TRANSMITTAL

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DATE: June 30, 1994
PROJECT #: 7909.70
SUBJECT: Remedial System Evaluation - First Quarter 1994 at ARCO Station 4931

FROM:
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cc: **Ms. Susan Hugo, Alameda County Health Care Services Agency**
Mr. Richard Hiett, Regional Water Quality Control Board

GeoStrategies Inc.

REMEDIAL SYSTEM EVALUATION
FIRST QUARTER 1994

at

ARCO Station 4931
731 West MacArthur Boulevard
Oakland, California

790970-25

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

by
GeoStrategies Inc.

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REGISTERED GEOLOGIST
STEPHEN J. CARTER
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June 27, 1994

GeoStrategies Inc.

June 27, 1994

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

Subject: **RECOVERY SYSTEM EVALUATION REPORT, FIRST QUARTER 1994** at 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 Recovery System Evaluation Report for the First Quarter 1994. This report evaluates the performance of the interim groundwater remediation system at the above referenced site (Figure 1) for the period from January 1994 through March 1994.

1.0 SITE BACKGROUND

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 (Figure 2). These wells were installed between 1982 and 1992 by Groundwater Technology, Inc., 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.

Quarterly monitoring and sampling of site wells began in 1989. Groundwater samples for the first quarter 1994 were collected from wells A-2 through A-7, A-10 through A-13, AR-2, and AR-3 by Integrated Wastestream Management (IWM) of Milpitas, California. Historical water-level data and a groundwater quality database are presented in Appendix A. Monthly water samples were collected from the interim groundwater remediation system influent (sample D), midpoint (between carbon canisters [sample ports B and C]), and effluent (sample port A) during the first quarter 1994 by Gettler-Ryan Inc. (G-R) of Dublin, California. The interim groundwater remediation system process flow diagram is shown on Figure 3.

6747 Sierra Court, Suite. G • Dublin, CA 94568 • (510) 551-8777 • Fax (510) 551-7888
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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. 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; Model No. 16E4; 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 removed 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 FIRST QUARTER 1994 ACTIVITIES

A summary of activities and findings associated with the 1994 first quarter system evaluation are presented below:

- The groundwater monitoring wells A-2 through A-13 were monitored and wells A-3 through A-7, A-10 through A-13 were sampled by IWM on February 10, 1994. IWM monitored and sampled recovery wells A-9, and AR-1 through AR-3 on March 21, 1994. Groundwater samples collected from the wells were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). In addition, the sample from well A-2 was analyzed for total oil and grease (TOG) and lead.

- Benzene was detected in wells A-4 (220 parts per billion [ppb]) and A-6 (2.8 ppb, respectively) during this period.

- Groundwater recovery wells AR-1 and AR-2 were activated on February 18, 1994.

- The groundwater remediation system was inspected and flowmeter readings were recorded on January 13, and March 13, 1994.

- Influent (D), mid-point (B & C), and effluent (A) water samples from the groundwater treatment system were collected on January 13, 1994 and analyzed for TPH-G and BTEX.

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 requires sampling the groundwater remediation system influent, mid-point B (between the second and third GAC vessels) and effluent on a quarterly basis. To provide data on system performance, midpoint C (between the first and second GAC carbon vessels) was sampled concurrently. Samples from these locations were collected on January 13, 1994 and analyzed for TPH-G and BTEX using EPA Methods 5030/8015 Mod./8020 by Sequoia Analytical (Sequoia), a California State-certified laboratory located in Redwood City, California (Hazardous Waste Testing Laboratory #1210). 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 January 13, and March 13, 1994.

4.2 Interim Groundwater Remediation System Performance

Since this system began operation on November 10, 1992, approximately 3,974,310 gallons of groundwater have been extracted and treated. Approximately 299,700 gallons of groundwater were treated and discharged during the first quarter of 1994. Water was pumped from the recovery wells AR-1 and AR-2 at a flow rate ranging from 2.26 to 5.32 gallons per minute (gpm) beginning February 18, 1994.

Analytical laboratory results from the groundwater remediation system influent (D) for January 13, 1994 indicated detectable concentrations of TPH-G (74 parts per billion [ppb]) and benzene (4.5 ppb). TPH-G and benzene were reported as not detected in the effluent (A) and both midpoint samples (B & C), (less than 50 ppb TPH-G and 0.5 ppb benzene). Sample analyses indicate that the system effluent meets the requirements of the EBMUD discharge permit.

Based on the flow rates and sample analytical data, approximately 0.185 pounds (0.031 gallons) of TPH-G were recovered during the first quarter 1994, and approximately 1.381 pounds (0.230 gallons) of TPH-G have been recovered since operation of the system began. Approximately 0.011 pounds (0.0015 gallons) of benzene were recovered during the first quarter 1994, and approximately 0.344 pounds (0.048 gallons) of benzene have been recovered to date.

Flow data, TPH-G and benzene analytical data, recovery 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.

4.2 Interim Groundwater Remediation System Carbon Loading

On December 30, 1993, the first granular activated carbon vessel had a calculated remaining bed capacity of 99.00%. On March 13, 1994, the first carbon vessel had a calculated remaining bed capacity of 98.85%. Approximately 0.15% of the first carbon vessel's capacity was utilized between December 30, 1993 and March 13, 1994. Carbon loading calculations assume an eight percent isotherm, and are presented in Table 1.

5.0 FIRST 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-2 through A-13 and AR-1 through AR-3 on February 10, 1994, and on wells A-2, A-9, AR-1 through AR-3 on March 21, 1994. Static groundwater levels were measured from the surveyed top of each well box and recorded to the nearest +/-0.01 foot. Groundwater measurements were referenced to Mean Sea Level (MSL) datum, and are presented with DTW level measurements 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 generating a depression in the shallow groundwater beneath most of the site.

Each well was checked for the presence of floating product. Floating product was detected in well A-8 on February 10, 1994, and in well AR-1 on March 21, 1994, at a thickness of 0.01 foot in each well. Floating product was not detected 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 the groundwater monitoring wells A-3 through A-7 and A-10 through A-13 on February 10, and wells A-9 and AR-2 through AR-3 on March 21, 1994. Wells A-8 and AR-1 were not sampled due to the presence of floating product. 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. Additionally, the groundwater sample from well A-2 was analyzed for TOG by Standard Method 5520 and lead by EPA Method 239.2.

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 wells A-2 (66 ppb), A-4 (56,000 ppb), and A-6 (140 ppb), while benzene was detected in wells A-4 (220 ppb) and A-6 (2.8 ppb), respectively. TOG was reported as not detected (less than 5 parts per million [ppm]) in the sample from A-2, and lead was detected at a concentrations of 62 ppb.

Results of current analytical data are summarized on Table 1. Groundwater Analytical Data and historical analytical data are presented

in Appendix A. TPH-G and benzene data are plotted on Figure 5, TPH-G/Benzene Concentration Map. The IWM Groundwater Sampling and Monitoring Reports are included in Appendix D.

Concentrations of TPH-G have decreased in wells A-2 and A-4 from fourth quarter 1993 levels of 350 ppb and 160,000 ppb to 66 ppb and 56,000 ppb, and increased in well A-6 from not detected to 140 ppb during the first quarter 1994. Concentrations of benzene have decreased in well A-4 from 1,200 ppb to 220 ppb and increased in well A-6 from not detected to 2.8 ppb during the same period.

6.0 DISCUSSION

The interim groundwater remediation system began operation on November 10, 1992. During first quarter 1994, the system was 100% operational from February 1 to March 31, 1994. The interim remediation system pumped approximately 299,700 gallons of groundwater and recovered approximately 0.185 pounds (0.031 gallons) of TPH-G. On March 13, 1994, carbon loading calculations indicate the first carbon vessel had a remaining bed capacity of 98.85%. Nondetectable concentrations of TPH-G and benzene in the groundwater treatment system effluent during first quarter 1994 indicate that the groundwater extraction and treatment system is efficiently removing dissolved hydrocarbons from the groundwater prior to discharge to the sanitary sewer.

7.0 ACTIVITIES PLANNED FOR SECOND QUARTER 1994

- Perform operation and maintenance duties for 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.

Table 1. Groundwater Remediation System Performance Data
Table 2. Current Groundwater Data

Figure 1. Vicinity Map
Figure 2. Site Plan
Figure 3. Process Flow Diagram
Figure 4. Potentiometric Map (February 10, 1994)
Figure 5. TPH-G/Benzene Concentration Map

Appendix A: Historical Water-Level Data and Groundwater Quality Database
Appendix B: East Bay Municipal Utility District Discharge Permit
Appendix C: Laboratory Analytical Reports, Chain-of-Custody Forms and Field Data Sheets for the Groundwater Remediation System Samples
Appendix D: IWM Groundwater Sampling and Monitoring Reports

TABLES

Table 1

Groundwater Remediation System Performance Data
ARCO Station 4931
Oakland, California

Date		1/13/94	3/13/94
Flow Data			
Flow Meter Reading (gallons)		3,783,120	3,975,520
Average Daily Flow (gpd)		7,664	3,261
Average Flow Rate (gpm)		5.32	2.26
Total Flow to Date (gallons)		3,781,910	3,974,310
Laboratory Results for Influent			
TPH-G (ug/L)		74	NS
Detection Limit (ug/L)		50	NS
Benzene (ug/L)		4.5	NS
Detection Limit (ug/L)		0.5	NS
Laboratory Results for Effluent			
TPH-G (ug/L)		ND	NS
Detection Limit (ug/L)		50	NS
Benzene (ug/L)		ND	NS
Detection Limit (ug/L)		0.5	NS
Recovery Data			
TPH-G Periodic Recovery (lbs)		0.0661	0.1186
TPH-G Recovered to Date (lbs)		1.2627	1.3812
TPH-G Recovered to Date (gallons)		0.2104	0.2302
Benzene Periodic Recovery (lbs)		0.0040	0.0072
Benzene Recovered to Date (lbs)		0.3363	0.3436
Benzene Recovered to Date (gallons)		0.0464	0.0474
Carbon Loading			
Primary Bed Capacity Remaining (%)		98.95%	98.85%
Carbon Weight (lbs) =	1,500		
Date Last Changed =	11/16/92		

