PACIFIC
ENVIRONMENTAL
GROUP, INC.

Quarterly Groundwater Monitoring Report
Fourth Quarter 1996

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

Prepared for

Mr. Paul Supple
ARCO Products Company

March 19, 1997

Prepared by

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

Project 330-084.2C

Shaw Garakani
Project Engineer

Michael Hurd
Senior Geologis
CHG 0068

REGISTERED GEOLOGIST
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No. 0068
CERTIFIED
HYDROGEOLOGIST
EXP. 9/98
STATE OF CALIFORNIA

Date: March 19, 1997
Quarter: 4Q96

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 0374 Address: 6407 Telegraph Avenue at Alcatraz Avenue, Oakland
ARCO Environmental Engineer: Paul Supple
Consulting Co./Contact Person: Pacific Environmental Group, Inc./Shaw Garakani
Consultant Project No.: 330-084.2C
Primary Agency/Regulatory ID No.: Regional Water Quality Control Board - S.F. Bay Region

WORK PERFORMED THIS QUARTER (Fourth - 1996):

1. Submitted third quarter 1996 groundwater monitoring report.
2. Performed fourth quarter 1996 groundwater monitoring event.
3. Prepared fourth quarter 1996 groundwater monitoring report.
4. Removed the GWE pump from Well W-2.
5. Drilled holes in secondary containment to accommodate rain water drainage.

WORK PROPOSED FOR NEXT QUARTER (First - 1997):

1. Submit fourth quarter 1996 groundwater monitoring report.
2. Perform first quarter 1997 groundwater monitoring event.
3. Prepare first quarter 1997 groundwater monitoring event.
4. Continue intrinsic bioremediation enhancement at Well MW-3.

Current Phase of Project:	Monitoring	(Assmnt. Remed., etc.)
Frequency of Groundwater Sampling:	Quarterly/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:	None	(gallons)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Bulk Soil Removed to Date:	None	(cubic yards)
Current Remediation Techniques:	Bioremediation enhancement	(SVE/Sparge/FP Removal, etc.)
Approximate Depth to Groundwater:	6.15 to 8.55	(Measure Feet)
Groundwater Gradient:	Southwest	(Direction)
	0.03	(Magnitude)

DISCUSSION:

- Hydrocarbon concentrations at all wells except MW-4 are at or below detection limits; concentrations at Well MW-4 appear to be diminishing.
- Intrinsic bioremediation is occurring based on an evaluation performed during third quarter 1996.

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 - Historical Groundwater Elevation and Analytical Data Tables
- Attachment B - Field and Laboratory Procedures
- Attachment C - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment D - Remedial System Performance Evaluation

cc: Ms. Susan Hugo, Alameda County Health Care Services Agency
Mr. Kevin Graves, Regional Water Quality Control Board - S.F. 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	Semiannually
MW-4	a	a	a	a	Semiannually
MW-5	a	a	a	a	Quarterly
MW-6			a		Annually

a. Samples analyzed for 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 0374
6407 Telegraph Avenue at Alcatraz Avenue
Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
MW-1	01/31/96	158.91	6.34	152.57	---------- Well Sampled Annually ----------					
	04/10/96		5.82	153.09	---------- Well Sampled Annually ----------					
	07/16/96		7.23	151.68	<50	<0.50	<0.50	<0.50	<0.50	340
	10/14/96		8.34	150.57	---------- Well Sampled Annually ----------					
MW-2	01/31/96	157.92	6.51	151.41	---------- Well Sampled Annually ----------					
	04/10/96		6.94	150.98	---------- Well Sampled Annually ----------					
	07/16/96		7.73	150.19	<50	1.2	<0.50	<0.50	<0.50	33
	10/14/96		8.35	149.57	---------- Well Sampled Annually ----------					
MW-3	01/31/96	153.64	7.02	146.62	140	20	0.87	11	14	NA
	04/10/96		7.82	145.82	84	2.4	<0.50	1.9	1.1	NA
	07/16/96		6.80	146.84	<50	2.2	<0.50	<0.50	<0.50	<2.5
	10/14/96		7.67	145.97	<50	1.2	<0.50	<0.50	0.81	2.9
MW-4	01/31/96	156.53	5.64	150.89	230	23	2.2	3.7	32	NA
	04/10/96		6.66	149.87	7,300	1,600	350	350	830	NA
	07/16/96		7.73	148.80	5,600	1,100	160	240	520	150
	10/14/96		8.55	147.98	4,500	860	72	160	340	<62
MW-5	01/31/96	151.33	8.64	142.69	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/10/96		N/A	--	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/16/96		8.15	143.18	<50	0.79	1.3	<0.50	<0.50	<2.5
	10/14/96		7.92	143.41	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MW-6	01/31/96	153.84	5.15	148.69	---------- Well Sampled Annually ----------					
	04/10/96		4.58	149.26	---------- Well Sampled Annually ----------					
	07/16/96		4.96	148.88	<50	<0.50	<0.50	<0.50	<0.50	150
	10/14/96		6.15	147.69	---------- Well Sampled Annually ----------					

MtBE	= Methyl tert-butyl ether
MSL	= Mean sea level
TOC	= Top of casing
ppb	= Parts per billion
<	= Less than laboratory detection limit stated to the right
NA	= Not analyzed
N/A	= Not available

