TRANSMITTAL

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DATE: October 3, 1994
PROJECT #: 4909.770
SUBJECT: 2nd QMR 94 at ARCO Station 4931

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cc: **Ms. Susan Hugo, ACHCSA**
Mr. Richard Hiett, RWQCB
Mr. Kelly Brown, PEG

GeoStrategies Inc.

LETTER REPORT
INTERIM REMEDIATION SYSTEM EVALUATION AND QUARTERLY GROUNDWATER MONITORING SECOND QUARTER 1994

at

ARCO Station 4931
731 West MacArthur Boulevard
Oakland, California

4909.770-23

Prepared for
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

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September 27, 1994

GeoStrategies Inc.

September 27, 1994

Mr. Michael Whelan
ARCO Products Company
Post Office Box 5811
San Mateo, California 94402

Subject: Interim Remediation System Evaluation and Quarterly Groundwater Monitoring - Second Quarter 1994, ARCO Service Station 4931, 731 West MacArthur Boulevard in Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), GeoStrategies Inc. (GSI) has prepared this letter report describing the performance of the interim groundwater remediation system and summarizing the results of the second quarter 1994 groundwater monitoring at the above-referenced site. The objectives of the quarterly groundwater monitoring are to evaluate changes in the groundwater levels and changes in concentrations of petroleum hydrocarbons in the shallow groundwater beneath the site.

1.0 SITE BACKGROUND

The subject site is an operating ARCO Station located at the intersection of West MacArthur Boulevard and West Street in Oakland, California, as shown on the Vicinity Map, Figure 1. There are currently eleven groundwater monitoring wells (A-2 through A-8 and A-10 through A-13) and four groundwater recovery wells (A-9 and AR-1 through AR-3) at the site. These wells were installed between 1982 and 1992 by Groundwater Technology, Inc. (GTI), Pacific Environmental Group, and GSI. Well A-1 was abandoned by GTI on August 23, 1983. Wells A-2 through A-10 and AR-1 through AR-3 are onsite, and wells A-11, A-12, and A-13 are offsite. The interim groundwater remedial system began operating on November 10, 1992. The locations of pertinent site features are shown on the Site Plan, Figure 2.

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Quarterly monitoring and sampling of site wells began in 1989. Currently, groundwater monitoring and sampling is being performed by Integrated Wastestream Management (IWM) of Milpitas, California. Groundwater samples are analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-G) and gasoline constituents benzene, toluene, ethylbenzene, and xylenes (BTEX) according to Environmental Protection Agency (EPA) Methods 8015 Mod./8020. Historical water-level data and a groundwater quality database are presented in Appendix A.

2.0 INTERIM GROUNDWATER REMEDIATION SYSTEM DESCRIPTION

The interim remediation system at the site consists of a groundwater recovery system utilizing granular activated carbon (GAC) for treatment. Figure 3 presents the interim remediation system process flow diagram. The following components comprise the system:

Recovery Wells (4):	A-9, AR-1 through AR-3
Groundwater Pumps (4):	Grundfos; Electric Water Table Depression Pumps with Control Panel; Model No. 16E4; 1/2 HP
Product Pump (1):	GRS; Product Pump with Control Panel; 12 Volt
Secondary Containment (1):	JJ Keller; Secondary Containment Drum for Product Storage; Model No. RN-482-R; 85 gallons
Bag Filter (1):	Rosedale; Oil Adsorbing Bag Filter; Model No. 6-18-2; 50 gallons per minute (gpm)
Particulate Filter (1):	Lakos; Particulate Filter; Model No. IL-0100-B; 32 gpm
Carbon Vessels (3):	Westates; Liquid Carbon Absorption Vessel; Model No. PV-50-2; 1,500 pounds

Auto-Dialer (1): Silent Knight; Auto-Dialer; Model No. 1410

Floating product is removed from well A-8 and groundwater is extracted from the recovery wells A-9 and AR-1 through AR-3. The product pump removes the floating product from well A-8 to the product storage drum. Extracted groundwater from wells A-9, and AR-1 through AR-3 is pumped through the particulate filter, the bag filter and the three GAC vessels arranged in series. The treated water is then discharged in the sanitary sewer under the East Bay Municipal Utility District (EBMUD) Discharge Permit No. 502-62131, issued on November 2, 1993 and effective through November 1, 1994. A copy of the EBMUD Discharge Permit is included as Appendix B.

3.0 SECOND QUARTER 1994 ACTIVITIES

A summary of activities performed at the site during the second quarter of 1994 is presented below:

- The groundwater monitoring wells A-3 through A-7, A-9 through A-13, AR-2, and AR-3 were monitored and sampled by IWM on May 6, 1994. Well A-2 was covered by an automobile and was not monitored or sampled, and wells A-8 and AR-1 contained floating product and were not sampled. Groundwater samples collected from the wells were analyzed for TPH-G and BTEX.

- Performed interim remediation system monitoring on April 11, May 18, and June 28, 1994.

- Performed interim remediation system sampling on April 11, 1994.

- Received letter dated April 7, 1994 stating EBMUD had inspected the facility and sampled the wastewater discharged on March 11, 1994 and that no discharge limit violations were noted.

- Bailed free product from wells A-8 and AR-1 on June 28, 1994.

4.0 INTERIM GROUNDWATER REMEDIATION SYSTEM MONITORING

4.1 Interim Groundwater Remediation System Monitoring and Sampling

The groundwater remediation system was monitored to satisfy permit requirements and to provide data for the evaluation of system performance. EBMUD permit conditions require sampling the groundwater remediation system influent, midpoint B (between the second and third GAC vessels) and effluent on a quarterly basis. On April 11, 1994, the system influent, midpoint C and effluent were sampled and analyzed for BTEX using EPA Methods 5030/8020 by Sequoia Analytical (Sequoia), a California State-certified laboratory located in Redwood City, California (Hazardous Waste Testing Laboratory #1210). Mr. Stan Archacki, of the EBMUD Source Control Division, was notified that the incorrect midpoint was sampled. He authorized GSI to forego sampling midpoint B during the second quarter of 1994, but emphasized the requirement of sampling midpoint B during the third quarter 1994 sampling event. The results of the analyses are discussed in the following section. Monitoring of system parameters, including flow rates, total flow, and filter pressure was conducted on April 11, May 18, and June 28, 1994.

4.2 Interim Groundwater Remediation System Performance

Since this system began operation on November 10, 1992, approximately 4,118,840 gallons of groundwater have been extracted and treated. During the second quarter of 1994, water was pumped from the recovery wells AR-1 and AR-2 at an average flow rate ranging from 0.51 to 1.23 gallons per minute (gpm) and approximately 144,530 gallons of groundwater were treated and discharged. In an attempt to evaluate pumping conditions at the site, groundwater extraction wells A-9 and AR-3 were not operational during the second quarter 1994.

Analytical laboratory results for the samples taken from the groundwater remediation system on April 11, 1994 indicated benzene concentrations of 25 parts per billion (ppb) in the influent sample and nondetectable concentrations (less than 0.5 ppb) in the midpoint C and effluent samples. The system effluent meets the requirements of the EBMUD discharge permit.

On June 28, 1994, GSI personnel pumped free product from the groundwater wells AR-1 and A-8. Approximately 1 gallon of free product was removed from extraction well AR-1 and approximately half a gallon of free product was removed from the groundwater well A-8.

Based on the amount of free product removed from the wells AR-1 and A-8, treatment system flow rates, and sample analytical data, approximately 9.09 pounds (1.51 gallons) of TPH-G were recovered during the second quarter 1994, and approximately 10.47 pounds (1.75 gallons) of TPH-G have been recovered since operation of the system began. Approximately 0.03 pounds (0.004 gallons) of benzene were recovered during the first quarter 1994, and approximately 0.37 pounds (0.05 gallons) of benzene have been recovered to date.

4.2 Interim Groundwater Remediation System Carbon Loading

On March 13, 1994, the first carbon vessel had a calculated remaining bed capacity of 98.85%. On June 28, 1994, the first carbon vessel had a calculated remaining bed capacity of 98.77%. Approximately 0.08% of the first carbon vessel's capacity was utilized between March 13, 1994 and June 28, 1994. Carbon loading calculations assume an eight percent isotherm. A summary of the primary carbon bed loading data is presented in Table 1.

Flow data, TPH-G and benzene analytical data, recovery system data, and carbon loading data are summarized in Table 1, Groundwater Remediation System Performance Data. The laboratory analytical reports, Chain-of-Custody Forms and field data sheets for the interim groundwater remediation system are included in Appendix C.

5.0 SECOND QUARTER 1994 GROUNDWATER MONITORING RESULTS

5.1 Groundwater Level Measurements and Gradient Evaluations

Depth-to-water (DTW) level measurements were performed by IWM on wells A-3 through A-13 and AR-1 through AR-3 on May 6, 1994. Well A-2 was covered by an automobile and not monitored this quarter. Static groundwater levels were measured from the surveyed top of each well box and recorded to the nearest +/-0.01 foot. DTW level measurements were referenced to Mean

Sea Level (MSL) datum, and are presented in Table 2, Current Groundwater Data. Historical water-level data are presented in Appendix A, Historical Water-Level Data and Groundwater Quality Database. Groundwater elevations were used to construct a potentiometric map (Figure 4), which indicates that pumping from recovery wells AR-1 and AR-2 has generated a cone of depression in the shallow groundwater beneath most of the site.

Each well was checked for the presence of floating product. Floating product was measured at a thickness of 0.42 foot in well A-8 and a heavy sheen was observed in well AR-1 on May 6, 1994. Floating product was not observed in any other well this quarter. Current floating product measurements and monitoring data are presented in Table 2 and have been added to Appendix A.

5.2 Laboratory Analytical Results of Groundwater Samples

IWM field personnel sampled groundwater monitoring wells A-3 through A-7, A-9 through A-13, AR-2, and AR-3 on May 6, 1994. Access to well A-2 was blocked by an automobile and could not be sampled. Wells A-8 and AR-1 were not sampled due to the presence of floating product and product sheen. Groundwater samples collected by IWM field personnel were preserved as required by the applicable analytical method and delivered, with Chain-of-Custody Forms, to Columbia Analytical Services, Inc. (Columbia) of San Jose, California, a State-certified laboratory (Hazardous Waste Testing Laboratory Certification #1426) for analyses of TPH-G and BTEX using EPA Methods 8015(modified)/8020.

TPH-G and benzene were reported as not detected (less than 50 ppb and less than 0.5 ppb, respectively) in groundwater samples collected from wells A-3, A-5, A-7, A-9 through A-13, AR-2, and AR-3. TPH-G was detected in groundwater samples from wells A-4 (18,000 ppb) and A-6 (61 ppb), while benzene was detected in groundwater samples from wells A-4 (210 ppb) and A-6 (1.7 ppb), respectively.

Results of current analytical data are summarized on Table 2. Current groundwater analytical data, and have been added to the historical analytical database in Appendix A. TPH-G and benzene data are plotted on Figure 5, TPH-G/Benzene Concentration Map. The IWM Groundwater Sampling and Monitoring Report is included in Appendix D.

Concentrations of TPH-G have decreased in wells A-6 and A-4 from first quarter 1994 levels of 140 ppb and 56,000 ppb to 61 ppb and 18,000 ppb, respectively. Concentrations of benzene have decreased from 2.8 ppb to 1.7 ppb in well A-6 and from 220 ppb to 210 ppb during the same period.

6.0 DISCUSSION

The interim groundwater remediation system began operation on November 10, 1992. During second quarter 1994, the interim groundwater remediation system was 100% operational and pumped approximately 144,530 gallons of groundwater. Approximately 9.09 pounds (1.51 gallons) of TPH-G were recovered from the subject site during the second quarter of 1994. On June 28, 1994, carbon loading calculations indicate the first carbon vessel had a remaining bed capacity of 98.77%. Nondetectable concentrations of TPH-G and benzene in the groundwater treatment system effluent indicate that the groundwater extraction and treatment system is efficiently removing dissolved hydrocarbons from the groundwater prior to discharge to the sanitary sewer.

The decrease of TPH-G and benzene in wells A-4 and A-6 during the second quarter is attributed to the operation of the groundwater treatment system. The system appears to be controlling the migration of gasoline hydrocarbons in the groundwater beneath the site.

7.0 ACTIVITIES PLANNED FOR THIRD QUARTER 1994

- Perform operation and maintenance duties for the interim groundwater remediation system.
- Perform quarterly sampling and monthly monitoring of the interim groundwater remediation system.
- Perform quarterly monitoring and sampling of site wells.

If you have any questions or comments, please call us at (510) 551-8777.