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

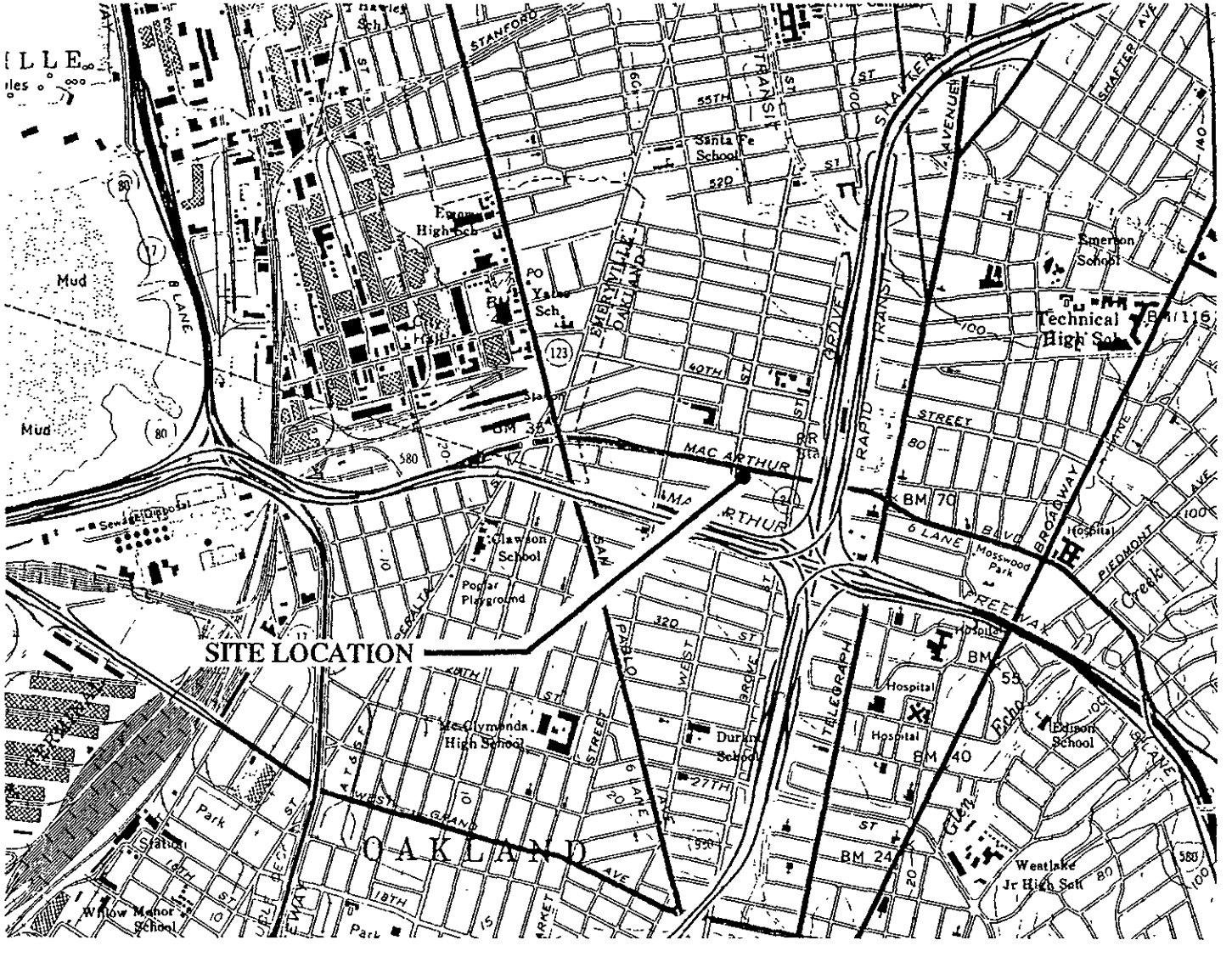
CURRENT GROUNDWATER DATA
ARCO Station 4931

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	10-Feb-94	----		Not Sampled		Purged Dry				55.48	4.88	0.00	50.60
	21-Mar-94		66	<0.5	<0.5	<0.5	<0.5	<5	62	55.48	4.94	0.00	50.54
A-3	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.66	9.20	0.00	45.46
A-4	10-Feb-94	22-Feb-94	56,000	220	68	790	700	NA	NA	54.73	9.30	0.00	45.43
A-5	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.17	8.94	0.00	45.23
A-6	10-Feb-94	22-Feb-94	140	2.8	<0.5	2.4	5.6	NA	NA	55.17	7.53	0.00	47.64
A-7	14-Oct-93	24-Oct-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.71	7.40	0.00	47.31
A-8	10-Feb-94	----		Not Sampled		Product				53.77	8.95	0.01	44.83
A-9	10-Feb-94	----		Not Sampled		Pump in Well				53.04	8.00	0.00	45.04
	21-Mar-94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA	53.04	9.62	0.00	43.42
A-10	10-Feb-94	23-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.26	9.61	0.00	44.65
A-11	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	53.74	9.30	0.00	44.44
A-12	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	52.05	8.66	0.00	43.39
A-13	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	55.11	9.64	0.00	45.47
AR-1	10-Feb-94	----		Not Sampled		Pump in Well				54.72	9.00	0.00	45.72
	21-Mar-94			Not Sampled		Floating	Product			54.72	10.01	0.01	44.71
AR-2	10-Feb-94	----		Not Sampled		Pump in Well				54.77	9.32	0.00	45.45
	21-Mar-94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.77	10.36	0.00	44.41
AR-3	10-Feb-94	----		Not Sampled		Pump in Well				54.19	9.20	0.00	44.99
	21-Mar-94		<50	<0.5	<0.5	<0.5	<0.5	NA	NA	54.19	10.80	0.00	43.39
MB	10-Feb-94	22-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---
MB	10-Feb-94	23-Feb-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---
MB	21-Mar-94	28-Mar-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---
MB	21-Mar-94	29-Mar-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	---	---	---	---
MB	21-Mar-94	30-Mar-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).
3. Static water levels corrected for floating product (conversion factor = 0.80).

FIGURES



N

0 2000

Scale in Feet

Base Map: USGS Topographic Map

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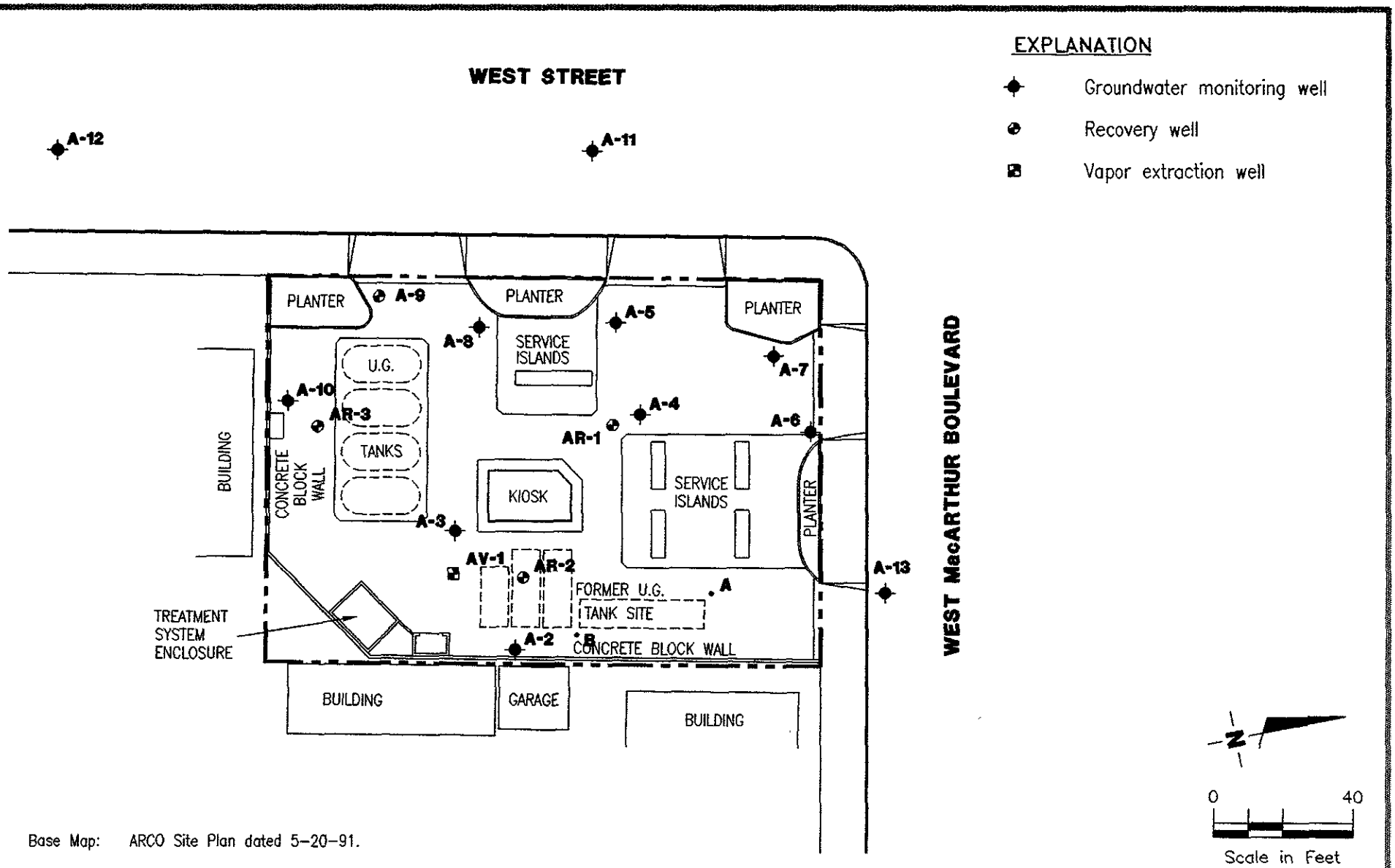
VICINITY MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/91	



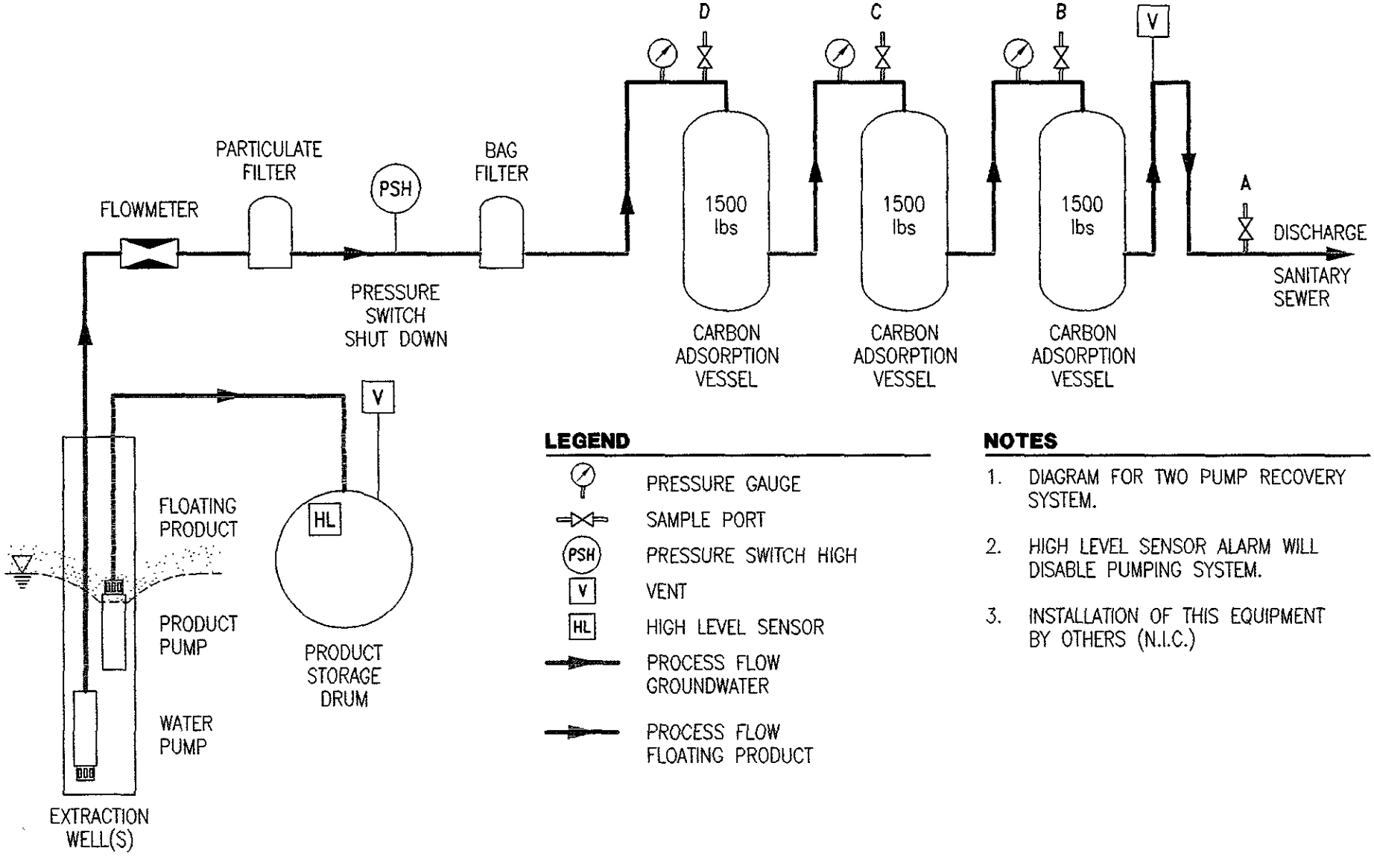
Base Map: ARCO Site Plan dated 5-20-91.

GeoStrategies Inc.

