GSI

GeoStrategies Inc. — **LETTER OF TRANSMITTAL**

Environmental Consulting
Engineering and Geologic Services

DATE June 24, 1993

TO: Ms. Susan Hugo
ACHCSA - Hazardous
Materials Division
80 Swan Way Room 200
Oakland, CA 94621

PROJECT NO. 7909-21
SUBJECT: Recovery System Evaluation
Report - 1st Q 1993
ARCO Station 4931
731 W. MacArthur Blvd.
Oakland, CA

THE FOLLOWING ITEMS ARE:

☒ ATTACHED ☐ FORWARDED SEPARATELY VIA _____

QUANTITY	PROJECT NO.	DATE	DESCRIPTION
1	7909-21	6/24/93	Recovery System Evaluation Report - 1st Q 1993.

THESE ARE TRANSMITTED as checked below:

- ☐ For approval
- ☒ For your use
- ☐ As requested
- ☐ For review and
- ☐ Approved
- ☐ Approved as noted
- ☐ Returned for
- ☐ Other _____

COMMENTS:

Signed: Robert D. Campbell

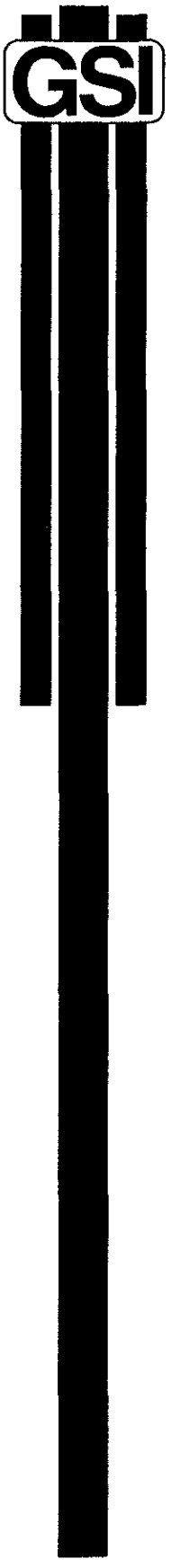
☒ 2140 W. Winton Avenue, Hayward, CA 94545
(510) 352-4800 - FAX (510) 783-1089

☐ 601 University Avenue, Suite 150, Sacramento, CA 95825
(916) 568-7500 - FAX (916) 568-7504

Copies To:

cc: Mr. Richard Hiett, RWQCB
Mr. Michael Whelan, ARCO

D:\KELLY\LTROFTRN.FRM(kj)



GeoStrategies Inc.

RECOVERY SYSTEM EVALUATION REPORT

ARCO Products Company
731 West MacArthur Boulevard
Oakland, California

790907-21

June 24, 1993

GeoStrategies Inc.

June 24, 1993

ARCO Products Company
Post Office Box 5811
San Mateo, California 94402

Attn: Mr. Michael Whelan

Re: **RECOVERY SYSTEM EVALUATION REPORT**
ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California

Mr. Whelan:

This Recovery System Evaluation Report has been prepared for ARCO Products Company (ARCO) by GeoStrategies Inc. (GSI) and describes the hydraulic and chemical performance of the interim groundwater remediation system at the above referenced location (Plate 1) for the period from January 1993 through March 1993.

SITE BACKGROUND

There are currently twelve groundwater monitoring wells (A-2 through A-13) and three groundwater recovery wells (AR-1 through AR-3) at the site (Plate 2). These wells were installed between 1982 and 1992 by Groundwater Technology, Inc., Pacific Environmental Group, and GSI. 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 was completed in early November 1992 and began operating on November 10, 1992.

Quarterly monitoring and sampling of site wells began in 1989. Quarterly groundwater samples were collected from wells A-2 through A-13 and monthly water samples were collected from the interim groundwater remediation system influent (sample D), midpoint (between carbon canisters [sample ports C and B]), and effluent (sample port A) during the first quarter 1993. The interim groundwater remediation system process flow diagram is shown on Plate 3.

EXECUTIVE SUMMARY

A summary of activities and findings associated with the 1993 first quarter system evaluation are presented below:

- The groundwater remediation system appears to be hydraulically controlling the groundwater flow beneath the site.

- The groundwater monitoring wells were sampled on January 26, 1993, and were analyzed for TPHg and BTEX.

- Benzene concentrations were detected in two of the nine wells sampled during the first quarter of 1993.

- The existing interim groundwater remediation system consists of three recovery wells (AR-1 through AR-3). Each well contains a pneumatic total fluids pump. Groundwater is pumped to an on site treatment system. The groundwater remedial system was activated on November 10, 1992. Approximately 1,037,480 gallons of groundwater have been removed by the system this quarter.

- The groundwater treatment facility consists of a surge tank, particulate filter, and three in-series 1,500-pound activated carbon vessels connected in series (Plate 3).

- TPHg and benzene were reported as not detected in samples from one of the groundwater treatment systems' midpoint (port B).

- Groundwater containing dissolved hydrocarbons was pumped through the treatment system at a rate ranging from 1 to 13 gallons per minute (gpm) for the first quarter of 1993.

HYDRAULIC MONITORING

Depth-to-water (DTW) measurements were performed on wells A-2, A-3, A-5 through A-7, and A-10 through A-13 on January 26, 1993. Well A-4 contained floating product, and wells A-8, A-9, and AR-1 through AR-3 were not monitored this quarter due to remedial system equipment installed in these wells. Static groundwater levels were measured from the surveyed top of each well box and recorded to the nearest +/-0.01 foot. Groundwater elevations were calculated from Mean Seal Level (MSL) datum and are presented with DTW measurements in Table 1, Groundwater Analytical Data. Historical water-level data are presented in Table 2, Historical Water-Level Data. The potentiometric map (Plate 4) indicates that current pumping from recovery wells AR-1, AR-2, and AR-3 have influenced shallow groundwater flow generating a depression in groundwater beneath most of the site.

Each well was checked for the presence of floating product. Floating product was detected in well A-4 with a thickness of approximately 0.04 foot. Floating product was not detected in any of the other wells this quarter. Current floating product measurements are presented in Table 1 and have been added to the Historical Water-Level data (Table 2). Current quarter monitoring data are presented in Appendix A.

The groundwater remediation system appears to be operating as designed. No modifications are recommended at this time.

CHEMICAL MONITORING

EMCON Associates (EMCON) field personnel sampled the interim groundwater monitoring wells A-2, A-3, A-5 through A-7, and A-10 through A-13 on January 26, 1993. Well A-4 was not sampled because it contained floating product, and wells A-8, A-9, and AR-1 through AR-3 were not sampled this quarter due to remedial system equipment installed in these wells.

Gettler-Ryan field personnel collected D-influent, B-midpoint, and A-effluent water samples from the groundwater remediation system on January 20, February 10, and March 14, 1993. Groundwater samples collected by EMCON and Gettler-Ryan field personnel were preserved as required by the applicable analytical method and delivered, with Chain of Custody Records, to Sequoia Analytical Laboratories of Redwood City, California, a State-certified laboratory (Hazardous Waste Testing Laboratory Certification #1210) for water analyses. The groundwater samples collected from monitoring wells A-2 through A-13 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) by Environmental Protection Agency (EPA) Methods 5030/8015/8020. Results of current analytical data are shown on Table 1, Groundwater Analytical Data and historical analytical data are presented in Table 3, Historical Groundwater Quality Database. TPHg and benzene data are plotted on Plate 5, TPH-G/Benzene Concentration Map. The EMCON Groundwater Sampling and Monitoring Reports are included in Appendix A. The Chain of Custodies and groundwater analytical reports are included in Appendix B.

GROUNDWATER TREATMENT SYSTEM MONITORING

Chemical Analytical Results

Monthly samples from ports A, B, and D of the interim groundwater remediation system, collected by Gettler-Ryan field personnel, were preserved as required by the applicable analytical method and delivered, with Chain of Custody Records, to Sequoia Analytical Laboratories of Redwood City, California, a State-certified laboratory (Hazardous Waste Testing Laboratory Certification #1210) for analyses for EPA Priority Pollutant Metals, purgeable halocarbons by EPA Method 601, and during the January 1993 system monitoring event, samples from port B was analyzed for TPHg and BTEX by EPA Methods 5030/8015/8020. The interim groundwater remediation system analytical data is shown on Tables 4A and 4B, Groundwater Remedial System Analytical Data-TPHg, BTEX, Metals, and VOCs.

The chain of custody and groundwater analytical reports are included in Appendix B.

During the first quarter 1993 sampling period, the midpoint samples (between carbon canisters [port B]) were reported as not detected (ND) for TPHg and BTEX, and ND for purgeable halocarbons. The midpoint samples did contain detectable concentrations of zinc (48 ppb) on January 20, 1993; antimony (16 ppb) and zinc (92 ppb) on February 10, 1993; and copper (21 ppb) and zinc (25 ppb) on March 14, 1993. Sample analyses indicate that the effluent discharge meets the parameters of the POTW permit. Chemical analytical data indicates that the treatment system is effectively removing dissolved hydrocarbons from groundwater prior to discharge to the sanitary sewer.

Groundwater Recovery System Operation

Flowmeter readings from the groundwater recovery system were recorded at the time of sampling and are presented in Table 5. Groundwater was pumped through the treatment system at approximate flow rates ranging from 1 to 13 gpm. Approximately 1,037,480 gallons of groundwater were recovered and treated from January through March 1993.

DISCUSSION

The groundwater remediation system appears to be operating as designed during the first quarter of 1993. Current quarter increases in concentrations of TPHg and benzene in Wells A-2 and A-6 may result from recent static water-level increases which dissolve residual hydrocarbons in the soil and possibly due to the movement of hydrocarbons during groundwater extraction. The need for modifications to the remediation system will be evaluated as additional data becomes available.