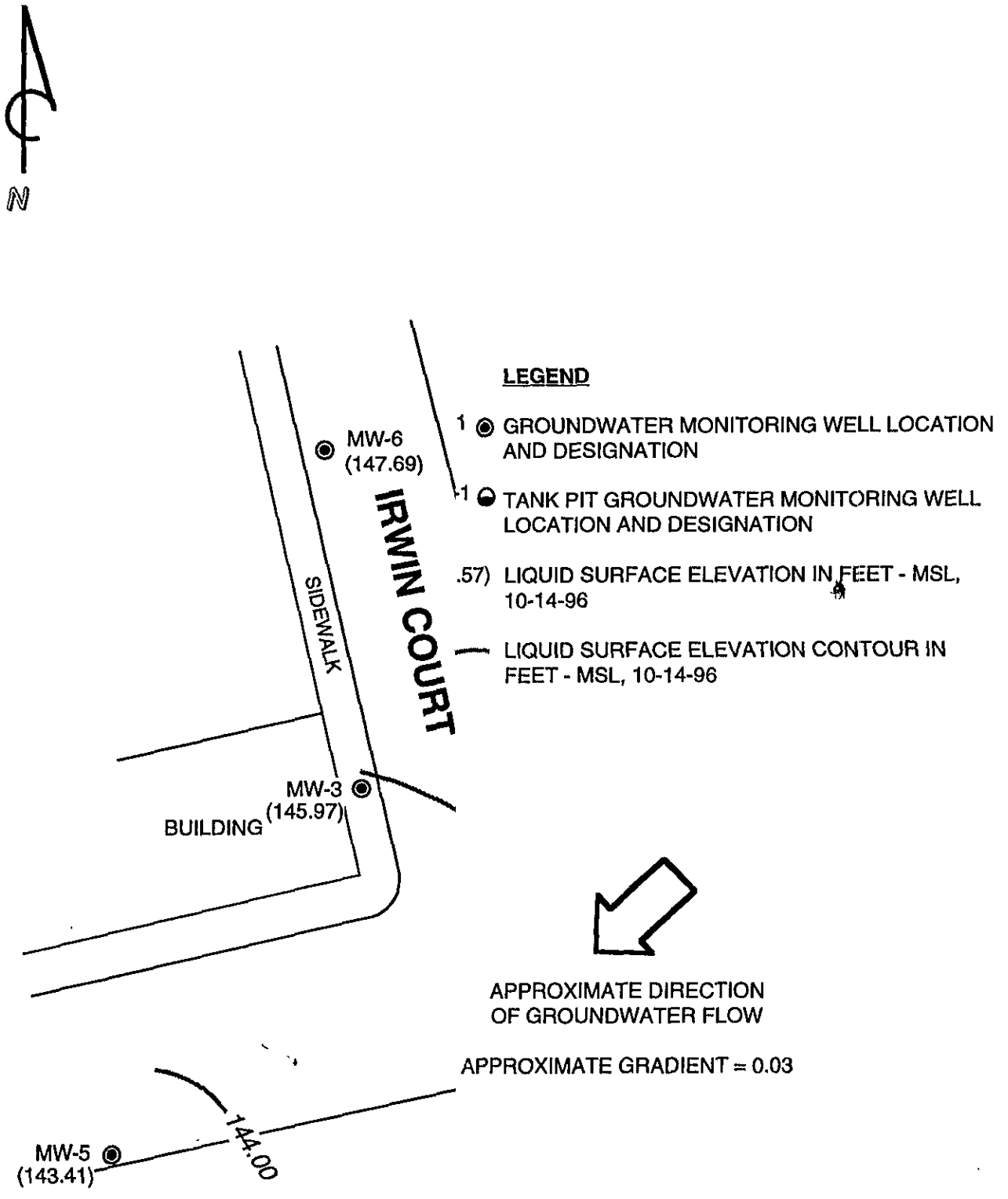

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FIGURE:
1
PROJECT:
330-084.2C

