PACIFIC
ENVIRONMENTAL
GROUP, INC.

Quarterly Groundwater Monitoring Report And Remedial System Performance Summary Third Quarter 1997

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Prepared for

Mr. Paul Supple
ARCO Products Company

December 30, 1997

Prepared by

Pacific Environmental Group, Inc.
2025 Gateway Place, Suite 440
San Jose, California 95110

Project 330-109.2D

Shaw Garakani
Project Engineer

Joseph J. Muzzio
Project Manager
CEG 1672

REGISTERED GEOLOGIST
JOSEPH J. MUZZIO
No. 1672
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Date: November 12,1997
Quarter: 3Q97

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 4931 Address: 731 West Boulevard at West Street
Oakland, California
ARCO Environmental Engineer: Paul Supple
Consulting Co./Contact Person: Pacific Environmental Group, Inc./Shaw Garakani
Consultant Project No.: 330-109.2D
Primary Agency/Regulatory ID No.: Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER (Third, 1997):

1. Submitted second quarter 1997 groundwater monitoring report.
2. Performed third quarter 1997 groundwater monitoring event on August 12.
3. Prepared third quarter 1997 groundwater monitoring report.

WORK PROPOSED FOR NEXT QUARTER (Fourth - 1997):

1. Submit third quarter 1997 groundwater monitoring report.
2. Perform fourth quarter 1997 groundwater monitoring event.
3. Prepare fourth quarter 1997 groundwater monitoring report.

Current Phase of Project:	Monitoring/Remediation	(Assmnt, Remed., etc.)
Frequency of Groundwater Sampling:	Quarterly, Semiannually, and Annually	(Quarterly, etc.)
Frequency of Groundwater Monitoring:	Quarterly	(Monthly, etc.)
Is Free Product (FP) Present On-Site:	No	(Yes/No)
FP Recovered this Quarter:	None	(gallons)
Cumulative FP Recovered to Date:	Unknown	(gallons)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Bulk Soil Removed to Date:	Unknown	(cubic yards)
Current Remediation Techniques:	Intrinsic Bioremediation Enhancement	(SVE/Sparge/FP Removal, etc.)
Approximate Depth to Groundwater:	7.43 to 11.59	(Measure Feet)
Groundwater Gradient:	Southwest	(Direction)
	0.02	(Magnitude)
Period TPPH- g/Benzene Removed:	0.0/0.0	(gallons)
Cumulative TPPH-g/Benzene Removed:	0.45/0.06	(gallons)

DISCUSSION:

- Hydrocarbon concentrations in wells sampled were within historic levels.
- Based on Alameda County Health Care Service Agency (ACHCSA) approval, the groundwater extraction (GWE) system has been deactivated and EBMUD sewer discharge permit relinquished. Plume appears stable.
- Intrinsic bioremediation enhancement program utilizing ORC units is in progress (Attachment C).
- Well A-13 is covered by asphalt pavement and could not be sampled. PACIFIC proposes to remove this up gradient well from the sampling schedule. TPPH-g and BTEX compound concentrations were reported as below laboratory detection limits for 11 consecutive quarters between July 1992, to November 1994.

ATTACHMENTS:

- Table 1 - Groundwater Sampling Schedule
- Table 2 - Groundwater Elevation and Analytical Data
- Figure 1 - Groundwater Elevation Contour Map
- Figure 2 - TPPH-g/Benzene Concentration Map
- Attachment A - Field and Laboratory Procedures
- Attachment B - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment C - Remedial System Performance Summary

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

Table 1
Groundwater Sampling Schedule

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Sampling Frequency
A-1	---------- Well Destroyed ----------				
A-2	a	a	a	a	Quarterly
A-3		a		a	Semiannually
A-4	a	a	a	a	Quarterly
A-5		a		a	Semiannually
A-6	a	a	a	a	Quarterly
A-7		a			Annually
A-8		a		a	Semiannually
A-9		a		a	Semiannually
A-10	---------- Removed from Sampling Program ----------				
A-11		a		a	Semiannually
A-12		a		a	Semiannually
A-13				a	Annually
AR-1	---------- Removed from Sampling Program ----------				
AR-2	---------- Removed from Sampling Program ----------				
AR-3	---------- Removed from Sampling Program ----------				

a. Groundwater samples analyzed for the presence of TPPH-g, BTEX compounds, and MtBE according to EPA Methods 8015 (modified) and 8020.