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

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790970-25		6/94	



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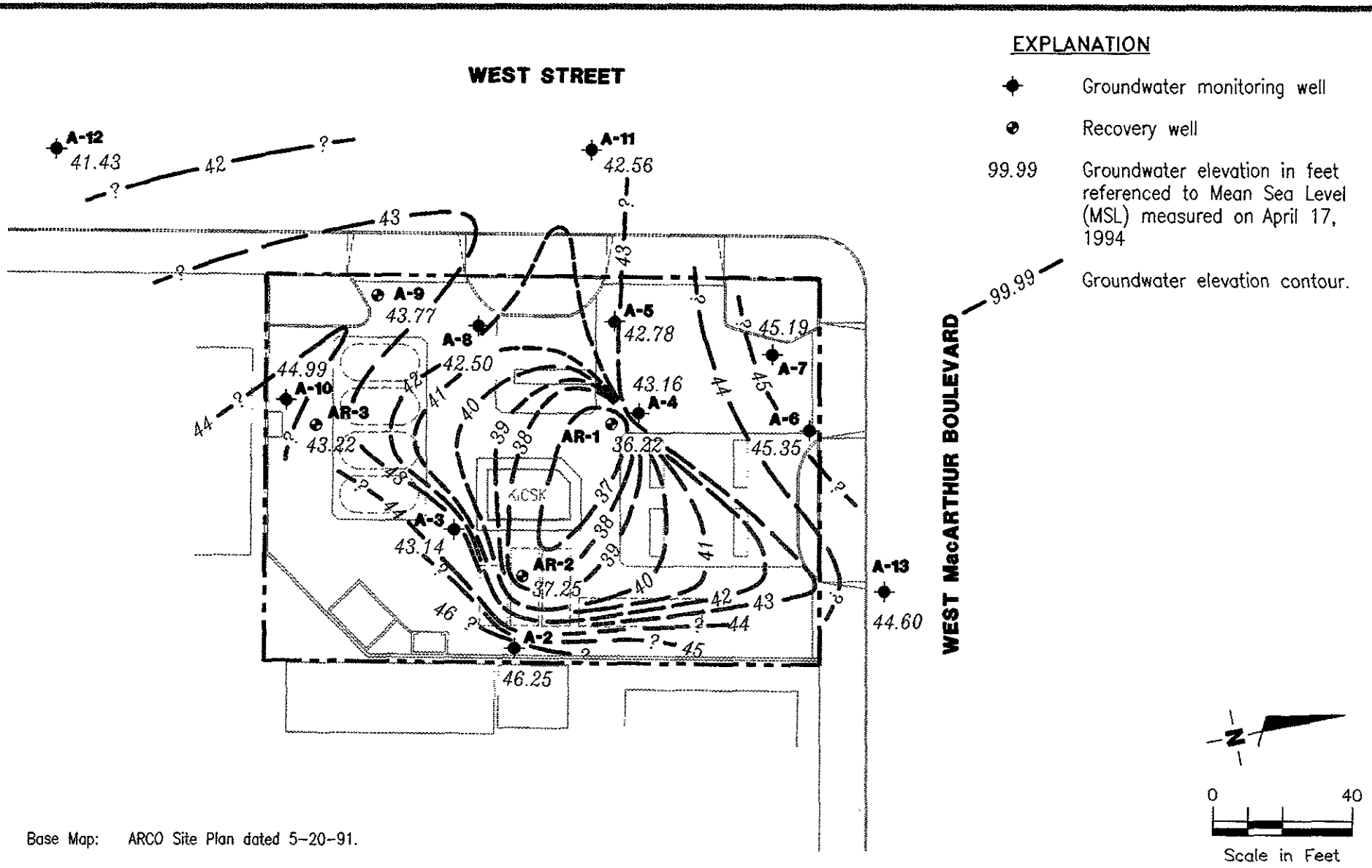
PROCESS FLOW DIAGRAM
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

FIGURE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790970-25		6/94	



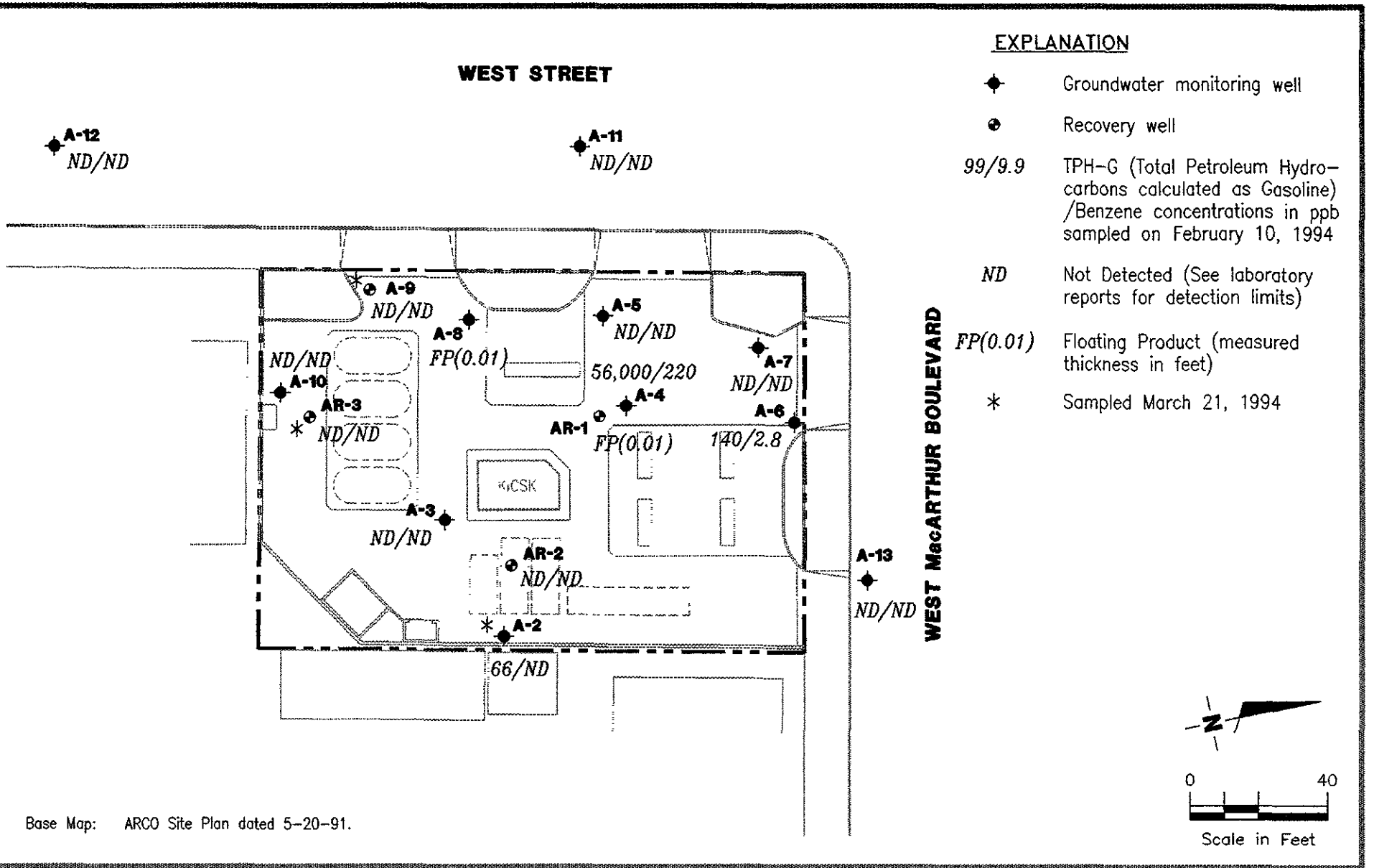
Base Map: ARCO Site Plan dated 5-20-91.

GeoStrategies Inc.

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

FIGURE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790970-25		6/94	



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
790970-25		6/94	

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
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	-----	----
29-Apr-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-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
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
28-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
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

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)
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
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	-----	----
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

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)
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
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
21-Mar-88	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
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

HISTORICAL WATER-LEVEL DATA
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MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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
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
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	-----	-----

HISTORICAL WATER-LEVEL DATA
ARCO STATION 4931
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Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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
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
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
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

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)
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
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
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
01-Jul-92	A-13	9.93	55.11	45.18	0.00

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-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
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
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	-----	----
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
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	-----	----

HISTORICAL WATER-LEVEL DATA
ARCO STATION 4931
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Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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

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
28-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
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
01-Feb-92	A-3		Not accessible			

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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
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
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.
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.

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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
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
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
07-Jan-88	A-7	<50.	<0.5	1.	----	4.

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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
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				
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				

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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	
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.
16-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
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.
16-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

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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
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	0.8	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
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
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.

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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
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
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	
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

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)
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
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

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

EAST BAY
MUNICIPAL UTILITY DISTRICT

MICHAEL J. WALLIS
DIRECTOR OF WASTEWATER

OCT 21 1993

GeoStrategies Inc.

CERTIFIED MAIL
(Return Receipt Requested)
No. P790 282 903

October 20, 1993

Michael R. Whelan
ARCO Products Company
P.O. Box 5811
San Mateo, CA 94402

Dear Mr. Whelan;

Re: Wastewater Discharge Permit (Account No. 502-62131)

Enclosed is the Wastewater Discharge Permit for your facility, effective November 2, 1993, through November 1, 1994. Please read the Permit Terms and Conditions and the attached Standard Provisions and Reporting Requirements. You are responsible for complying with all Permit conditions and requirements.

Arco Products Company shall report to the Source Control Division any changes, either permanent or temporary, to the premise or operation that significantly affect either the volume or quality of wastewater discharged or deviate from the Terms and Conditions under which this Permit is granted.

If you have any questions regarding this matter, please contact Stan Archacki of the Source Control Division at 287-0333.

Sincerely,

JOSEPH G. DAMAS, JR.
Manager of Source Control

JGD:SAA:dlp

SC3.157_123

Enclosures

cc: Matthew Donohue
GeoStrategies Inc.
2140 West Winton Avenue
Hayward, CA 94545

909-M

WASTEWATER DISCHARGE PERMIT APPLICATION

EBMUD

PERMIT NUMBER
502-62131

APPLICANT BUSINESS NAME

ARCO Products Company

ADDRESS OF PREMISE DISCHARGING WASTEWATER	BUSINESS MAILING ADDRESS
731 West MacArthur Boulevard (STREET ADDRESS)	P.O. Box 5811 (STREET ADDRESS)
Oakland, CA (CITY)	San Mateo, CA (CITY) 94402 (ZIP CODE)

CHIEF EXECUTIVE OFFICER

Michael R. Whelan (NAME)	Environmental Engineer (TITLE)
P.O. Box 5811 (STREET ADDRESS)	San Mateo (CITY) 94402 (ZIP CODE)

PERSON TO BE CONTACTED ABOUT THIS APPLICATION	PERSON TO BE CONTACTED IN EVENT OF EMERGENCY
Matthew E. Donohue (NAME)	Bob Herron (NAME)
Project Engineer (TITLE) (510) 352-4800 (PHONE)	(510) 783-7500 (DAY PHONE) (510) 783-7500 (NIGHT PHONE)

DOCUMENTATION TO BE RETURNED WITH THE PERMIT APPLICATION:

- ☐ PROCESS DESCRIPTION
- ☐ DESCRIPTION OF TREATMENT SYSTEM
- ☐ WATER BALANCE CALCULATIONS
- ☐ SELF-MONITORING METHOD
- ☐ WASTEWATER STRENGTH DATA BASE
- ☐ SPILL PREVENTION AND CONTAINMENT PLAN
- ☐ SCHEMATIC FLOW DIAGRAM
- ☐ A LIST OF ALL ENVIRONMENTAL PERMITS (E.G. Air, Hazardous Waste)
- ☐ BUILDING LAYOUT PLAN
- ☐ OTHER _____ (SPECIFY)

PROVISIONS

Applicant will comply with the EBMUD Wastewater Control Ordinance and all applicable rules and regulations.