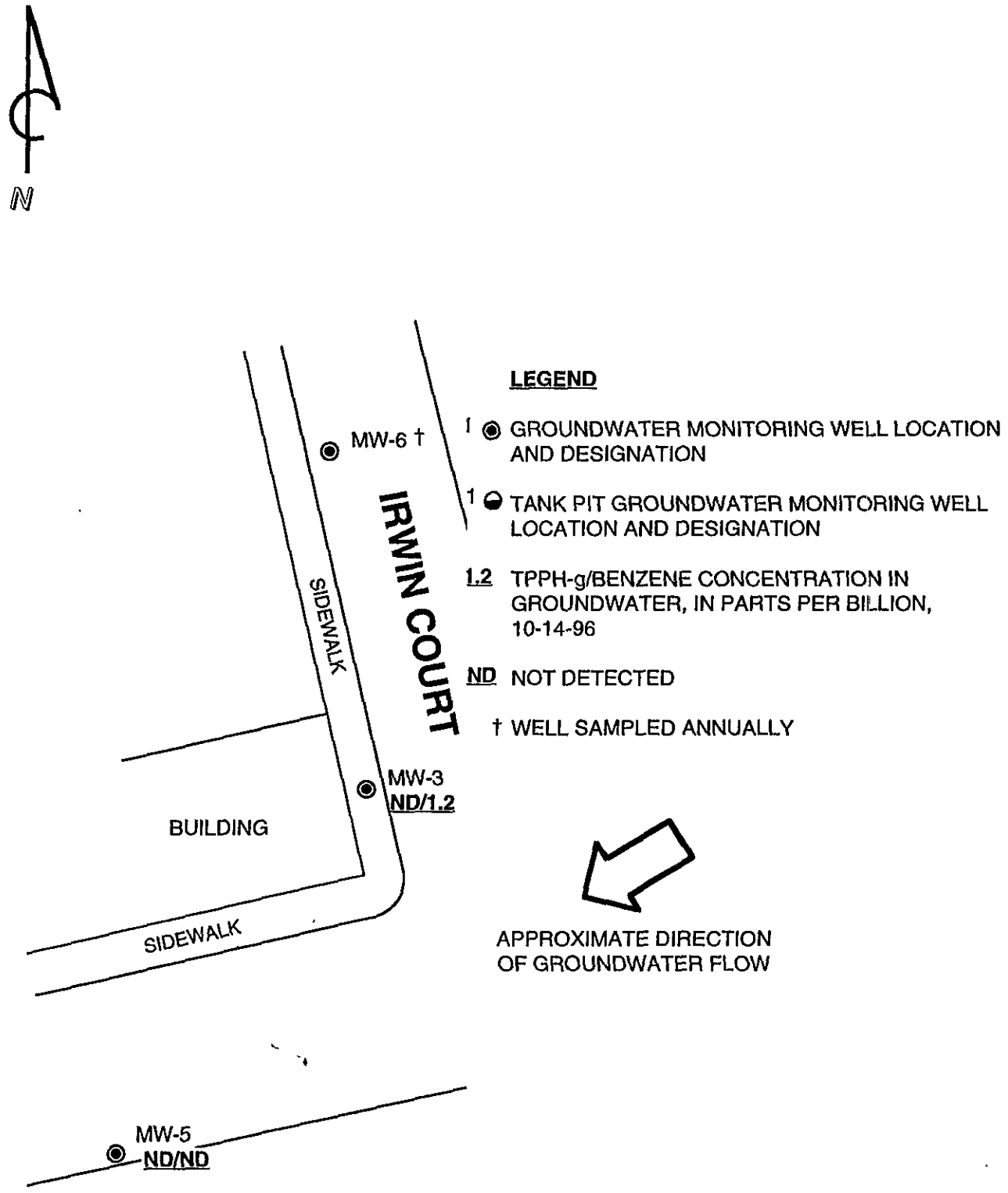

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FIGURE: 2

PROJECT: 330-084.2C

ATTACHMENT A

HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA TABLES

Table A-1
Historical 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 A-1 (continued)
Historical 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 A-1 (continued)
Historical 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 A-1 (continued)
Historical 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 A-1 (continued)
Historical 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 A-2
Historical 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
	02/23/95		<50	1.8	<0.50	<0.50	<0.50	NA	NA
	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

Table A-2 (continued)
Historical 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-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
	10/13/93	16,000	3,500	800	470	1,800	670	NA
	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

Table A-2 (continued)
Historical 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-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 A-3
Historical 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.

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, xylenes, and methyl tert-butyl ether. 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 C.

ATTACHMENT C

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: Kelly Brown

Project: Arco 330-084.2l/374

Enclosed are the results from samples received at Sequoia Analytical on October 15, 1996. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9610933 -01	LIQUID, MW-3	10/14/96	MTBE_W Methyl t-Butyl Ethe
9610933 -01	LIQUID, MW-3	10/14/96	TPHGBW Purgeable TPH/BTEX
9610933 -02	LIQUID, MW-4	10/14/96	MTBE_W Methyl t-Butyl Ethe
9610933 -02	LIQUID, MW-4	10/14/96	TPHGBW Purgeable TPH/BTEX
9610933 -03	LIQUID, MW-5	10/14/96	MTBE_W Methyl t-Butyl Ethe
9610933 -03	LIQUID, MW-5	10/14/96	TPHGBW Purgeable TPH/BTEX
9610933 -04	LIQUID, TB-1	10/14/96	MTBE_W Methyl t-Butyl Ethe
9610933 -04	LIQUID, TB-1	10/14/96	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

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

Attention: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: MW-3
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9610933-01

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/17/96
Reported: 10/24/96

QC Batch Number: GC101796BTEX06A
Instrument ID: GCHP06

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	2.9

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	85

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	Client Proj. ID: Arco 330-084.2I/374	Sampled: 10/14/96
2025 Gateway Place, Suite 440	Sample Descript: MW-3	Received: 10/15/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 10/17/96
Attention: Kelly Brown	Lab Number: 9610933-01	Reported: 10/24/96

QC Batch Number: GC101796BTEX06A
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**	**1.2**
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	**0.50**	**0.81**
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	85

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: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: MW-4
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9610933-02

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/17/96
Reported: 10/24/96

QC Batch Number: GC101796BTEX06A
Instrument ID: GCHP06

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	62	N.D.

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

Tod Granicher
Project Manager

Sequoia Analytical

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

Attention: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: MW-4
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9610933-02

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/17/96
Reported: 10/24/96

QC Batch Number: GC101796BTEX06A
Instrument ID: GCHP06

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	1250	4500
Benzene	12	860
Toluene	12	72
Ethyl Benzene	12	160
Xylenes (Total)	12	340
Chromatogram Pattern:		Gas

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

Tod Granicher
Project Manager

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

Attention: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: MW-5
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9610933-03

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/16/96
Reported: 10/24/96

QC Batch Number: GC101696BTEX07A
Instrument ID: GCHP07

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	87

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: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: MW-5
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9610933-03

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/16/96
Reported: 10/24/96

QC Batch Number: GC101696BTEX07A
Instrument ID: GCHP07

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

Tod Granicher
Project Manager

Sequoia Analytical

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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: Kelly Brown

Client Proj. ID: Arco 330-084.2l/374
Sample Descript: TB-1
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9610933-04

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/16/96
Reported: 10/24/96

QC Batch Number: GC101696BTEX07A
Instrument ID: GCHP07

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	84

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

Attention: Kelly Brown

Client Proj. ID: Arco 330-084.2I/374
Sample Descript: TB-1
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9610933-04

Sampled: 10/14/96
Received: 10/15/96

Analyzed: 10/16/96
Reported: 10/24/96

QC Batch Number: GC101696BTEX07A
Instrument ID: GCHP07

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	84

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, (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: Kelly Brown

Client Project ID: Arco 330-084.2I / 374
Matrix: LIQUID
Work Order #: 9610933 01-04
Reported: Oct 28, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC101696BTEX07A	GC101696BTEX07A	GC101696BTEX07A	GC101696BTEX07A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	Porter	Porter	Porter	Porter
MS/MSD #:	961081103	961081103	961081103	961081103
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/16/96	10/16/96	10/16/96	10/16/96
Analyzed Date:	10/16/96	10/16/96	10/16/96	10/16/96
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	12	11	12	35
MS % Recovery:	120	110	120	117
Dup. Result:	12	11	11	32
MSD % Recov.:	120	110	110	107
RPD:	0.0	0.0	8.7	9.0
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK101696	BLK101696	BLK101696	BLK101696
Prepared Date:	10/16/96	10/16/96	10/16/96	10/16/96
Analyzed Date:	10/16/96	10/16/96	10/16/96	10/16/96
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	10	9.6	9.6	29
LCS % Recov.:	100	96	96	97
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