If you have any questions or comments, please call.

Sincerely,

GeoStrategies Inc.

Robert D. Campbell
Assistant Project Geologist

John F. Vargas
Senior Geologist

REGISTERED GEOLOGIST
JOHN F. VARGAS
NO. 5046
STATE OF CALIFORNIA

RDC/JFV:rt

TABLES

PLATES

APPENDICES

QC Review: _____

TABLE 1

GROUNDWATER ANALYTICAL DATA

WELL NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	WELL ELEV. (FT)	STATIC WATER ELEV. (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
A-2	26-Jan-93	03-Feb-93	390	0.87	<0.50	<0.50	4.3	55.48	50.42	0.00	5.06
A-3	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	54.66	44.84	0.00	9.82
A-4	26-Jan-93	03-Feb-93	---	---	---	---	---	54.73	44.14	0.00	10.59
A-5	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	54.17	43.85	0.00	10.32
A-6	26-Jan-93	03-Feb-93	1600	4.8	1.2	14	46	55.17	47.67	0.00	7.50
A-7	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	54.71	47.38	0.00	7.33
A-8	26-Jan-93	03-Feb-93	---	---	---	---	---	53.77	---	---	---
A-9	26-Jan-93	03-Feb-93	---	---	---	---	---	53.04	---	---	---
A-10	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	54.26	43.45	0.00	10.81
A-11	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	57.74	43.84	0.00	9.90
A-12	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	52.05	42.57	0.00	9.48
A-13	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	55.11	46.12	0.00	8.99
AR-1	26-Jan-93	03-Feb-93	---	---	---	---	---	54.72	---	---	---
AR-2	26-Jan-93	03-Feb-93	---	---	---	---	---	54.77	---	---	---
AR-3	26-Jan-93	03-Feb-93	---	---	---	---	---	54.19	---	---	---
XDUP (A-2)	26-Jan-93	03-Feb-93	310	0.58	<0.50	<0.50	3.5	---	---	---	---
FB-1	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	---	---	---	---
TB-1	26-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	---	---	---	---

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPB = Parts Per Billion.
TB = Trip Blank.
FB = Field Blank.
XDUP = Duplicate Sample.

Notes:
1. All data shown as <x are reported as ND (none detected).
2. Water level elevations referenced to Mean Sea Level (MSL).

TABLE 2

HISTORICAL WATER-LEVEL DATA

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
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

TABLE 2

HISTORICAL WATER-LEVEL DATA

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

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
16-Jan-91	A-4	11.89	54.62	42.74	0.01
12-Apr-91	A-4	9.54	54.62	45.08	0.00
10-Jul-91	A-4	11.55	54.62	43.07	0.00
20-Sep-91	A-4	12.12	54.62	42.50	0.00
21-Oct-91	A-4	11.76	54.62	42.88	0.03
02-Feb-92	A-4	11.18	54.62	43.46	0.02
29-Apr-92	A-4	10.78	54.62	43.86	0.02
29-Jul-92	A-4	11.74	54.73	43.02	0.04
28-Oct-92	A-4	11.93	54.73	42.82	0.03
26-Jan-93	A-4	10.59	54.73	44.17	0.04
20-Mar-89	A-5	8.09	54.15	46.06	0.00
24-May-89	A-5	11.13	54.15	43.02	0.00
18-Aug-89	A-5	11.58	54.15	42.57	0.00
27-Oct-89	A-5	10.68	54.15	43.47	0.00
15-Jan-90	A-5	9.24	54.15	44.91	0.00
04-Apr-90	A-5	10.93	54.15	43.22	0.00
30-Jul-90	A-5	11.48	54.15	42.67	0.00
29-Oct-90	A-5	11.77	54.15	42.38	0.00
16-Jan-91	A-5	11.36	54.15	42.79	0.00
12-Apr-91	A-5	9.64	54.15	44.51	0.00
10-Jul-91	A-5	11.30	54.15	42.85	0.00
21-Oct-91	A-5	11.48	54.15	42.67	0.00

TABLE 2

HISTORICAL WATER-LEVEL DATA

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

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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
21-Mar-86	A-8	-----	53.61	-----	0.02
07-Jan-88	A-8	-----	53.61	-----	0.18
20-Mar-89	A-8	8.21	53.61	45.93	0.66
24-May-89	A-8	11.41	53.61	43.16	1.20
18-Aug-89	A-8	10.88	53.61	43.35	0.77

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
27-Oct-89	A-8	11.66	53.61	43.00	1.31
15-Jan-90	A-8	9.84	53.61	44.47	0.87
04-Apr-90	A-8	11.35	53.61	42.46	0.25
30-Jul-90	A-8	10.48	53.61	44.53	1.75
29-Oct-90	A-8	11.39	53.61	42.30	0.10
16-Jan-91	A-8	11.11	53.61	42.51	0.01
12-Apr-91	A-8	9.16	53.61	44.46	0.01
10-Jul-91	A-8	10.73	53.61	42.89	0.01
21-Oct-91	A-8	10.98	53.61	42.72	0.11
02-Feb-92	A-8	10.80	53.61	43.93	1.40
29-Apr-92	A-8	11.15	53.61	43.50	1.30
29-Jul-92	A-8	11.33	53.77	42.49	0.06
28-Oct-92	A-8	N/A	53.77	-----	-----
26-Jan-93	A-8	N/A	53.77	-----	-----
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

TABLE 2

HISTORICAL WATER-LEVEL DATA

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

TABLE 2

HISTORICAL WATER-LEVEL DATA

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

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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-Jul-92	A-13	9.93	55.11	45.18	0.00
29-Jul-92	A-13	11.12	55.11	43.99	0.00
28-Oct-92	A-13	10.84	55.11	44.27	0.00
26-Jan-93	A-13	8.99	55.11	46.12	0.00
01-Jul-92	AR-1	10.27	54.72	44.45	0.00

TABLE 2

HISTORICAL WATER-LEVEL DATA

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

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.
9. Wells A-8, A-9, and AR-1 through AR-3 were not measured on October 28, 1992 and after, due to remediation equipment installed in the wells.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
21-Mar-86	A-2	31000.	---	---	---	---
07-Jan-88	A-2	12000.	920.	1500.	---	4000.
20-Mar-89	A-2	22000.	1200.	1800.	1200.	7700.
24-May-89	A-2	9000.	460.	260.	250.	2400.
18-Aug-89	A-2	14000.	900.	200.	<200.	1300.
27-Oct-89	A-2	16000.	1200.	340.	90.	3100.
15-Jan-90	A-2	9900.	1100.	460.	150.	2900.
04-Apr-90	A-2	16000.	1100.	400.	380.	3900.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
30-Jul-90	A-2	16000.	1400.	340.	290.	3600.
29-Oct-90	A-2	14000.	1100.	210.	66.	2700.
16-Jan-91	A-2	15000.	1200.	800.	190.	4600.
12-Apr-91	A-2	16000	640	290	280	2600
21-Oct-91	A-2	26000	1100	560	81	3900
02-Feb-92	A-2	11000	150	13	91	94
29-Apr-92	A-2	5400	120	16	129	19
30-Jul-92	A-2	590	10	<2.0	<2.0	9.0
29-Oct-92	A-2	77	0.56	<0.50	<0.50	0.51
26-Jan-93	A-2	390	0.87	<0.50	<0.50	4.3
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.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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				
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
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				

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
21-Oct-91	A-4			Floating product		
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		
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.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
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

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
07-Jan-88	A-7	<50.	<0.5	1.	----	4.
20-Mar-89	A-7	<50.	0.9	<1.	<1.	<3.
24-May-89	A-7	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-7	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-7	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-7	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-7	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-7	<50.	2.7	7.6	1.1	3.0
16-Jan-91	A-7	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-7	<30	<0.30	<0.30	<0.30	0.48
10-Jul-91	A-7	<30	<0.30	0.49	<0.30	1.2
21-Oct-91	A-7	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-7	<30	<0.30	<0.30	<0.30	<0.30

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
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		

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

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

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
24-May-89	A-10	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-10	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-10	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-10	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-10		Not accessible			
30-Jul-90	A-10	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-10	<50.	2.3	6.9	1.2	3.0
16-Jan-91	A-10	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-10	<30	0.67	0.55	<0.30	0.90
10-Jul-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-10	<30	<0.30	<0.30	<0.30	<0.30
02-Feb-92	A-10		Not accessible			
29-Apr-92	A-10	<30	<0.30	<0.30	<0.30	<0.30
29-Jul-92	A-10	<50	25	<0.50	<0.50	1.8
28-Oct-92	A-10	<50	<0.50	<0.50	<0.50	<0.50
26-Jan-93	A-10	<50	<0.50	<0.50	<0.50	<0.50
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.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
04-Apr-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-11	<50.	<0.5	0.6	<0.5	0.5
29-Oct-90	A-11	<50.	0.6	2.4	0.6	1.5
16-Jan-91	A-11	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-11	<30	<0.30	0.37	<0.30	<0.30
10-Jul-91	A-11	<30	0.61	0.46	<0.30	1.0
21-Oct-91	A-11	<30	<0.30	<0.30	<0.30	<0.30
01-Feb-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
29-Apr-92	A-11	<30	<0.30	<0.30	<0.30	<0.30
30-Jul-92	A-11	<50.	<0.50	<0.50	<0.50	<0.50
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
07-Jan-88	A-12	<50.	<0.5	2.	---	<4.
20-Mar-89	A-12	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-12	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-12	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-12	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-12	<50.	<0.5	<0.5	<0.5	<0.5

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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-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-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-Jul-92	AR-2	<50	<0.50	<0.50	<0.50	<0.50
29-Jul-92	AR-2	350	130	8.5	<10	<10
28-Oct-92	AR-2		Not Accessible			
26-Jan-93	AR-2		Not Accessible			
01-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

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
28-Oct-92	AR-3		Not Accessible			
26-Jan-93	AR-3		Not Accessible			

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 October 28, 1992 due to remediation equipment in the wells.