Table 2
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
A-2	03/26/96	55.48	5.37	50.11	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		5.25	50.23	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.45	45.03	<50	1.1	1.8	<0.50	1.3	<2.5
	12/19/96		5.53	49.95	<50	<0.50	<0.50	<0.50	<0.50	2.7
	04/01/97		8.77	46.71	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	05/27/97		9.87	45.61	<50	<0.50	<0.50	<0.50	<0.50	4.6
	08/12/97		11.11	44.37	<50	<0.50	<0.50	<0.50	<0.50	5.6
A-3	03/26/96	54.66	7.20	47.46	---------- Well Sampled Semiannually ----------					
	05/22/96		7.70	46.96	<50	1.2	1.9	0.70	1.3	NA
	08/22/96		10.88	43.78	---------- Well Sampled Semiannually ----------					
	12/19/96		7.70	46.96	5,900	<25	<25	<25	<25	5,300 *
	04/01/97		9.78	44.88	---------- Well Sampled Semiannually ----------					
	05/27/97		10.55	44.11	2,300	<20	<20	<20	<20	3,800
	08/12/97		11.12	43.54	---------- Well Sampled Semiannually ----------					
A-4	03/26/96	54.73	7.95	46.78	8,900	1,200	21	200	220	NA
	05/22/96		8.35	46.38	5,300	700	<10	170	130	NA
	08/22/96		11.03	43.70	3,000	480	<5.0	75	26	150
	12/19/96		8.67	46.06	<2,000	<20	<20	<20	<20	15,000 *
	04/01/97		11.95	42.78	8,900	1,700	22	310	260	6,900
	05/27/97		10.80	43.93	7,100	960	<20	150	74	7,900
	08/12/97		11.38	43.35	4,300	670	12	51	27	2,800
A-5	03/26/96	54.17	7.93	46.24	---------- Well Sampled Semiannually ----------					
	05/22/96		8.20	45.97	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.70	43.47	---------- Well Sampled Semiannually ----------					
	12/19/96		8.39	45.78	9,900	1,100	330	230	700	24
	04/01/97		10.83	43.34	---------- Well Sampled Semiannually ----------					
	05/27/97		10.65	43.52	100	<0.50	<0.50	<0.50	<0.50	120
	08/12/97		11.05	43.12	---------- Well Sampled Semiannually ----------					
A-6	03/26/96	55.17	7.15	48.02	52	2.7	<0.50	1.1	2.0	NA
	05/22/96		7.35	47.82	<50	2.4	<0.50	0.88	1.7	NA
	08/22/96		10.12	45.05	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	12/19/96		7.43	47.74	<50	1.7	<0.50	0.78	1.5	<2.5
	04/01/97		9.97	45.20	<50	4.7	<0.50	1.9	3.2	<2.5
	05/27/97		9.66	45.51	<50	0.69	<0.50	<0.50	<0.50	<2.5
	08/12/97		10.43	44.74	<50	<0.50	<0.50	<0.50	<0.50	<2.5
A-7	03/26/96	54.71	6.90	47.81	---------- Well Sampled Semiannually ----------					
	05/22/96		8.27	46.44	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.80	44.91	---------- Well Sampled Semiannually ----------					
	12/19/96		7.19	47.52	---------- Well Sampled Annually ----------					
	04/01/97		9.63	45.08	---------- Well Sampled Annually ----------					
	05/27/97		9.34	45.37	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	08/12/97		10.10	44.61	---------- Well Sampled Annually ----------					
A-8 a	03/26/96	53.77	7.10	46.67	48,000	2,600	<100	650	1,100	NA
	05/22/96		7.20	46.57	14,000	2,800	160	320	190	NA
	08/22/96		11.57	42.20	8,000	1,000	76	150	96	4,300
	12/19/96		8.04	45.73	12,000	450	110	210	230	<500
	04/01/97		9.98	43.79	---------- Well Sampled Semiannually ----------					
	05/27/97		11.45	42.32	11,000	1,600	100	220	210	2,300
	08/12/97		11.59	42.18	---------- Well Sampled Semiannually ----------					
A-9 b	03/26/96	53.04	7.05	45.99	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		7.20	45.84	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.68	43.36	<50	<0.50	<0.50	<0.50	<0.50	8.5