Applicant will report to EBMUD, Wastewater Department any changes, permanent or temporary, to the premise or operations that significantly change the quality or volume of the wastewater discharge or deviation from the terms and conditions under which this permit is granted.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that the qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael R. Whelan
NAME (See certification requirements on reverse)

Michael R. Whelan
SIGNATURE

Environmental Engineer
TITLE

September 2, 1993
DATE

EBMUD

ARCO Products Company
BUSINESS NAME

Process Description

PURPOSE — The Process Description is intended to provide a description of the primary business activities and the substances which may enter into the wastewater from the business activity.	EBMUD USE Permit Number 502-62131
BUSINESS ACTIVITY Groundwater Extraction System	Business Classification Code 4950

DESCRIPTION OF PRODUCT

TYPE OF PRODUCT OR BRAND NAME	QUANTITIES (gallons)	
	Past Calendar Year	Estimated This Year
Extracted Groundwater	563,590	3,190,000

PROCESS DESCRIPTION

PROCESS DESCRIPTION List all wastewater generating operations	CHARACTERISTICS List all substances that may be discharged to the sewer.
Example: Rinsewater from electroplating bath	Cr, Cu, Ni, Zn
Example: Washdown of milk filling area	fatty acids, milk
Carbon Treated Extracted Groundwater	None

DISCHARGE PERIOD (24 hours)

a. Time of day from 12 am to 12 am

b. Days of the week 7

BATCH DISCHARGE(S) None

a. Day(s) of the week ______ b. Time(s) of the day ______

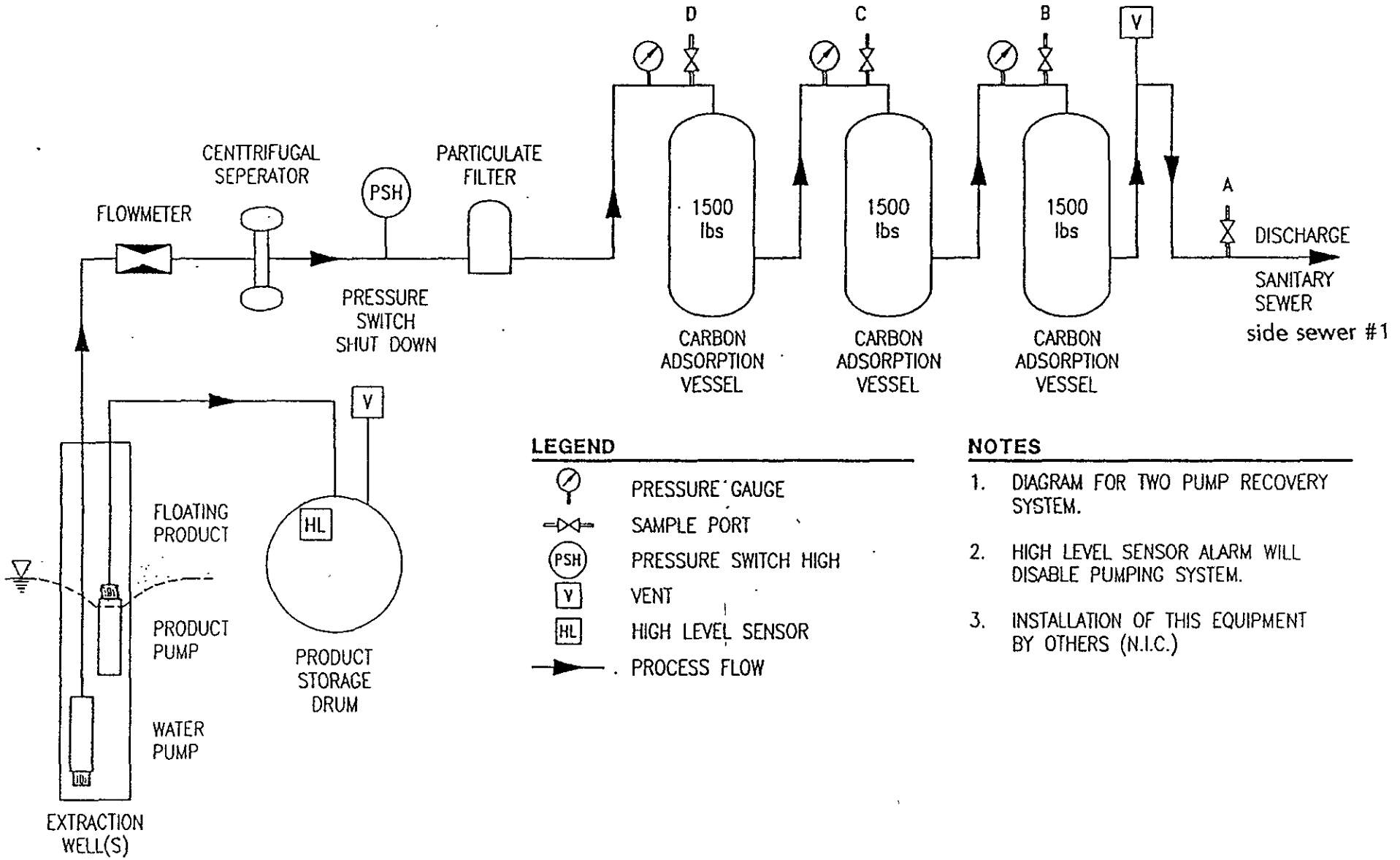
c. Volume discharged ______ d. Rate of discharge ______

OTHER WASTES — List the type and volume of liquid waste and sludges removed from the premises by means other than the community sewer.

WASTE REMOVED BY (Name, address and State Transporter ID No.)	TYPE OF WASTE (Example: alkaline cleaners, organic solvents, treatment sludge)	WASTE I.D. No.	VOLUME (lbs)(gal)/mo

SD-31 • 2

EAST BAY MUNICIPAL UTILITY DISTRICT



LEGEND

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

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.)

GeoStrategies Inc.

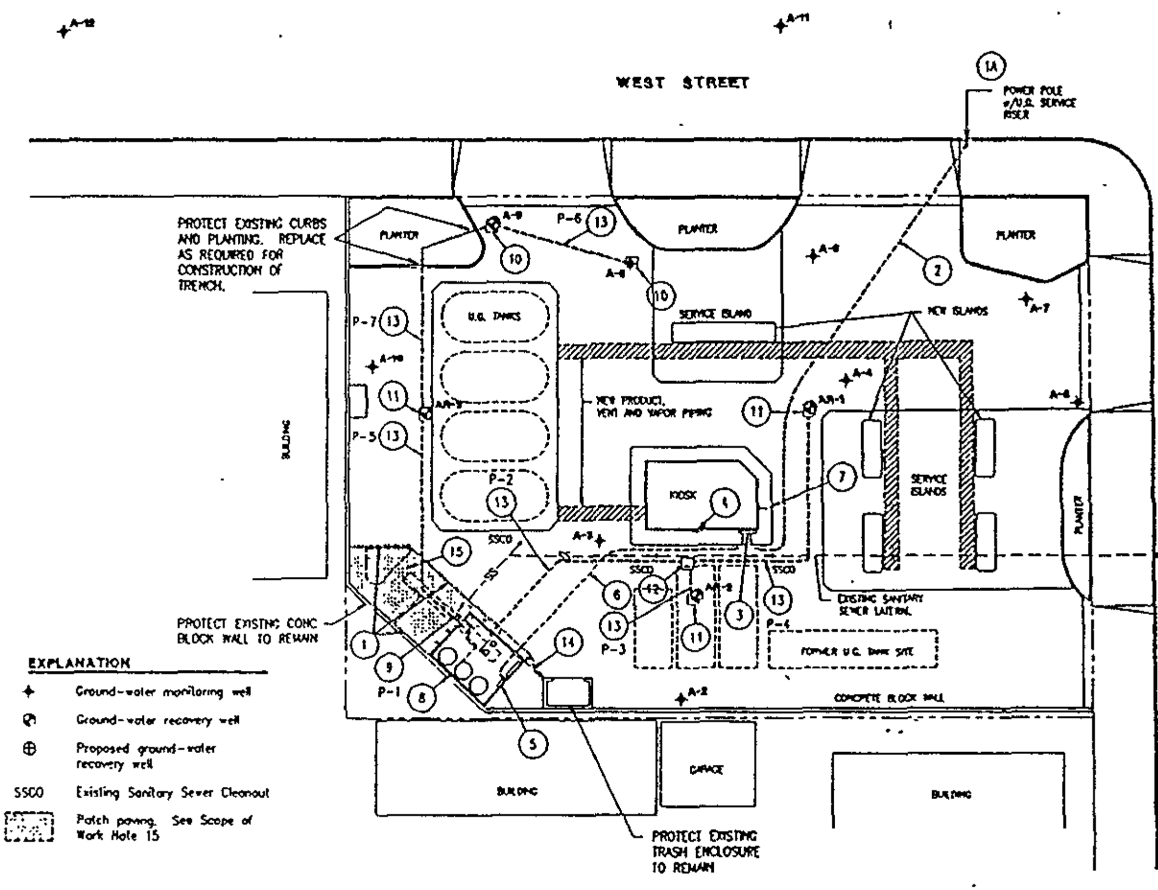
PROCESS FLOW DIAGRAM
ARCO Service Station #4931
731 W. MacArthur Boulevard
Oakland, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		6/93	

Acct. #502-62131

Acct. #5210-62131



SITE PLAN

Base Map: ARCO site plan dated 5-20-91

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO LOCAL CODES AND ORDINANCES. ALL ELECTRICAL WORK SHALL CONFORM TO THE NATIONAL ELECTRIC CODE (N.E.C.). ALL TRENCHING SHALL CONFORM TO OSHA REQUIREMENTS AND RECOMMENDATIONS.
2. UNLESS NOTED OTHERWISE, ALL PVC PIPE SHALL BE SCHEDULE 40. CONTRACTOR SHALL PROVIDE PROPER TRANSISTION FITTINGS FOR ALL PIPE CONNECTIONS.
3. EXISTING BURIED PIPE AND UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL EXPOSE AND VERIFY LOCATION AND MATERIAL PRIOR TO CONSTRUCTION.
4. OPEN TRENCHES SHALL BE PLATED AT ALL TIMES WHEN WORK IS NOT IN PROGRESS.
5. EDGES OF EXISTING PAVING SHALL BE NEATLY TRIMMED PRIOR TO PATCH PAVING. CONTRACTOR SHALL SAWCUT EXISTING PAVING IN NEAT STRAIGHT LINES.
6. ALL WELLS ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. CONNECTIONS BETWEEN EXTRACTION WELLS AND CONVEYANCE PIPELINES SHALL BE BASED UPON THE ACTUAL FIELD LOCATIONS OF THE WELLS.
7. GENERAL CONTRACTOR SHALL FURNISH AND INSTALL PULL ROPES IN ALL 4" DIA. PIPE CHASES EXCEEDING 50 FEET IN TOTAL LENGTH.
8. GENERAL CONTRACTOR SHALL VERIFY LOCATION OF PROPOSED NEW UNDERGROUND TANKS AND ADJUST TRENCH LOCATIONS AS REQUIRED TO AVOID NEW TANKS AND PAVING.
9. GENERAL CONTRACTOR SHALL INSTALL LONG RADIUS, CLEAN SWEEP, FITTINGS AT ALL CHANGES IN PIPE DIRECTION EXCEEDING 45 DEGREES.

SCOPE OF WORK

(1) REMOVE EXISTING RESTROOM/STORAGE BUILDING, FOOTINGS, CURBS, ETC.

(1A) EXISTING POWER POLE WITH UNDERGROUND RISER (ASSUMED SERVICE POINT).

(2) INSTALL NEW UNDERGROUND ELECTRIC SERVICE TO KIOSK PER P.G. & E. REQUIREMENTS AND SPECIFICATIONS. GENERAL CONTRACTOR SHALL COORDINATE INSTALLATION OF NEW SERVICE WITH P.G. & E. ALL CONDUIT AND TRENCHING SHALL BE TO P.G. & E. REQUIREMENTS.