TABLES

Table 1

Groundwater Remediation System Performance Data
ARCO Station 4931
Oakland, California

Date		4/11/94	5/18/94	6/28/94
Flow Data				
Flow Meter Reading (gallons)		3,996,660	4,062,460	4,120,050
Average Daily Flow (gpd)		729	1,778	1,405
Average Flow Rate (gpm)		0.51	1.23	0.98
Total Flow to Date (gallons)		3,995,450	4,061,250	4,118,840
Laboratory Results for Influent				
TPH-G (ug/L)		NS	NS	NS
Detection Limit (ug/L)		NS	NS	NS
Benzene (ug/L)		25	NS	NS
Detection Limit (ug/L)		0.50	NS	NS
Laboratory Results for Effluent				
TPH-G (ug/L)		NS	NS	NS
Detection Limit (ug/L)		NS	NS	NS
Benzene (ug/L)		ND	NS	NS
Detection Limit (ug/L)		0.50	NS	NS
Recovery Data				
TPH-G Periodic Recovery* (lbs)		0.0130	0.0405	9.0355
TPH-G Recovered to Date (lbs)		1.3943	1.4348	10.4703
TPH-G Recovered to Date (gallons)		0.2324	0.2391	1.7450
Benzene Periodic Recovery (lbs)		0.0044	0.0137	0.0120
Benzene Recovered to Date (lbs)		0.3480	0.3617	0.3736
Benzene Recovered to Date (gallons)		0.0480	0.0499	0.0515
Carbon Loading				
Primary Bed Capacity Remaining (%)		98.84%	98.80%	98.77%
Carbon Weight (lbs) =	1,500			
Date Last Changed =	11/16/92			

*Free product removed from wells included in TPH-G periodic recovery.

gpd = gallons per day

gpm = gallons per minute

lbs = pounds

ug/L = micrograms per liter

ND = None Detected

NS = Not Sampled

Notes:

1. Densities used for TPH-G and benzene were 6 lb/gal and 7.25 lb/gal, respectively.
2. Carbon loading assumes an 8% isotherm.
3. System sampled quarterly

TABLE 2

CURRENT GROUNDWATER DATA
ARCO Station 4931

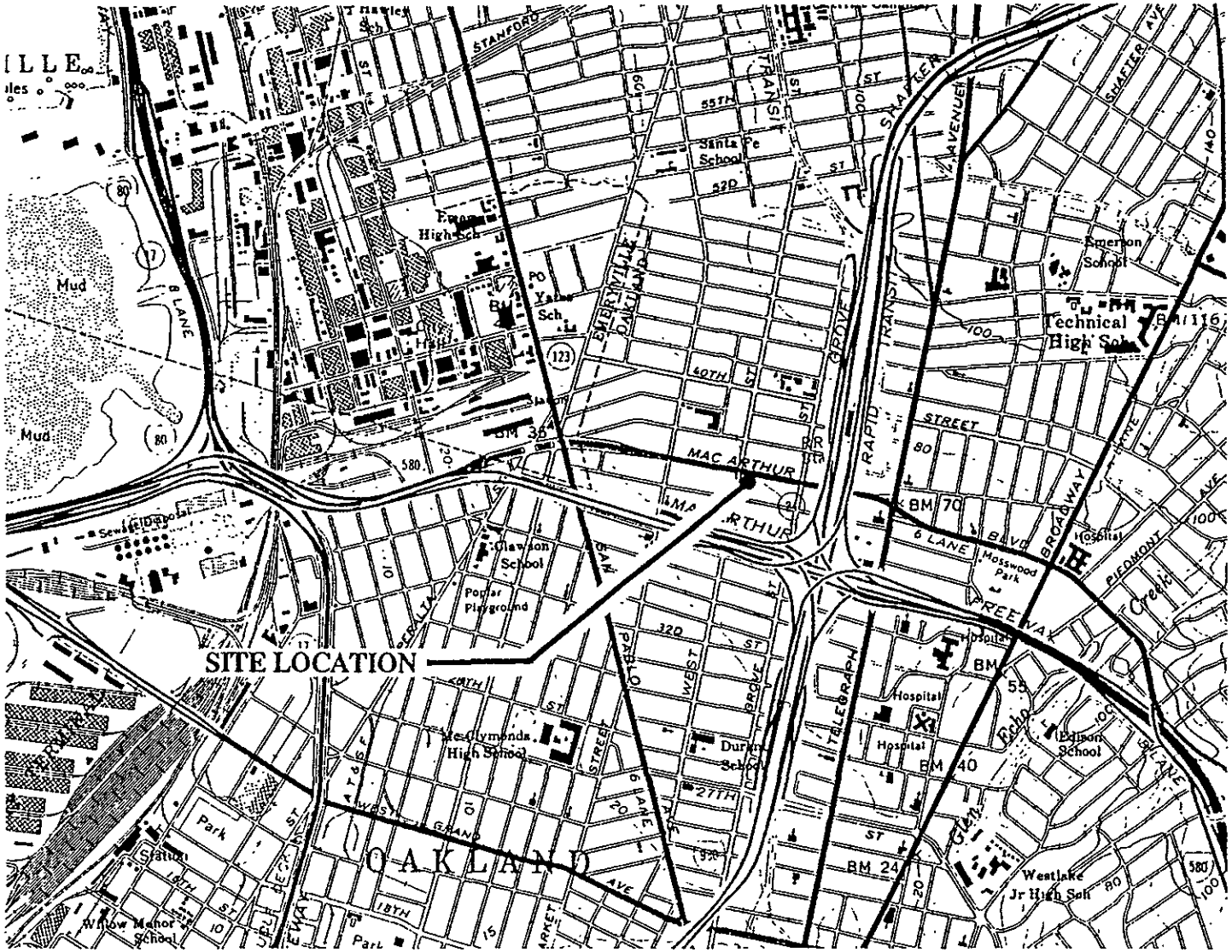
Well No.	Sample Date	Analyzed Date	TPH-G (PPB)	Benzene (PPB)	Toluene (PPB)	Ethylbenzene (PPB)	Xylenes (PPB)	TOG (PPM)	Total Lead (PPB)	Well Elev. (ft)	Depth to Water (ft)	Product Thickness (ft)	Static Water Elev. (ft)
A-2	06-May-94	----		Not Sampled		Well Obstructed				55.48	—	—	—
A-3	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.66	10.34	0.00	44.32
A-4	06-May-94	17-May-94	18,000	210	<30*	200	101	NA	NA	54.73	10.02	0.00	44.71
A-5	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.17	10.48	0.00	43.69
A-6	06-May-94	16-May-94	61	1.7	<0.5	0.6	1.4	NA	NA	55.17	8.71	0.00	47.00
A-7	06-May-93	16-May-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.71	8.41	0.00	46.30
A-8	06-May-94	----		Not Sampled		Floating Product				53.77	8.80	0.42	44.63
A-9	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	53.04	9.41	0.00	43.63
A-10	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.26	10.81	0.00	43.45
A-11	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	53.74	9.94	0.00	43.80
A-12	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	52.05	9.89	0.00	42.16
A-13	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	55.11	10.29	0.00	44.82
AR-1	06-May-94			Not Sampled		Product Sheen				54.72	19.61	0.00	35.11
AR-2	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.77	15.14	0.00	39.63
AR-3	06-May-94	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.19	10.54	0.00	43.65
MB	—	16-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---
MB	---	17-May-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---

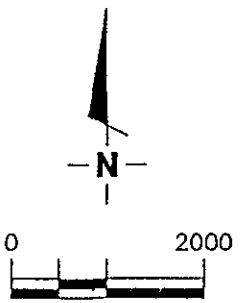
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline TOG = Total Oil & Grease
PPB = Parts Per Billion; PPM = Parts Per Million; MB = Method Blank; and TB = Trip Blank

Notes:
1. All data shown as <x are reported as ND (none detected).
2. Water level elevations referenced to Mean Sea Level (MSL), from top of well boxes.
3. Static water levels corrected for floating product (conversion factor = 0.80).

* = Raised detection limit due to matrix interference.

FIGURES





Base Map: USGS Topographic Map

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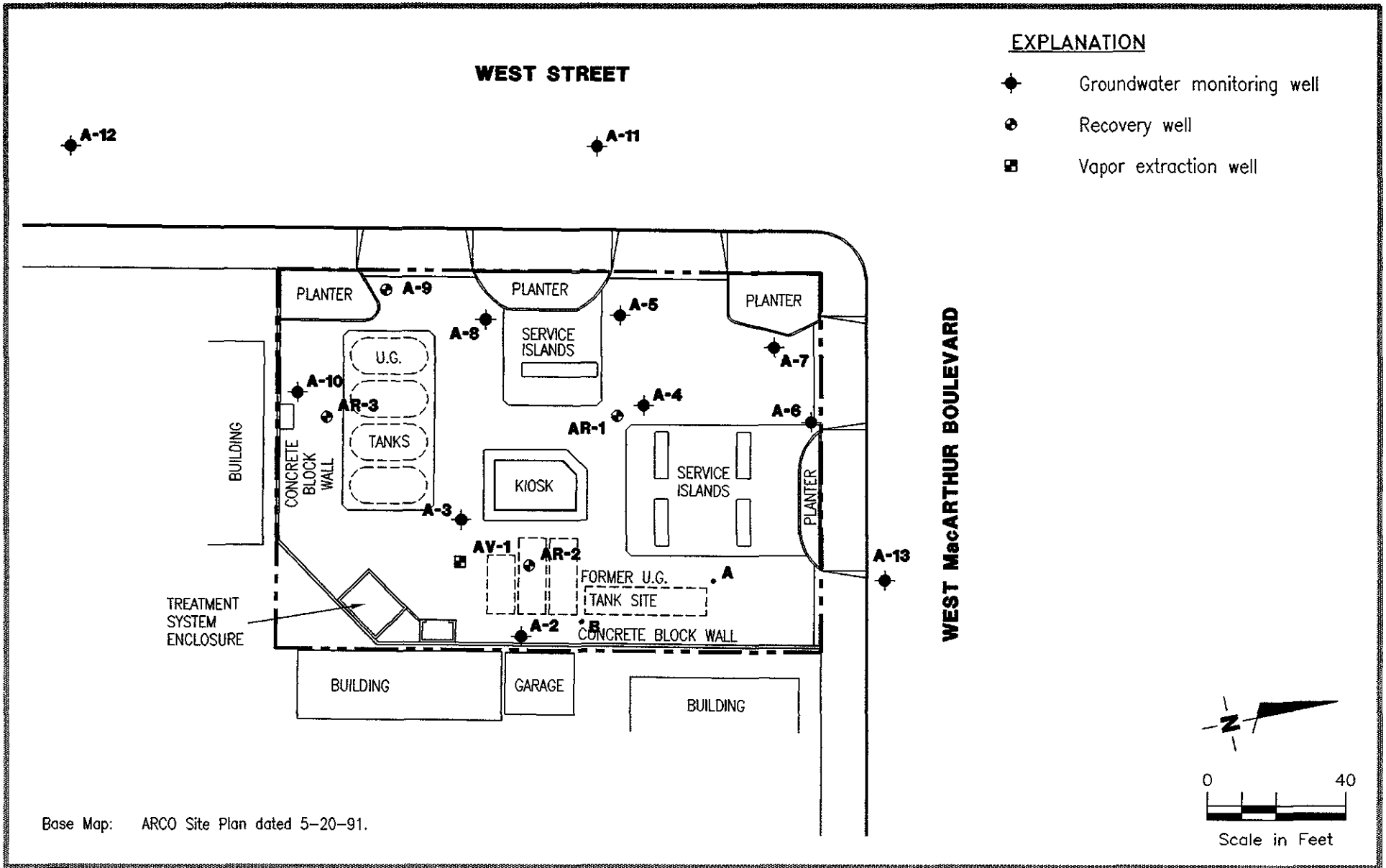
VICINITY MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE 1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
4909		8/94	



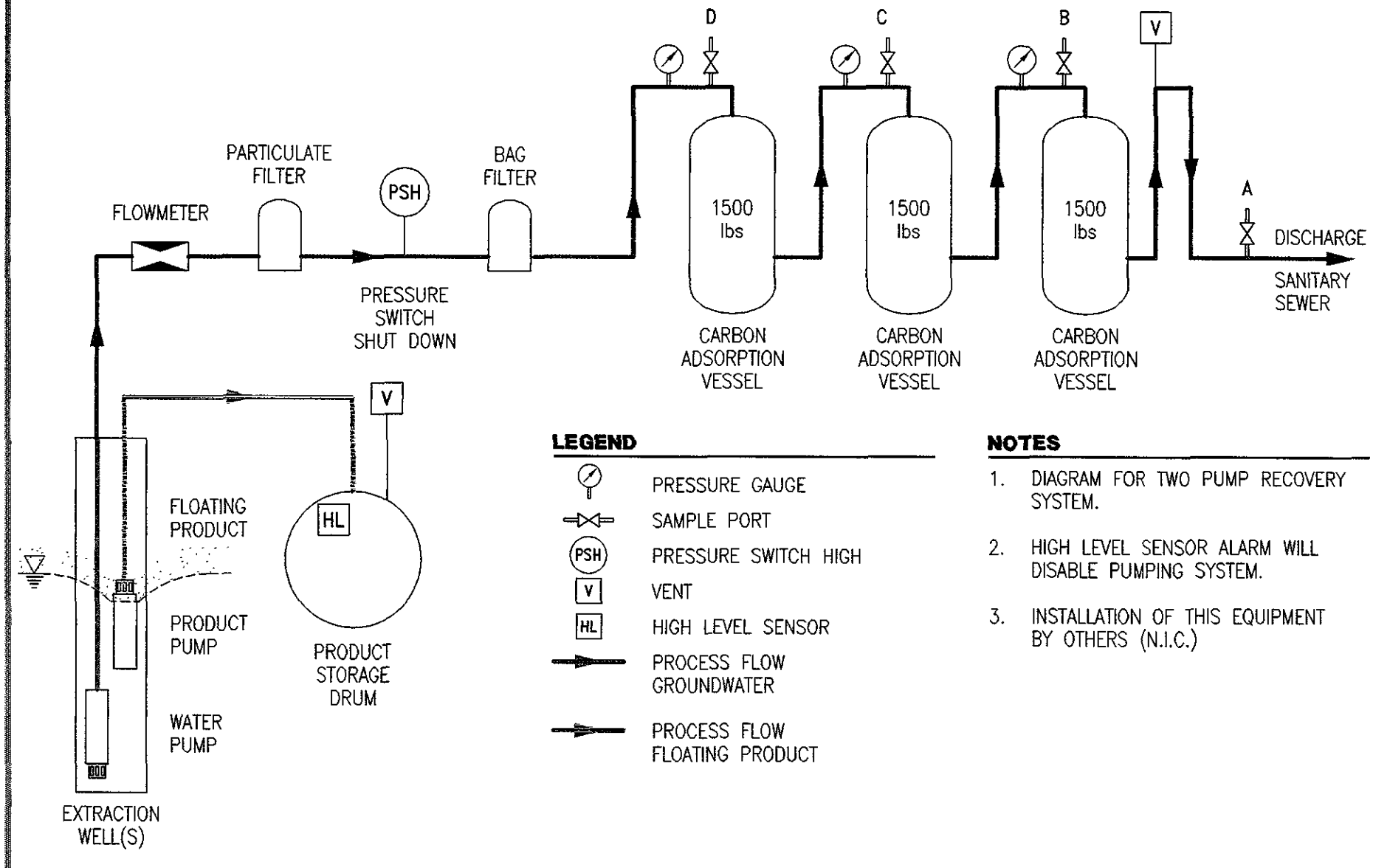
Base Map: ARCO Site Plan dated 5-20-91.