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

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: Kelly Brown

Client Project ID: Arco 330-084.2l / 374
Matrix: LIQUID
Work Order #: 9610933 01-04

Reported: Oct 28, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC101796BTEX06A	GC101796BTEX06A	GC101796BTEX06A	GC101796BTEX06A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	Porter	Porter	Porter	Porter
MS/MSD #:	961081103	961081103	961081103	961081103
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/17/96	10/17/96	10/17/96	10/17/96
Analyzed Date:	10/17/96	10/17/96	10/17/96	10/17/96
Instrument I.D.#:	GCHP6	GCHP6	GCHP6	GCHP6
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	11	10	9.9	30
MS % Recovery:	110	100	99	100
Dup. Result:	11	10	10	31
MSD % Recov.:	110	100	100	103
RPD:	0.0	0.0	1.0	3.3
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK101796	BLK101796	BLK101796	BLK101796
Prepared Date:	10/17/96	10/17/96	10/17/96	10/17/96
Analyzed Date:	10/17/96	10/17/96	10/17/96	10/17/96
Instrument I.D.#:	GCHP6	GCHP6	GCHP6	GCHP6
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	12	11	10	32
LCS % Recov.:	120	110	100	107
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

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

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 SAMPLE RECEIPT LOG

CLIENT NAME: PEG
REC. BY (PRINT): PVL

WORKORDER: 9610933
DATE OF LOG-IN: 10/16/96

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: 10-15-96
12. Temp. Rec. at Lab: 12°C
13. Time Rec. at Lab: 11:43

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
1	A-C	MW-3	VOA (3)	Aqueous	10-14	
2	↓	↓ 4	↓	↓	↓	
3	↓	↓ 5	↓	↓	↓	
4	AB	TB-1	VOA (2)	↓	↓	

Rec'd 10-17-96

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

ARCO Products Company ◆ Division of AtlanticRichfieldCompany — 330084.21 — **Task Order No.** 1934800 — **Chain of Custody**

ARCO Facility no. 374	City (Facility) 6407 Telegraph Ave, Berkeley	Project manager (Consultant) Kelly Brown	Laboratory name Sequoia
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no (Consultant) (408) 441 7500	Fax no. (Consultant) (408) 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 HCl	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH(Ext.)/MTBE 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
MW-3	1	3		X		X	X	10/14/96	13:20		X									
MW-4	2	↓		↓		↓	↓	↓	14:25		↓									
MW-5	3	↓		↓		↓	↓	↓	12:45		↓									
TB-1	4	2		↓		↓	↓	↓	N/A		↓									

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9610933

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: Walter Hall	Date 10/15/96 Time 730	Received by: D. Clarion	10/15/96 0730
Relinquished by: D. Clarion	Date 10/15/96 Time 1000	Received by: Thushan Wei	
Relinquished by: Thushan Wei	Date Time	Received by laboratory:	Date 10-15-96 Time 11:43

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

APC-3292 (2-91)

10/15 ✓

FIELD SERVICES / O & M REQUEST

SITE INFORMATION FORM

Project #:330-084.2I

Station #:374

Site Address:6407 Telegraph ave Berkeley, California

County: Alameda

Project Manager: Kelly Brown

Requestor: Denise Alarcon

Client: Arco

Prefield contacts: None

☐ **1st time visit**

☐ **1st** ☐ **2nd** ☐ **3rd** ☒ **4th**

☐ **Monthly**

☐ **Semi-Monthly**

☐ **Weekly**

☐ **One time Event**

☐ **Other.**_____

Client P.O.C.: Paul Supple

Date of Request: 4Q

Ideal Field Date:

Budget Hrs._____

Actual Hrs. 3.5

Mob de Mob 3

Total Purge = 80.8 Gal.

Field Tasks: For General Description

Fourth Quarter 1996 Groundwater sampling event: DTW/DTL on all wells TOB/TOC sample per attached protocol.

WA# 19348 00

Comments, remarks, from Field Staff (include problems encountered)

Completed by: C) Reich Date: 10/14/96

Checked by:_____

V

WELL SAMPLING REQUEST

SAMPLING PROTOCOL								
Project No.	Station #	Project Name	SEQUENCE	Project Manager	Approval	Date/s	Laboratory:	Client Engineer:
330-084.21	374	6407 Telegraph Berkeley	4Q96	Kelly Brown	9/12/96	10/15/96	Sequoia	Paul Supple

Well Number	Ideal Sampling Order	Sample I.D.	Sampling Frequency	Analyses	TOB TOC	Well Depth	Casing Diameter	Well goes Dry?	Comments
MW-1	3		ANNUAL-3Q	DTW ONLY	TOB/TOC	26.5	4"	NO	
MW-2	4		ANNUAL-3Q	DTW ONLY	TOB/TOC	26	4"	NO	
MW-3	5		QLY	MtBE/GAS/BTEX	TOB/TOC	27	4"	NO	
MW-4	6		QLY	MtBE/GAS/BTEX	TOB/TOC	27	4"	NO	
MW-5	2		QLY	MtBE/GAS/BTEX	TOB/TOC	22	4"	NO	
MW-6	1		ANNUAL-3Q	DTW ONLY	TOB/TOC	14.5	4"	NO	
TB-1			QLY	MtBE/GAS/BTEX					

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330 084 21 LOCATION: 6407 Telegraph Ave Berkely DATE: 10/14/98