(3) INSTALL NEW 400 AMP SINGLE PHASE METER AND W.P. MAIN ELECTRICAL PANEL ON EXTERIOR WALL OF KIOSK ADJACENT TO EXISTING METER AND ELECTRICAL PANEL.

(4) REMOVE EXISTING ELECTRICAL METER. CONVERT EXISTING MAIN ELECTRICAL PANEL TO SUB PANEL AND CONNECT TO THE MAIN ELECTRICAL PANEL.

(5) INSTALL NEW 100 AMP W.P. SUB PANEL FOR TREATMENT SYSTEM EQUIPMENT. GENERAL CONTRACTOR SHALL FURNISH AND INSTALL SUB-METER BETWEEN MAIN AND THIS SUB PANEL.

(6) INSTALL 2" CONDUIT AND WIRING FROM NEW MAIN ELECTRICAL PANEL TO TREATMENT SYSTEM SUB PANEL. PROVIDE CONDUIT SEALS PER N.E.C. REQUIREMENTS.

(7) EXISTING EMERGENCY SHUT OFF SWITCH (ESO) ON FACE OF KIOSK. REWIRE ESO TO INCLUDE SHUT DOWN OF TREATMENT SYSTEM EQUIPMENT WHEN ACTIVATED.

(8) CONSTRUCT NEW TREATMENT SYSTEM ENCLOSURE AND CONTAINMENT SLAB. SEE DETAILS ON SHEET 2.

(9) INSTALL ONE 4" DIA. SCHEDULE 40 PVC EFFLUENT DISCHARGE LINE. CONNECT TO EXISTING ON-SITE SANITARY SEWER LATERAL. VERIFY LOCATION OF EXISTING LATERAL IN THE FIELD. INSTALL CLEAN OUT TO GRADE AT NEW CONNECTION POINT.

(10) CONSTRUCT RECOVERY WELL JUNCTION BOX OVER EXISTING WELL A-8 AND A-9. SEE DETAIL A/3

(11) CONSTRUCT RECOVERY WELL JUNCTION BOX OVER PROPOSED WELL. VERIFY LOCATION IN THE FIELD. SEE DETAIL A/3

(12) CONSTRUCT PIPING JUNCTION BOX. SEE DETAIL B/3

(13) INSTALL RECOVERY SYSTEM PIPING AND ELECTRICAL CONDUITS PER RECOVERY SYSTEM PIPING SCHEDULE. PROVIDE CONDUIT SEALS ON CONDUITS PER N.E.C. REQUIREMENTS. SEE C/3 FOR TRENCHING DETAILS.

(14) RECONSTRUCT 6" HIGH CONCRETE PLANTER CURB AS REQUIRED.

(15) PATCH YARD WITH 3" MINIMUM COMPACTED DEPTH OF TYPE "B" A.C. OVER 5" MINIMUM COMPACTED DEPTH OF CLASS 2 A.B. (COMPACTED TO 95% OF MAXIMUM DENSITY PER CALTRANS STANDARDS) OVER COMPACTED SUBGRADE (COMPACTED TO 95% OF MAXIMUM DENSITY PER ASTM D-1557).

RECOVERY SYSTEM PIPING SCHEDULE

LINE	GROUNDWATER SYSTEM PIPING	VAPOR RECOVERY SYSTEM PIPING	ELECTRICAL CONDUITS
P-1	(1) 4" Sch. 40 PVC	N/A	N/A
P-2	(2) 4" Sch. 40 PVC	(2) 2" Sch. 40 PVC	(2) 1" + (2) 3/4"
P-3	(1) 4" Sch. 40 PVC	(1) 2" Sch. 40 PVC	(1) 1" + (1) 3/4"
P-4	(2) 4" Sch. 40 PVC	(1) 2" Sch. 40 PVC	(1) 1" + (1) 3/4"
P-5	(2) 4" Sch. 40 PVC	(2) 2" Sch. 40 PVC	(2) 1" + (2) 3/4"
P-6	(1) 4" Sch. 40 PVC	(1) 2" Sch. 40 PVC	(1) 1" + (1) 3/4"
P-7	(2) 4" Sch. 40 PVC	(1) 2" Sch. 40 PVC	(1) 1" + (1) 3/4"

INDEX TO DRAWINGS

AS BUILT (11-92)

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

GSI GeoStrategies Inc.

JOB NUMBER 7909-AB
DATE 3/3/92
REVISED DATE 4/93
PLATE 1

EBMUD

Business Name ARCO Products Company

Water Balance / Strength Summary

PURPOSE: This information will enable EBMUD to evaluate the volumes, source(s) and strengths of wastewater discharged to the community sewer.

Permit Number 502-62131

WATER USE AND DISPOSITION: Show on a separate sheet the method and calculations used to determine the quantities shown in the table.

Figures are: ☒ gallons per calendar day ☐ gallons per working day Number of working days per year _____

WATER USE	WATER SUPPLY FROM:			WASTEWATER DISCHARGED TO:					
	EBMUD	OTHER (1)		SIDE SEWER (gal/day)				OTHER (2)	
	gal/day	gal/day	CODE	No.1	No. ____	No. ____	No. ____	gal/day	CODE
Sanitary									
Processes									
Boiler									
Cooling									
Washing									
Irrigation									
Product									
Stormwater									
Other (3)		8735	A	8735					
Subtotal									

EBMUD AND OTHER SUPPLY TOTAL 8735

ALL SIDE SEWERS TOTAL 8735

NOTES:

1. Enter the quantity and the appropriate code letter indicating the source: **a.** Well **b.** Creek **c.** Stormwater **d.** Reclaimed Water **e.** Raw Materials
2. Enter the quantity and appropriate code letter indicating the discharge point: **a.** Stormdrain **b.** Rail, Truck, Barge **c.** Evaporation **d.** Product
3. Describe Other: Groundwater extracted from the shallow aquifer and sent through a granular activated carbon remediation system to clean it up prior to discharge.

SANITARY DISCHARGE: Please use the following data from the Uniform Plumbing Code, 1985, to determine sanitary wastewater volumes.

Field service employees - 5 gallons per employee per day
Office employees - 20 gallons per employee per day
Production employees - 25 gallons per employee per day
Production employees with showers - 35 gallons per employee per day

Include the effect that seasonal and weekend staffing changes may have on determining average volumes.

AVERAGE WASTEWATER STRENGTH: Data base must be attached, average self-monitoring and EBMUD data.

	SIDE SEWER (mg/L)			
	No. 1	No. ____	No. ____	No. ____
CODF	15 mg/l			
TSS	2 mg/l			

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 2/91

Arco Station No. 4931
Account No. 502-62131
Page No. 2

II. 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 = 1,355 $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 2/94

WASTEWATER DISCHARGE PERMIT

EBMUD

Terms and Conditions

Arco Station No. 4931
Account No. 502-62131

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 Gruen 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 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan/Geostrategies
6747 Sierra Court, Ste J
Dublin, CA 94568
Attention: Matt Donohue

Project: 4931-93-5, Arco 4931-Oakland

Enclosed are the results from 4 water samples received at Sequoia Analytical on January 13,1994. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
4A70401	Water, A-Eff.	1/13/94	EPA 5030/8015 Mod./8020
4A70402	Water, B-Mid	1/13/94	EPA 5030/8015 Mod./8020
4A70403	Water, C-Mid	1/13/94	EPA 5030/8015 Mod./8020
4A70404	Water, D-Inf.	1/13/94	EPA 5030/8015 Mod./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

Nokowhat D. Herrera
Project Manager

909.70

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan/Geostrategies	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 13, 1994
6747 Sierra Court, Ste J	Sample Matrix:	Water	Received:	Jan 13, 1994
Dublin, CA 94568	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	Jan 25, 1994
Attention: Matt Donohue	First Sample #:	4A70401		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4A70401 A-Eff.	Sample I.D. 4A70402 B-Mid	Sample I.D. 4A70403 C-Mid	Sample I.D. 4A70404 D-Inf.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	74		
Benzene	0.50	N.D.	N.D.	N.D.	4.5		
Toluene	0.50	N.D.	N.D.	N.D.	N.D.		
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.		
Total Xylenes	0.50	N.D.	N.D.	N.D.	3.4		
Chromatogram Pattern:		--	--	--	Weathered Gas		

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	1/21/94	1/21/94	1/21/94	1/21/94
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	103	102	92	104

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan/Geostrategies	Client Project ID:	4931-93-5, Arco 4931-Oakland
6747 Sierra Court, Ste J	Matrix:	Water
Dublin, CA 94568		
Attention: Matt Donohue	QC Sample Group:	4A70401 - 04

Reported: Jan 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.C.	M.C.	M.C.	M.C.
MS/MSD Batch#:	4010645	4010645	4010645	4010645
Date Prepared:	1/21/94	1/21/94	1/21/94	1/21/94
Date Analyzed:	1/21/94	1/21/94	1/21/94	1/21/94
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:	92	95	93	93
Matrix Spike Duplicate % Recovery:	110	110	110	110
Relative % Difference:	18	15	17	17
LCS Batch#:	LCS012194	LCS012194	LCS012194	LCS012194
Date Prepared:	1/21/94	1/21/94	1/21/94	1/21/94
Date Analyzed:	1/21/94	1/21/94	1/21/94	1/21/94
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	104	107	104	106
% Recovery Control Limits:	80-120	80-120	80-120	80-120

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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. 4931-93-5

Chain of Custody

ARCO Facility no.	4931
City (Facility)	Oakland
ARCO engineer	Mike Whelan
Telephone no. (ARCO)	
Consultant name	Gettler Ryan Inc
Project manager (Consultant)	Joel Coffman
Telephone no. (Consultant)	510-551-7555
Fax no. (Consultant)	551-7888
Address (Consultant)	6747 Sierra Ct Suite J Dublin CA
Laboratory name	Sequoia
Contract number	
Method of shipment	GR 9401704
Special detection Limit/reporting	Standard
Special QA/QC	Stand
Remarks	GR# 9909.75
Lab number	

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
A-Eff		2		X		X	X	1-13-94	10:25	X						-01					
B-Mid		2		X		X	X	↓	10:28	X						-02					
C-Mid		2		X		X	X	↓	10:31	X						-03					
D-Inf		2		X		X	X	↓	10:34	X						-04					

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler [signature]	1-13-94	18:35	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory [signature] Date 1/13/94 Time 18:38

Turnaround time

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

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

APPC-3292 (2-91)

GETTLER-RYAN
GROUNDWATER EXTRACTION SYSTEM DATA SHEET

Job: 9904

Date: 3-13-96

Customer: ARCO 4931

Address: 731 West Arrow Highway
Garland, CA

Time of Day: 13:00

Individual Well Data Well Number =>	AR-1	AR-2				
Active On Arrival?	Yes	Yes				
Active On Departure?	Yes	Yes				
Flowrate (gpm)	8.0 cycle	7.0 cycle				
Product Pump Depth (ft.)						
Water Pump Depth (ft.)	15'	15'				
Bailing (product volume)	n/a	n/a				
Where are bailings stored?						
Sample Taken?						
Lab Analysis Type?						

Total System Data System Description (separator, carbon, etc.):	
Active or Down on Arrival (why?)	Yes
Active On Departure?	Yes
Anticipated Restart Date	
Hour Meter	N/A
Flowmeter (total gallons)	397520
Flowmeter (gpm)	0-8.6
Filter Pressure (psig)	3 psi
Filter Changed Out? (Y or N)	N
Electric Meter Reading	72578
Samples Taken ? Where?	n/a
Lab Analysis Type?	N/A

Product Tank Level (prior to bailing)- total: 0 water:

Chemical Additives- name: flowrate: drum level:

Noise Level? Decibels (first visit only)

Site Cleaned Up? garbage, etc. (y or n) Yes

Supplies Used/Needed?

Carbon Vessel Data Sampling Points:	A	B	C	D	other
Pressure At Point (psig)	N/A	N/A	3.5	7 psi	8 psi
Samples Taken? (Y or N)	N	N	N	N	N
Lab Analysis Type (TPH-G, BTEX, etc.)					