TABLE 4A

GROUNDWATER REMEDIAL SYSTEM
ANALYTICAL DATA - TPH-G, BTEX AND METALS

DATE	SAMPLE NO.	TPH-G	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	At	AS	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Ti	Zn
20-Jan-93	A	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	<10	<5	<0.2	<50	<5	<10	<5	48
	B	<50	<0.50	<0.50	<0.50	<0.50	<5	<5	<10	<10	<10	<10	<5	<0.2	<50	<5	<10	<5	<10
	D	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	<10	12	<0.2	<50	<5	<10	<5	<10
10-Feb-93	A	NA	NA	NA	NA	NA	18	<5	<10	<10	<10	<10	<5	<0.2	<50	<5	<10	<5	92
	B	NA	NA	NA	NA	NA	7.4	<5	<10	<10	<10	<10	<5	<0.2	<50	<5	<10	<5	<10
	D	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	<10	<5	<0.2	<50	<5	<10	<5	34
14-Mar-93	A	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	21	<5	<0.2	<50	<5	<10	<5	25
	B	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	89	<5	<0.2	<50	<5	<10	<5	29
	D	NA	NA	NA	NA	NA	<5	<5	<10	<10	<10	82	<5	<0.2	<50	<5	<10	<5	<10

All Metals were analyzed by EPA priority pollutants: metals.
Analytical results in parts per billion (ppb).
TPH-g = Total Petroleum Hydrocarbons calculated as Gasoline by EPA Methods 5030/8015.

Sample A = Effluent
Sample B = midpoint
Sample C = Influent

At = Antimony
As = Arsenic
Be = Beryllium
Cd = Cromium
Cr = Chromium
Cu = Copper
Pb = Lead
Hg = Mercury
Ni = Nickel
Se = Selenium
Ag = Silver
Ti = Thallium
Zn = Zinc

NA = Not Analyzed.
< = Less than the detection limit.

TABLE 4B

GROUNDWATER REMEDIAL SYSTEM ANALYTICAL DATA - VOC's

DATE	SAMPLE NO.	COMPOUND	RESULT
20-Jan-93	A	---	<1.0 for all compounds
	B	---	<1.0 for all compounds
	D	Carbon Tetrachloride	2.3
		Chloroform	1.6
		cis-1,2-Dichloroethene	3.3
		Tetrachlorethene	20
		Trichloroethene	1.1
10-Feb-93	A	---	<1.0 for all compounds
	B	---	<1.0 for all compounds
	D	Carbon Tetrachloride	1.9
		Chloroform	1.3
		cis-1,2-Dichloroethene	1.0
		Tetrachloroethene	21
14-Mar-93	A	---	<1.0 for all compounds
	B	---	<1.0 for all compounds
	D	Carbon Tetrachloride	1.9
		Chloroform	1.3
		cis-1,2-Dicloroethene	1.0
		Tetrachloroethene	21

Results in parts per billion (ppb).
VOCs = Volatile Organic Compounds by EPA Method 601.
< = Less than detection limit.

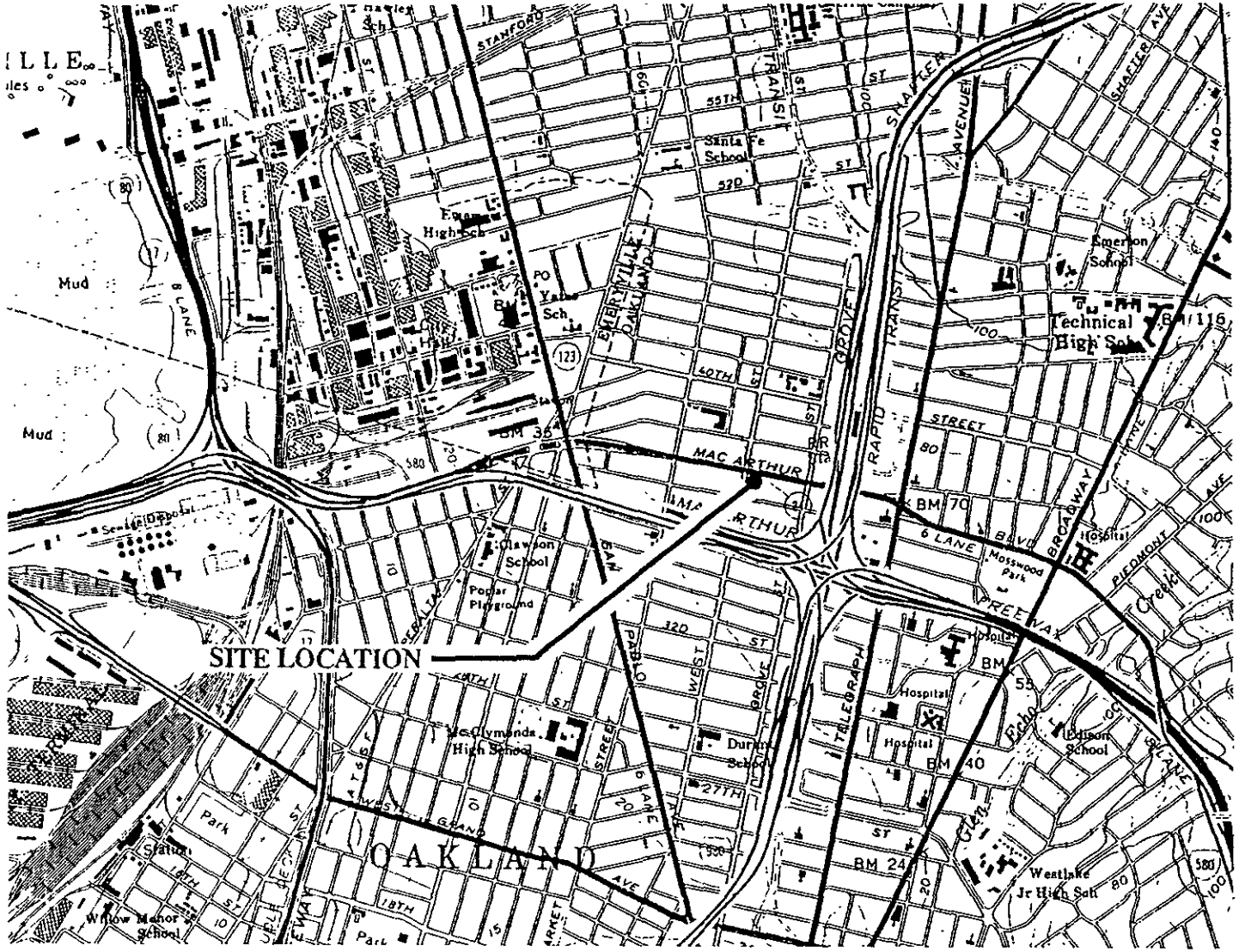
Sample A = Effluent
Sample B = midpoint
Sample D = Influent

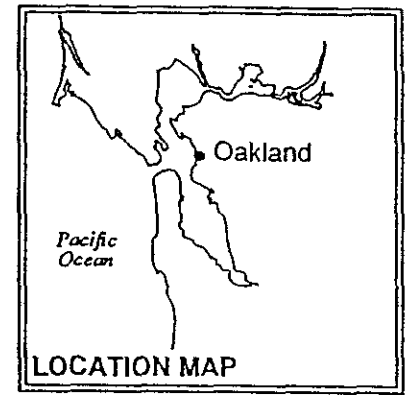
Table 5
Groundwater Treatment System Flow Data

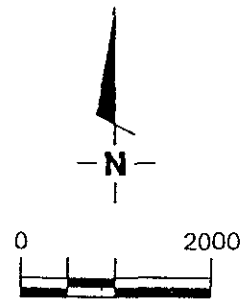
Sample Date	Flow Meter Reading	Cumulative flow (gallons)	Average Flowrates (gal/day)	(gal/min)
11/16/92	1,090	0	---	---
11/18/92	22,690	21,600	10,800	8
11/20/92	44,920	43,830	11,115	8
12/17/92	92,210	91,120	1,751	1
1/12/93	564,680	563,590	18,172	13
2/10/93	838,640	837,550	9,447	7
2/24/93	947,220	946,130	7,756	5
3/14/93	1,086,630	1,085,540	7,745	5
4/1/93	1,129,690	1,128,600	2,392	2
1st Quarter 1993		1,037,480		
Total		1,128,600		
Averages			8,299	6

Note:

1) Average flowrates calculated using flowmeter readings and the number of days between readings.