Table 2
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

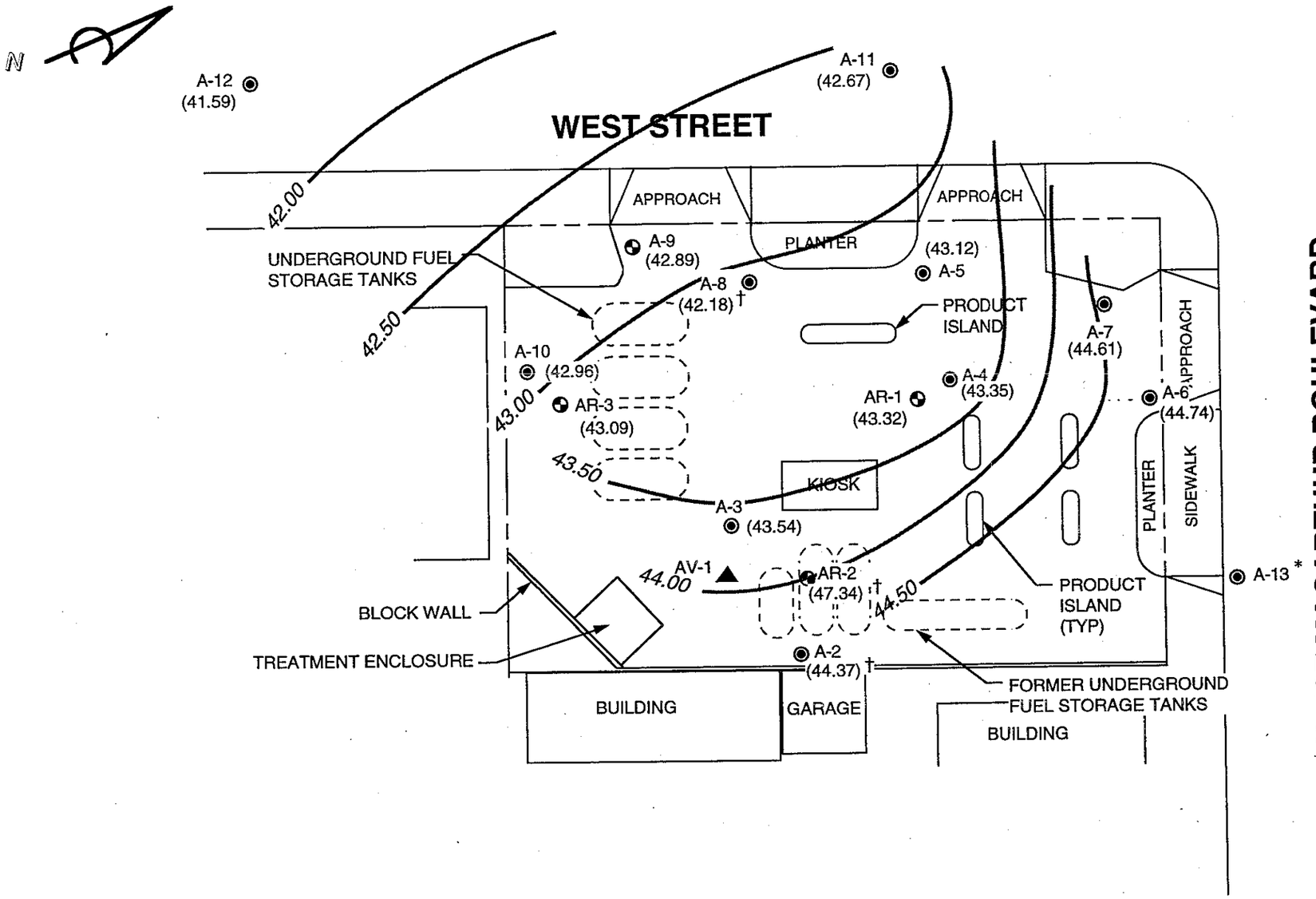
Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
A-9	12/19/96		7.43	45.61	<50	<0.50	<0.50	<0.50	<0.50	2.6
(cont.)	04/01/97		9.95	43.09	---------- Well Sampled Semiannually ----------					
	05/27/97		9.56	43.48	<50	2.3	<0.50	<0.50	<0.50	45
	08/12/97		10.15	42.89	---------- Well Sampled Semiannually ----------					
A-10	03/26/96	54.26	8.28	45.98	--------- Well Removed from Sampling Program ---------					
	05/22/96		8.60	45.66	--------- Well Removed from Sampling Program ---------					
	08/22/96		10.98	43.28	--------- Well Removed from Sampling Program ---------					
	12/19/96		8.80	45.46	--------- Well Removed from Sampling Program ---------					
	04/01/97		11.15	43.11	--------- Well Removed from Sampling Program ---------					
	05/27/97		10.90	43.36	--------- Well Removed from Sampling Program ---------					
	08/12/97		11.30	42.96	--------- Well Removed from Sampling Program ---------					
A-11	03/26/96	53.74	8.10	45.64	---------- Well Sampled Semiannually ----------					
	05/22/96		8.25	45.49	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.58	43.16	---------- Well Sampled Semiannually ----------					
	12/19/96		8.37	45.37	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/01/97		10.95	42.79	---------- Well Sampled Semiannually ----------					
	05/27/97		10.60	43.14	<50	<0.50	<0.50	<0.50	<0.50	3.1
	08/12/97		11.07	42.67	---------- Well Sampled Semiannually ----------					
A-12	03/26/96	52.05	7.83	44.22	---------- Well Sampled Semiannually ----------					
	05/22/96		7.80	44.25	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.97	42.08	---------- Well Sampled Semiannually ----------					
	12/19/96		8.18	43.87	85	<0.50	<0.50	<0.50	<0.50	170
	04/01/97		10.30	41.75	---------- Well Sampled Semiannually ----------					
	05/27/97		10.05	42.00	50	12	<0.50	<0.50	<0.50	96
	08/12/97		10.46	41.59	---------- Well Sampled Semiannually ----------					
A-13	03/26/96	55.11	---------- Well Inaccessible ----------							
	05/22/96		---------- Well Inaccessible ----------							
	08/22/96		---------- Well Inaccessible ----------							
	12/19/96		---------- Well Inaccessible ----------							
	04/01/97		---------- Well Inaccessible ----------							
	05/27/97		---------- Well Inaccessible ----------							
	08/12/97		---------- Well Inaccessible ----------							
AR-1	03/26/96	54.72	8.13	46.59	6,200	110	64	38	520	NA
	05/22/96		8.57	46.15	NS	NS	NS	NS	NS	NS
	08/22/96		10.97	43.75	5,600	100	28	29	310	960
	12/19/96		8.93	45.79	-------- Well Removed from Sampling Program --------					
	04/01/97		11.78	42.94	-------- Well Removed from Sampling Program --------					
	05/27/97		10.76	43.96	-------- Well Removed from Sampling Program --------					
	08/12/97		11.40	43.32	-------- Well Removed from Sampling Program --------					
AR-2	03/26/96	54.77	4.93	49.84	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		5.65	49.12	NS	NS	NS	NS	NS	NS
	08/22/96		7.27	47.50	<50	<0.50	<0.50	<0.50	<0.50	200
	12/19/96		7.78	46.99	-------- Well Removed from Sampling Program --------					
	04/01/97		6.80	47.97	-------- Well Removed from Sampling Program --------					
	05/27/97		6.32	48.45	-------- Well Removed from Sampling Program --------					
	08/12/97		7.43	47.34	-------- Well Removed from Sampling Program --------					
AR-3	03/26/96	54.19	7.95	46.24	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		8.30	45.89	NS	NS	NS	NS	NS	NS
	08/22/96		10.84	43.35	-------- Well Removed from Sampling Program --------					
	12/19/96		8.56	45.63	-------- Well Removed from Sampling Program --------					

