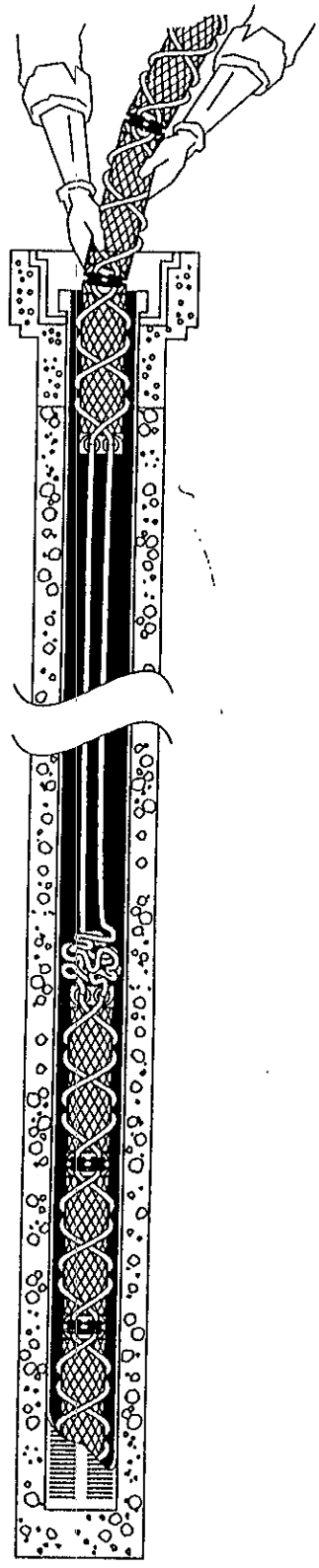
7) Lace each subsequent ORC Sock exactly the same as in Figure 5 and 6.

IMPORTANT:

- *Do not exceed the maximum number of socks per section (see "Key Requirements D & E" on page 1).*
- *Minimize the slack between the socks.*



8) If you need to install more ORC Socks than the maximum allowed per well size (see "Key Requirements D & E" on page 1), then multiple sections must be installed. Each section is laced exactly the same, but they should be tied off to each other. Tie the end of the rope from the lower section to the bottom sock of the upper section; this allows each section to be installed and removed independently. (see well diagram)



Well Diagram