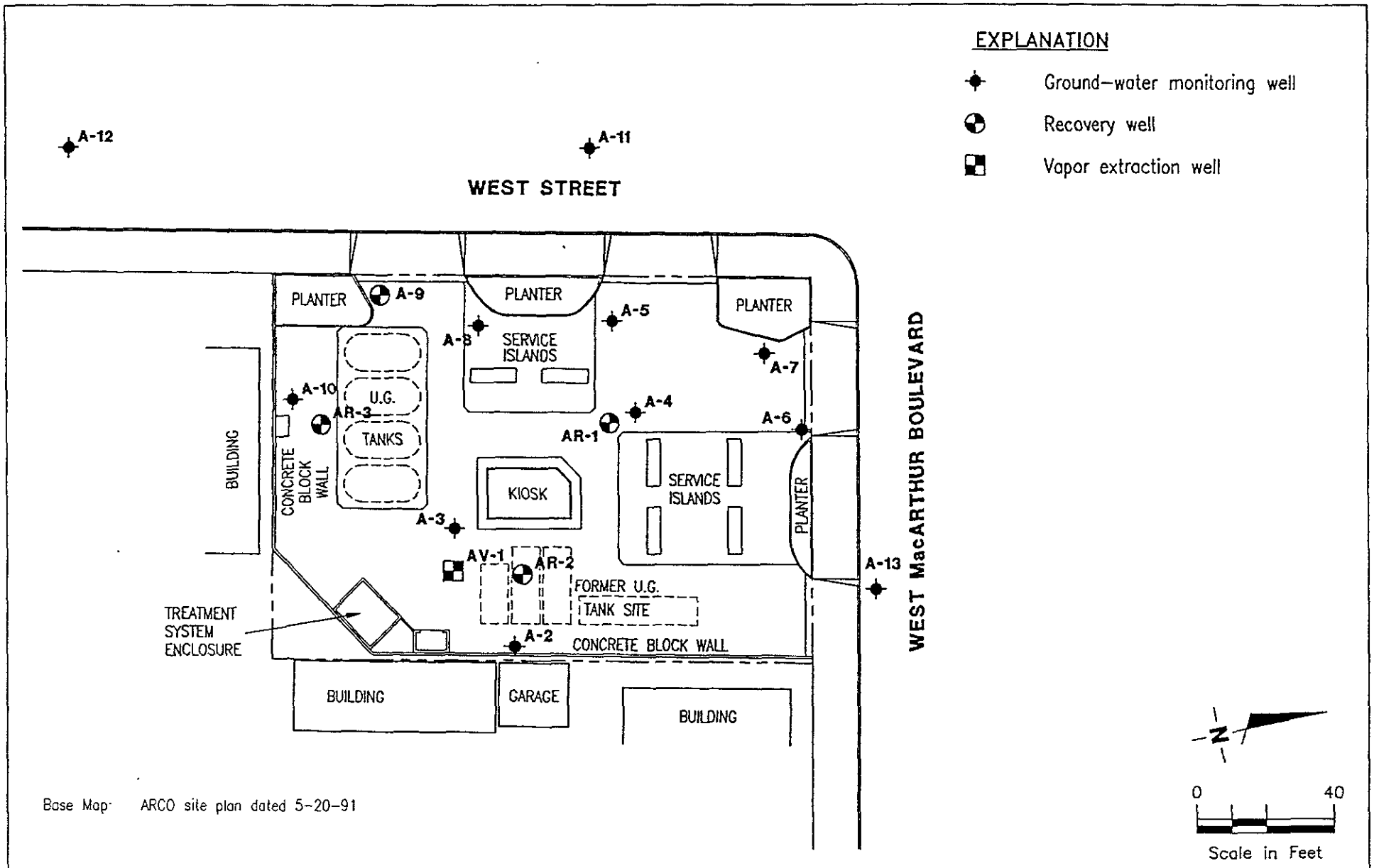
Base Map: USGS Topographic Map

GeoStrategies Inc.

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

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/91	

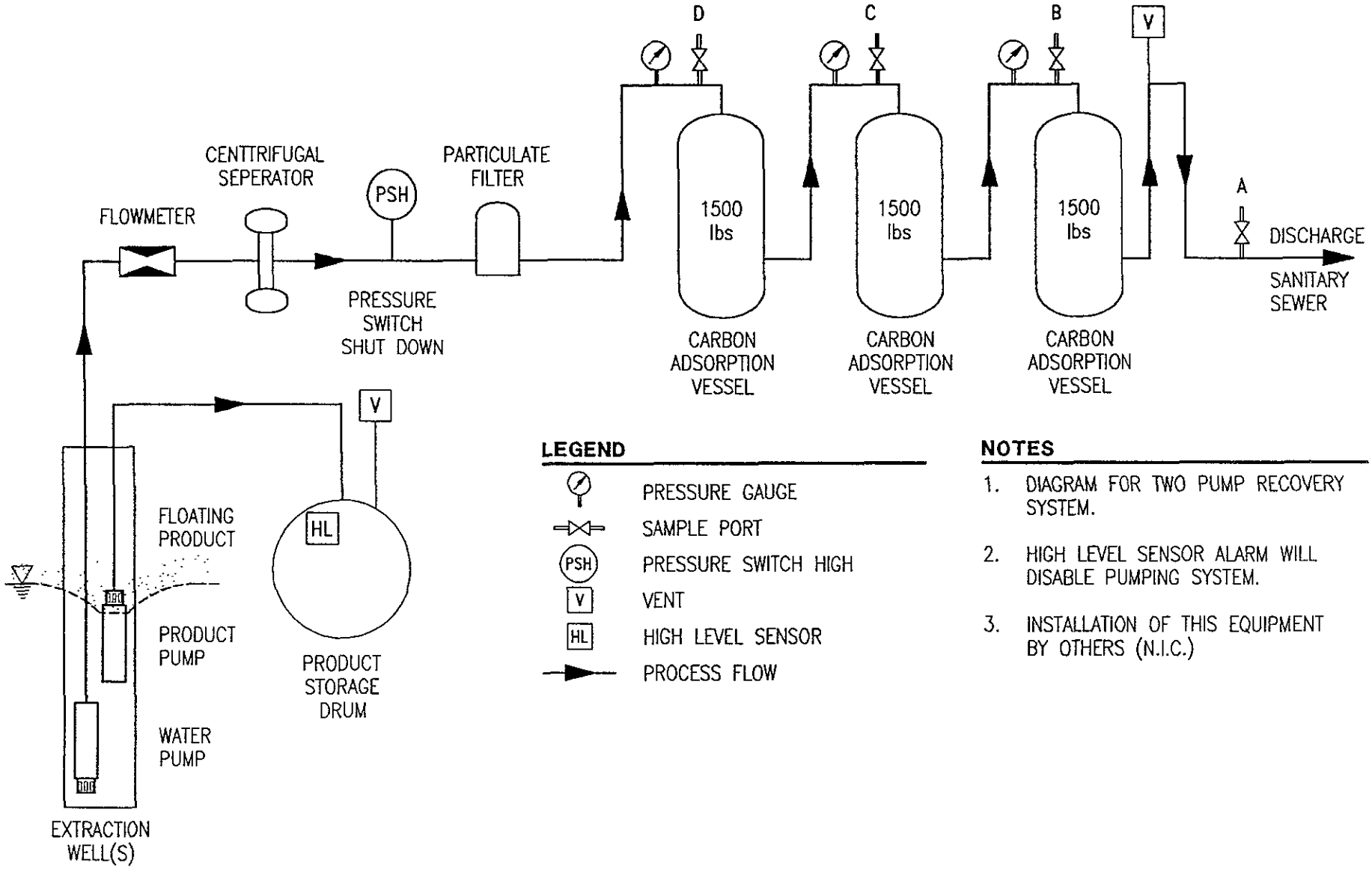


GeoStrategies Inc.

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

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/92	



LEGEND

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

NOTES

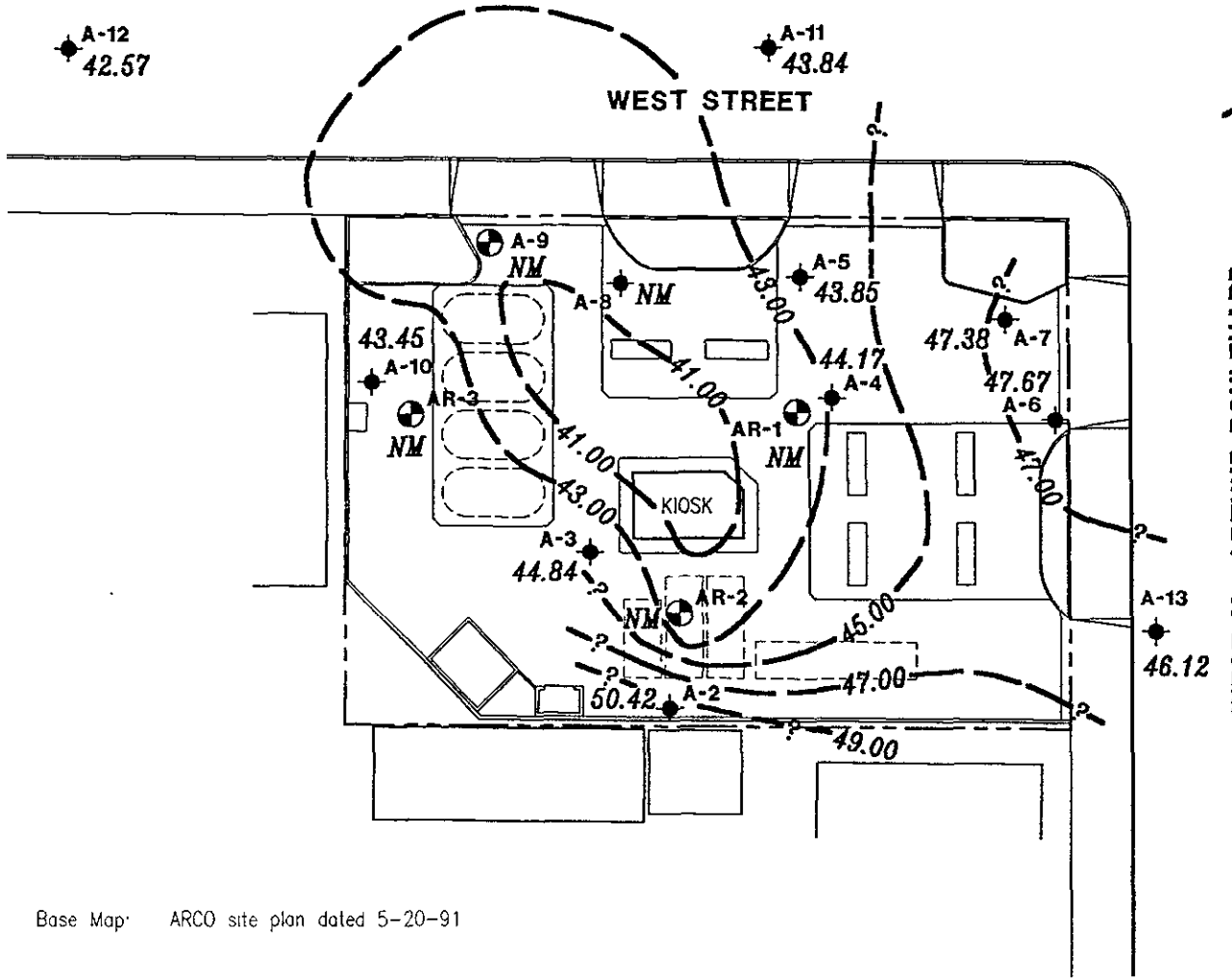
1. DIAGRAM FOR TWO PUMP RECOVERY SYSTEM.
2. HIGH LEVEL SENSOR ALARM WILL DISABLE PUMPING SYSTEM.
3. INSTALLATION OF THIS EQUIPMENT BY OTHERS (N.I.C.)