CLIENT/STATION NO.: Arco #374 FIELD TECHNICIAN: W. Peck DAY OF WEEK: MON

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

Casing Size	Dtw Order	Well ID	Time	Surface Seal	Lid Secure	Gasket	Lock	Expanding Cap	TOC Total Depth (feet)	First Depth to Water (feet) TOB/TOC	Second Depth to Water (feet) TOB/TOC	~~SPH Depth (feet) TOB/TOC~~	SPH Thickness (feet)	SEPARATE-PHASE HYDROCARBONS (SPH): COLOR Fresh	Weathered	Gas	Oil	VISCOSITY Lite	Medium	Heavy	LIQUID REMOVED (gallons) SPH / H_2O
4"	3	MW-1	11:15	Y	Y	Y	Y	Y	—	8.34 / 8.34	8.53 / 8.55										
4"	4	MW-2	11:50	Y	Y	Y	Y	Y	—	8.35 / 8.35	8.66 / 8.66										
4"	5	MW-3	11:56	Y	Y	Y	Y	Y	26.74	7.67 / 7.67	7.67 / 7.68										
4"	6	MW-4	12:00	Y	Y		Y	Y	26.90	8.55 / 8.55	9.34 / 9.34										
4"	2	MW-5	11:37	Y	Y	Y	Y	Y	23.0	7.92 / 7.92	8.59 / 8.59	8.55 / 8.55									
4"	1	MW-6	11:33	Y	Y	Y	Y	Y		6.15 / 6.15	6.63 / 6.63										
										/	/										
										/	/										
										/	/										

Comments: _____

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 084 21 LOCATION: 6407 Telegraph Ave Berkely WELL ID #: MW-3

CLIENT/STATION No.: Arco # 374 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: ____ TOB ____ TOC
Depth to water: 7.92 TOB 7.67 TOC
Total depth: ____ TOB 26.74 TOC
Date: 10/14/96 Time (2400): 11:56

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 26.74 - DTW 7.67 = 19.07 x Gal/Linear Foot .66 = 12.58 x Number of Casings 3 = Calculated Purge 37.75

DATE PURGED: 10/14/96 START: 12:50 END (2400 hr): 13:10 PURGED BY: W Peck

DATE SAMPLED: 10/14/96 START: 13:15 END (2400 hr): 13:20 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
12:57	12.75	7.75	8170	70.4	Brown	Mod	None
13:07	25.50	7.08	9170	70.3	Brown	Mod	None
13:10	27.50	6.23	9640	71.4	Cloudy	Light	None
			DRY AT 27.50				

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: 22.95	TOB (TOC)	7.54	9020	69.1	Cloudy	Light	None

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: G 17
- ☐ Dedicated: ____
- ☐ Other: ____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW-3	10/14/96	13:20	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: DRY AT 27.50

Walter Peck

PACE

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 0842 1 LOCATION: 6407 Telegraph Ave Berkely WELL ID #: MW-4

CLIENT/STATION No.: Arco # 374 FIELD TECHNICIAN: W Beck

WELL INFORMATION

Depth to Liquid: ____ TOB ____ TOC
Depth to water: 9.01 TOB 8.55 TOC
Total depth: ____ TOB 26.90 TOC
Date: 10/14/96 Time (2400): 1100

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 8.55 = 18.35 x Gal/Linear Foot .66 = 12.11 x Number of Casings 3 = Calculated Purge 36.33

DATE PURGED: 10/14/96 START: 13:55 END (2400 hr): 14:15 PURGED BY: W Beck

DATE SAMPLED: 10/14/96 START: 14:20 END (2400 hr): 14:25 SAMPLED BY: W Beck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
14:06	12.25	6.99	1550	71.7	Brown	Med	Faint
14:11	25.50	6.94	1400	71.8	Clear	Trace	Faint
14:15	31.0	6.92	1260	72.2	Clear	Trace	Faint
			DRY AT 31.0 Gal				

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: 22.05 TOB (TOC) 7.09 1260 72.0 Clear Trace Faint

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: G3
- ☐ Dedicated: ____
- ☐ Other: ____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW-4	10/14/96	14:25	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: DRY AT 31.0

W Beck

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 084 21 LOCATION: 6407 Telegraph Ave Berkely WELL ID #: MW-5

CLIENT/STATION No.: Arco #374 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 8.55 TOB 7.92 TOC
Total depth: — TOB 23.0 TOC
Date: 10/14/96 Time (2400): 11:37

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 23.0 - DTW 7.92 = 15.08 x Gal/Linear Foot .66 = 9.95 x Number of Casings 3 = Calculated Purge 29.85

DATE PURGED: 10/14/96 START: 12:20 END (2400 hr): 12:33 PURGED BY: W Peck

DATE SAMPLED: 10/14/96 START: 12:40 END (2400 hr): 12:45 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
12:26	10.0	8.51	7510	77.4	Brown	Mod	Mod.
12:31	20.0	8.59	6670	73.0	Cloudy	Light	None
12:32	22.0	6.68	6870	72.1	Cloudy	Light	Mod
			DRY AT 22.0 Gal				

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

Pumped dry (Yes) / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW	TOB (TOC)						
20.75	TOC	8.82	6820	68.5	Cloudy	Light	None

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

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

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW-5	10/14/96	12:45	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: DRY AT 22.0 Gal

W Peck

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330 0842 21 LOCATION: 6407 Telegraph Ave Berkely WELL ID #: TB -1

CLIENT/STATION No.: Arco #374 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: 10/14/96 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 3 = Calculated Purge _____

DATE PURGED: 10/14/96 START: _____ END (2400 hr): _____ PURGED BY: W Peck

DATE SAMPLED: 10/14/96 START: _____ END (2400 hr): _____ SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/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: _____
- ☒ Centrifugal Pump: _____
- ☐ Other: _____
- ☐ Airlift Pump: _____
- ☐ Dedicated: _____

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

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
TB-1	10/14/96	N/A	2	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: _____

W Peck

ARCO Products Company
Division of AtlanticRichfieldCompany

330084.21 **Task Order No.** 1934800

Chain of Custody

ARCO Facility no. 374	City (Facility) 6407 Telegraph Ave., Berkeley	Project manager (Consultant) Kelly Brown	Laboratory name Sequoia
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441 7500	Fax no. (Consultant) (408) 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 HCl	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH G+/MTBE 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-3		3		X		X	X	10/14/96	13:20		X											
MW-4		↓		↓		↓	↓	↓	14:25		↓											
MW-5		↓		↓		↓	↓	↓	12:45		↓											
TB-1		2		↓		↓	↓	↓	N/A		↓											