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
4909770-26		8/94	



LEGEND

- PRESSURE GAUGE
- SAMPLE PORT
- PSH — PRESSURE SWITCH HIGH
- V — VENT
- HL — HIGH LEVEL SENSOR
- PROCESS FLOW GROUNDWATER
- PROCESS FLOW FLOATING PRODUCT

NOTES

1. DIAGRAM FOR TWO PUMP RECOVERY SYSTEM.
2. HIGH LEVEL SENSOR ALARM WILL DISABLE PUMPING SYSTEM.
3. INSTALLATION OF THIS EQUIPMENT BY OTHERS (N.I.C.)

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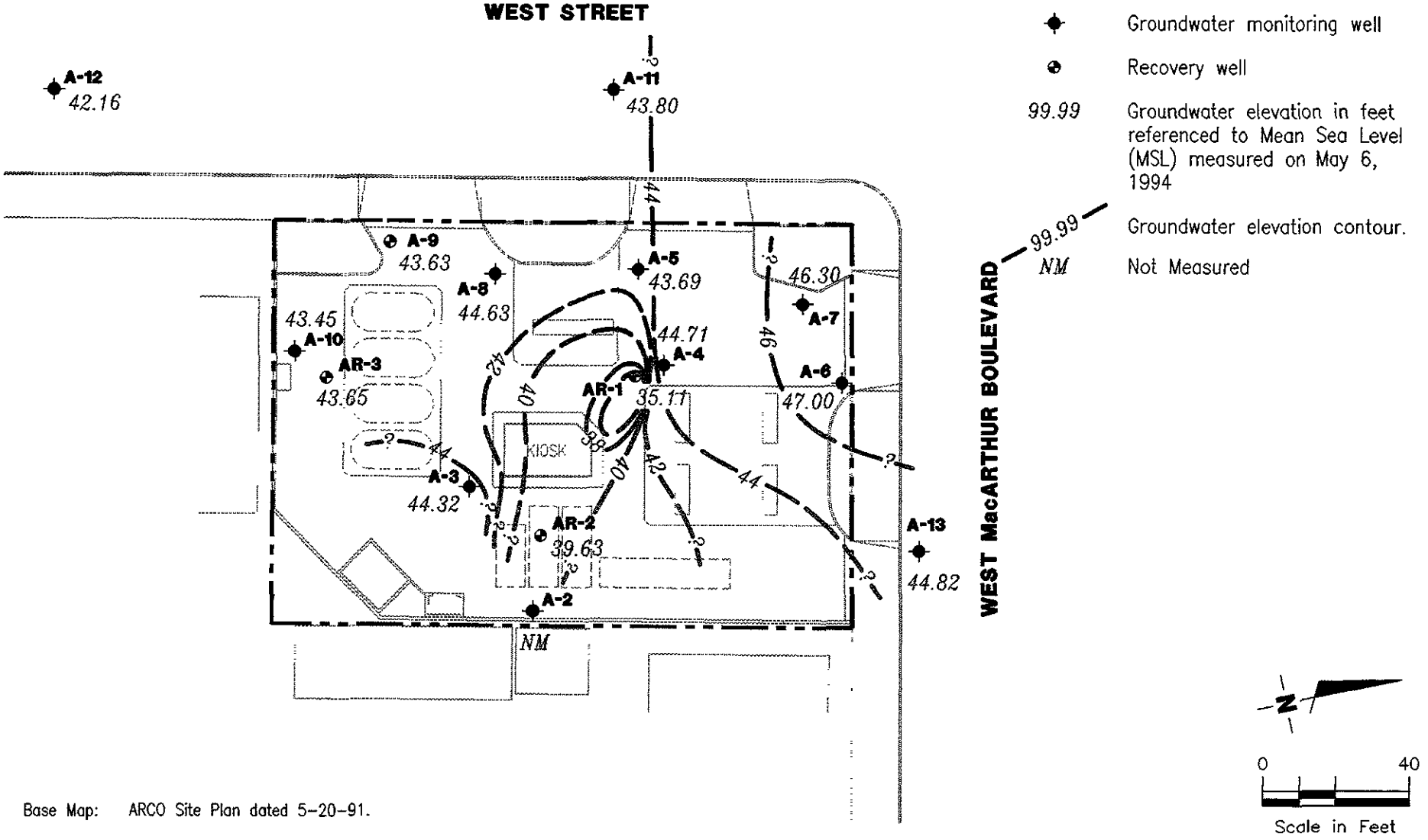
PROCESS FLOW DIAGRAM
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
4909770-26		8/94	



Base Map: ARCO Site Plan dated 5-20-91.

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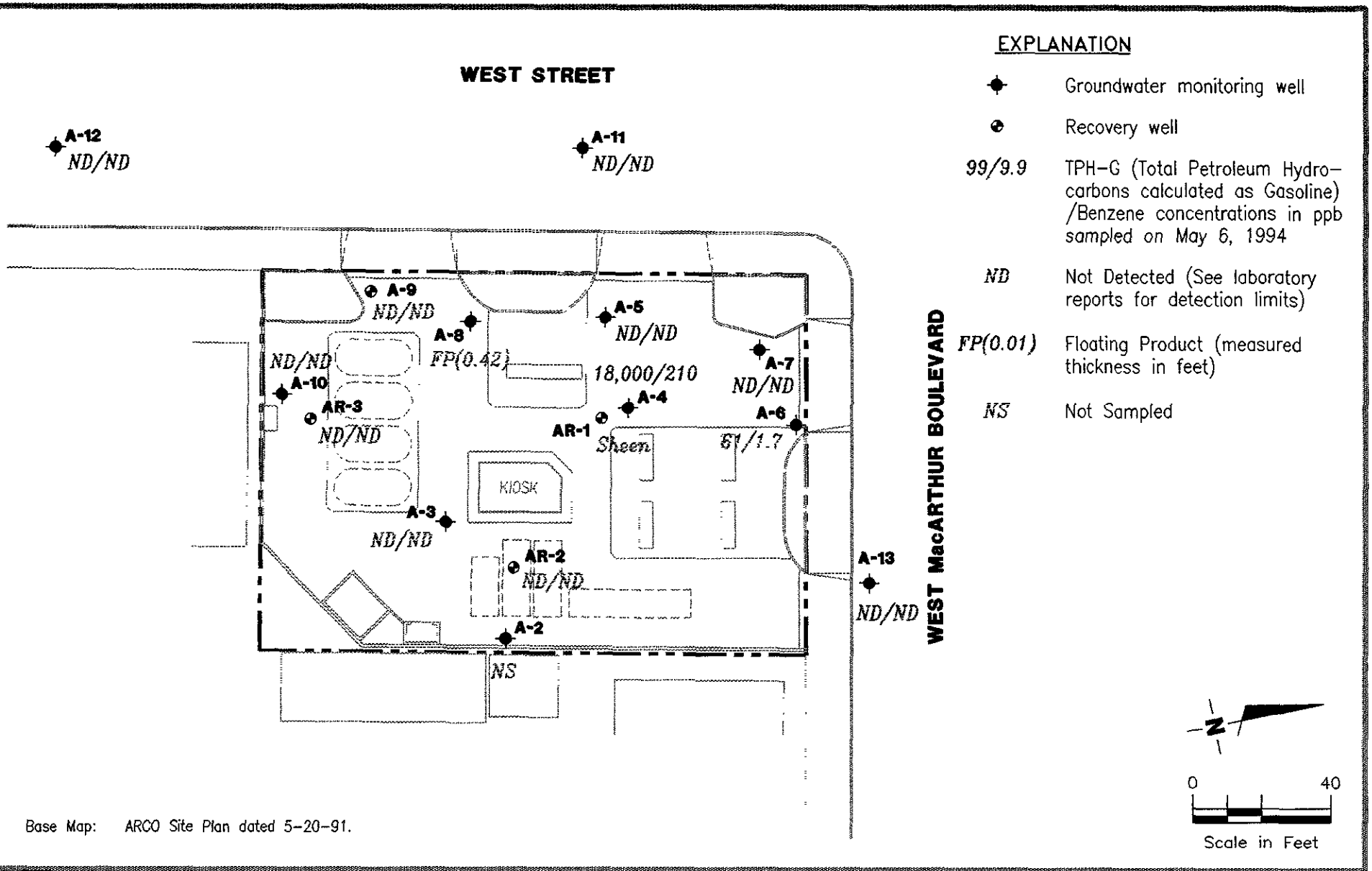
POTENTIOMETRIC MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
4909770-26		8/94	



Base Map: ARCO Site Plan dated 5-20-91.

GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
4909770-26		8/94	

APPENDIX A

HISTORICAL WATER-LEVEL DATA AND GROUNDWATER QUALITY DATABASE

HISTORICAL WATER-LEVEL DATA
ARCO STATION 4931
731 West MacArthur Boulevard
Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
20-Mar-89	A-2	3.45	55.38	51.93	0.00
24-May-89	A-2	6.80	55.38	48.58	0.00
18-Aug-89	A-2	10.82	55.38	44.56	0.00
27-Oct-89	A-2	8.25	55.38	47.13	0.00
15-Jan-90	A-2	4.87	55.38	50.51	0.00
04-Apr-90	A-2	7.03	55.38	48.35	0.00
30-Jul-90	A-2	10.01	55.38	45.37	0.00
29-Oct-90	A-2	11.60	55.38	43.78	0.00
16-Jan-91	A-2	9.43	55.38	45.95	0.00
12-Apr-91	A-2	3.65	55.38	51.73	0.00
10-Jul-91	A-2	9.57	55.38	45.81	0.00
21-Oct-91	A-2	11.54	55.38	43.84	0.00
01-Feb-92	A-2	11.20	55.38	44.18	0.00
29-Apr-92	A-2	7.18	55.38	48.20	0.00
29-Jul-92	A-2	11.81	55.48	43.67	0.00
29-Oct-92	A-2	11.91	55.48	43.57	0.00
26-Jan-93	A-2	5.06	55.48	50.42	0.00
01-Apr-93	A-2	5.15	55.48	50.33	0.00
06-Aug-93	A-2	15.33	55.48	40.15	0.00
14-Oct-93	A-2	15.74	55.48	39.74	0.00
16-Nov-93	A-2	14.61	55.48	40.87	0.00
16-Dec-93	A-2	5.80	55.48	49.68	0.00
10-Feb-94	A-2	4.88	55.48	50.60	0.00
21-Mar-94	A-2	4.94	55.48	50.54	0.00
06-May-94	A-2	Not	Monitored	Well	Obstructed
20-Mar-89	A-3	7.51	54.48	46.97	0.00
24-May-89	A-3	10.29	54.48	44.19	0.00
18-Aug-89	A-3	11.60	54.48	42.88	0.00
27-Oct-89	A-3	10.16	54.48	44.32	0.00
15-Jan-90	A-3	8.55	54.48	45.93	0.00
04-Apr-90	A-3	10.66	54.48	43.82	0.00
30-Jul-90	A-3	11.26	54.48	43.22	0.00
29-Oct-90	A-3	11.86	54.48	42.62	0.00
16-Jan-91	A-3	11.46	54.48	43.02	0.00
12-Apr-91	A-3	9.28	54.48	45.20	0.00
10-Jul-91	A-3	11.29	54.48	43.19	0.00
21-Oct-91	A-3	11.51	54.48	42.97	0.00
02-Feb-92	A-3	N/A	54.48	-----	----