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	



EXPLANATION

- Ground-water monitoring well
- Recovery well
- 99.99 — Ground-water elevation contour.
- 99.99 — Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on January 26, 1993
- NM — Not Measured

NOTES: 1. Contours may be influenced by irrigation practices and/or site construction activities.

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

N

0 40

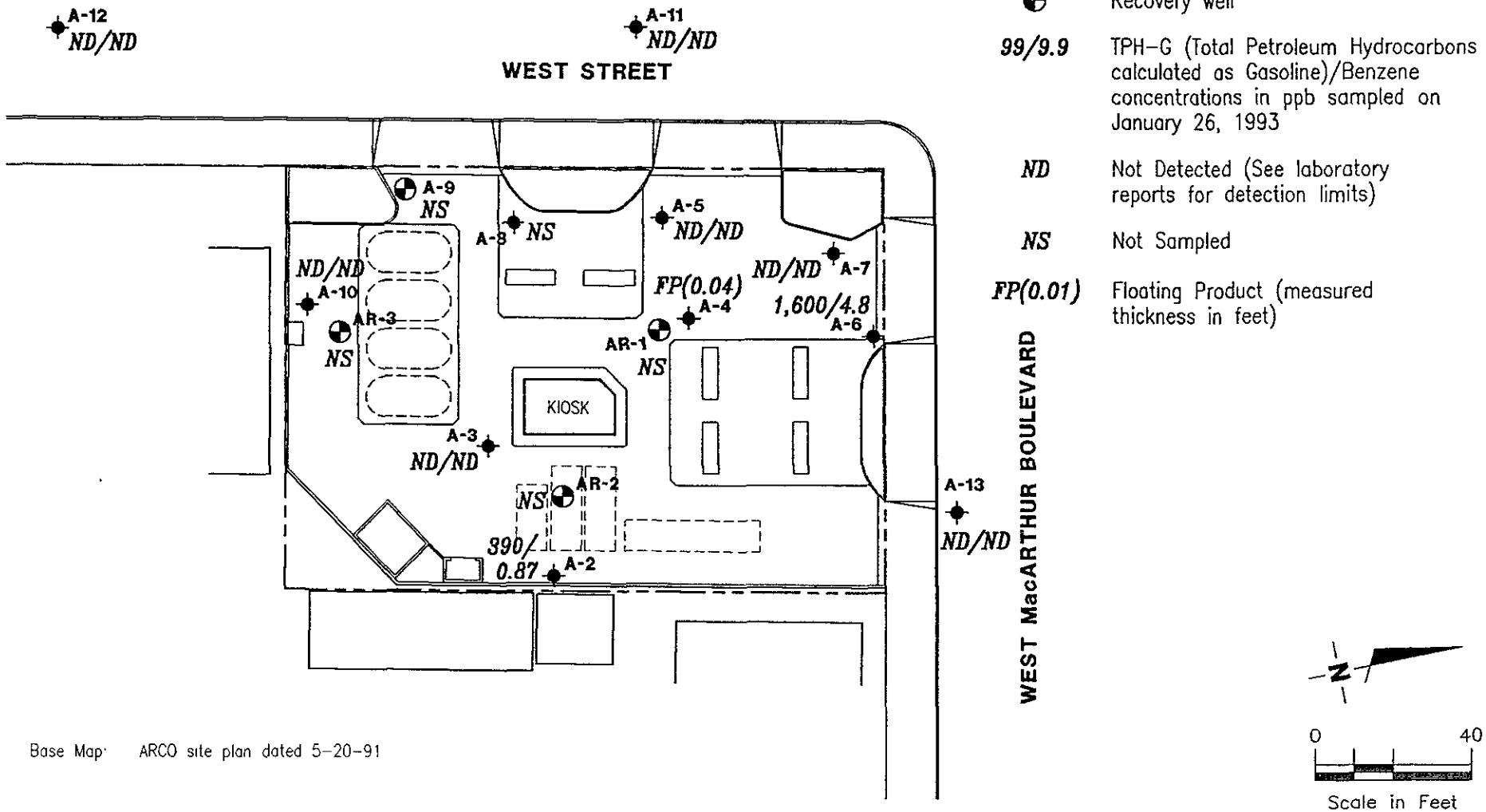
Scale in Feet

GeoStrategies Inc.

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

PLATE 4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790970-21		6/93	



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

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790970-21		6/93	

APPENDIX A

EMCON GROUNDWATER SAMPLING AND MONITORING REPORTS

3.23.93 cmg

RECEIVED

FEB 23 1993

GeoStrategies Inc.

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date February 18, 1993
Project 0G70-032.01

To:
Mr. John Vargas
GeoStrategies, Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
15	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the first quarter 1993 monitoring event at ARCO service station 4931, 731 West MacArthur Boulevard, Oakland, CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Jim Butera JB

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
ROBERT CURTIS PORTER
No: 4094
Exp. 6/30/96
INDUSTRIAL
STATE OF CALIFORNIA

Robert Porter

Robert Porter, Senior Project Engineer.

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

909-0

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-032.01 STATION ADDRESS : 731 West MacArthur Blvd. Oakland, DATE : 1-26-93

ARCO STATION # : 4931 FIELD TECHNICIAN : REICHELDERFER / ADLER DAY : TUESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	AR-1	OK	YES	NO	NA	NA	NA	NA	NA	NA	NA	NO WL or SAMPLE PORT
2	AR-2	OK	YES	NO	NA	———	———	———	———	———	->	↓
3	AR-3	OK	YES	NO	NA	———	———	———	———	———	->	↓
4	A-13	OK	YES	NO	~~2268~~	~~BAD~~ OK	8.99	8.99	~~8.76~~ ND	NA	29.4	BOX COMPLETELY FULL OF WATER / REPLACED LOCK & LWC
5	A-7	OK	YES	NO	~~2008~~	FLIP CAP	7.33	7.33	ND	NA	22.8	—
6	A-11	OK	YES	NO	?	FLIP CAP	9.90	9.90	ND	NA	27.8	HAD TO PULL FLIP CAP ASSEMBLY OFF TO GET WL LOCK IS FROZEN
7	A-12	OK	YES	NO	2268	FLIP CAP	9.48	9.48	ND	NA	30.0	
8	A-10	OK	YES	NO	3283	FLIP CAP	10.81	10.81	ND	NA	30.2	BOX COMPLETELY FULL OF WATER
9	A-5	OK	YES	NO	2008	FLIP CAP	10.32	10.32	ND	NA	23.9	—
10	A-6	OK	YES	NO	2008	BAD	7.50	7.50	ND	NA	24.6	BROKED LIP ON FLIP CAP WHERE IT LOCKS → LOCK HOLE
11	A-9	OK	YES	NO	NA	———	———	———	———	———	->	NO WL or SAMPLE PORT
12	A-3	OK	YES	NO	2357	~~BAD~~ OK	9.82	9.82	ND	NA	17.0	BOX COMPLETELY FULL OF WATER / REPLACED LOCK & LWC
13	A-2	OK	YES	NO	2357	FLIP CAP	5.06	5.06	ND	NA	19.8	—
14	A-4	OK	YES	NO	3283	FLIP CAP	10.59	10.59	ND *	NA	19.9 *	0.04' OF PRODUCT DETECTED IN / ECONO-TEFLON BAILER (DARK BROWN/BLACK IN COLOR)

SURVEY POINTS ARE TOP OF WELL BOXES

* PREFERABLY 90-NECK

MOST LOCKS ARE DIFFICULT TO OPEN - ALL LOCKS SHOULD BE [illegible] / REPLACE

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-032.01 STATION ADDRESS : 731 West MacArthur Blvd. Oakland, DATE : 1-26-93

ARCO STATION # : 4931 FIELD TECHNICIAN : REICHELDERFER/ADLER DAY : TUESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
15	A-8	OK	YES	NO	NA	—	—	—	—	—	>	NO WL or SAMPLE PORT