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 Walter Hart	Date 10/15/96 Time 7:30	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

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

ATTACHMENT D

REMEDIAL SYSTEM PERFORMANCE EVALUATION

ATTACHMENT D
REMEDIAL SYSTEM PERFORMANCE EVALUATION

GWE System

Groundwater extraction (GWE) was conducted between December 21, 1993, and October 13, 1995. No evidence of plume migration has been observed since system deactivation. The GWE system was comprised of a pneumatic pump in Well W-2 and three 200-pound granular activated carbon vessels arranged in series to treat the extracted groundwater. Extracted and treated groundwater was discharged into the East Bay Municipal Utility District (EBMUD) Permit Account Number 502-85611. Based on verbal approval from the ACHCSA, indicating that GWE would no longer be required at the site, the EBMUD permit was relinquished on June 14 1996. Overall, approximately 0.1 million gallons of groundwater were extracted and less than 0.05 gallon of benzene was removed. Brief descriptions and performance evaluations of the remedial system and bioremediation enhancement program between October 1 and December 31, 1996, are presented below.

Historical GWE system performance and analytical data are presented in Tables D-1 and D-2. Graphical presentations of TPPH-g and benzene mass removal and concentration data are shown on Figures D-1 and D-2, respectively.

Intrinsic Bioremediation Evaluation

At the request of ARCO, PACIFIC monitored intrinsic bioremediation indicator parameters (bioparameters) during the third quarter 1996 groundwater monitoring event. Groundwater samples from Wells MW-3, MW-4, and MW-5 were analyzed for total alkalinity, dissolved oxygen (DO), ferrous iron, nitrate, sulfate, methane, biological oxygen demand (BOD), chemical oxygen demand (COD), and carbon dioxide (CO_2). Intrinsic bioremediation evaluation data are presented in Table D-3.

In general, depleted concentrations of electron acceptors (DO, nitrate, and sulfate), and elevated concentrations of bioremediation byproducts (CO_2, methane, and ferrous iron) within the hydrocarbon-impacted plume compared to background levels indicate that intrinsic

bioremediation is occurring. As indicated by Table D-3, collected data follow the trend that indicates the occurrence of intrinsic bioremedation.

Bioremediation Enhancement Program

At the request of ARCO, PACIFIC initiated an in-situ bioremediation enhancement program at offsite Well MW-3 on November 14, 1995. The in-situ bioremediation enhancement program utilizes oxygen releasing compound (ORC) manufactured by Regenesis Bioremediation Products, Inc. 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 was presented in PACIFIC's fourth quarter 1995 report.

Data collected from Well MW-3 indicate that dissolved oxygen concentration has increased since ORCs were installed. ORC units are changed when dissolved oxygen data indicate that they have been depleted. PACIFIC plans to replace ORCs in Well MW-3 during first quarter 1997.

Conclusions

As indicated above, GWE at the site has been terminated with verbal approval from ACHCSA. Bioremediation enhancement program will continue during first quarter 1997.

Attachments:
- Table D-1 - Groundwater Extraction System Performance Data
- Table D-2 - Groundwater Extraction System Analytical Data - Total Purgeable Petroleum Hydrocarbons (TPPH as Gasoline and BTEX Compounds)
- Table D-3 - Groundwater Biodegradation Study Field and Laboratory Data
- Figure D-1- Groundwater Extraction System Mass Removal Trend
- Figure D-2 Groundwater Extraction System Hydrocarbon Concentrations
- Attachment D-A- Operation and Maintenance Field Data Sheets

Table D-1

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	i,h	93,989	1,071	0.07	NS	0.006	2.61	NS	0.000	0.38	3.3

REPORTING PERIOD:	**10/01/96 - 12/31/96**	**(i)**			
TOTAL POUNDS REMOVED:		**2.61**		**0.38**	
TOTAL GALLONS REMOVED:		**0.43**		**0.05**	
PERIOD POUNDS REMOVED:		**0.000**		**0.00**	
PERIOD GALLONS REMOVED:		**0.000**		**0.00**	
TOTAL GALLONS EXTRACTED:	**93,989**				
PERIOD GALLONS EXTRACTED:	**0**				
PERIOD AVERAGE FLOW RATE (gpm):	**N/A**				
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 D-2
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	27	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 D-3
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)	D.O. (mg/L)	Ferrous Iron (mg/L)	Total Alkalinity (mg CaCO3/L	B.O.D. (mg/L)	Carbon Dioxide (mg/L)	C.O.D. (mg/L)	Methane (%)	Nitrate as Nitrate (mg/L)	Nitrite as Nitrite (mg/L)	Sulfate (mg/L)	TPPH as Gasoline (µg/L)	Total BTEX (µg/L)
MW-3	11/14/95 **	65.5*	6.76*	508*	7.17	N/A	NS	NS	NS	NS	NS	6.6	<1.0	NS	140	46
	06/06/96 **	66.2	7.38	700	12.28	N/A	NS	NS	NS	NS	NS	NS	NS	NS	84†	5.4†
	07/16/96	67.8	7.08	1,010	8.73	0.0	280	1.8	270	44	<0.020	<1.0	NS	78	<50	2.2
MW-4	07/16/96	69.5	6.72	1,370	3.20	4.20	420	NS	470	NS	0.11	<1.0	NS	18	5,600	2,020
MW-5	07/16/96	70 4	6.85	690	6.80	0.0	170	NS	180	NS	<0.020	<1.0	NS	35	<50	1 1
MW-6	06/06/96	N/A	N/A	N/A	3.47	N/A	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

D.O. = Dissolved oxygen
B.O.D = Biochemical oxygen demand
C.O.D = Chemical oxygen demand
TPPH = Total purgeable petroleum hydrocarbons
BTEX = Benzene, toluene, ethylbenzene, and xylenes
deg F = Degrees Fahrenheit
µmhos = Micromhos
mg/L = Milligrams per liter
µg/L = Micrograms per liter
NS = Not sampled
N/A = Not available
* Field measurements collected on November 2, 1995.
** ORC installed following data collection.
† From April 10, 1996 groundwater monitoring event.