HISTORICAL WATER-LEVEL DATA
ARCO STATION 4931
731 West MacArthur Boulevard
Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
29-Apr-92	A-3	N/A	54.48	-----	----
29-Jul-92	A-3	11.59	54.66	43.07	0.00
28-Oct-92	A-3	12.00	54.66	42.66	0.00
26-Jan-93	A-3	9.82	54.66	44.84	0.00
01-Apr-93	A-3	10.61	54.66	44.05	0.00
06-Aug-93	A-3	14.90	54.66	39.76	0.00
14-Oct-93	A-3	15.11	54.66	39.55	0.00
16-Nov-93	A-3	14.72	54.66	39.94	0.00
16-Dec-93	A-3	13.37	54.66	41.29	0.00
10-Feb-94	A-3	9.20	54.66	45.46	0.00
06-May-94	A-3	10.34	54.66	44.32	0.00
21-Mar-86	A-4	-----	54.62	-----	3.50
07-Jan-88	A-4	-----	54.62	-----	0.02
20-Mar-89	A-4	8.13	54.62	46.49	0.00
24-May-89	A-4	11.40	54.62	43.22	0.00
18-Aug-89	A-4	11.91	54.62	42.72	0.01
27-Oct-89	A-4	11.37	54.62	43.26	0.01
15-Jan-90	A-4	9.74	54.62	44.89	0.01
04-Apr-90	A-4	11.19	54.62	43.43	0.00
30-Jul-90	A-4	11.71	54.62	42.92	0.01
29-Oct-90	A-4	12.21	54.62	42.43	0.03
16-Jan-91	A-4	11.89	54.62	42.74	0.01
12-Apr-91	A-4	9.54	54.62	45.08	0.00
10-Jul-91	A-4	11.55	54.62	43.07	0.00
20-Sep-91	A-4	12.12	54.62	42.50	0.00
21-Oct-91	A-4	11.76	54.62	42.88	0.03
02-Feb-92	A-4	11.18	54.62	43.46	0.02
29-Apr-92	A-4	10.78	54.62	43.86	0.02
29-Jul-92	A-4	11.74	54.73	43.02	0.04
28-Oct-92	A-4	11.93	54.73	42.82	0.03
26-Jan-93	A-4	10.59	54.73	44.17	0.04
01-Apr-93	A-4	10.17	54.73	44.58	0.02
06-Aug-93	A-4	15.12	54.73	39.61	0.03
14-Oct-93	A-4	15.37	54.73	39.36	0.00
16-Nov-93	A-4	14.86	54.73	39.87	0.00
16-Dec-93	A-4	13.41	54.73	41.32	0.00
10-Feb-94	A-4	9.30	54.73	45.43	0.00
06-May-94	A-4	10.02	54.73	44.71	0.00

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MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
20-Mar-89	A-5	8.09	54.15	46.06	0.00
24-May-89	A-5	11.13	54.15	43.02	0.00
18-Aug-89	A-5	11.58	54.15	42.57	0.00
27-Oct-89	A-5	10.68	54.15	43.47	0.00
15-Jan-90	A-5	9.24	54.15	44.91	0.00
04-Apr-90	A-5	10.93	54.15	43.22	0.00
30-Jul-90	A-5	11.48	54.15	42.67	0.00
29-Oct-90	A-5	11.77	54.15	42.38	0.00
16-Jan-91	A-5	11.36	54.15	42.79	0.00
12-Apr-91	A-5	9.64	54.15	44.51	0.00
10-Jul-91	A-5	11.30	54.15	42.85	0.00
21-Oct-91	A-5	11.48	54.15	42.67	0.00
02-Feb-92	A-5	10.73	54.15	43.42	0.00
29-Apr-92	A-5	10.58	54.15	43.57	0.00
29-Jul-92	A-5	11.46	54.17	42.71	0.00
28-Oct-92	A-5	11.55	54.17	42.62	0.00
26-Jan-93	A-5	10.32	54.17	43.85	0.00
01-Apr-93	A-5	10.36	54.17	43.81	0.00
06-Aug-93	A-5	14.82	54.17	39.35	0.00
14-Oct-93	A-5	14.99	54.17	39.18	0.00
16-Nov-93	A-5	14.47	54.17	39.70	0.00
16-Dec-93	A-5	12.94	54.17	41.23	0.00
10-Feb-94	A-5	8.94	54.17	45.23	0.00
06-May-94	A-5	10.48	54.17	43.69	0.00
20-Mar-89	A-6	6.43	55.13	48.70	0.00
24-May-89	A-6	9.43	55.13	45.70	0.00
18-Aug-89	A-6	10.10	55.13	45.03	0.00
27-Oct-89	A-6	9.16	55.13	45.97	0.00
15-Jan-90	A-6	8.02	55.13	47.11	0.00
04-Apr-90	A-6	9.29	55.13	45.84	0.00
30-Jul-90	A-6	9.93	55.13	45.20	0.00
29-Oct-90	A-6	10.42	55.13	44.71	0.00
16-Jan-91	A-6	10.15	55.13	44.98	0.00
12-Apr-91	A-6	8.05	55.13	47.08	0.00
10-Jul-91	A-6	10.03	55.13	45.10	0.00
21-Oct-91	A-6	10.30	55.13	44.83	0.00
02-Feb-92	A-6	9.81	55.13	45.32	0.00
29-Apr-92	A-6	N/A	55.13	-----	----

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29-Jul-92	A-6	10.40	55.17	44.77	0.00
28-Oct-92	A-6	10.55	55.17	44.62	0.00
26-Jan-93	A-6	7.50	55.17	47.62	0.00
01-Apr-93	A-6	7.59	55.17	47.58	0.00
06-Aug-93	A-6	12.32	55.17	42.85	0.00
14-Oct-93	A-6	12.82	55.17	42.35	0.00
16-Nov-93	A-6	12.34	55.17	42.83	0.00
16-Dec-93	A-6	10.40	55.17	44.77	0.00
10-Feb-94	A-6	7.53	55.17	47.64	0.00
06-May-94	A-6	8.71	55.17	47.00	0.00
20-Mar-89	A-7	6.29	54.67	48.38	0.00
24-May-89	A-7	9.26	54.67	45.41	0.00
18-Aug-89	A-7	9.97	54.67	44.70	0.00
27-Oct-89	A-7	9.02	54.67	45.65	0.00
15-Jan-90	A-7	7.90	54.67	46.77	0.00
04-Apr-90	A-7	9.15	54.67	45.52	0.00
30-Jul-90	A-7	9.80	54.67	44.87	0.00
29-Oct-90	A-7	10.30	54.67	44.37	0.00
16-Jan-91	A-7	11.35	54.67	43.32	0.00
12-Apr-91	A-7	7.90	54.67	46.77	0.00
10-Jul-91	A-7	9.82	54.67	44.85	0.00
21-Oct-91	A-7	10.12	54.67	44.55	0.00
02-Feb-92	A-7	9.28	54.67	45.39	0.00
29-Apr-92	A-7	8.85	54.67	45.82	0.00
29-Jul-92	A-7	10.09	54.71	44.62	0.00
28-Oct-92	A-7	10.31	54.71	44.40	0.00
26-Jan-93	A-7	7.33	54.71	47.38	0.00
01-Apr-93	A-7	7.35	54.71	47.36	0.00
06-Aug-93	A-7	12.67	54.71	42.04	0.00
14-Oct-93	A-7	12.52	54.71	42.19	0.00
16-Nov-93	A-7	12.13	54.71	42.58	0.00
16-Dec-93	A-7	10.18	54.71	44.53	0.00
10-Feb-94	A-7	7.40	54.71	47.31	0.00
06-May-94	A-7	8.41	54.71	46.30	0.00
21-Mar-86	A-8	-----	53.61	-----	0.02
07-Jan-88	A-8	-----	53.61	-----	0.18
20-Mar-89	A-8	8.21	53.61	45.93	0.66
24-May-89	A-8	11.41	53.61	43.16	1.20

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18-Aug-89	A-8	10.88	53.61	43.35	0.77
27-Oct-89	A-8	11.66	53.61	43.00	1.31
15-Jan-90	A-8	9.84	53.61	44.47	0.87
04-Apr-90	A-8	11.35	53.61	42.46	0.25
30-Jul-90	A-8	10.48	53.61	44.53	1.75
29-Oct-90	A-8	11.39	53.61	42.30	0.10
16-Jan-91	A-8	11.11	53.61	42.51	0.01
12-Apr-91	A-8	9.16	53.61	44.46	0.01
10-Jul-91	A-8	10.73	53.61	42.89	0.01
21-Oct-91	A-8	10.98	53.61	42.72	0.11
02-Feb-92	A-8	10.80	53.61	43.93	1.40
29-Apr-92	A-8	11.15	53.61	43.50	1.30
29-Jul-92	A-8	11.33	53.77	42.49	0.06
28-Oct-92	A-8	Dry	53.77	-----	-----
26-Jan-93	A-8	Dry	53.77	-----	-----
01-Apr-93	A-8	9.38	53.77	44.39	0.00
06-Aug-93	A-8	Dry	53.77	-----	-----
14-Oct-93	A-8	13.10	53.77	40.67	0.00
16-Nov-93	A-8	Dry	53.77	-----	-----
16-Dec-93	A-8	13.40	53.77	40.37	0.00
10-Feb-94	A-8	8.94	53.77	44.83	0.01
06-May-94	A-8	8.80	53.77	44.63	0.42
20-Mar-89	A-9	6.28	52.96	46.68	0.00
24-May-89	A-9	10.12	52.96	42.84	0.00
18-Aug-89	A-9	9.51	52.96	43.45	0.00
27-Oct-89	A-9	8.56	52.96	44.40	0.00
15-Jan-90	A-9	7.20	52.96	45.76	0.00
04-Apr-90	A-9	8.78	52.96	44.18	0.00
30-Jul-90	A-9	10.16	52.96	42.80	0.00
29-Oct-90	A-9	10.71	52.96	42.25	0.00
16-Jan-91	A-9	10.44	52.96	42.52	0.00
12-Apr-91	A-9	8.69	52.96	44.27	0.00
10-Jul-91	A-9	10.23	52.96	42.73	0.00
20-Sep-91	A-9	10.47	52.96	42.49	0.00
21-Oct-91	A-9	10.39	52.96	42.57	0.00
02-Feb-92	A-9	9.05	52.96	43.91	0.00
29-Apr-92	A-9	9.56	52.96	43.40	0.00
29-Jul-92	A-9	10.43	53.04	42.61	0.00

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28-Oct-92	A-9	N/A	53.04	-----	-----
26-Jan-93	A-9	N/A	53.04	-----	-----
01-Apr-93	A-9	N/A	53.04	-----	-----
06-Aug-93	A-9	N/A	53.04	-----	-----
14-Oct-93	A-9	14.11	53.04	38.93	0.00
16-Nov-93	A-9	N/A	53.04	-----	-----
16-Dec-93	A-9	12.10	53.04	40.94	0.00
10-Feb-94	A-9	8.00	53.04	45.08	0.00
21-Mar-94	A-9	9.62	53.04	43.42	0.00
06-May-94	A-9	9.41	53.04	43.63	0.00
20-Mar-89	A-10	8.52	54.16	45.64	0.00
24-May-89	A-10	11.31	54.16	42.85	0.00
18-Aug-89	A-10	11.82	54.16	42.34	0.00
27-Oct-89	A-10	10.94	54.16	43.22	0.00
15-Jan-90	A-10	9.58	54.16	44.58	0.00
04-Apr-90	A-10	N/A	54.16	-----	----
30-Jul-90	A-10	11.67	54.16	42.49	0.00
29-Oct-90	A-10	12.11	54.16	42.05	0.00
16-Jan-91	A-10	11.60	54.16	42.56	0.00
12-Apr-91	A-10	10.04	54.16	44.12	0.00
10-Jul-91	A-10	11.55	54.16	42.61	0.00
21-Oct-91	A-10	11.79	54.16	42.37	0.00
02-Feb-92	A-10	N/A	54.16	-----	----
29-Apr-92	A-10	10.85	54.16	43.31	0.00
29-Jul-92	A-10	11.84	54.26	42.42	0.00
28-Oct-92	A-10	11.89	54.26	42.37	0.00
26-Jan-93	A-10	10.81	54.26	43.45	0.00
01-Apr-93	A-10	10.85	54.26	43.41	0.00
06-Aug-93	A-10	15.06	54.26	39.20	0.00
14-Oct-93	A-10	15.22	54.26	39.04	0.00
16-Nov-93	A-10	14.70	54.26	39.56	0.00
16-Dec-93	A-10	13.22	54.26	41.04	0.00
10-Feb-94	A-10	9.61	54.26	44.65	0.00
06-May-94	A-10	10.81	54.26	43.45	0.00
20-Mar-89	A-11	8.11	53.75	45.64	0.00
24-May-89	A-11	10.92	53.75	42.83	0.00
18-Aug-89	A-11	11.52	53.75	42.23	0.00
27-Oct-89	A-11	10.63	53.75	43.12	0.00

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15-Jan-90	A-11	9.22	53.75	44.53	0.00
04-Apr-90	A-11	10.85	53.75	42.90	0.00
30-Jul-90	A-11	11.29	53.75	42.46	0.00
29-Oct-90	A-11	11.66	53.75	42.09	0.00
16-Jan-91	A-11	11.31	53.75	42.44	0.00
12-Apr-91	A-11	9.55	53.75	44.20	0.00
10-Jul-91	A-11	11.18	53.75	42.57	0.00
21-Oct-91	A-11	11.24	53.75	42.51	0.00
02-Feb-92	A-11	10.70	53.75	43.05	0.00
29-Apr-92	A-11	10.57	53.75	43.18	0.00
29-Jul-92	A-11	11.33	53.74	42.41	0.00
28-Oct-92	A-11	11.54	53.74	42.20	0.00
26-Jan-93	A-11	9.90	53.74	43.84	0.00
01-Apr-93	A-11	10.11	53.74	43.63	0.00
06-Aug-93	A-11	14.43	53.74	39.31	0.00
14-Oct-93	A-11	14.72	53.74	39.02	0.00
16-Nov-93	A-11		Not Monitored		
16-Dec-93	A-11		Not Monitored		
10-Feb-94	A-11	9.30	53.74	44.44	0.00
06-May-94	A-11	9.94	53.74	43.80	0.00
20-Mar-89	A-12	8.00	52.05	44.05	0.00
24-May-89	A-12	10.35	52.05	41.70	0.00
18-Aug-89	A-12	10.75	52.05	41.30	0.00
27-Oct-89	A-12	10.06	52.05	41.99	0.00
15-Jan-90	A-12	8.88	52.05	43.17	0.00
04-Apr-90	A-12	10.30	52.05	41.75	0.00
30-Jul-90	A-12	10.66	52.05	41.39	0.00
29-Oct-90	A-12	10.90	52.05	41.15	0.00
16-Jan-91	A-12	10.60	52.05	41.45	0.00
12-Apr-91	A-12	9.45	52.05	42.60	0.00
10-Jul-91	A-12	10.56	52.05	41.49	0.00
21-Oct-91	A-12	10.62	52.05	41.43	0.00
02-Feb-92	A-12	10.10	52.05	41.95	0.00
29-Apr-92	A-12	10.19	52.05	41.86	0.00
29-Jul-92	A-12	10.81	52.05	41.24	0.00
28-Oct-92	A-12	10.81	52.05	41.24	0.00
26-Jan-93	A-12	9.48	52.05	42.57	0.00