Table 2
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
AR-3 (cont.)	04/01/97		11.24	42.95	------- Well Removed from Sampling Program -------					
	05/27/97		10.67	43.52	------- Well Removed from Sampling Program -------					
	08/12/97		11.10	43.09	------- Well Removed from Sampling Program -------					

MSL = Mean sea level
TOB = Top of box
ppb = Parts per billion
< = Denotes laboratory detection limit
NA = Not analyzed
NS = Not sampled
a. = Bioremediation enhancement at this well has been in progress since 05/22/96.
b. = Bioremediation enhancement at this well has been in progress since 11/17/95.
* = MtBE results confirmed by EPA Method 8260.



LEGEND

A-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

AR-3 ◉ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

AV-1 ▲ SOIL VAPOR WELL LOCATION AND DESIGNATION

(44.74) GROUNDWATER ELEVATION IN FEET - MSL, 8-12-97

44.50 GROUNDWATER ELEVATION CONTOUR IN FEET - MSL, 8-12-97

* WELL INACCESSIBLE

† NOT USED IN CONTOURING

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE GRADIENT = 0.02

SOURCE: MAP FROM GEO STRATEGIES INC. DATED 6-94

PACIFIC ENVIRONMENTAL GROUP, INC.

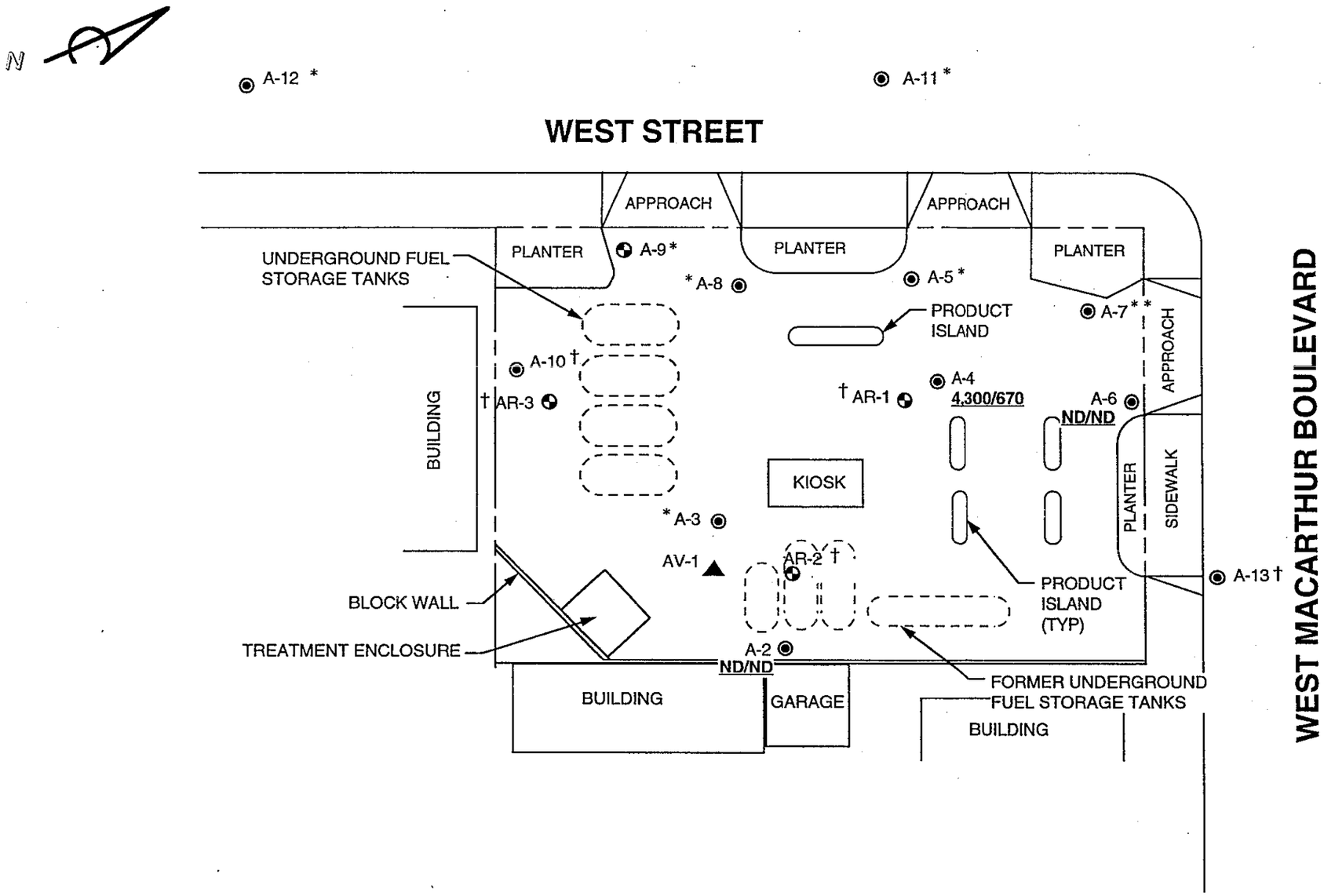
SCALE
0 30 60 FEET

ARCO SERVICE STATION 4931
731 West MacArthur Boulevard at West Street
Oakland, California