Figure D-1
Groundwater Extraction System Mass Removal Trend

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

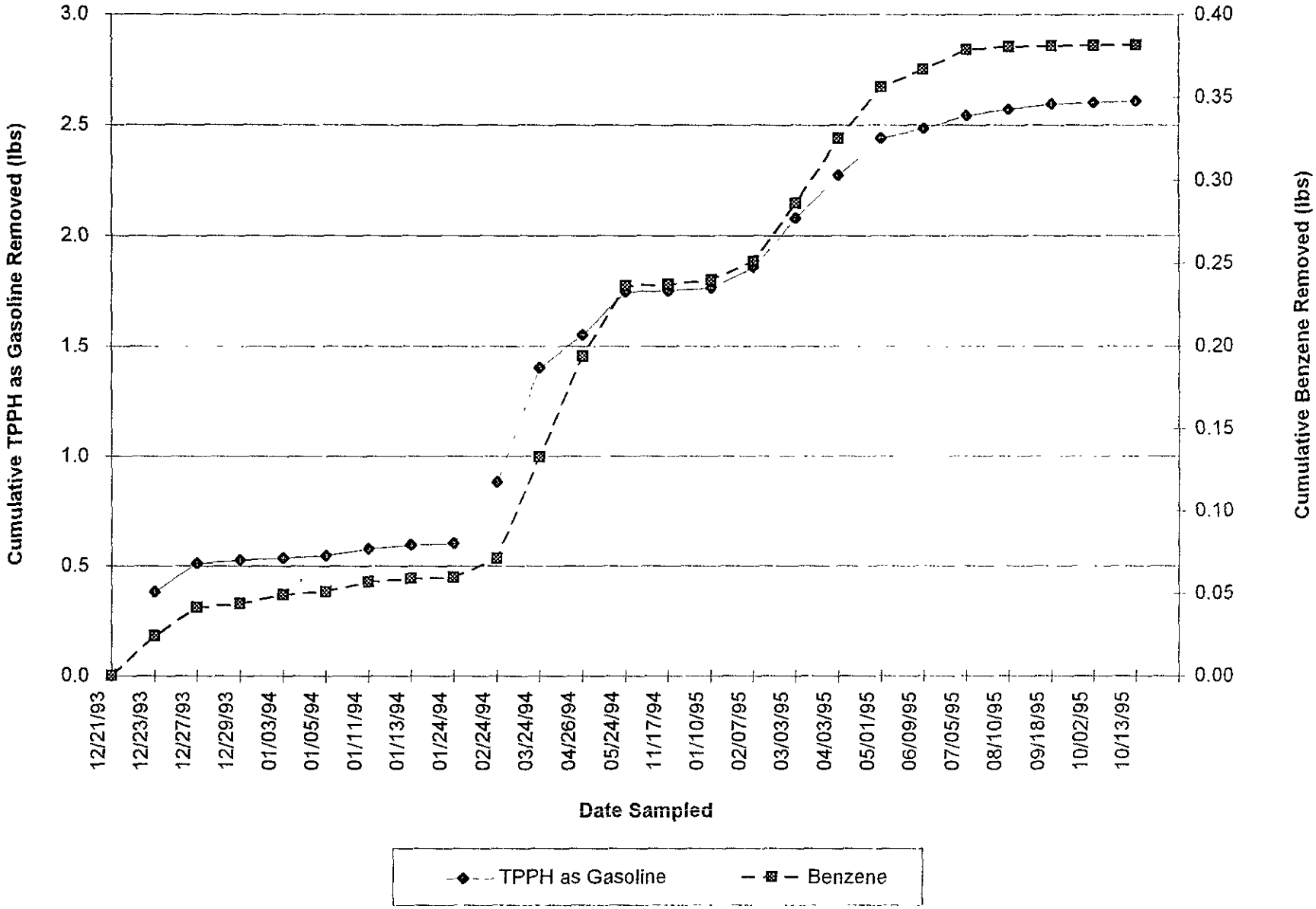
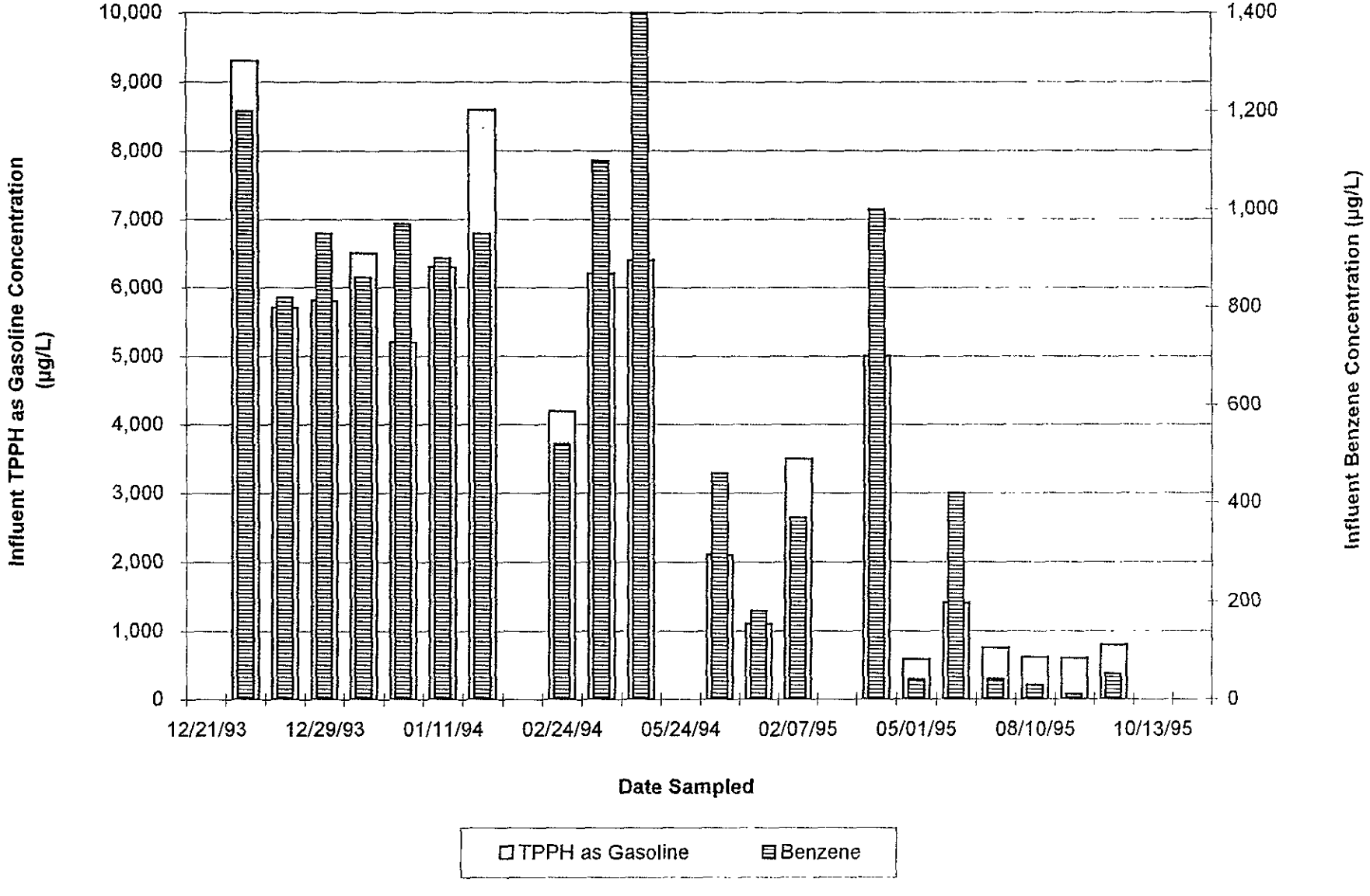