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01-Apr-93	A-12	10.67	52.05	41.38	0.00
06-Aug-93	A-12	12.95	52.05	39.10	0.00
14-Oct-93	A-12	13.28	52.05	38.77	0.00
16-Nov-93	A-12		Not Monitored		
16-Dec-93	A-12		Not Monitored		
10-Feb-94	A-12	8.66	52.05	43.39	0.00
06-May-94	A-12	9.89	52.05	42.16	0.00
01-Jul-92	A-13	9.93	55.11	45.18	0.00
29-Jul-92	A-13	11.12	55.11	43.99	0.00
28-Oct-92	A-13	10.84	55.11	44.27	0.00
26-Jan-93	A-13	8.99	55.11	46.12	0.00
01-Apr-93	A-13	9.18	55.11	45.93	0.00
06-Aug-93	A-13	13.70	55.11	41.41	0.00
14-Oct-93	A-13	14.02	55.11	41.09	0.00
16-Nov-93	A-13		Not Monitored		
16-Dec-93	A-13		Not Monitored		
10-Feb-94	A-13	9.64	55.11	45.47	0.00
06-May-94	A-13	10.29	55.11	44.82	0.00
01-Jul-92	AR-1	10.27	54.72	44.45	0.00
29-Jul-92	AR-1	11.32	54.72	43.40	0.00
28-Oct-92	AR-1	N/A	54.72	-----	----
26-Jan-93	AR-1	N/A	54.72	-----	----
01-Apr-93	AR-1	N/A	54.72	-----	----
06-Aug-93	AR-1	17.42	54.72	37.30	Product on Sounder
14-Oct-93	AR-1		Well Inaccessible		
16-Nov-93	AR-1	13.76	54.72	40.96	----
16-Dec-93	AR-1	19.44	54.72	35.28	----
10-Feb-94	AR-1	9.00	54.72	45.72	0.00
21-Mar-94	AR-1	10.00	54.72	44.72	0.01
06-May-94	AR-1	19.61	54.72	35.11	Sheen
01-Jul-92	AR-2	11.33	54.77	43.44	0.00
29-Jul-92	AR-2	11.90	54.77	42.87	0.00
28-Oct-92	AR-2	N/A	54.77	-----	----
26-Jan-93	AR-2	N/A	54.77	-----	----
01-Apr-93	AR-2	N/A	54.77	-----	----

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06-Aug-93	AR-2	17.16	54.77	37.61	----
14-Oct-93	AR-2	18.11	54.77	36.66	----
16-Nov-93	AR-2	17.92	54.77	36.85	----
16-Dec-93	AR-2	18.02	54.77	36.75	----
10-Feb-94	AR-2	9.32	54.77	45.45	0.00
21-Mar-94	AR-2	10.36	54.77	44.41	0.00
06-May-94	AR-2	15.14	54.77	39.63	0.00
01-Jul-92	AR-3	10.11	54.19	44.08	0.00
29-Jul-92	AR-3	11.55	54.19	42.64	0.00
28-Oct-92	AR-3	N/A	54.19	-----	----
26-Jan-93	AR-3	N/A	54.19	-----	----
01-Apr-93	AR-3	N/A	54.19	-----	----
06-Aug-93	AR-3	16.12	54.19	38.07	----
14-Oct-93	AR-3		Well Inaccessible		
16-Nov-93	AR-3	16.38	54.19	37.81	----
16-Dec-93	AR-3		Well Inaccessible		
10-Feb-94	AR-3	9.20	54.19	44.99	0.00
21-Mar-94	AR-3	10.80	54.19	43.39	0.00
06-May-94	AR-3	10.54	54.19	43.65	0.00

N/A = Not Accessible.

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Static water-levels corrected for floating product (conversion factor = 0.80).
3. Wells A-3 and A-10 were not monitored on February 2, 1992 due to site construction activities.
4. Wells A-3 and A-6 were not monitored on April 29, 1992 due to site construction activities.
5. Water level data prior to March, 1989 are not available.
6. Depth-to-water from wells AR-1, AR-2, and AR-3 measured on July 1, 1992 were referenced to the top of the casing. These measurements have been adjusted to the top of well box referenced.
7. Well elevations and depth-to-water are referenced to the top of the well box.
8. Wells re-surveyed July 30, 1992.

HISTORICAL GROUNDWATER QUALITY DATABASE
ARCO STATION 4931
731 West MacArthur Boulevard
Oakland, California

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
21-Mar-86	A-2	31000.	----	----	----	----
07-Jan-88	A-2	12000.	920.	1500.	----	4000.
20-Mar-89	A-2	22000.	1200.	1800.	1200.	7700.
24-May-89	A-2	9000.	460.	260.	250.	2400.
18-Aug-89	A-2	14000.	900.	200.	<200.	1300.
27-Oct-89	A-2	16000.	1200.	340.	90.	3100.
15-Jan-90	A-2	9900.	1100.	460.	150.	2900.
04-Apr-90	A-2	16000.	1100.	400.	380.	3900.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
29-Oct-90	A-2	14000.	1100.	210.	66.	2700.
16-Jan-91	A-2	15000.	1200.	800.	190.	4600.
12-Apr-91	A-2	16000	640	290	280	2600
21-Oct-91	A-2	26000	1100	560	81	3900
02-Feb-92	A-2	11000	150	13	91	94
29-Apr-92	A-2	5400	120	16	129	19
30-Jul-92	A-2	590	10	<2.0	<2.0	9.0
29-Oct-92	A-2	77	0.56	<0.50	<0.50	0.51
26-Jan-93	A-2	390	0.87	<0.50	<0.50	4.3
01-Apr-93	A-2	16,000	<10	<10	<10	<10
06-Aug-93	A-2		Purged Dry			
14-Oct-93	A-2	350	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-2	Not	Sampled		Dry	
21-Mar-94	A-2	66	<0.5	<0.5	<0.5	<0.5
06-May-94	A-2	Not	Sampled		Well Obstructed	
21-Mar-86	A-3	1000.	----	----	----	----
07-Jan-88	A-3	250.	2.3	8.	----	21.
20-Mar-89	A-3	230.	1.6	<1.	3.	3.
24-May-89	A-3	170.	0.9	2.	1.	<3.
18-Aug-89	A-3	180.	0.7	1.	<1.	<3.
27-Oct-89	A-3	120.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-3	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-3	88.	1.2	2.0	0.8	4.
30-Jul-90	A-3	120.	8.3	2.9	2.3	12.
29-Oct-90	A-3	780.	10.	27.	18.	85.
16-Jan-91	A-3	69.	2.0	3.5	<0.5	9.6
12-Apr-91	A-3	<30	<0.30	<0.30	<0.30	<0.30
10-Jul-91	A-3	59	<0.30	<0.30	0.50	0.51
21-Oct-91	A-3	56	0.44	0.77	0.41	1.3

HISTORICAL GROUNDWATER QUALITY DATABASE
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SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
01-Feb-92	A-3			Not accessible		
29-Apr-92	A-3			Not accessible		
30-Jul-92	A-3	<50	<0.50	<0.50	<0.50	<0.50
28-Oct-92	A-3	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-3	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-3	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-3	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-3	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-3	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-3	<50	<0.5	<0.5	<0.5	<0.5
21-Mar-86	A-4			Floating product		
07-Jan-88	A-4			Floating product		
20-Mar-89	A-4	360000.	1500.	3700.	6500.	35000.
24-May-89	A-4	1500000.	1000.	2000.	6000.	23000.
18-Aug-89	A-4			Floating product		
27-Oct-89	A-4			Floating product		
15-Jan-90	A-4			Floating product		
04-Apr-90	A-4	40000.	680.	320.	1400.	4900.
30-Jul-90	A-4			Floating product		
29-Oct-90	A-4			Floating product		
16-Jan-91	A-4			Floating product		
12-Apr-91	A-4	1800	<60	90	650	1700
10-Jul-91	A-4	61000	2700	8500	1700	8200
20-Sep-91	A-4	N/A	1200	5300	1500	11000
01-Feb-92	A-4			Floating product		
29-Apr-92	A-4			Floating product		
29-Jul-92	A-4			Floating product		
28-Oct-92	A-4			Floating product		
26-Jan-93	A-4			Floating product		
01-Apr-93	A-4			Floating Product		
06-Aug-93	A-4			Floating Product		
14-Oct-93	A-4	160000	1200	<250	4100	950
10-Feb-94	A-4	56000	220	68	790	700
06-May-94	A-4	18000	210	<30	200	101
21-Mar-86	A-5	88.	----	----	----	----
07-Jan-88	A-5	<50.	0.5	1.	----	4.
20-Mar-89	A-5	60.	0.5	1.	2.	10.
24-May-89	A-5	<50.	0.5	<1.	<1.	<3.
18-Aug-89	A-5	<50.	<0.5	<1.	<1.	<3.

HISTORICAL GROUNDWATER QUALITY DATABASE
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SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
27-Oct-89	A-5	<50.	<0.50	<0.50	<0.50	<1.
15-Jan-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-5	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-5	280.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-5	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-5	<30	<0.30	<0.30	<0.30	0.84
10-Jul-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-5	<30	1.7	<0.30	<0.30	<0.30
29-Apr-92	A-5	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-5	<50	<0.50	<0.50	<0.50	<0.50
28-Oct-92	A-5	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-5	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-5	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-5	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-5	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-5	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-5	<50	<0.5	<0.5	<0.5	<0.5
21-Mar-86	A-6	<10.	----	----	----	----
07-Jan-88	A-6	390.	54.	89.	----	110.
20-Mar-89	A-6	220.	33.	21.	9.	39.
24-May-89	A-6	110.	13.	6.	3.	13.
18-Aug-89	A-6	<50.	2.1	1.	<1.	<3.
27-Oct-89	A-6	55.	3.8	1.6	1.7	6.
15-Jan-90	A-6	100.	12.	2.5	5.5	18.
04-Apr-90	A-6	100.	17.	7.1	5.5	18.
30-Jul-90	A-6	<50.	2.6	<0.5	<0.5	1.2
29-Oct-90	A-6	<50.	0.7	<0.5	<0.5	<0.5
16-Jan-91	A-6	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-6	430	24	5.1	9.4	32
10-Jul-91	A-6	<30	1.4	0.39	0.47	1.5
21-Oct-91	A-6	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-6	<30	2.0	0.40	0.58	1.7
29-Apr-92	A-6		Not accessible			
30-Jul-92	A-6	<50	0.64	<0.50	<0.50	<0.50
28-Oct-92	A-6	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-6	1600	4.8	1.2	14	46
01-Apr-93	A-6	310	4.8	0.74	3.3	8.7

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06-Aug-93	A-6	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-6	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-6	140	2.8	<0.5	2.4	5.6
06-May-94	A-6	61	1.7	<0.5	0.6	1.4
07-Jan-88	A-7	<50.	<0.5	1.	----	4.
20-Mar-89	A-7	<50.	0.9	<1.	<1.	<3.
24-May-89	A-7	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-7	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-7	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-7	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-7	<50.	2.7	7.6	1.1	3.0
16-Jan-91	A-7	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-7	<30	<0.30	<0.30	<0.30	0.48
10-Jul-91	A-7	<30	<0.30	0.49	<0.30	1.2
21-Oct-91	A-7	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-7	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-7	<30	<0.30	<0.30	<0.30	<0.30
29-Jul-92	A-7	<50.	<0.50	<0.50	<0.50	<0.50
28-Oct-92	A-7	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-7	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-7	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-7	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-7	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-7	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-7	<50	<0.5	<0.5	<0.5	<0.5
21-Mar-86	A-8	Floating Product				
07-Jan-88	A-8	Floating Product				
20-Mar-89	A-8	Floating Product				
24-May-89	A-8	Floating Product				
18-Aug-89	A-8	Floating Product				
27-Oct-89	A-8	Floating Product				
15-Jan-90	A-8	Floating Product				
04-Apr-90	A-8	Floating Product				
30-Jul-90	A-8	Floating Product				
29-Oct-90	A-8	Floating Product				
16-Jan-91	A-8	Floating Product				
12-Apr-91	A-8	Floating Product				