GROUNDWATER ELEVATION CONTOUR MAP

FIGURE: 1

PROJECT: 330-109.2D



LEGEND

A-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

AR-3 ⊕ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

AV-1 ▲ SOIL VAPOR WELL LOCATION AND DESIGNATION

4,300/670 TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 8-12-97

ND NOT DETECTED

* WELL SAMPLED SEMIANNUALLY

** WELL SAMPLED ANNUALLY

† WELL REMOVED FROM SAMPLING PROGRAM

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SOURCE: MAP FROM GEO STRATEGIES INC. DATED 6-94

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

ARCO SERVICE STATION 4931
731 West MacArthur Boulevard at West Street
Oakland, California

TPPH-g/BENZENE CONCENTRATION MAP

FIGURE: 2
PROJECT: 330-109.2D

ATTACHMENT A

FIELD AND LABORATORY PROCEDURES

ATTACHMENT A
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, xylenes, and methyl tert-butyl ether. The analyses were performed according to EPA Methods 8015 (modified) and 8020 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 C.

ATTACHMENT B

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

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 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: Shaw Garakani

Project: 330-109.2K/4931, Oakland

Enclosed are the results from samples received at Sequoia Analytical on August 13, 1997. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9708506 -01	LIQUID, A-2	08/12/97	MTBE_W Methyl t-Butyl Ethe
9708506 -01	LIQUID, A-2	08/12/97	TPHGBW Purgeable TPH/BTEX
9708506 -02	LIQUID, A-4	08/12/97	MTBE_W Methyl t-Butyl Ethe
9708506 -02	LIQUID, A-4	08/12/97	TPHGBW Purgeable TPH/BTEX
9708506 -03	LIQUID, A-6	08/12/97	MTBE_W Methyl t-Butyl Ethe
9708506 -03	LIQUID, A-6	08/12/97	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

Project Manager

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-2
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9708506-01

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/20/97
Reported: 08/25/97

QC Batch Number: GC082097BTEX01A
Instrument ID: GCHP01

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	5.6

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	124

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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

Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-2
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9708506-01

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/20/97
Reported: 08/25/97

QC Batch Number: GC082097BTEX01A
Instrument ID: GCHP01

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	124

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

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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: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-4
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9708506-02

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/21/97
Reported: 08/25/97

QC Batch Number: GC082197BTEX18A
Instrument ID: GCHP18

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	25	2800

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	147 Q

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-4
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9708506-02

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/21/97
Reported: 08/25/97

QC Batch Number: GC082197BTEX18A
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	4300
Benzene	5.0	670
Toluene	5.0	12
Ethyl Benzene	5.0	51
Xylenes (Total)	5.0	27
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	147 Q

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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

Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-6
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9708506-03

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/21/97
Reported: 08/25/97

QC Batch Number: GC082197BTEX18A
Instrument ID: GCHP18

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	80

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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

Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Sample Descript: A-6
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9708506-03

Sampled: 08/12/97
Received: 08/13/97

Analyzed: 08/21/97
Reported: 08/25/97

QC Batch Number: GC082197BTEX18A
Instrument ID: GCHP18

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	80

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granlcher
Project Manager

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Client Project ID: 330-109.2K/4931, Oakland
Matrix: Liquid
Work Order #: 9708506 -01-03
Reported: Aug 28, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC082097BTEX01A	GC082097BTEX01A	GC082097BTEX01A	GC082097BTEX01A	GC082097BTEX01A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	A. Porter	A. Porter	A. Porter	A. Porter	A. Porter
MS/MSD #:	970872002	970872002	970872002	970872002	970872002
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	8/20/97	8/20/97	8/20/97	8/20/97	8/20/97
Analyzed Date:	8/20/97	8/20/97	8/20/97	8/20/97	8/20/97
Instrument I.D.#:	GCHP01	GCHP01	GCHP01	GCHP01	GCHP01
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	10	9.7	10	30	49
MS % Recovery:	100	97	100	100	82
Dup. Result:	10	9.8	10	30	49
MSD % Recov.:	100	98	100	100	82
RPD:	0.0	1.0	0.0	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25
LCS #:	BLK082097	BLK082097	BLK082097	BLK082097	BLK082097
Prepared Date:	8/20/97	8/20/97	8/20/97	8/20/97	8/20/97
Analyzed Date:	8/20/97	8/20/97	8/20/97	8/20/97	8/20/97
Instrument I.D.#:	GCHP01	GCHP01	GCHP01	GCHP01	GCHP01
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	11	10	11	32	52
LCS % Recov.:	110	100	110	107	87
MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