SURVEY POINTS ARE TOP OF WELL BOXES

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California
micrograms per liter (µg/l) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)
AR-1	01/26/93	NR.[2]	NR.	NR.	NR.	NR.	NR.	NR.
AR-2	01/26/93	NR.	NR.	NR.	NR.	NR.	NR.	NR.
AR-3	01/26/93	NR.	NR.	NR.	NR.	NR.	NR.	NR.
A-2(19)	01/26/93	5.06	ND.[3]	390.	0.87	<0.50	<0.50	4.3
A-3(17)	01/26/93	9.82	ND.	<50.	<0.50	<0.50	<0.50	<0.50
A-4	01/26/93	10.59	0.04	FP.[4]	FP.	FP.	FP.	FP.
A-5(23)	01/26/93	10.32	ND.	<50.	<0.50	<0.50	<0.50	<0.50
A-6(24)	01/26/93	7.50	ND.	1,600.	4.8	1.2	14.	46.
A-7(22)	01/26/93	7.33	ND.	<50.	<0.50	<0.50	<0.50	<0.50
A-8	01/26/93	NR.	NR.	NR.	NR.	NR.	NR.	NR.
A-9	01/26/93	NR.	NR.	NR.	NR.	NR.	NR.	NR.
A-10(30)	01/26/93	10.81	ND.	<50	<0.50	<0.50	<0.50	<0.50
A-11(27)	01/26/93	9.90	ND.	<50.	<0.50	<0.50	<0.50	<0.50
A-12(30)	01/26/93	9.48	ND.	<50.	<0.50	<0.50	<0.50	<0.50
A-13(29)	01/26/93	8.99	ND.	<50.	<0.50	<0.50	<0.50	<0.50
XDup[5]	01/26/93	NA.[6]	ND.	310.	0.58	<0.50	<0.50	3.5
FB-1[7]	01/26/93	NA.	NA.	<50.	<0.50	<0.50	<0.50	<0.50
TB-1[8]	01/26/93	NA.	NA.	<50.	<0.50	<0.50	<0.50	<0.50

1. TPH = Total petroleum hydrocarbons
2. NR. = Not recorded due to ground water extraction system installed in well.
3. ND. = Not detected
4. FP. = Floating product; well was not sampled due to detection of floating product
5. XDup = Duplicate well sample collected at well A-2
6. NA = Not applicable
7. FB = Field Blank
8. TB = Trip Blank

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California
parts per million (ppm) and milligrams per liter (mg/l)

Well ID and Sample Depth	TOG[1] (mg/l)	Total Lead (mg/l)
A-2(19)	<5.0	0.026

1. TOG = Total Oil and Greese

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Project: ARCO 4931, Oakland / EMCGC-92-1

Enclosed are the results from 12 water samples received at Sequoia Analytical on January 27,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3A52301	Water, A-2 (19)	1/26/93	Lead EPA 5030/8015/8020 SM 5520 C&F (Infrared)
3A52302	Water, A-3 (17)	1/26/93	EPA 5030/8015/8020
3A52303	Water, A-5 (23)	1/26/93	EPA 5030/8015/8020
3A52304	Water, A-6 (24)	1/26/93	EPA 5030/8015/8020
3A52305	Water, A-7 (22)	1/26/93	EPA 5030/8015/8020
3A52306	Water, A-10 (30)	1/26/93	EPA 5030/8015/8020
3A52307	Water, A-11 (27)	1/26/93	EPA 5030/8015/8020
3A52308	Water, A-12 (30)	1/26/93	EPA 5030/8015/8020
3A52309	Water, A-13 (29)	1/26/93	EPA 5030/8015/8020
3A52310	Water, XDUP	1/26/93	EPA 5030/8015/8020
3A52311	Water, FB-1	1/26/93	EPA 5030/8015/8020
3A52312	Water, TB-1	1/26/93	EPA 5030/8015/8020

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

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	ARCO 4931, Oakland / EMCGC-92-1	Sampled:	Jan 26, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Jan 27, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 9, 1993
Attention: Jim Butera	First Sample #:	3A52301		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A52301 A-2 (19)	Sample I.D. 3A52302 A-3 (17)	Sample I.D. 3A52303 A-5 (23)	Sample I.D. 3A52304 A-6 (24)	Sample I.D. 3A52305 A-7 (22)	Sample I.D. 3A52306 A-10 (30)
Purgeable Hydrocarbons	50	390	N.D.	N.D.	1,600	N.D.	N.D.
Benzene	0.50	0.87	N.D.	N.D.	4.8	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	1.2	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	14	N.D.	N.D.
Total Xylenes	0.50	4.3	N.D.	N.D.	46	N.D.	N.D.
Chromatogram Pattern:		Gasoline	--	--	Weathered Gas	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	2/3/93	2/3/93	2/3/93	2/3/93	2/3/93	2/3/93
Instrument Identification:	GCHP-6	GCHP-6	GCHP-6	GCHP-6	GCHP-6	GCHP-6
Surrogate Recovery, %: (QC Limits = 70-130%)	109	105	91	114	108	84

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

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	ARCO 4931, Oakland / EMCGC-92-1	Sampled:	Jan 26, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Jan 27, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 9, 1993
Attention: Jim Butera	First Sample #:	3A52307		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A52307 A-11 (27)	Sample I.D. 3A52308 A-12 (30)	Sample I.D. 3A52309 A-13 (29)	Sample I.D. 3A52310 XDUP	Sample I.D. 3A52311 FB-1	Sample I.D. 3A52312 TB-1
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	310	N.D.	N.D.
Benzene	0.50	N.D.	N.D.	N.D.	0.58	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.	3.5	N.D.	N.D.
Chromatogram Pattern:		--	--	--	Weathered Gas	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	2/3/93	2/3/93	2/3/93	2/6/93	2/3/93	2/3/93
Instrument Identification:	GCHP-6	GCHP-6	GCHP-6	GCHP-3	GCHP-6	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	97	94	106	99	104	102

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

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	ARCO 4931, Oakland / EMCGC-92-1	Sampled:	Jan 26, 1993
1938 Junction Avenue	Matrix Descript:	Water	Received:	Jan 27, 1993
San Jose, CA 95131	Analysis Method:	SM 5520 C&F (Infrared)		
Attention: Jim Butera	First Sample #:	3A52301	Analyzed:	Feb 5, 1993
			Reported:	Feb 9, 1993

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L
3A52301	A-2 (19)	N.D.

Detection Limits:	5.0

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

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	ARCO 4931, Oakland / EMCGC-92-1	Sampled:	Jan 26, 1993
1938 Junction Avenue	Sample Descript:	Water, A-2 (19)	Received:	Jan 27, 1993
San Jose, CA 95131			Analyzed:	see below
Attention: Jim Butera	Lab Number:	3A52301	Reported:	Feb 9, 1993

LABORATORY ANALYSIS

Analyte	Date Analyzed	Detection Limit mg/L	Sample Result mg/L
Lead	2/3/93	0.0050	0.026

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

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: ARCO 4931, Oakland / EMCGC-92-1

QC Sample Group: 3A52301-09, 11

Reported: Feb 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Donohue	C. Donohue	C. Donohue	C. Donohue
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993
QC Sample #:	G9301539-01A MS/MSD	G9301539-01A MS/MSD	G9301539-01A MS/MSD	G9301539-01A MS/MSD
Sample Conc.:	N.D.	N.D.	N.D.	25
Spike Conc. Added:	50	50	50	150
Conc. Matrix Spike:	47	48	48	138
Matrix Spike % Recovery:	94	96	96	75
Conc. Matrix Spike Dup.:	45	44	44	127
Matrix Spike Duplicate % Recovery:	90	88	88	68
Relative % Difference:	4.3	8.7	8.7	8.3

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: ARCO 4931, Oakland / EMCGC-92-1

QC Sample Group: 3A52310

Reported: Feb 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 6, 1993	Feb 6, 1993	Feb 6, 1993	Feb 6, 1993
QC Sample #:	GBLK020893 MS/MSD	GBLK020893 MS/MSD	GBLK020893 MS/MSD	GBLK020893 MS/MSD
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	31
Matrix Spike % Recovery:	100	100	100	103
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0.0	0.0	0.0	3.3

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

% Recovery:	Conc. of M.S - Conc. of Sample / Spike Conc Added	x 100
Relative % Difference	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: ARCO 4931, Oakland / EMCGC-92-1

QC Sample Group: 3A52312

Reported: Feb 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993
QC Sample #:	G9302041-02C MS/MSD	G9302041-02C MS/MSD	G9302041-02C MS/MSD	G9302041-02C MS/MSD
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	7.5	7.7	7.9	22
Matrix Spike % Recovery:	75	77	79	73
Conc. Matrix Spike Dup.:	8.3	8.5	8.8	25
Matrix Spike Duplicate % Recovery:	83	85	88	83
Relative % Difference:	10	9.9	11	13

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: ARCO 4931, Oakland / EMCGC-92-1

QC Sample Group: 3A52301

Reported: Feb 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Total Petroleum Hydrocarbons

Method:	SM 5520 CF
Analyst:	P. Penner
Reporting Units:	mg/L
Date Analyzed:	Feb 5, 1993
QC Sample #:	BLK020593

Sample Conc.:	N.D.
Spike Conc. Added:	7.0
Conc. Matrix Spike:	6.7
Matrix Spike % Recovery:	96
Conc. Matrix Spike Dup.:	5.0
Matrix Spike Duplicate % Recovery:	71
Relative % Difference:	29

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: ARCO 4931, Oakland / EMCGC-92-1