Comments:

Technician: F. Ch

GETTLER-RYAN
GROUNDWATER EXTRACTION SYSTEM DATA SHEET

Job # 9908

Date: 1-13-94

Customer: Arco # 6931

Address: 731 W. MacArthur Blvd
Oakland CA

Time of Day:

Individual Well Data Well Number = >	AR-1	AR-2	AR3	MW	MW-8	
Active On Arrival?	Yes	Yes	Yes	Yes	No	
Active On Departure?	Yes	Yes	Yes	Yes	No	
Flowrate (gpm)	0.8	2.0	2.2	1.5	0	
Product Pump Depth (ft.)	NA	NA	N/A		8'	
Water Pump Depth (ft.)	12'	12'	12'	12'		
Bailing (product volume)						
Where are bailings stored?						
Sample Taken?	No	No	No	No	No	
Lab Analysis Type?						

Total System Data			
System Description (separator, carbon, etc.):		2.1	4.4
Active or Down on Arrival (why?)	Yes	4.9	5.5
		1.5	1.2
Active On Departure?	YES	6.4	6.7
Anticipated Restart Date	—		
Hour Meter	N/A		
Flowmeter (total gallons)	378320		
Flowmeter (gpm)	5.9 - 6.3		
Filter Pressure (psig)	0 PSI		
Filter Changed Out? (Y or N)	YES		
Electric Meter Reading	71642		
Sample Taken ? Where?	N/A		
Lab Analysis Type?			

Product Tank Level (prior to bailing)- total: 0 water:

Chemical Additives- name: flowrate: drum level:

Supplies Used/Needed?
Swept enclosure.
Drained water

Carbon Vessel Data Sampling Points:	A	B	C	D	E	other
Pressure At Point (psig)	N/A	N/A	2	6	8	
Samples Taken? (Y or N)	Yes	Yes	No	Yes		
Lab Analysis Type (TPH-G, BTEX, etc.)	BPA 8010, PPMetals					

Comments:

Technician: F. Ch (F. Cline) 90

GETTLER-RYAN INC.
General and Environmental Contractors

RECOVERY SYSTEM
SAMPLING DATA SHEET

COMPANY Arco #4931 JOB # 7909.70
LOCATION 731 W. MacArthur DATE 1-13-93
CITY Oakland CA TIME

SAMPLING POINT	TIME	pH	TEMP F-C	CONDUCTIVITY	ANALYSIS	COMMENTS
A	10:25	6.75	16.0	~~150~~ 1000		
B	10:28	6.80	15.8	980		
C	10:31	6.82	17.0	970		
D	10:34	6.80	17.0	980		

Flowmeter Reading 3783120 Time

Did you reopen any valves closed? yes no

COMMENTS

FOREMAN E. Cline ASSISTANT

APPENDIX D

IWM GROUNDWATER SAMPLING AND MONITORING REPORTS

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

March 7, 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 February 10, 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

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A4931QA4.XLS

Summary of Ground Water Sample Analyses ARCO Facility No. 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
DATE SAMPLED	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94	2/10/94
DEPTH TO WATER	4.88	9.20	9.30	8.94	7.53	7.40	8.95	8.00	9.61	9.30	8.66
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	YES	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	N/A	N/A
TPHg	*	ND	56,000	ND	140	ND	**	*	ND	ND	ND
BTEX											
BENZENE	*	ND	220	ND	2.8	ND	**	*	ND	ND	ND
TOLUENE	*	ND	68	ND	ND	ND	**	*	ND	ND	ND
ETHLYBENZENE	*	ND	790	ND	2.4	ND	**	*	ND	ND	ND
XYLENES	*	ND	700	ND	5.6	ND	**	*	ND	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)

* = No sample, pump in well.

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

N.D. = Not Detected.

** = Product in well

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

Summary of Ground Water Sample Analyses ARCO Facility No. A-4931, Oakland, California

WELL NUMBER	A-13	AR-1	AR-2	AR-3
DATE SAMPLED	2/10/94	2/10/94	2/10/94	2/10/94
DEPTH TO WATER	9.64	9.00	9.32	9.20
SHEEN	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA
TPHg	ND	*	*	*
BTEX				
BENZENE	ND	*	*	*
TOLUENE	ND	*	*	*
ETHLYBENZENE	ND	*	*	*
XYLENES	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)

* = No sample, pump in well

= No sample, well pumped dry

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

N.D. = Not Detected.

** =

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

FIELD REPORT

DEPTH TO WATER / FLOATING PRODUCT SURVEY

SITE ARRIVAL TIME: ~~[illegible]~~ 1130

SITE DEPARTURE TIME: 1830

WEATHER CONDITIONS: cloudy/cool

PROJECT NO.:

LOCATION: 731 W MacArthur

DATE: 2-10-94

CLIENT/STATION #: A 4931

FIELD TECHNICIAN: Vince/Francisco

DAY OF WEEK: thursday

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
1	AR-1	OK	yes	OK	OK	OK	N/A	9.0	9.0	N/A	N/A	N	Pump in well 2x4 grading no bolts	
2	AR-2	OK	yes	OK	OK	OK	↓	9.32	9.32	↓	↓	N	pump in well 2x4 grading missing bolts	
3	AR-3	OK	yes	OK	OK	OK	↓	9.20	9.20	↓	↓	N	pump in well 2x4 grading missing bolts	
4	A-8	OK	yes	OK	O	O	20.7	8.95	8.95	8.94	~~[illegible]~~ 0.01	Yes	3" Hoses jammed inside 3" well	
5	A-9	OK	yes	OK	O	OK	38.7	8.00	8.00	N/A	N/A	N	Pump in well 2x4 grad missing bolts	
6	A-13	OK	yes	OK	OK	OK	29.4	9.64	9.64	↓	↓	N	3" street well well box 4/4 filled w/ H2O	
7	A-11	OK	yes	OK	OK	OK	28.4	9.30	9.30			N	3" street well	
8	A-12	OK	yes	OK	OK	OK	29.0	8.66	8.66			N	3" street well, well box ½ filled w/ H2O	
9	A-3	OK	yes	OK	OK	OK	19.3	9.33	9.33			N	4" well box filled 4/4 w/ H2O	
10	A-5	OK	yes	OK	OK	OK	23.9	8.94	8.94			N	3"	
11	A-7	OK	yes	OK	OK	OK	22.7	7.40	7.40			N	3"	
12	A-10	OK	yes	OK	OK	OK	28.1	9.61	9.61			N	3" well box 4/4 filled w/ H2O	
13	A-6	OK	yes	OK	OK	OK	25.0	7.53	7.53			N	3"	
14	A-2	OK	yes	OK	OK	OK	18.3	4.88	4.88			N	4"	
15	A-4	OK	yes	OK	OK	OK	19.7	9.30	9.30	↓	↓	N	4" XDUP AT A-2.	

1 of 11 * Could not get a bailer into A-8 for [illegible]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-12

CLIENT/STATION #: ARCO 705 ADDRESS: [illegible]

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 _____

TD 24.14 - DTW 7.64 X GALLON/LINEAR FT. 0.38 X CASING VOLUME 3 = CALCULATED PURGE 22.52 ACTUAL PURGE 23.0

DATE PURGED: 2-12-91 START (2400 Hr) 1245 END (2400 Hr) 1252

DATE SAMPLED: 2-12-91 START (2400 Hr) 1309 END (2400 Hr) 1309

DTW 17.0

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1247	1	6.84	0.53	67.0	clear	
1248	6	6.89	0.55	66.5	clear	
1250	12	6.65	0.56	66.1	clear	
1251	18	6.73	0.55	65.5	clear	
1252	23	6.69	0.52	65.3	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: Vince Vasco

SIGNATURE: [signature]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: _____

CLIENT/STATION #: _____ ADDRESS: _____

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 _____

TD _____ - DTW _____ X GALLON/LINEAR FT. _____ X CASING VOLUME _____ = CALCULATED PURGE _____ ACTUAL PURGE 220

DATE PURGED: _____ START (2400 Hr) 1319 END (2400 Hr) 1327

DATE SAMPLED: _____ START (2400 Hr) 1321 END (2400 Hr) 1321

DTW 10.0

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1320	3	7.17	0.57	67.0	cloudy	
1321	8	7.00	0.56	66.2	clear	
1323	12	6.93	0.55	66.4	clear	
1325	17	6.91	0.56	66.1	clear	
1327	22	6.87	0.55	65.9	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: _____

SIGNATURE: _____

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-12

CLIENT/STATION #: A-431 ADDRESS: [illegible]

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 _____

TD [illegible] - DTW [illegible] X GALLON/LINEAR FT. [illegible] X CASING VOLUME [illegible] = CALCULATED PURGE 25.18

ACTUAL PURGE 24.0

DATE PURGED: 2-16-94 START (2400 Hr) 1352 END (2400 Hr) 1359

DATE SAMPLED: 2-16-94 START (2400 Hr) 1408 END (2400 Hr) 1408

DTW 13.5

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1353	2	7.45	0.56	65.2	clear	
1354	8	7.46	0.56	65.0	clear	
1356	14	7.49	0.55	64.9	clear	
1357	20	7.32	0.55	64.5	clear	
1359	24	7.28	0.57	64.3	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: [illegible]

SIGNATURE: [illegible]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A - 3

CLIENT/STATION #: 4451 ADDRESS: 731 W MS ARTHUR

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 _____

TD 19.2 - DTW 4.55 X GALLON/LINEAR FT. 0.66 X CASING VOLUME 3 = CALCULATED PURGE 19.74 ACTUAL PURGE 8.0

DATE PURGED: 2-12-94 START (2400 Hr) 1418 END (2400 Hr) 1422

DATE SAMPLED: 2-12-94 START (2400 Hr) 1426 END (2400 Hr) 1436

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1419	2	6.65	0.87	68.0	clear	
1420	6	6.55	0.89	67.1	clear	
1422	8	6.55	0.93	67.0	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: Well pumped dry at 8 gallons.

PRINT NAME: Vince Vasquez

SIGNATURE: Vince Vasquez

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-5

CLIENT/STATION #: A002i ADDRESS: [illegible]

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 _____

TD 23.4 - DTW 7.44 X GALLON/LINEAR FT. 0.38 X CASING VOLUME 3 = CALCULATED PURGE 17.05 ACTUAL PURGE 17.0

DATE PURGED: 2-12-14 START (2400 Hr) 1445 END (2400 Hr) 1454

DATE SAMPLED: 2-12-14 START (2400 Hr) 1515 END (2400 Hr) 1515

DTW 12.0

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1447	2	6.91	0.67	67.5	clear	
1448	7	6.89	0.64	67.0	clear	
1449	12	6.81	0.61	66.8	cloudy	
1452	16	6.82	0.60	66.5	cloudy	
1454	17	6.80	0.58	66.1	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: [illegible]

PAGE 6 OF 11 SIGNATURE: [illegible]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-7

CLIENT/STATION #: 4-1351 ADDRESS: 751 W Mt Arthur

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 _____

TD 227 - DTW 74 X GALLON/LINEAR FT. 0.38 X CASING VOLUME 3 = CALCULATED PURGE 17.44 | ACTUAL PURGE 18.0

DATE PURGED: 2-10-94 START (2400 Hr) 1529 END (2400 Hr) 1535

DATE SAMPLED: 2-10-94 START (2400 Hr) 1551 END (2400 Hr) 1551

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1530	3	7.28	0.30	66	cloudy	
1531	9	7.21	0.28	[illegible]	cloudy	
1532	15	7.18	0.28	65.4	clear	
1535	18	7.15	0.26	65.2	clear	
[illegible]						