SEQUOIA ANALYTICAL

Tod Granicher
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

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Client Project ID: 330-109.2K/4931, Oakland
Matrix: Liquid
Work Order #: 9708506 -01-03
Reported: Aug 28, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC082197BTEX18A	GC082197BTEX18A	GC082197BTEX18A	GC082197BTEX18A	GC082197BTEX18A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	A. Porter	A. Porter	A. Porter	A. Porter	A. Porter
MS/MSD #:	970870301	970870301	970870301	970870301	970870301
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	8/21/97	8/21/97	8/21/97	8/21/97	8/21/97
Analyzed Date:	8/21/97	8/21/97	8/21/97	8/21/97	8/21/97
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	10	10	10	32	66
MS % Recovery:	100	100	100	107	110
Dup. Result:	10	11	10	33	66
MSD % Recov.:	100	110	100	110	110
RPD:	0.0	9.5	0.0	3.1	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25
LCS #:	BLK082197	BLK082197	BLK082197	BLK082197	BLK082197
Prepared Date:	8/21/97	8/21/97	8/21/97	8/21/97	8/21/97
Analyzed Date:	8/21/97	8/21/97	8/21/97	8/21/97	8/21/97
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	9.8	10	10	31	63
LCS % Recov.:	98	100	100	103	105
MS/MSD Control Limits	60-140	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
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

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Client Proj. ID: 330-109.2K/4931, Oakland
Lab Proj. ID: 9708506

Received: 08/13/97
Reported: 08/25/97

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 11 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: Pacific Env. Group Inc.
REC. BY (PRINT): Clemer

WORKORDER: 9708506
DATE OF LOG-IN: 8-15-97

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / Absent (circled) — Intact / Broken*
2. Custody Seal #: Put in Remarks Section
3. Chain-of-Custody: Present (circled) / Absent*
4. Traffic Reports or Packing List: Present / Absent (circled)
5. Airbill: Airbill / Sticker — Present / Absent (circled)
6. Airbill #: ______
7. Sample Tags: Present (circled) / Absent
   Sample Tags #s: Listed (circled) / Not Listed on Chain-of-Custody
8. Sample Condition: Intact (circled) / Broken* / Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? Yes (circled) / No*
10. Proper Preservatives used: Yes (circled) / No*
11. Date Rec. at Lab: 8/13/97
12. Time Rec. at Lab: 1224
13. Temp Rec. at Lab: 16°C

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC.)
		A-2	VOA (3)	Liquid	8/12/97	
		A-4	↓	↓	↓	[redacted] Cancel 1202
		A-6	↓	↓	↓	E3

*If Circled, contact Project Manager and attach record of resolution.

Revision 6/18/97
RCPTLOG.XLS

ARCO Products Company
Division of AtlanticRichfieldCompany

330109 2K **Task Order No.** WA 2105500

Chain of Custody

ARCO Facility no. 4931	City (Facility) 731 McArthur Blvd Oakland	Project manager (Consultant) Shaw Garakani	Laboratory name Sequoia
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) 408 441 7500	Fax no. (Consultant) 4084417539
Consultant name Pacific Env. Group Inc	Address (Consultant) 2025 Gateway Pl Suite 440, San Jose CA 95110		Contract number 2105500

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/M 602/8020/8015	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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
A-2	1	3		X			HCl	8/12/97	10:40		X									
A-4	2	↓		↓			↓	↓	10:15		↓									
A-6	3	↓		↓			↓	↓	9:15		↓									

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9708506

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑ 13 12 24

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler: Don Watenpaugh	8/12/97	17:15	Received by: Krissy Flesoras		
Relinquished by: Krissy Flesoras	8/13/97	11:45	Received by:		
Relinquished by:	8/13/97		Received by laboratory:	8/13/97	1721

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

APPC-3292 (2-91)

WELL SAMPLING REQUEST

SAMPLING PROTOCOL								
Project No.	Station #	Project Name	SEQUENCE	Project Manager	Approval	Date/s	Laboratory:	Client Engineer:
330-109.2k	4931	731 McArthur BL Oakland	3Q97	Shaw Garakani			Sequoia 23440	PAUL SUPPLE

Well Number	Ideal Sampling Order	Sample I.D.	Sampling Frequency	Analyses	TOB TOC	Well Depth	Casing Diameter	Top of Screen	Well goes Dry?	Comments
A-2	1		QLY	MtBE/GAS/BTEX	TOB/TOC	20	4"		yes	Slow recharge
A-3	10		Semiannual 2Q/4Q	DTW ONLY	TOB/TOC	17	4"		yes	
A-4	14		QLY	MtBE/GAS/BTEX	TOB/TOC	20	4"		yes	
A-5	5		Semiannual 2Q/4Q	DTW ONLY	TOB/TOC	24.5	3"		no	
A-6	12		QLY	MtBE/GAS/BTEX	TOB/TOC	25.5	3"		no	
A-7	11		Annually 2Q	DTW ONLY	TOB/TOC	23	3"		no	
A-8	15		Semiannual 2Q/4Q	DTW ONLY	TOB/TOC	18	3"		no	ORC in well.
A-9	9		Semiannual 2Q/4Q	DYW ONLY	TOB/TOC	19	6"	5'	no	ORC in well.
A-10	3		REMOVED	DTW ONLY	TOB/TOC	30'	3"	5'	?	
A-11	2		Semiannual 2Q/4Q	DTW ONLY	TOB/TOC	28	3"	5'	no	
A-12	4		Semiannual 2Q/4Q	DTW ONLY	TOB/TOC	30	3"	5'	no	
A-13	6		ANNUAL 2Q	DTW ONLY	TOB/TOC	29.5	3"	10'	no	
AR-1	13		REMOVED	DTW ONLY	TOB/TOC	31.5	6"	10'	no	
AR-2	7		REMOVED	DTW ONLY	TOB/TOC	27.5	6"	10'	no	
AR-3	8		REMOVED	DTW ONLY	TOB/TOC	27	6"	10'	no	