QC Sample Group: 3A52301

Reported: Feb 9, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Lead (CLP - LLD)
Method:	EPA 239.2
Analyst:	S. Chin
Reporting Units:	mg/L
Date Analyzed:	Feb 3, 1993
QC Sample #:	9301525-05B
Sample Conc.:	N.D.
Spike Conc. Added:	0.050
Conc. Matrix Spike:	0.049
Matrix Spike % Recovery:	98
Conc. Matrix Spike Dup.:	0.050
Matrix Spike Duplicate % Recovery:	100
Relative % Difference:	2.0

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc of M.S - Conc of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 4931	City (Facility) OAKLAND	Project manager (Consultant) Jim Butera	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) 453-0949	Fax no. (Consultant) 453-0452
Consultant name ENCON Associates	Address (Consultant) 1938 Junction Ave San Jose		Contract number

Method of shipment: Courier will Pick up

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

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 GAS EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease (O&G) 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-19	01	2		X		X	HCl	1-26-93	1419		X											
MW-17	02	2						↓	1456		X											
MW-6		2									X → NO SAMPLE TAKEN, PRODUCT IN WELL											
MW-23	03	2						1-26-93	1351		X											
MW-24	04	2							1435		X											
MW-22	11	2						↓	1231		X											
MW-8		2									X → } NO SAMPLES TAKEN; NO SAMPLE PORTS											
MW-4		2									X → }											
MW-30	06	2						1-26-93	1305		X											
MW-27	07	2							1259		X											
MW-30	08	2							1344		X											
MW-29	09	2						↓	1215		X											
MW-1		2									X → } INACCESSIBLE WELLS, NO SAMPLE											
MW-2		2									X → } NO SAMPLE PORTS TAKEN											
MW-5		2									X → }											
TRIP	10	2						1-26-93			X											

Remarks: 2-40ml HCl VOA's; 2-Liter HCl 504 GLASS; 1 Liter HNO3 metals (32)

Lab number: 9301523

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler: Eric Schaefer	1-26-93	1700	Received by: Tina Van Laanhove
Relinquished by: Tina Van Laanhove	1/27/93	1535	Received by:
Relinquished by	Date	Time	Received by laboratory: Date 1-27-93 Time 1515

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

APC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 4931	City (Facility) OAKLAND	Project manager (Consultant) JIM BUTERA	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0452
Consultant name EILCON Associates	Address (Consultant) 1938 Junction Avenue San Jose		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 GAS	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐ FREON	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 ☐	TOTAL LEAD
B-1	11	2		X	X	X	HCl	1-26-93	1355		X										
B-1	12	2		X		X		↓			X										
12(11)	01	1		X		X	HNO_3		1419												X
2(11)	01	4		X		X	H_2SO_4	↓	1419				X								

Method of shipment: Courier will Pick up

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2-40 ml HCl VOA's
1-Liter HNO_3 Plastic
(32)

Lab number

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

Condition of sample:

Temperature received:

	Date	Time	Received by	Date	Time
Relinquished by sampler	1-26-93	1700	Received by		
Relinquished by	1/27/93	1515	Received by		
Relinquished by			Received by laboratory	1/27/93	1515

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

ARC-3292 (2-91)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-2(19)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	9.63
DEPTH TO WATER (feet):	5.06	CALCULATED PURGE (gal.):	28.89
DEPTH OF WELL (feet):	19.8	ACTUAL PURGE VOL. (gal.):	10.50

DATE PURGED: 1-26-93 Start (2400 Hr) 1156 End (2400 Hr) 1202

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1419 End (2400 Hr) 1534

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1159	10.00	6.38	339	63.4	BROWN	HEAVY
1202	WELL DRIED @ 10.50 GALLONS					
1420	recharge	7.04	363	70.6	grey/green	HEAVY
	~~RECHARGE~~					

D. O. (ppm): NR ODOR: Strong COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: ~~2008~~ 2357

REMARKS: 1202 WELL DRIED @ 10.50 GALLONS DTW 19.46

Meter Calibration: Date: 1-26-93 Time: 1145 Meter Serial #: 9203 Temperature °F: 66.7

(EC 1000 993 / 1000) (DI 3.92) (pH 7 6.97 / 7.00) (pH 10 9.90 / 10.00) (pH 4 3.93 / ___)

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: ___ Page 1 of 15

Rev. 2, 5/

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-132.01 SAMPLE ID: A-3 (17)

PURGED BY: M Adler CLIENT NAME: Arco 4931

SAMPLED BY: M Adler LOCATION: 731 W. MacArthur Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 4.69

DEPTH TO WATER (feet): 9.82 CALCULATED PURGE (gal.): 14.07

DEPTH OF WELL (feet): 17.0 ACTUAL PURGE VOL. (gal.): 6.00

DATE PURGED: 1-26-93 Start (2400 Hr) 1440 End (2400 Hr) 1445

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1456 End (2400 Hr) 1457

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1443	5.0	6.65	1053	66.1	TAN	light
1445	6.0	Well dried				
1455	recharge	6.72	1051	66.8	Tan	light

D. O. (ppm): NR ODOR: moderate

NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2357

REMARKS: replaced 4" LWC & lock (2357)

Well dried at 6.0 gallons @ 1445 hrs.

recharge DTW 15.30

Meter Calibration: Date: 1-26-93 Time: 1157 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: M Adler Reviewed By: [illegible] Page 2 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-4

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR B
OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): 10.59 CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): 19.9 ACTUAL PURGE VOL. (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLES TAKEN - PRODUCT IN WELL						

D. O. (ppm): NR ODOR: NA COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™ NA	___ Dedicated	___ Well Wizard™ NA	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 3283

REMARKS: NO PRODUCT DETECTED WITH THE MMC, 0.04' OF PRODUCT DETECTED WITH THE ECONO-TEFLON BAILER (PRODUCT WAS BROWN/BLACK IN COLOR)

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: Karen Reichelderfer Reviewed By: JB Page 3 of 5

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-5 (23)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	4.97
DEPTH TO WATER (feet):	10.34	CALCULATED PURGE (gal.):	14.92
DEPTH OF WELL (feet):	23.9	ACTUAL PURGE VOL. (gal.):	15.00

DATE PURGED: 1-26-93 Start (2400 Hr) 1336 End (2400 Hr) 1346

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1351 End (2400 Hr) 1353

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1339	5.00	6.67	773	66.0	BROWN	HEAVY
1342	10.00	6.74	716	66.5	↓	↓
1346	15.00	6.76	700	67.3	↓	↓

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): FB-1 @ 1355

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2008

REMARKS: ___

Meter Calibration: Date: 1-26-93 Time: 1145 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: Kevin Reichelderfer Reviewed By: AB Page 4 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-6(24)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	6.16
DEPTH TO WATER (feet):	7.81	CALCULATED PURGE (gal.):	18.47
DEPTH OF WELL (feet):	24.6	ACTUAL PURGE VOL (gal.):	18.50

DATE PURGED: 1-26-93 Start (2400 Hr) 1419 End (2400 Hr) 1431

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1435 End (2400 Hr) 1437

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1423	6.50	6.67	595	65.6	BROWN	HEAVY
1427	13.00	6.71	583	64.9	↓	↓
1431	18.50	6.72	588	65.6		

D. O. (ppm): NR ODOR: NONE

COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: BAD LOCK #: 2008

REMARKS: THE LIP ON THE FLIP CAP WHERE THE LOCK GOES, IS BROKEN, ∴ WELL DOES NOT LOCK

Meter Calibration: Date: 1-26-93 Time: 1145 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: Kevin Reichelderfer Reviewed By: [illegible] Page 5 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-7(22)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 X 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.66
DEPTH TO WATER (feet):	7.36	CALCULATED PURGE (gal.):	16.98
DEPTH OF WELL (feet):	22.8	ACTUAL PURGE VOL. (gal.):	17.00

DATE PURGED: 1-26-93 Start (2400 Hr) 1217 End (2400 Hr) 1225

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1231 End (2400 Hr) 1233

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1220	6.00	6.59	528	66.8	BROWN	HEAVY
1223	12.00	6.55	567	67.3	↓	↓
1225	17.00	6.64	572	68.0		

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: OK LOCK #: 2008

REMARKS: WELL NEARLY DRIED BETWEEN 2ND & 3RD C.V.

Meter Calibration: Date: 1-26-93 Time: 1145 Meter Serial #: 9203 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: A-2

Signature: Kevin Reichelderfer Reviewed By: KB Page 6 of 5

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0470-032.01 SAMPLE ID: A-8

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR B
OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): NA ACTUAL PURGE VOL. (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE PORT - NO SAMPLES TAKEN						

D. O. (ppm): NR ODOR: NA COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: NA		Other: NA	

WELL INTEGRITY: OK LOCK #: NONE

REMARKS: NO SAMPLE PORTS, NO WL PORT

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: AJS Page #7 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0470-032.01 SAMPLE ID: A-9

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): NA ACTUAL PURGE VOL (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE PORT - NO SAMPLES TAKEN						

D. O. (ppm): NR ODOR: NA COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump ___ Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ NA ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ NA ___ Dedicated

Other: ___

WELL INTEGRITY: OK LOCK #: NONE

REMARKS: NO SAMPLE PORTS, NO WL PORT

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

115 8 . 15

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70-032.01 SAMPLE ID: A-10(30)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	7.10
DEPTH TO WATER (feet):	10.85	CALCULATED PURGE (gal.):	21.29
DEPTH OF WELL (feet):	30.2	ACTUAL PURGE VOL. (gal.):	21.50

DATE PURGED: 1-26-93 Start (2400 Hr) 1250 End (2400 Hr) 1259

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1305 End (2400 Hr) 1307

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1253	7.50	6.58	702	64.6	BROWN	HEAVY
1256	15.00	6.55	613	64.6	↓	↓
1259	21.50	6.61	669	64.7	↓	↓