Figure D-2
Groundwater Extraction System Hydrocarbon Concentrations

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



ATTACHMENT D-A

OPERATION AND MAINTENANCE
FIELD DATA SHEETS

FIELD SERVICES REQUEST

SITE INFORMATION FORM

Identification

Project # 330-084.5C

Station ID #0374

Site Address: 6407 Telegraph Ave, Oakland

Lab: Sequoia

County:

Project Manager: Shaw Garakani

Requester: David S. Nanstad

Client: ARCO

Client P.O.C: MIKE WHELAN

Date of Request: August 26, 1996

Project Type

☒ Operation & Maintenance

☐ Sampling

☐ 1st time visit

☐ Quarterly

☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

X Monthly

☐ Semi-Monthly

☐ Weekly

☐ One time event

☐ Other:

Ideal field date: asap

Check Appropriate Category

X In Budget Site Visit

☐ Out of Budget Site Visit

Budget Hours: +1.5

Actual Hours: .5

Mob de Mob: 1.5

Site Safety Concerns

STANDARD

Field Tasks General Description

3:24

OBJECTIVE: Go to the referenced site and remove GWE pumps from Well W-2.

Make sure power is turned off to pumps. Leave well boxes neat and cleanly "buttoned up". Lable pump ARCO #0374 and store in boneyard.

Comments, remarks from field staff

Arrived @ 2:15

left 2:45

Completed By: Don Wa[illegible] Date: 10-4-96

Pacific Environmental Group, Inc.

(36)

RECEIVED NOV 18 1996 PACIFIC ENVIRONMENTAL GROUP, INC.

FIELD SERVICES REQUEST

SITE INFORMATION FORM

Identification

Project # 330-084.5C
Station ID #0374
Site Address: 6407 Telegraph Ave. Oakland
Lab: Sequoia
County:
Project Manager: Shaw Garakani
Requester: David S. Nanstad
Client: ARCO
Client P.O.C: MIKE WHELAN
Date of Request: November 18, 1996

Project Type

- ☒ Operation & Maintenance
- ☐ Sampling
- ☐ 1st time visit
- ☐ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- X Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Ideal field date: asap

Check Appropriate Category

- X In Budget Site Visit
- ☐ Out of Budget Site Visit

Budget Hours: +1.5
Actual Hours: 2.5 hrs
Mob de Mob: ~~5~~ 2.5

Site Safety Concerns

STANDARD

Field Tasks General Description

OBJECTIVE: Go to the referenced site and drill holes in the secondary containement burm to drain water from the inside the secondary containement. The secondary containment is overflowing currently and the water is going into the adjoining station. We want to drain the water from the containment before it gets to the level that it flows over the burm and into building.

Drill 3 to 4 holes that allow the water to drain evenly away from the building.

Assess the situation upon arrival and make sure the above plan makes sense. If not come up with an alternative and call engineer to discuss. NOTE: Cover holes with chicken wire or somekind of screen to prevent debris from clogging holes. Holes should be a min of 1 inch diameter. If you need to, purchase enough concrete drill bits to do the job. You may also rent a more powerful drill if you need to. We need to address this today due to upcoming rain. Station managers name is John.

Comments, remarks from field staff

Pump in sump still works but needs electricity - need generator to pump out water in containment, ~~Chevron~~ Manager can use extension cord to power sump to drain containment
Drilled 3-1½" holes on 2 ends of the containment berm to drain water until sump can be operated. Station manager would like the sump pump left after taking out all the other remediation equip.
(arrived 13:00 left 15:30)

Completed By: Don [illegible] **Date:** 11/18/96

Pacific Environmental Group, Inc.