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: Vince Gates

SIGNATURE: [signature]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A 10

CLIENT/STATION #: A 4431 ADDRESS: 33 W Mt. Arthur

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 _____

TD 25 i - DTW 9 4 X GALLON/LINEAR FT. 0 66 X CASING VOLUME 3 = CALCULATED PURGE 21 C7 ACTUAL PURGE 21 C

DATE PURGED: 2-12-94 START (2400 Hr) 1559 END (2400 Hr) 1607

DATE SAMPLED: 2-12-94 START (2400 Hr) 1623 END (2400 Hr) 1623

DTW 9.4

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1601	3	7.12	0.66	65.9	Cloudy	
1603	8	7.24	0.61	65.4	green	
1604	14	7.20	0.56	65.2	clear	
1607	21	7.11	0.55	65.0	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ✓ Centrifugal Pump
- ___ Submersible Pump
- ___ Dedicated
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ✓ Bailer Disposable
- ___ Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: Vince Valles

SIGNATURE: _____

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-6

CLIENT/STATION #: A-[illegible] ADDRESS: [illegible]

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 _____

TD [illegible] - DTW [illegible] X GALLON/LINEAR FT [illegible] X CASING VOLUME 3 = CALCULATED PURGE 19.91 | ACTUAL PURGE 20

DATE PURGED: 2-16-94 START (2400 Hr) 1628 END (2400 Hr) 1636

DATE SAMPLED: 2-16-94 START (2400 Hr) 1655 END (2400 Hr) 1655

DTW 12

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1629	1	6.91	0.41	65.0	clear	
1631	4	6.92	0.39	64.5	clear	
1633	12	6.86	0.47	64.0	cloudy	
1636	20	6.84	0.48	63.9	cloudy	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: _____

PRINT NAME: Vince Vallejos

SIGNATURE: [signature]

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-2

CLIENT/STATION #: A 4431 ADDRESS: 731 N Macarthur

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

TD 18.5 - DTW 4.3 X GALLON/LINEAR FT 6.66 X CASING VOLUME 3 = CALCULATED PURGE 26.57 ACTUAL PURGE 26.0

DATE PURGED: 2-10-94 START (2400 Hr) 1705 END (2400 Hr) 1712

DATE SAMPLED: 2-10-94 START (2400 Hr) N A END (2400 Hr) N A

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1704	5	7.01	0.51	65.9	clear	
1708	13	7.05	0.50	65.8	clear	
1709	19	7.06	0.45	65.6	clear	
1712	26	7.11	0.45	65.3	clear	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: Pumped well dry for Sample!

PRINT NAME: Vince Wade

SIGNATURE: _____

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: A-4

CLIENT/STATION #: A 4451 ADDRESS: 731 W. MacArthur

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 _____

TD 29 - DTW 13.0 X GALLON/LINEAR FT. 3.66 X CASING VOLUME 3 = CALCULATED PURGE 20.51 ACTUAL PURGE 15.0

DATE PURGED: 2-10-94 START (2400 Hr) 1722 END (2400 Hr) 1728

DATE SAMPLED: 2-10-94 START (2400 Hr) 1754 END (2400 Hr) 1759

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1723	3	6.61	C.89	64.5	clear	
1725	9	6.56	C.96	64.1	cloudy	
1728	15	6.53	C.87	64 C	cloudy	

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ✓ Centrifugal Pump
- ____ Submersible Pump
- ____ Dedicated
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)

Other: _____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ✓ Bailer Disposable
- ____ Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: _____

REMARKS: well purged almost 15 gallons.

PRINT NAME: Vince Vaden

SIGNATURE: Vincent Vaden

Columbia Analytical Services inc.

February 28, 1994

Service Request No. SJ94-0218

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

Re: ARCO Facility No. A4931

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on February 18, 1994. For your reference, these analyses have been assigned our service request number SJ94-0218.

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.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/kmh

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	**Dates Collected:**	02/10/94
Project:	ARCO Facility No. A4931	**Date Received:**	02/18/94
Sample Matrix:	Water	**Date Extracted:**	N/A
		Date Analyzed:	02/22, 23/94
		Service Request:	SJ94-0218

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

Analyte:		**Benzene**	**Toluene**	**Ethyl-benzene**	**Total Xylenes**	**TPH as Gasoline**
Units:		µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
Method Reporting Limit:		0.5	0.5	0.5	0.5	50
Sample Name	**Date Analyzed**					
A-3 (15.5)	02/22/94	ND	ND	ND	ND	ND
A-4 (16.9)	02/22/94	220.	68.	790.	700.	56,000.
A-5 (12.0)	02/22/94	ND	ND	ND	ND	ND
A-6 (11.2)	02/22/94	2.8	ND	2.4	5.6	140.
A-7 (10.0)	02/22/94	ND	ND	ND	ND	ND
A-10 (9.4)	02/23/94	ND	ND	ND	ND	ND
A-11 (10.0)	02/22/94	ND	ND	ND	ND	ND
A-12 (13.5)	02/22/94	ND	ND	ND	ND	ND
A-13 (17.0)	02/22/94 (a)	ND	ND	ND	ND	ND
Method Blank	02/22/94	ND	ND	ND	ND	ND
Method Blank	02/23/94	ND	ND	ND	ND	ND

(a) This sample was part of the analytical batch started on February 22, 1994. However, it was analyzed after midnight so the actual date analyzed is February 23, 1994

Approved By: Kenneth Murphy Date: February 28, 1994

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Dates Collected:**	02/10/94
Project:	ARCO Facility No A4931	**Date Received:**	02/18/94
Sample Matrix:	Water	**Date Extracted:**	N/A
		Date Analyzed:	02/22, 23/94
		Service Request:	SJ94-0218

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

Sample Name	Date Analyzed	Percent Recovery a,a,a-Trifluorotoluene
A-3 (15.5)	02/22/94	84.
A-4 (16.9)	02/22/94	117.
A-5 (12.0)	02/22/94	89.
A-6 (11.2)	02/22/94	92.
A-7 (10.0)	02/22/94	88.
A-10 (9.4)	02/23/94	79.
A-11 (10.0)	02/22/94	78.
A-12 (13.5)	02/22/94	86.
A-13 (17.0)	02/22/94	86.
MS	02/22/94	92.
DMS	02/22/94	94.
Method Blank	02/22/94	89.
Method Blank	02/23/94	81.

CAS Acceptance Limits. 62-112

Approved By: Edward Murphy Date: February 28, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Dates Collected:**	02/10/94
Project:	ARCO Facility No. A4931	**Date Received:**	02/18/94
Sample Matrix:	Water	**Date Extracted:**	N/A
		Date Analyzed:	02/22/94
		Service Request:	SJ94-0218

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

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
Benzene	25.	24.4	98.	85-115
Toluene	25.	24.1	96.	85-115
Ethylbenzene	25.	23.3	93.	85-115
Total Xylenes	75.	70.4	94.	85-115
TPH as Gasoline	250.	257.	101.	90-110

Approved By: [signature] Date: February 28, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM		**Dates Collected:**	02/10/94
Project:	ARCO Facility No.	A4931	**Date Received:**	02/18/94
Sample Matrix:	Water		**Date Extracted:**	N/A
			Date Analyzed:	02/22/94
			Service Request:	SJ94-0218

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: µg/L (ppb)

					Percent Recovery		
		Sample	Spike Result				CAS Acceptance
Analyte	Spike Level	Result	MS	DMS	MS	DMS	Criteria
Benzene	25.	ND	26.1	26.2	104.	105.	75-135
Toluene	25.	ND	26.3	26.3	105.	105.	73-136
Ethylbenzene	25.	ND	25.8	26.2	103.	105.	69-142

Approved By: Kevin A. Murphy Date February 25, 1994

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) TOM DeTOR	Laboratory name Columbia
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) 408/942 8955	Fax no. (Consultant) 408/942 1499
Consultant name IWM	Address (Consultant) 950 Ames av. Milp. Ca. 95035		Contract number 07077

Method of shipment: Consultant delivered

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 ☐
F-B	1-2	2		✓		✓	✓	2-10-94	1230		✓	✓								
A-3	3-4	2		✓		✓	✓		1436		✓	✓								
A-4	5-6	2		✓		✓	✓		~~1518~~ V.V. 1754		✓	✓								
A-5	7-8	2		✓		✓	✓		1518		✓	✓								
A-6	9-10	2		✓		✓	✓		1655		✓	✓								
A-7	11-12	2		✓		✓	✓		1551		✓	✓								
A-10	13-14	2		✓		✓	✓		1623		✓	✓								
A-11	15-16	2		✓		✓	✓		1341		✓	✓								
A-12	17-18	2		✓		✓	✓		1408		✓	✓								
A-13	19-20	2		✓		✓	✓		1309		✓	✓								

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on F.B.

Lab number: SJ94-0218

Turnaround time

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

1 WK TAT EF 2-18-94

Condition of sample: OK	Temperature received: cool	
Relinquished by sampler: Vincent Valdes	Date: 2-18 Time: 1515	Received by: [signature] 2-18-94 1515
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
APPC-3292 (2-91)

1 week TAT OK'd w/ Gina 2-18-94

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

April 12, 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 ground water sampling at ARCO Facility No. A-4931 in Oakland, California. Integrated Wastestream Management performed subjective evaluation on wells AR-1,AR-2, AR-3, A-2, and A-9 and collected samples from wells AR-2, AR-3, A-2, and A-9 at this site on March 21, 1994.

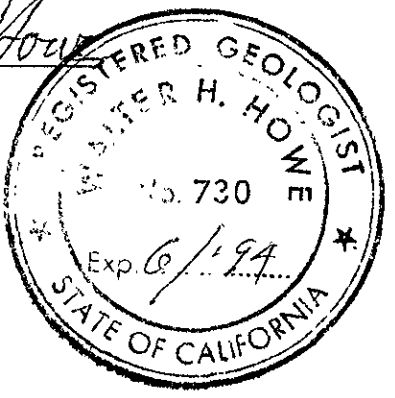
Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist



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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A4931QA3.XLS

Summary of Ground Water Sample Analyses ARCO Facility No. A-4931, Oakland, California

WELL NUMBER	A-2	A-9	AR-1	AR-2	AR-3
DATE SAMPLED	3/21/94	3/21/94	3/21/94	3/21/94	3/21/94
DEPTH TO WATER	4.94	9.62	10.01	10.36	10.80
SHEEN	NONE	NONE	YES	NONE	NONE
PRODUCT THICKNESS	N/A	N/A	0.01	NA	NA
TPHg	66	ND	**	ND	ND
BTEX					
BENZENE	ND	ND	**	ND	ND
TOLUENE	ND	ND	**	ND	ND
ETHLYBENZENE	ND	ND	**	ND	ND
XYLENES	ND	ND	**	ND	ND
SM 5520 B&F					
OIL & GREASE	ND				
HYDROCARBONS	ND				
EPA 7421					
TOTAL LEAD	2				

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)

* = No sample, pump in well.

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

N.D. = Not Detected.

** = Product in well

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

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: _____

Site Departure Time: _____

Weather Conditions: _____

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

Project No.: _____ **Location:** 731 W. MacArthur Blvd **Date:** 3-21-94

Client / Station#: A-4931 **Field Technician:** Vince / Francisco **Day of Week:** Monday

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 * measurement from top of Box	MATERIALS
1	A-9	OK	yes	OK	OK	OK	35.9	9.62	*10.35	N/A	N/A	N	6"	
2	AR-3	OK	yes	OK	OK	OK	27.8	10.80	*11.85	N/A	N/A	N	6"	
3	AR-2	OK	yes	OK	OK	OK	24.7	10.36	10.36	N/A	N/A	N	6"	
4	AR-1	OK	yes	OK	OK	OK		10.01	10.01	10.00	0.01	Y	6"	
	A-2	OK	yes	OK	OK	OK	18.3	4.94	4.94			N	4"	

AGE 2 OF 2 DATE: 3-21-94 CLIENT/STATION #: Arco 4931 ADDRESS: 731 W. MacArthur Blvd. OAK.