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330109 26 LOCATION: 731 McArthur DATE: 8/12/97

CLIENT/STATION NO.: ARCO 0193 FIELD TECHNICIAN: Don Watterson DAY OF WEEK: Tuesday

PROBE TYPE/ID No.
- ☐ Oil/Water IF/ _____
- ☒ H_2O level indicator 31
- ☐ 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	SEPARATE-PHASE HYDROCARBONS (SPH): SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	COLOR: Fresh	Weathered	Gas	Oil	VISCOSITY: Lite	Medium	Heavy	LIQUID REMOVED (gallons): SPH / H_2O
4"	1	A-2	7:20	✓	✓	✓	✓		20	11.11 / 10.72	11.11 / 10.72										
	10	A-3	7:41	✓	✓	✓	✓	✓	17	11.12 / 10.18	11.12 / 10.18										
4"	14	A-4	7:50	✓	✓	✓	✓		20	11.38 / 10.76	11.38 / 10.76										
	5	A-5	7:28	✓	✓	✓	✓		24.5	11.05 / 10.45	11.05 / 10.45										
3"	12	A-6	7:46	✓	✓	✓	✓		25.5	10.43 / 9.77	10.43 / 9.77										
	11	A-7	7:44	✓	✓	✓	✓		23	10.10 / 9.57	10.10 / 9.57										
	15	A-8	8:19	✓	✓	✓			18	11.59 / 11.01	11.59 / 11.01										
	9	A-9	8:01	✓	✓	✓			19	10.15 / 9.30	10.15 / 9.30										
	3	A-10	7:24	✓	✓	✓	✓		30	11.30 / 10.78	11.30 / 10.78										

Comments: _____

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330109.28 LOCATION: 731 McArthur DATE: 8/12/97

CLIENT/STATION NO. CH1931 FIELD TECHNICIAN: Don Watenpaugh DAY OF WEEK: Tuesday

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	SEPARATE-PHASE HYDROCARBONS (SPH): SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	COLOR: Fresh	Weathered	Gas	Oil	VISCOSITY: Lite	Medium	Heavy	LIQUID REMOVED (gallons): SPH / H_2O
2	A-11	11:00	✓	✓	✓	✓		28	11.07 / 10.80	11.07 / 10.80										
4	A-12	10:55	✓	✓	✓	✓		30	10.46 / 9.70	10.46 / 9.70										
6	A-13							29.5												
13	AR-1	9:00	✓	✓	✓			31.5	11.40 / 10.65	11.40 / 10.65										
7	AR-2	7:34	✓	✓	✓			27.5	7.43 / 6.36	7.43 / 6.36										
8	AR-3	7:38	✓	✓	✓			27	11.10 / 10.38	11.10 / 10.38										

Comments: Couldn't find A-13

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 1097 LOCATION: 731 McArthur OAKLAND WELL ID #: A-2

CLIENT/STATION No.: 04931 FIELD TECHNICIAN: Don Watenpaugh

WELL INFORMATION

Depth to Liquid: ——— TOB ——— TOC
Depth to water: 11.11 TOB ——— TOC
Total depth: 20 TOB ——— TOC
Date: 8/12/97 Time (2400): 7:20

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator 31
- ☐ 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 20 - DTW 11.11 = 8.89 x Gal/Linear Foot 0.66 = 5.86 x Number of Casings 3 = Calculated Purge 17.6

DATE PURGED: 8/12/97 START: 8:50 END (2400 hr): 8:55 PURGED BY: Don
DATE SAMPLED: 8/12/97 START: 10:40 END (2400 hr): 10:40 SAMPLED BY: Don

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
8:53	6	7.54	440	69.0	Cloudy	mod	none
8:55	8	6.69	450	69.1	~~Brown~~	~~Heavy~~	none

Pumped dry (Yes) / No Dry @ 8 gallons

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: 18.37 TOB/TOC 7.44 510 67.7 Brown heavy none

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☐ Airlift Pump:
- ☒ Centrifugal Pump: 31
- ☐ Dedicated:
- ☐ Other:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 31-1
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-2	8/12/97	10:40	3	40ml	VOA	HCL	TPH/BTEX

REMARKS: Extremely slow recharge waited an hour and 40 minutes for recharge only recharge ≈ 1 foot.

SIGNATURE: Don Watenpaugh

PACIFIC ENVIRONMENTAL GROUP, INC.