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SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
10-Jul-91	A-8		Floating Product			
21-Oct-91	A-8		Floating Product			
01-Feb-92	A-8		Floating Product			
29-Apr-92	A-8		Floating Product			
29-Jul-92	A-8		Floating Product			
28-Oct-92	A-8		Not Accessible			
26-Jan-93	A-8		Not Accessible			
01-Apr-93	A-8		Not Accessible			
06-Aug-93	A-8		Dry			
14-Oct-93	A-8		Not Accessible			
10-Dec-93	A-8	29000000	16000	12000	19000	99000
10-Feb-94	A-8	Not	Sampled		Product	
06-May-94	A-8	Not	Sampled		Product	
07-Jan-88	A-9	300.	45.	14.	---	43.
21-Mar-89	A-9	50.	2.8	1.	1.	3.
24-May-89	A-9	120.	26.	12.	4.	79.
18-Aug-89	A-9	14000.	400.	800.	400.	2000.
27-Oct-89	A-9	1700.	150.	36.	30.	110.
15-Jan-90	A-9	860.	140.	58.	38.	140.
04-Apr-90	A-9	620.	36.	13.	9.4	32.
30-Jul-90	A-9	180.	77.	1.6	2.1	4.2
29-Oct-90	A-9	110.	30.	3.7	4.1	8.3
16-Jan-91	A-9	<50.	15.	<0.5	<0.5	0.6
12-Apr-91	A-9	130	52	0.83	5.3	6.0
10-Jul-91	A-9	<30	7.8	<0.30	<0.30	<0.30
20-Sep-91	A-9	N/A	21	<2.0	<2.0	<2.0
21-Oct-91	A-9	240	63	0.65	5.1	1.6
01-Feb-92	A-9	320	77	0.95	11	6.5
29-Apr-92	A-9	170	52	<0.30	5.6	1.4
30-Jul-92	A-9	<50	14	<0.50	1.7	6.0
28-Oct-92	A-9		Not Accessible			
26-Jan-93	A-9		Not Accessible			
01-Apr-93	A-9		Not Accessible			
06-Aug-93	A-9		Not Accessible			
14-Oct-93	A-9		Not Accessible			
10-Dec-93	A-9	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-9	Not	Sampled		Well Obstructed	
21-Mar-94	A-9	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-9	<50	<0.5	<0.5	<0.5	<0.5

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SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
07-Jan-88	A-10	<50.	0.6	11.	----	4.
20-Mar-89	A-10	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-10	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-10	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-10	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-10	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-10			Not accessible		
30-Jul-90	A-10	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-10	<50.	2.3	6.9	1.2	3.0
16-Jan-91	A-10	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-10	<30	0.67	0.55	<0.30	0.90
10-Jul-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
02-Feb-92	A-10			Not accessible		
29-Apr-92	A-10	<30	<0.30	<0.30	<0.30	<0.30
29-Jul-92	A-10	<50	25	<0.50	<0.50	1.8
28-Oct-92	A-10	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-10	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-10	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-10	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-10	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-10	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-10	<50	<0.5	<0.5	<0.5	<0.5
07-Jan-88	A-11	<50.	1.1	2.	----	5.
20-Mar-89	A-11	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-11	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-11	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-11	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-11	<50.	<0.5	0.6	<0.5	0.5
29-Oct-90	A-11	<50.	0.6	2.4	0.6	1.5
16-Jan-91	A-11	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-11	<30	<0.30	0.37	<0.30	<0.30
10-Jul-91	A-11	<30	0.61	0.46	<0.30	1.0
21-Oct-91	A-11	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-11	<50.	<0.50	<0.50	<0.50	<0.50

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28-Oct-92	A-11	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-11	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-11	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-11	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-11	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-11	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-11	<50	<0.5	<0.5	<0.5	<0.5
07-Jan-88	A-12	<50.	<0.5	2.	---	<4.
20-Mar-89	A-12	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-12	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-12	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-12	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-12	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
10-Jul-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-12	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-12	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-12	<50.	<0.50	<0.50	<0.50	<0.50
28-Oct-92	A-12	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-12	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-12	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-12	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-12	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-12	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-12	<50	<0.5	<0.5	<0.5	<0.5
01-Jul-92	A-13	<50	<0.50	<0.50	<0.50	<0.50
30-Jul-92	A-13	<50	<0.50	<0.50	<0.50	<0.50
28-Oct-92	A-13	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-13	<50	<0.50	<0.50	<0.50	<0.50
01-Apr-93	A-13	<50	<0.50	<0.50	<0.50	<0.50
06-Aug-93	A-13	<50	<0.5	<0.5	<0.5	<0.5
14-Oct-93	A-13	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	A-13	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	A-13	<50	<0.5	<0.5	<0.5	<0.5

HISTORICAL GROUNDWATER QUALITY DATABASE
ARCO STATION 4931
731 West MacArthur Boulevard
Oakland, California

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
01-Jul-92	AR-1	2300	260	150	38	470
29-Jul-92	AR-1	1600	340	180	52	320
28-Oct-92	AR-1		Not Accessible			
26-Jan-93	AR-1		Not Accessible			
01-Apr-93	AR-1		Not Accessible			
06-Aug-93	AR-1		Not Accessible			
14-Oct-93	AR-1		Not Accessible			
10-Dec-93	AR-1	3,400	<25	<25	<25	250
10-Feb-94	AR-1	Not	Sampled		Well Obstructed	
21-Mar-94	AR-1	Not	Sampled		Floating Product	
06-May-94	AR-1	Not	Sampled		Product Sheen	
01-Jul-92	AR-2	<50	<0.50	<0.50	<0.50	<0.50
29-Jul-92	AR-2	350	130	8.5	<10	<10
28-Oct-92	AR-2		Not Accessible			
26-Jan-93	AR-2		Not Accessible			
01-Apr-93	AR-2		Not Accessible			
06-Aug-93	AR-2		Not Accessible			
14-Oct-93	AR-2		Not Accessible			
10-Dec-93	AR-2	<50	<0.5	<0.5	<0.5	<0.5
10-Feb-94	AR-2	Not	Sampled		Well Obstructed	
21-Mar-94	AR-2	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	AR-2	<50	<0.5	<0.5	<0.5	<0.5
01-Jul-92	AR-3	<50	1.8	0.86	<0.50	2.2
29-Jul-92	AR-3	<50	1.6	<0.50	<0.50	<0.50
28-Oct-92	AR-3		Not Accessible			
26-Jan-93	AR-3		Not Accessible			
01-Apr-93	AR-3		Not Accessible			
06-Aug-93	AR-3		Not Accessible			
14-Oct-93	AR-3		Not Accessible			
10-Dec-93	AR-3	<50	<0.5	<0.50	<0.50	<0.50
10-Feb-94	AR-3	Not	Sampled		Well Obstructed	
21-Mar-94	AR-3	<50	<0.5	<0.5	<0.5	<0.5
06-May-94	AR-3	<50	<0.5	<0.5	<0.5	<0.5

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPB = Parts Per Billion.

Notes:
1. All data shown as <x are reported as ND (none detected)
2. Ethylbenzene & Xylenes were combined in 1986 and 1988.
3. Wells A-4 and A-9 were sampled in September, 1991 for water discharge permits for the proposed groundwater treatment system.
4. Wells A-8, A-9, and AR-1 through AR-3 were not sampled on April 1, 1993 due to remediation equipment in the wells.

APPENDIX B

EAST BAY MUNICIPAL UTILITY DISTRICT
DISCHARGE PERMIT

Arco Station No. 4931
Account No. 502-62131
Page No. 1

STANDARD PROVISIONS AND REPORTING REQUIREMENTS CONDITIONS

I. Arco Station No. 4931 located at 731 W.MacArthur in Oakland, shall comply with all items of the attached STANDARD PROVISIONS AND REPORTING REQUIREMENTS, 11/92 Revision.

REPORTING REQUIREMENTS

I. Arco Station No. 4931 shall monitor discharges per the schedule found in the Self-Monitoring and Reporting Requirements, Section IV, on page 3 of this permit.

II. Arco Station No. 4931 shall submit quarterly reports as follows:

Date Due	Reporting Period
January 15, 1994	November 1 through December 31, 1993
April 15, 1994	January through March 31, 1994
July 15, 1994	April 1 through June 30, 1994
October 15, 1994	July 1 through September 30, 1994

1. A summary of the treatment unit self-monitoring results, any other monitoring, and well sample results that occurred during the reporting period.

2. The estimated date that the primary carbon canister breakthrough will occur, using current loading data.

3. Copies of the Facility Inspection Log. This log must include flow totalizer readings from each sample date, maintenance activities performed, description of operational changes, visual observations of the unit for leaks or fouling and offhaul of hazardous wastes.

SD-30.7 2w

I. WASTEWATER DISCHARGE LIMITATIONS

Arco Station No. 4931 shall not discharge wastewater from a side sewer into a community sewer if the strength of the wastewater exceeds the following:

REGULATED PARAMETER	DAILY MAXIMUM, mg/L	
Arsenic	2	mg/L
Cadmium	1	mg/L
Chlorinated Hydrocarbons (Total Identifiable)	0.5	mg/L
Chromium	2	mg/L
Copper	5	mg/L
Cyanide	5	mg/L
Iron	100	mg/L
Lead	2	mg/L
Mercury	0.05	mg/L
Nickel	5	mg/L
Oil and Grease	100	mg/L
Phenolic compounds	100	mg/L
Silver	1	mg/L
Zinc	5	mg/L
pH (not less than)	5.5	S.U.
Temperature	150	°F
Benzene	0.005	mg/L
Toluene	0.012	mg/L
Ethylbenzene	0.005	mg/L
Xylenes	0.011	mg/L

SELF-MONITORING REPORTING REQUIREMENTS

I. Arco Station No. 4931 shall obtain representative samples of the wastewater discharge. The sampling shall be performed according to the frequency and methods outlined below and according to the methods and requirements found in STANDARD PROVISIONS AND REPORTING REQUIREMENTS, 11/92 Revision.

II. Self-monitoring Reports shall contain:

1. Laboratory results.
2. Chain of custody documentation.
3. Signatory requirements.

III. Sample location "A", also known as side sewer no. 1, shall be the sample tap located on the effluent side of the third carbon vessel. Sample location "B" shall be the sample tap located between the second and third carbon vessels. Sample location "D" shall be the sample tap located on the influent side of the first carbon vessel, after the flow meter. The sample location are shown on GeoStrategies, Inc. drawing; job number 7909, plate 3, dated 6/93.

IV. Sample locations "A", "B" and "D" per the following schedule:

Week of November 8, 1993.
Week of January 10, 1994.
Week of April 11, 1994.
Week of July 11, 1994.

V. Parameters to be monitored and sample types:

EPA 8020 - grab sample

VI. All samples must be obtained using containers, collection methods, preservation techniques, holding times and analytical methods set forth in 40 CFR Part 136, except for the 8000 series methods, which are found in U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Test Methods for Evaluating Solid Waste, SW-846.

Arco Station No. 4931
Account No. 502-62131
Page 4

MONITORING and TESTING CHARGES

Total EBMUD Inspections Per Year: 2 @ $510.00 each = $1,020.00 /year

Total Analyses Per Year:

Parameter	Tests per year	Charge per test	Total Charge per year
EPA 624	2	$156.00	$312.00

Monitoring and Testing Charge = $1,332.00 /year
$111.00 /month

WASTEWATER DISPOSAL CHARGE

All wastewater discharged will be charged for treatment and disposal service at the unit rate measured for other carbon treated groundwater discharges.
Current unit rate: $0.31 /Ccf

Volume discharged in Ccf/month = 355 $110.05 /month

WASTEWATER CAPACITY FEE

The capacity fee is calculated by multiplying the monthly wastewater discharge volume by the applicable fee in effect at start-up. Each month, 1/36 of the capacity fee will be charged, until the entire fee has been paid in 3 years.

Discharge volume = 264044 gallons per month
Capacity fee rate = $46.72 /Ccf-month
Capacity fee = $16,492.16 or $458.12 /month

SD-30.7 2/8

WASTEWATER DISCHARGE PERMIT

Terms and Conditions

EBMUD

Arco Station No. 4931
Account No. 502-62131
Page No. 5

FEES AND WASTEWATER CHARGES

The following fees and charges are due when billed by the District:

Permit Fee	$2,260.00
Monthly Monitoring Charges	$111.00
Monthly Wastewater Disposal Charge	$110.05
Monthly Wastewater Capacity Fee	$458.12
Total Monthly Charges =	$679.17

This Permit may be amended to include changes to rates and charges which may be established by the District during the term of this Permit.

AVERAGE WASTEWATER DISCHARGE *

LAST 12 MONTHS	PRECEDING 12 - 24 MONTHS
8735	N/A

* Gallons per calendar day.

AUTHORIZATION

The above named Applicant is hereby authorized to discharge wastewater to the community sewer, subject to said Applicant's compliance with EBMUD Wastewater Control Ordinance, compliance conditions, reporting requirements and billing conditions.