WELL ID: A-9 TD 35.9 - 9.62 (DTW) x 1.5 (Gal./Linear Ft.) x 2 (Casing Volume) - 7.84 (Calculated Purge)

DATE PURGED: 3-21-94 START (2400 HR): 1415 END (2400 HR) 1432
DATE SAMPLED: 3-21-94 TIME (2400 HR): 1438 DTW: 17

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1420	15	6.91	0.55	67.5	clear
1424	35	6.62	0.53	66.3	clear
1427	55	6.65	0.54	65.3	clear
1432	80	6.65	0.52	65.1	clear

Total purge: 80

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp. (½ in. TEFLON)

REMARKS: Vince Valdes

Vince Valdes 3-18-94 1500

WELL ID: AR-3 TD 27.8 - 10.80 (DTW) x 1.5 (Gal./Linear Ft.) x 2 (Casing Volume) - 5.1 (Calculated Purge)

DATE PURGED: 3-21-94 START (2400 HR): 1421 END (2400 HR) 1435
DATE SAMPLED: 3-21-94 TIME (2400 HR): 1454 DTW: 12

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1426	13	6.52	0.54	67.4	cloudy
1429	25	6.51	0.50	66.7	CLEAR
1431	40	6.67	0.49	66.0	CLEAR
1435	53	6.65	0.51	65.7	CLEAR

Total purge: 53

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp. (½ in. TEFLON)

REMARKS: Francisco ABUNGAN

Francisco ABungan 3-18-94 1500

WELL ID: AR-2 TD 24.7 - 10.36 (DTW) x 1.5 (Gal./Linear Ft.) x 2 (Casing Volume) - 4.302 (Calculated Purge)

DATE PURGED: 3-21-94 START (2400 HR): 1537 END (2400 HR) 1559
DATE SAMPLED: 3-21-94 TIME (2400 HR): 1602 DTW: 19

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1539	5	6.96	0.55	66.8	clear
1547	35	6.82	0.52	65.1	CLEAR
1554		6.38	0.52	65.1	RUST rod
1559		6.78	0.52	65.6	

Total purge: 35

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp. (½ inch TEFLON)

REMARKS:

WELL ID: AR-1 TD VOID - DTW x Gal./Linear Ft. x Casing Volume - Calculated Purge

DATE PURGED: 3-21-94 START (2400 HR). END (2400 HR)
DATE SAMPLED: 3-21-94 TIME (2400 HR): DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
		NO SAMPLE			

Total purge:

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

REMARKS:

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes by Jon Kolton

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 1 DATE: 3-21-94 CLIENT/STATION #: ARCO 4931 ADDRESS: ~~400~~ 200 Ames av. Milp.

WELL ID: A-2 TD 18.3 - DTW 4.94 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) = 26.45 (Calculated Purge)

DATE PURGED: 3-21-94 START (2400 HR): 1558 END (2400 HR) 1606
DATE SAMPLED: 3-21-94 TIME (2400 HR): 1650 DTW: 17

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1603	7	7.53	0.34	61.2	CLEAR
1606	15	7.49	0.33	61.0	clear

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 10 and again at 15 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. (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. (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. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

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

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes by [illegible]

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.

April 4, 1994 Service Request No. SJ94-0344

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 March 23, 1994. For your reference, these analyses have been assigned our service request number SJ94-0344.

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.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

COLUMBIA ANALYTICAL SERVICES, Inc.

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:**	3/21/94
Project:	ARCO Facility No. 4931	**Date Received:**	3/23/94
Sample Matrix:	Water	**Date Extracted:**	3/30/94
		Date Analyzed:	4/4/94
		Service Request:	SJ94-0344

Oil and Grease, Gravimetric
SM 5520B & F
Units: mg/L (ppm)

			Sample Name	A-2 (17)	Method Blank
			Lab Code	SJ940344-5	SJ940330-WMB
Analyte	**Method**	**MRL**			
Oil & Grease	SM5520B	5		ND	ND
Hydrocarbons	SM5520F	5		ND	ND

SM *Standard Methods for the Examination of Water and Wastewater,* 18th Ed., 1993.

Approved By Kevin A Murphy Date April 5, 1994

940344 XLS/4/5/94

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Dates Collected: 3/21/94
Date Received: 3/23/94
Date Extracted: N/A
Date Analyzed: 3/28-30/94
Service Request: SJ94-0344

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

Analyte:		Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH as Gasoline
Units:		µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
Method Reporting Limit:		0.5	0.5	0.5	0.5	50
Sample Name	**Lab Code**					
A-9 (17)	SJ940344-2	ND	ND	ND	ND	ND
AR-3 (14)	SJ940344-3	ND	ND	ND	ND	ND
AR-2 (19)	SJ940344-4	ND	ND	ND	ND	ND
A-2 (17)	SJ940344-5	ND	ND	ND	ND	66
XDUP	SJ940344-6	ND	ND	ND	ND	ND
Method Blank	SJ940328-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940329-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940330-WMB	ND	ND	ND	ND	ND

Approved By: Kevin Murphy Date: April 5, 1994

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Collected:**	3/21/94
Project:	ARCO Facility No. 4931	**Date Received:**	3/23/94
Sample Matrix:	Water	**Date Extracted:**	3/30/94
		Date Analyzed:	4/4/94
		Service Request:	SJ94-0344

Laboratory Control Sample
Oil and Grease
SM 5520B & F
Units: mg/L (ppm)

Analyte	Spike Level	LCS Result	Percent Recovery	CAS Acceptance Criteria
Hydrocarbon Mix	100.	97.	97.	54-129

SM *Standard Methods for the Examination of Water and Wastewater,* 18th Ed., 1993.

Approved By: Kevin Murphy Date: April 5, 1994

940344 XLS/4/5/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Dates Collected: 3/21/94
Date Received: 3/23/94
Date Extracted: N/A
Date Analyzed: 3/28-30/94
Service Request: SJ94-0344

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

Sample Name	Lab Code	Percent Recovery a,a,a-Trifluorotoluene
A-9 (17)	SJ940344-2	91.
AR-3 (14)	SJ940344-3	82.
AR-2 (19)	SJ940344-4	80.
A-2 (17)	SJ940344-5	81.
XDUP	SJ940344-6	79.
MS	SJ940331-13MS	87.
DMS	SJ940331-13DMS	88.
Method Blank	SJ940328-WMB	92.
Method Blank	SJ940329-WMB	82.
Method Blank	SJ940330-WMB	77.

CAS Acceptance Limits: 62-112

Approved By: Kevin A Murphy Date: April 5, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Dates Collected: 3/21/94
Date Received: 3/23/94
Date Extracted: N/A
Date Analyzed: 3/28/94
Service Request: SJ94-0344

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

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
Benzene	25.	25.8	103.	85-115
Toluene	25.	25.2	101.	85-115
Ethylbenzene	25.	25.5	102.	85-115
Total Xylenes	75.	77.7	104.	85-115
Gasoline	250.	251.	100.	90-110

Approved By: Kevin Murphy Date: April 5, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Dates Collected: 3/21/94
Date Received: 3/23/94
Date Extracted: N/A
Date Analyzed: 3/28/94
Service Request: SJ94-0344

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: µg/L (ppb)

Sample Name: Batch QC
Lab Code: SJ940331-13

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	25.	ND	26.0	24.9	104.	100.	75-135
Toluene	25.	ND	25.5	24.7	102.	99.	73-136
Ethylbenzene	25.	ND	25.2	24.3	101.	97.	69-142

Approved By: Kevin A Murphy Date: April 5, 1994

APPENDIX B

CHAIN OF CUSTODY

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-SCC

Chain of Custody

ARCO Facility no. A 4931	City (Facility) OAKLAND	Project manager (Consultant) TOM DeCON / R. Campbell	Laboratory name Columbia
ARCO engineer Kyle Christie	Telephone no. (ARCO) 415/571 2434	Telephone no. (Consultant) 408/842 8855	Fax no. (Consultant) 408/842 1499
Consultant name IWM / Geostrategies	Address (Consultant) 950 Ames av. Milp. Ca 95035		Contract number 07077

Method of shipment: CAS COURIER

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 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 ☐	TOG 5520 B/F ☐	TOTAL LEAD
FB-1	1	2		✓		✓	✓	3-21-94	1300		✓	✓										
A-9	2	2		✓		✓	✓		1438		✓	✓										
AR-3	3	2		✓		✓	✓		1454		✓	✓										
AR-2	4	2		✓		✓	✓		1602		✓	✓										
A-2	5	4		✓		✓	✓		1650		✓	✓									✓	✓
X-DUP	6	2		✓		✓	✓	3-21-94			✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB TOTAL LEAD preserved w/ HNO_3

Lab number: 5194-0344

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: [signature]	Date 3/23/94	Time 10:00AM	Received by: [signature]
Relinquished by: [signature]	Date 3/23/94	Time 1320	Received by: [signature] CAS/85
Relinquished by:	Date	Time	Received by laboratory: Date 3/23/94 Time 1320

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

IC 3579; total Pb

Columbia Analytical Services inc.

RECEIVED APR 0 5 1994

April 4, 1994

Service Request No.: K941774S

Tom Delon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **Arco A4931/Oakland/Project #IWM-94-5CC**

Dear Tom:

Enclosed are the results of the sample(s) submitted to our laboratory on March 24, 1994. For your reference, these analyses have been assigned our service request number K941774S.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (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. My extension is 243.

Respectfully submitted,

Columbia Analytical Services, Inc.

Eileen M. Arnold
Project Chemist

EMA/sm

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
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
MPN	Most Probable Number
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
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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Received:**	3/24/94
Project:	Arco A4931 / Oakland/#IWM-94-5CC	**Work Order No.:**	K941774 S
Matrix:	Water		

Total Lead
EPA Method 7421
µg/L (ppb)

Sample Name:	Lab Code	MRL	Result
A-2 (17)	K177401	2	62
Method Blank	K1774MB	2	ND

GEN1B/03-13-92

Approved: Eileen M Arnold Date: 4/4/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Received:**	3/24/94
Project:	Arco A4931 / Oakland/#IWM-94-5CC	**Work Order No.:**	K941774 S
Matrix:	Water		

Duplicate Summary
Total Metals
µg/L (ppb)

Sample Name: A-2 (17)
Lab Code: K177401

Analyte	EPA Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Lead	7421	2	62	65	64	5

METD.GW/03-13-92

Approved: Eileen M Arnold Date: 4/4/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Received:**	3/24/94
Project:	Arco A4931 / Oakland/#IWM-94-5CC	**Work Order No.:**	K941774 S
Matrix:	Water		

Matrix Spike Summary
Total Metals
µg/L (ppb)

Sample Name: A-2 (17)
Lab Code: K177401

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Lead	2	20	62	84	110	75-125

METMS.W/03-13-92

Approved: Eileen M Arnold Date: 4/4/94

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. TWM-94-5CC

Chain of Custody

ARCO Facility no. A4931	City (Facility) OAKLAND	Project manager (Consultant) TOM DeCON / R. Campbell	Laboratory name Columbia
ARCO engineer Kyle Christie	Telephone no. (ARCO) 925/551 2434	Telephone no. (Consultant) 408/842 8855	Fax no. (Consultant) 408/842 1499
Consultant name TWM / Geostrategies	Address (Consultant) 950 Ames Ave. Milp. Ca 95035		Contract number 07077

Method of shipment: CMS courier

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 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 ☐	7240 SSTLC BJF	TOTAL LEAD
FB-1	1	2		✓		✓	✓	3-21-94	1300		✓	✓										
17 A-9	2	2		✓		✓	✓		1438		✓	✓										
14 AR-3	3	2		✓		✓	✓		1454		✓	✓										
19 AR-2	4	2		✓		✓	✓		1602		✓	✓										
17 A-2	5	4		✓		✓	✓		1650		✓	✓									✓	✓
X-DUP	6	2		✓		✓	✓	3-21-94			✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks: Add FB TOTAL LEAD preserved w/ HNO_3

Lab number: SJ94-0344

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: [signature]		Date 3/23/94	Time 10:00AM	Received by: Dina Austin			
Relinquished by: Dina Austin		Date 3/23/94	Time 1320	Received by: [signature]	CMS/SS	3/23/94	1320
Relinquished by: [signature]	CMS/SS	Date 3/23/94	Time 1600	Received by laboratory: D Storms		Date 3/24	Time 0570

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

APPC-3292 (2-91)

IC 3579; total Pb