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 1097 LOCATION: 731 McArthur OAKLAND WELL ID #: A-4

CLIENT/STATION No.: 04931 FIELD TECHNICIAN: Don Valenzuela

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 11.38 (TOB) — TOC
Total depth: 20 (TOB) — TOC
Date: 8/12/97 Time (2400): 7:50

Probe Type and I.D. #: ☐ Oil/Water interface ☒ Electronic indicator 31 ☐ 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 20 - DTW 11.38 = 8.62 x Gal/Linear Foot 0.66 = 5.68 x Number of Casings 3 = Calculated Purge 17

DATE PURGED: 8/12/97 START: 9:28 END (2400 hr): 9:33 PURGED BY: Don
DATE SAMPLED: 8/12/97 START: 10:15 END (2400 hr): 10:15 SAMPLED BY: Don

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
9:31	5.7	6.25	1350	68.4	cloudy	light	mod
9:33	11.7	6.25	1420	70.2	cloudy	mod	mod
	17						

Pumped dry (Yes) / No Dry @ 7 gallons

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: 15.48 (TOB) TOC 7.15 1310 66.9 cloudy trace faint

PURGING EQUIPMENT/I.D. #

☐ Bailer: ☐ Airlift Pump:
☒ Centrifugal Pump: 3 ☐ Dedicated:
☐ Other:

SAMPLING EQUIPMENT/I.D. #

☒ Bailer: 3-3
☐ Dedicated:
☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-4	8/12/97	10:15	3	40ml	VOA	HCL	TPH/BTEX

REMARKS: Re-glued top of casing back on

SIGNATURE: Don Valenzuela

PACIFIC ENVIRONMENTAL GROUP, INC.

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 1097 B LOCATION: 731 MacArthur OAKLAND WELL ID #: A-6

CLIENT/STATION No.: 04931 FIELD TECHNICIAN: Don Watanpaugh

WELL INFORMATION

Depth to Liquid: ——— TOB ——— TOC
Depth to water: 10.43 TOB ——— TOC
Total depth: 25.5 TOB ——— TOC
Date: 8/12/97 Time (2400): 7:46

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 25.5 - DTW 10.43 = 15.07 x Gal/Linear Foot 0.38 = 5.72 x Number of Casings 3 = Calculated Purge 17.17

DATE PURGED: 8/12/97 START: 9:03 END (2400 hr): 9:14 PURGED BY: Don
DATE SAMPLED: 8/12/97 START: 9:15 END (2400 hr): 9:15 SAMPLED BY: Don

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
9:07	6	6.55	590	68.7	Brown	mod	none
9:10	12	6.49	600	69.1	Brown	mod	none
9:14	18	6.44	620	69.4	Brown	mod	none

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: 37 ☐ Dedicated:
☐ Other:

SAMPLING EQUIPMENT/I.D. #

☒ Bailer: 31-2
☐ Dedicated:
☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-6	8/12/97	9:15	3	40ml	VOA	HCl	TPH-g/BTEX

REMARKS:

SIGNATURE: Don Watanpaugh

PACIFIC ENVIRONMENTAL GROUP, INC.

ARCO Products Company ✣ 330109 2K **Task Order No.** WA 2105500

Division of AtlanticRichfieldCompany

Chain of Custody

ARCO Facility no. 4931	City (Facility) 731 McArthur Blvd Oakland	Project manager (Consultant) Shaw Gonakane	Laboratory name Sequoia
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) 408 441 7500	Fax no. (Consultant) 4084417539
Consultant name Pacific Env. Group Inc	Address (Consultant) 2025 Gateway A Suite 440, San Jose CA 95110		Contract number 2105500

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 as gas/M-602/8020/8015	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 ☐		
A-2		3		X			HCl	8/12/91	10:40		X											
A-4		↓		↓			↓	↓	10:15		↓											
A-6		↓		↓			↓	↓	9:15		↓											

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: Don Watenpaugh	Date 8/12/91	Time 17:15
Relinquished by	Date	Time
Relinquished by	Date	Time

Received by

Received by

Received by laboratory | Date | Time

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

APPC-3292 (2-91)

ATTACHMENT C

REMEDIAL SYSTEM PERFORMANCE SUMMARY

ATTACHMENT C
REMEDIAL SYSTEM PERFORMANCE SUMMARY

GWE System

Groundwater extraction (GWE) was conducted intermittently between November 10, 1992, and July 5, 1995. The GWE system was comprised of electric GWE pumps in Wells A-9, AR-1, AR-2, and AR-3, and three 1,500-pound granular activated carbon vessels arranged in series. The GWE system was permitted by East Bay Municipal Utility District Permit Account Number 502-62131. Based on Alameda County Health Care Services Agency authorization that GWE at the site was no longer required, the permit was relinquished during second quarter 1996. Overall, 4.6 million gallons of groundwater were extracted and less than 0.06 gallon of benzene removed. Please refer to PACIFIC's *Quarterly Groundwater Monitoring Report - Second Quarter 1997* for historical GWE system performance and analytical data.

Intrinsic Bioremediation Evaluation

At the request of ARCO, PACIFIC monitored intrinsic bioremediation indicator parameters (bioparameters) during the fourth quarter 1996 groundwater monitoring event. Groundwater samples from Wells A-4, A-8, and A-12 were analyzed for biological oxygen demand (BOD), carbon dioxide (CO_2), chemical oxygen demand (COD), methane, nitrate, sulfate, dissolved oxygen (DO), and ferrous iron. Wells A-4 and A-8 are located within the plume; Well A-12 is located outside the plume. Based on analysis of the collected data, PACIFIC concluded that intrinsic bioremediation was active at the site. Please refer to PACIFIC's *Quarterly Groundwater Monitoring Report - First Quarter 1997* for details.