Effective Date: November 2, 1993

Expiration Date: November 1, 1994

Michael Frazer 10/19/93

MANAGER, WASTEWATER DEPARTMENT — DATE

SD-30.2 2/91

EAST BAY MUNICIPAL UTILITY DISTRICT

APPENDIX C

LABORATORY ANALYTICAL REPORTS, CHAIN-OF-CUSTODY FORMS AND FIELD DATA SHEETS FOR THE GROUNDWATER REMEDIATION SYSTEM SAMPLES

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 940- (415) 364-9600 FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520 (510) 686-9600 FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

Gettler Ryan/Geostrategies
6747 Sierra Court, Ste J
Dublin, CA 94568
Attention: Joel Coffman

Project: Arco, 4931-94-4

Enclosed are the results from 3 water samples received at Sequoia Analytical on April 11,1994. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
4D57801	Water, A-Eff.	4/11/94	EPA 5030/8020
4D57802	Water, C-Mid	4/11/94	EPA 5030/8020
4D57803	Water, D-Inf.	4/11/94	EPA 5030/8020

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

Todd Olive
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 940[illegible], (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Gettler Ryan/Geostrategies	Client Project ID:	Arco, 4931-94-4	Sampled: Apr 11, 1994
6747 Sierra Court, Ste J	Sample Matrix:	Water	Received: Apr 11, 1994
Dublin, CA 94568	Analysis Method:	EPA 5030/8020	Reported: Apr 21, 1994
Attention: Joel Coffman	First Sample #:	4D57801	

BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4D57801 A-Eff.	Sample I.D. 4D57802 C-Mid	Sample I.D. 4D57803 D-Inf.	Sample I.D.	Sample I.D.	Sample I.D.
Benzene	0.50	N.D.	N.D.	25			
Toluene	0.50	N.D.	N.D.	2.0			
Ethyl Benzene	0.50	N.D.	N.D.	N.D.			
Total Xylenes	0.50	N.D.	N.D.	21			

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	4/16/94	4/16/94	4/16/94
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	84	92	80

Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Todd Olive
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 940[illegible], (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Gettler Ryan/Geostrategies
6747 Sierra Court, Ste J
Dublin, CA 94568
Attention: Joel Coffman

Client Project ID: Arco, 4931-94-4
Matrix: Liquid
QC Sample Group: 4D57801 -03

Reported: Apr 21, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
MS/MSD Batch#:	G4D72106	G4D72106	G4D72106	G4D72106
Date Prepared:	N.A.	N.A.	N.A.	N.A.
Date Analyzed:	4/16/94	4/16/94	4/16/94	4/16/94
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	97	96	97	97
Matrix Spike Duplicate % Recovery:	98	98	98	97
Relative % Difference:	1.0	2.1	1.0	0.0

LCS Batch#:				
Date Prepared:				
Date Analyzed:				
Instrument I.D.#:				
LCS % Recovery:				
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Todd Olive
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.

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4931-94-4

Chain of Custody

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) Joel Coffman	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 551-7555	Fax no. (Consultant) 551-7888
Consultant name GSI	Address (Consultant) 6747 Sierra Ct Suite B Dublin CA		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
A-Bff		2		+		+	+	4-11-94	11:30	+						9404578					-01
C-Mid		2		+		+	+		11:32	+											-02
D-Inf		2		+		+	+		11:34	+											-03

Special detection Limit/reporting: Standar

Special QA/QC: Standard

Remarks: GSI # 9909.70

Method of shipment: CoR

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	Date 4-11-94 Time 19:14	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 4/11/94 Time 19:15

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

GETTLER-RYAN
GROUNDWATER EXTRACTION SYSTEM DATA SHEET

Job # 9909

Date. 4-11-94

Customer: Arco #4931

Address: 741 ~~4978~~ MacArthur/Ives Oakland CA

Time of Day. 11.00

Individual Well Data Well Number = >	AR-1	AR-2	AR-3	~~AR-9~~	A-8	
Active On Arrival?	Yes	Yes	NC	NC	No	
Active On Departure?	Yes	Yes	NC	No	No	
Flowrate (gpm)	2.40	5.10				
Product Pump Depth (ft.)						
Water Pump Depth (ft.)	20'	20'				
Bailing (product volume)	N/A	N/A				
Where are bailings stored?	Dram					
Sample Taken?						
Lab Analysis Type?						

Total System Data	
System Description (separator, carbon, etc.):	4 pumps - 2 Active 3 carbon vessel
Active or Down on Arrival (why?)	Active
Active On Departure?	Active
Anticipated Restart Date	
Hour Meter	N/A
Flowmeter (total gallons)	3996660
Flowmeter (gpm)	0 - 7.3 gpm
Filter Pressure (psig)	5
Filter Changed Out? (Y or N)	Yes
Electric Meter Reading	72754
Sample Taken ? Where?	Inf Eff Mid
Lab Analysis Type?	

Product Tank Level (prior to bailing)- total: water:

Chemical Additives- name: flowrate: drum level:

Supplies Used/Needed?

Need to steam clean pad to wash down mud & winter sludge need to read water levels to check gradient

Carbon Vessel Data Sampling Points:	A	B	C	D	E other
Pressure At Point (psig)	N/A	N/A	6	8	8
Samples Taken? (Y or N)	Y	N	Y	Y	N
Lab Analysis Type (TPH-G, BTEX, etc.)	BPA 8020				

Comments:

Swept enclosure.

Technician R Chui

GROUNDWATER RECOVERY SYSTEM MONITORING DATA SHEET

Client: Arco #4931 Job#: 9909

Site: 731 Mac Arthur / West Field Technician: Fi Chin

Oakland CA Date: 5-18-94

EXTRACTION WELL #		AE-1	AE2	AE-3	A-9	A-8	
Time							
GW Pump	Active on Arrival (Y/N)	Y	Y	N	N	N	
	Active on Departure (Y/N)	Y	Y	N	N	N	
	Flow Rate (gpm)	0-1	0-3	-	-	-	
	Depth to Water (ft)	11'	11'	-	-	-	
Product Pump	Active on Arrival (Y/N)					N	
	Active on Departure (Y/N)					NO	
	Pump Depth (ft)					9'	
Sampled (Y/N) / ID#		N	N	N	N	N	

SYSTEM	
Active on Arrival (Y/N)	Yes.
Active on Departure (Y/N)	Yes
Re-start Date	-
Flowmeter (gallons)	406246
Instantaneous Flow (gpm)	0-4.0
Electric Meter	73094
dP Across Filter (psig)	3psi AFC 1psi
Filter Replaced (Y/N)	Yes
Product Tank Level - Total (inches)	0"
Product Tank Level - Water (inches)	0"

CARBON VESSELS	INFLUENT (D)	MID-POINT 1 (C)	MID-POINT 2 (B)	EFFLUENT (A)
Pressure (psig)	N/A	N/A	2	7
Sample Taken (Y/N)	N	No	No	No
Analysis				

Comments/Supplies Used: Need Normally closed Float Switch to mate Sump system active again to Be repair 5-21-94 Along with product pumping

GROUNDWATER RECOVERY SYSTEM MONITORING DATA SHEET

Client: ARCO #4931
Site: 731 W. MacArthur
Oakland, CA

Job#: 7909
Field Technician: F. Cline
Date: 6-28-94

EXTRACTION WELL #		AR-1 RW	AR-2	AR-3	RW
	Time	~~13:00~~ 11:30			
GW Pump	Active on Arrival? (Y/N)	Y	Y	N	N
	Active on Departure? (Y/N)	Y	Y	N	N
	Flow Rate (gpm)	0-1 gpm	0-3 gpm	—	—
	Depth to Water (ft)	~~NT~~ 18'	~~NT~~ 18'		
Product Pump	Active on Arrival? (Y/N)	N/A	N/A	N/A	N/A
	Active on Departure? (Y/N)				
	Pump Depth (ft)				
	Sampled? (Y/N) / ID#	N	N		

SYSTEM	
Active on Arrival? (Y/N)	Yes
Active on Departure? (Y/N)	Yes
Re-Start Date	
Flowmeter (gallons)	~~41985~~ 4120050
Instantaneous Flow (gpm)	0-4.1
Electric Meter	~~73694~~ 73604
Filter Pressure (psig)	4 psi
Filter Replaced? (Y/N)	Yes
Product Tank Level - Total (in)	6'
Product Tank Level - Water (in)	2"

CARBON VESSELS	INFLUENT (D)	MIDPOINT (C)	MIDPOINT (B)	EFFLUENT (A)
Time	13:30	11:30	11:30	11:30
Pressure (psig)	4	2	N/A	N/A
Sampled? (Y/N) / ID#	N	N	N	N
Analysis				

Comments: Swept out enclosure removed trash.
Alarm tripped while onsite (Normal filter Blocked)
Reset system

Supplies Used:

APPENDIX D

IWM GROUNDWATER SAMPLING AND MONITORING REPORTS

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

May 26, 1994

Mr. Robert Campbell
Geostrategies
6747 Sierra Court, Suite G
Dublin, CA. 94568

Dear Mr. Campbell:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. A-4931 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on May 6, 1994.

Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

REGISTERED GEOLOGIST
WALTER H. HOWE
No. 730
Exp. 6a/194 Renwd
STATE OF CALIFORNIA

950 AMES AVENUE MILPITAS, CA. 95035 (408) 942-8955

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

Summary of Ground Water Sample Analyses for ARCO Facility A-4931, Oakland, California

WELL NUMBER	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	AR-1	AR-2	AR-3
DATE SAMPLED	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94	5/6/94
DEPTH TO WATER	*	9.42	9.39	9.82	8.07	7.91	8.58	8.84	10.36	10.10	9.31	9.91	18.01	14.90	10.04
SHEEN	*	NONE	NONE	NONE	NONE	NONE	FP	NONE	NONE	NONE	NONE	NONE	HEAVY	NONE	NONE
PRODUCT THICKNESS	*	NA	NA	NA	NA	NA	0.42	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	*	ND	18,000	ND	61	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
BTEX															
BENZENE	*	ND	210	ND	1.7	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
TOLUENE	*	ND	<30	ND	ND	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
ETHLYBENZENE	*	ND	200	ND	0.6	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
XYLENES	*	ND	101	ND	1.4	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND

FOOTNOTES:

Concentrations reported in ug/L (ppb).
TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)
BTEX Distinction (USEPA Method 8020)
PCE = Tetrachloroethene (USEPA Method 8010)
* = Well inaccessible
** = Not sampled per consultant request.

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)
TCE = Trichloroethene (USEAP Method 8010)
ND = Not Detected.
NA = Not applicable.
FP = Floating product.

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 700

Site Departure Time: 1300

Weather Conditions: Cloudy

DTW: (Well Box / or / Well Casing) (circle one) BOTH

Project No.:

Location: 731 W MacArthur

Date: May 6, 1994

Client / Station#: Shell 4931

Field Technician: Vince / Cisco

Day of Week: Friday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y=YES, N=NO)	COMMENTS	MATERIALS
11	A-2	~		N/A	~		N/A	N/A	N/A	N/A	N/A	N/A	LOCKING ACCESS / CAROUSEL WELL	N/A
5	A-3	OK	yes	OK*	OK	OK	10.37 TOBOX	9.42	9.42	N/A	N/A	N	4" TD = 17.15 TOBOX = 10.34 BLACK H2O IN w/ SHEEN BOX	Christy
13	A-4	OK	yes	OK*	OK	OK	N/A	9.39	9.39	N/A	N/A	N	3" TOBOX = 10.02 / TD. = 20.40 NO SHEEN OBSERVED	Christy
7	A-5	OK	yes	OK*	OK	OK	24.01	9.82	9.82	N/A	N/A	N	3" TOBOX = 10.48	Christy
12	A-6	OK	yes	OK*	OK	OK	25.60	8.07	8.07	N/A	N/A	N	3" TOBOX = 8.71	Christy
9	A-7	OK	yes	OK*	OK	OK	22.86	7.91	7.91	N/A	N/A	N	3" TOBOX = 8.41	Christy
14	A-8	OK	yes	OK	OK	OK	N/A	8.58	8.58	8.16	0.42	Y	3" TOBOX = 9.14	GRADING
3	A-9	OK	yes	OK	OK	OK	36.0	8.84	8.84	N/A	N/A	N	6" TOBOX = 9.41 / TOBOX FP = 8.75	GRADING
4	A-10	OK	yes	OK*	OK	OK	30.16	10.36+	10.36+	N/A	N/A	N	3" TOBOX = 10.81 WOOD BOX FILLED W/ BLACK H2O	Christy
2	A-11	OK	yes	OK*	OK	OK	28.12	10.10	10.10	N/A	N/A	N	3" TOBOX = 9.94 H2O IN WOOD BOX	Christy
1	A-12	OK	yes	OK*	OK	OK	29.92	9.31	9.31	N/A	N/A	N	3" TOP OF BOX = 9.89	Christy
8	A-13	OK	yes	OK*	OK	OK	29.40	9.91	9.91	N/A	N/A	N	3" TOBOX = 10.29	Christy
15	AR-1	OK	yes	OK	OK	OK	N/A	18.01	18.01		SHEEN	Y	6" TOBOX 19.61 1" FP MEASURED w/ 3/4 BAILER	GRADING
10	AR-2	OK	yes	OK	OK	OK	27.50	14.90	14.90	N/A	N/A	N	6" TOBOX = 15.74 WELL UNDER VACUUM VALVES	GRADING
6	AR-3	OK	yes	OK	OK	OK	27.20	10.04+	10.04+	N/A	N/A	N	4" TOBOX = 10.54	GRADING

* NK GASKET NOT Required

AGE 2 OF 5 DATE: 5-6-94 CLIENT/STATION #: ARCC 493 ADDRESS: 731 W MacArthur Blvd.

WELL ID: A-4 TD 20.4 - DTW 9.39 x 0.66 (Gal./Linear Ft.) x 3 (Casing/Volume) - 21.79 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1235 END (2400 HR) 1240
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1242 DTW: 18

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1236	2	6.99	0.44	66.9	cloudy
238	8	7.02	0.31	66.4	cloudy
240	9	6.98	0.33	66.1	cloudy

Total purge: 9
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 8 and 9 gallons.

Vincent Calder

WELL ID: AR-2 TD 27.50 - DTW 14.90 x ~~Gal.~~ 1.5 (Gal./Linear Ft.) x 2 (Casing/Volume) - 37.8 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1306 END (2400 HR) 1318
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1321 DTW: 29.7

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1307	4	6.95	0.49	66.2	CLEAR
1311	17	6.94	0.47	65.9	CLEAR
1314	25	6.93	0.46	65.9	CLEAR
1318	36	6.92	0.45	65.8	CLEAR

Total purge: 36
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pump DRY AT 36 GALLONS

Francisco Abungan

WELL ID: _____ TD _____ - DTW _____ x Gal./Linear Ft. _____ x Casing/Volume _____ - Calculated Purge _____

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: _____ TD _____ - DTW _____ x Gal./Linear Ft. _____ x Casing/Volume _____ - Calculated Purge _____

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp
REMARKS:

A-4
PRINT NAME: Vincent Calder

AR-2
SIGNATURE: Francisco Abungan

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

PAGE 3 OF 5 DATE: 5-6-94 CLIENT/STATION #: A 4931 ADDRESS: 731 W MacArthur Blvd

WELL ID: A-13 TD 24.40 DTW 9.91 x 0.38 (Gal./Linear Ft.) x 3 (Casing Volume) = 22.21 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1112 END (2400 HR) 1118
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1120 DTW: 12

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1114	3	7.85	0.70	64.9	clear
1115	9	7.75	0.46	64.7	clear
1116	16	7.49	0.49	64.8	clear
1118	23	7.46	0.48	64.6	clear

Total purge: 23
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-7 TD 22.86 DTW 7.91 x 0.38 (Gal./Linear Ft.) x 3 (Casing Volume) = 17.04 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1129 END (2400 HR) 1131
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1136 DTW: 16

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1130	2	7.29	0.30	65.1	clear
1131	9	7.27	0.27	65.5	clear
1132	12	7.16	0.37	65.3	clear
1134	13	7.15	0.37	64.8	clear

Total purge: 13
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well Pumped dry at 12, and 13 gallon.

WELL ID: A-5 TD 24.01 DTW 9.82 x 0.38 (Gal./Linear Ft.) x 3 (Casing Volume) = 16.17 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1147 END (2400 HR) 1153
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1155 DTW: 16.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1148	2	6.89	0.59	65.8	clear
1150	6	6.90	0.52	65.7	clear
1152	12	6.84	0.58	65.4	clear
1153	16	6.85	0.54	65.3	clear to cloudy

Total purge: 16
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-6 TD 25.60 DTW 8.07 x 0.38 (Gal./Linear Ft.) x 3 (Casing Volume) = 19.96 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1209 END (2400 HR) 1214
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1216 DTW: 14.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1210	2	6.88	0.43	65.7	clear
1212	10	7.03	0.28	65.4	clear
1213	15	6.98	0.36	65.3	clear
1214	20	6.94	0.43	65.1 / 65.1	cloudy

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Valdes SIGNATURE:

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

PAGE 1 OF 2 DATE: 5-6-94 CLIENT/STATION #: Arco 4931 ADDRESS: 731 W MacArthur blvd

WELL ID: A-12 TD 29.92 DTW 9.31 x 0.38 (Gal./Linear Ft.) x 3 (Casing/Volume) - 23.49 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1012 END (2400 HR) 909
DATE SAMPLED: 5-6-94 TIME (2400 HR): 315 DTW: 14.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
904	3	7.03	0.44	64.0	CLEAR
905	10	7.03	0.36	66.0	CLEAR
906	15	7.03	0.43	65.6	CLEAR
909	24	7.07	0.44	64.8	CLEAR

Total purge: 24
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-11 TD 28.12 DTW 10.10 x 0.38 (Gal./Linear Ft.) x 3 (Casing/Volume) - 20.54 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 919 END (2400 HR) 925
DATE SAMPLED: 5-6-94 TIME (2400 HR): 930 DTW: 11

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
921	3	7.04	0.43	66.5	CLEAR
922	10	7.10	0.75	66.4	CLEAR
923	15	7.21	0.75	65.8	CLEAR
925	21	7.18	0.76	65.4	CLEAR

Total purge: 21
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-9 TD 30.0 DTW 8.84 x 1.5 (Gal./Linear Ft.) x 2 (Casing/Volume) - 81.48 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1015 END (2400 HR) 1032
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1040 DTW: 9.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1016	5	7.07	0.63	66.5	CLEAR
1023	35	7.18	0.61	66.3	CLEAR
1028	60	7.14	0.64	65.8	CLEAR
1032	82	7.11	0.61	65.1	CLEAR

Total purge: 82
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-10 TD 30.16 DTW 10.36 x 0.38 (Gal./Linear Ft.) x 3 (Casing/Volume) - 22.57 (Calculated Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1100 END (2400 HR) 1106
DATE SAMPLED: 5-6-94 TIME (2400 HR): 1115 DTW: 11

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1101	3	6.91	0.65	66.2	CLEAR
1103	10	6.94	0.62	65.7	CLEAR
1104	16	6.93	0.60	65.3	CLEAR
1106	23	6.94	0.62	65.1	CLEAR

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Mungaray SIGNATURE: Francisco Mungaray

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

PAGE 5 OF -- DATE: 5-6-94 CLIENT/STATION #: A 4931 ADDRESS: 731 W. MacArthur

WELL ID: AR-3 TD 2720 - DTW 10.04 x Gal. 0.66 (Linear Ft.) x Casing 5 (Volume) - Calculated 33.97 (Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1131 END (2400 HR) 1135

DATE SAMPLED: 5-6-94 TIME (2400 HR): 1145 DTW: 10.4

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1132	4	6.55	0.48	67.3	CLEAR
1133	12	6.89	0.55	67.1	CLEAR
1136	23	6.90	0.59	66.7	CLEAR
1139	34	6.92	0.63	66.5	CLEAR

Total purge: 34

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: A-3 TD 1715 - DTW 9.42 x Gal. 0.66 (Linear Ft.) x Casing 5 (Volume) - Calculated 15.88 (Purge)

DATE PURGED: 5-6-94 START (2400 HR): 1204 END (2400 HR)

DATE SAMPLED: 5-6-94 TIME (2400 HR): 1210 DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1205	3	6.58	0.11	67.3	CLEAR
1206	5	6.59	0.14	67.3	CLEAR

Total purge: 5

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS: WELL PUMPED DRY AT 5 GALLONS

WELL ID: TD - DTW x Gal. (Linear Ft.) x Casing (Volume) - Calculated (Purge)

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge:

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: TD - DTW x Gal. (Linear Ft.) x Casing (Volume) - Calculated (Purge)

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge:

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

PRINT NAME: Francisco Abarca SIGNATURE: Francisco Abarca

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

Columbia Analytical Services inc.

May 20, 1994 Service Request No. SJ940560

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 4931**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on May 10, 1994. For your reference, these analyses have been assigned our service request number SJ940560.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Carol J Klein

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/drf

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Service Request:	SJ940560

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: µg/L(ppb)

		Sample Name:	A-3 (15.5)	A-4 (18)	A-5 (16.5)
		Lab Code:	SJ940560-2	SJ940560-3	SJ940560-4
		Date Analyzed:	5/16/94	5/17/94	5/16/94
Analyte	**MRL**				
Benzene	0.5		ND	210	ND
Toluene	0.5		ND	<30*	ND
Ethylbenzene	0.5		ND	200	ND
Total Xylenes	0.5		ND	101	ND
TPH as Gasoline	50		ND	18,000	ND

* Raised MRL due to matrix interference.

Approved By: Carol J Klein Date: 5-20-94

3S22/041594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Service Request:	SJ940560

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: µg/L(ppb)

	Sample Name:	**A-6 (14.8)**	**A-7 (16)**	**A-9 (9.1)**
	Lab Code:	SJ940560-5	SJ940560-6	SJ940560-7
	Date Analyzed:	5/16/94	5/16/94	5/16/94
Analyte	**MRL**			
Benzene	0.5	1.7	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	0.6	ND	ND
Total Xylenes	0.5	1.4	ND	ND
TPH as Gasoline	50	61	ND	ND

* Raised MRL due to matrix interference.

Approved By: Carol Klein Date: 5-20-94

3S22/041594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Service Request:	SJ940560

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: µg/L(ppb)

Sample Name:	**A-10 (11)**	**A-11 (11.6)**	**A-12 (14.9)**
Lab Code:	SJ940560-8	SJ940560-9	SJ940560-10
Date Analyzed:	5/16/94	5/16/94	5/16/94

Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

* Raised MRL due to matrix interference.

Approved By: Carol Klein Date: 5-20-94

3S22/041594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Service Request:	SJ940560

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: µg/L(ppb)

Sample Name:	**A-13 (18)**	**AR-2 (20.7)**	**AR-3 (10.4)**
Lab Code:	SJ940560-11	SJ940560-12	SJ940560-13
Date Analyzed:	5/16/94	5/16/94	5/16/94

Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

* Raised MRL due to matrix interference.

Approved By: Carol Klein Date: 5-20-94

3S22/041594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Service Request:	SJ940560

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: µg/L(ppb)

		Sample Name:	**Method Blank**	**Method Blank**
		Lab Code:	SJ940516-WMB	SJ940517-WMB
		Date Analyzed:	5/16/94	5/17/94
Analyte	**MRL**			
Benzene	0.5		ND	ND
Toluene	0.5		ND	ND
Ethylbenzene	0.5		ND	ND
Total Xylenes	0.5		ND	ND
TPH as Gasoline	50		ND	ND

* Raised MRL due to matrix interference.

Approved By: Carol Klein Date: 5-20-94

3S22/041594

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Date Analyzed:	5/16, 17/94
		Service Request:	SJ940560

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotolulene
A-3 (15.5)	SJ940560-2	109
A-4 (18)	SJ940560-3	112*
A-5 (16.5)	SJ940560-4	106
A-6 (14.8)	SJ940560-5	110
A-7 (16)	SJ940560-6	100
A-9 (9.1)	SJ940560-7	102
A-10 (11)	SJ940560-8	101
A-11 (11.6)	SJ940560-9	101
A-12 (14.9)	SJ940560-10	101
A-13 (18)	SJ940560-11	101
AR-2 (20.7)	SJ940560-12	100
AR-3 (10.4)	SJ940560-13	99
A-3 (15.5) MS	SJ940560-2MS	105*
A-3 (15.5) DMS	SJ940560-2DMS	113*
Method Blank	SJ940516-WMB	109
Method Blank	SJ940517-WMB	100

CAS Acceptance Limits: 69-116

* The surrogate used for this sample was 4-Bromofluorobenzene.

Approved By: Carol Klein Date: 5-20-94

SUR1/041594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Analyzed:**	5/16/94
Project:	ARCO Facility No. 4931	**Service Request:**	SJ940560

Initial Calibration Verification (ICV) Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.5	102	85-115
Toluene	25	25.3	101	85-115
Ethylbenzene	25	25.1	100	85-115
Total Xylenes	75	77.2	103	85-115
TPH as Gasoline	250	254	102	90-110

Approved By: Carol Klein Date: 5-20-94

ICV24/041594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Collected:**	5/6/94
Project:	ARCO Facility No. 4931	**Date Received:**	5/10/94
Sample Matrix:	Water	**Date Extracted:**	NA
		Date Analyzed:	5/16/94
		Service Request:	SJ940560

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Method 5030/California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: A-3 (15.5)
Lab Code: SJ940560-2

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
TPH as Gasoline	250	250	ND	260	264	104	106	67-121	2

Approved By: Carol Klein Date: 5-20-94

DMS1S/041594

APPENDIX B

CHAIN OF CUSTODY

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-SCC

Chain of Custody

ARCO Facility no. A4931	City (Facility) OAKLAND	Project manager (Consultant) DM DeTar / B. Seminski	Laboratory name Columbia
ARCO engineer Mike Wheeland	Telephone no. (ARCO) 415 571 2431	Telephone no. (Consultant) 408/942/8855	Fax no. (Consultant) 408/942/1499	Contract number 07077
Consultant name IWM/GSI	Address (Consultant) 950 Ames av. Mtn. Ca 95035		Method of shipment CAS COURIER

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☑ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
FB-1	1	2		✓		✓	✓	5-6-94	645		✓	✓									
A-3	2	2		✓		✓	✓		1210		✓	✓									
A-4	3	2		✓		✓	✓		1242		✓	✓									
A-5	4	2		✓		✓	✓		1155		✓	✓									
A-6	5	2		✓		✓	✓		1216		✓	✓									
A-7	6	2		✓		✓	✓		1136		✓	✓									
A-9	7	2		✓		✓	✓		1040		✓	✓									
A-10	8	2		✓		✓	✓		1115		✓	✓									
A-11	9	2		✓		✓	✓		930		✓	✓									
A-12	10	2		✓		✓	✓		915		✓	✓									
A-13	11	2		✓		✓	✓		1120		✓	✓									
AR-2	12	2		✓		✓	✓		1321		✓	✓									
AR-3	13	2		✓		✓	✓		1145		✓	✓									

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB-1

Lab number: 5194-0560

Turnaround time

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

Condition of sample: Good		Temperature received: Cool	
Relinquished by sampler	Date 5/10/94	Time 3:10PM	Received by
Relinquished by	Date 5/10/94	Time 1600	Received by
Relinquished by	Date	Time	Received by laboratory CAS/BS Date 5/10/94 Time 1600

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

APPC-3292 (2-91)