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 3283

REMARKS: BOX COMPLETELY FULL OF WATER

Meter Calibration: Date: 1-26-93 Time: 1145 Meter Serial #: 9203 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-2

Signature: Kevin Reichelderfer Reviewed By: JB Page 9 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0470-032.01 SAMPLE ID: A-11 (27)

PURGED BY: MAdler CLIENT NAME: Arco 4931

SAMPLED BY: MAdler LOCATION: 731 W. MacArthur Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NK VOLUME IN CASING (gal.): 6.56

DEPTH TO WATER (feet): 9.89 CALCULATED PURGE (gal.): 19.7

DEPTH OF WELL (feet): 27.8 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 1-26-93 Start (2400 Hr) 1247 End (2400 Hr) 1257

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1259 End (2400 Hr) 1300

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1250	7.0	7.09	681	69.9	brown	heavy
1254	14.0	6.97	682	68.4	brown	heavy
1257	20.0	6.99	669	67.6	brown	heavy

D. O. (ppm): NR ODOR: none NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): none

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: unknown

REMARKS: need new lock (old one needs to be cut off)

Meter Calibration: Date: 1-26-93 Time: 1157 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-13 (29)

MAdler AD

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/9

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: A-12 (70)

PURGED BY: MAdler CLIENT NAME: Arco 4931

SAMPLED BY: MAdler LOCATION: 731 W. MacArthur Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NM VOLUME IN CASING (gal.): ~~7.5~~ 22.58

DEPTH TO WATER (feet): 9.47 CALCULATED PURGE (gal.): ~~23.5~~

DEPTH OF WELL (feet): 30.0 ACTUAL PURGE VOL. (gal.): 23.0

DATE PURGED: 1-26-93 Start (2400 Hr) 1330 End (2400 Hr) 1341

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1344 End (2400 Hr) 1345

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1333	7.5	7.09	653	67.6	brown	heavy
1338	15.0	6.88	654	67.1	brown	heavy
1341	23.0	6.88	658	67.2	brown	heavy

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 1-26-93 Time: 1157 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-13 (29)

Signature: MCAdler Reviewed By: AB Page 11 of 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/9

EMCON ASSOCIATES

PROJECT NO: JG70-032.01 SAMPLE ID: A-13 (29)

PURGED BY: MHeller CLIENT NAME: Arco 4931

SAMPLED BY: MHeller LOCATION: 731 W. MacArthur St Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.48

DEPTH TO WATER (feet): 8.99 CALCULATED PURGE (gal.): 22.45

DEPTH OF WELL (feet): 29.4 ACTUAL PURGE VOL. (gal.): 22.5

DATE PURGED: 1-26-93 Start (2400 Hr) 1207 End (2400 Hr) 1213

DATE SAMPLED: 1-26-93 Start (2400 Hr) 1215 End (2400 Hr) 1216

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmnos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1209	7.5	6.39	703	69.0	TAN	light
1211	15.0	6.48	723	68.8	TAN	light
1213	22.5	6.56	722	68.4	TAN	light

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2357

REMARKS: installed new 4" LWC & 2357 Locks

Meter Calibration: Date: 1-26-93 Time: 1157 Meter Serial #: 9112 Temperature °F: 70.1

(EC 1000 939 / 1060) (DI ___) (pH 7 7.05 / 7.00) (pH 10 9.94 / 10.00) (pH 4 4.06 / ___)

Location of previous calibration: A-13 (29)

MHeller AB

Rev. 2, 5/9

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0470-032.01 SAMPLE ID: AR-1

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR, OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): NA ACTUAL PURGE VOL. (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE PORT - NO SAMPLES TAKEN						

D. O. (ppm): NR ODOR: NA COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™ NA	___ Dedicated	___ Well Wizard™ NA	___ Dedicated
Other:		Other:	

WELL INTEGRITY: OK LOCK #: NONE

REMARKS: NO SAMPLE PORTS, NO WL PORT

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: [illegible] AB 13 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0470-032.01 SAMPLE ID: AR-2

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): NA ACTUAL PURGE VOL (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE PORT - NO SAMPLES TAKEN						

D. O. (ppm): NR ODOR: NA COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™ NA	___ Dedicated	___ Well Wizard™ NA	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: NONE

REMARKS: NO SAMPLE PORTS, NO WL PORT

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

K. Reichelderfer NA NR 15

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0670-032.01 SAMPLE ID: AR-3

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 4931

SAMPLED BY: ↓ LOCATION: 731 W. MacARTHUR, OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

DEPTH OF WELL (feet): NA ACTUAL PURGE VOL (gal.): NA

DATE PURGED: 1-26-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE PORT - NO SAMPLES TAKEN						

D. O. (ppm): NR ODOR: NA COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: NA		Other: NA	

WELL INTEGRITY: OK LOCK #: NONE

REMARKS: NO SAMPLE PORTS, NO WL PORT

Meter Calibration: Date: 1-26-93 Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

NR

APPENDIX B

GROUNDWATER RECOVERY SYSTEM ANALYTICAL REPORTS

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

Enclosed are the results from 4 water samples received at Sequoia Analytical on January 21,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3A25901	Water, A	1/20/93	Priority Pollutant Metals EPA 601
3A25902	Water, B	1/20/93	EPA 5030/8015/8020 EPA 601 Priority Pollutant Metals
3A25903	Water, D	1/20/93	Priority Pollutant Metals EPA 5030/8015/8020 EPA 601
3A25904	Water, Trip Blank	1/20/93	EPA 601

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

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A	Received: Jan 21, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed: Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25901	Reported: Feb 4, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B	Received:	Jan 21, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25902	Reported:	Feb 4, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, D	Received:	Jan 21, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25903	Reported:	Feb 4, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	**0.50**	**2.3**
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	**0.50**	**1.6**
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	**0.50**	**3.3**
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	**0.50**	**20**
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	**0.50**	**1.1**
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, Trip Blank	Received:	Jan 21, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25904	Reported:	Feb 4, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Matrix:	Water	Received.	Jan 21, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 4, 1993
Attention: John Vargas	First Sample #:	3A25902		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A25902 B	Sample I.D. 3A25903 Trip Blank	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	N.D.	N.D.				
Benzene	0.50	N.D.	N.D.				
Toluene	0.50	N.D.	N.D.				
Ethyl Benzene	0.50	N.D.	N.D.				
Total Xylenes	0.50	N.D.	N.D.				
Chromatogram Pattern:		--	--				

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	1/26/93	1/26/93
Instrument Identification:	GCHP-6	GCHP-6
Surrogate Recovery, %: (QC Limits = 70-130%)	88	82

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A	Received:	Jan 21, 1993
Hayward, CA 94545			Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25901	Reported:	Feb 4, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	48

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B	Received:	Jan 21, 1993
Hayward, CA 94545			Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25902	Reported:	Feb 4, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Jan 20, 1993
2150 W. Winton Avenue	Sample Descript:	Water, D	Received:	Jan 21, 1993
Hayward, CA 94545			Analyzed:	Jan 25, 1993
Attention: John Vargas	Lab Number:	3A25903	Reported:	Feb 4, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	12
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	N.D.

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

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
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

QC Sample Group: 3A25901 - 04

Reported: Feb 4, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	V.Nunzir	V.Nunzir	V.Nunzir
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Jan 25, 1993	Jan 25, 1993	Jan 25, 1993
QC Sample #:	V930116001	V930116001	V930116001
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	25	25	25
Conc. Matrix Spike:	23	21	20
Matrix Spike % Recovery:	92	84	80
Conc. Matrix Spike Dup.:	22	23	20
Matrix Spike Duplicate % Recovery:	88	92	80
Relative % Difference:	4.4	9.1	0.0

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

QC Sample Group: 3A25902, 04

Reported: Feb 4, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	E.Cunanan	E.Cunanan	E.Cunanan	E.Cunanan
Reporting Units:	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jan 26, 1993	Jan 26, 1993	Jan 26, 1993	Jan 26, 1993
QC Sample #:	93A20101	93A20101	93A20101	93A20101
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	8.9	9.1	9.3	30
Matrix Spike % Recovery:	89	91	93	100
Conc. Matrix Spike Dup.:	9.2	9.4	9.5	31
Matrix Spike Duplicate % Recovery:	92	94	95	103
Relative % Difference:	3.3	3.2	2.1	3.3

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

3A25901.GET <10>

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

QC Sample Group: 3A25901 - 03

Reported: Feb 4, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Mercury	Lead	Arsenic	Selenium	Thallium	Antimony
Method:	EPA 245.1	EPA 239.2	EPA 206.2	EPA 270.2	EPA 279.2	EPA 204.2
Analyst:	J.Martinez	S.Chin	K.Newberry	K.Newberry	K.Newberry	F.Contreras
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 26, 1993	Jan 27, 1993	Jan 26, 1993	Jan 26, 1993	Jan 26, 1993	Jan 28, 1993
QC Sample #:	3A19401	BLK012593	3A10202	3A10202	3A10202	BLK012793
Sample Conc.:	N.D.	N.D.	6.4	N.D.	N.D.	N.D.
Spike Conc. Added:	2.0	50	50	50	50	50
Conc. Matrix Spike:	1.8	48	56	36	41	55
Matrix Spike % Recovery:	90	96	99	72	82	110
Conc. Matrix Spike Dup.:	1.8	49	54	39	35	57
Matrix Spike Duplicate % Recovery:	90	98	95	78	70	114
Relative % Difference:	0.0	2.1	3.6	8.0	16	3.6

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

QC Sample Group: 3A25901 - 03

Reported: Feb 4, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Beryllium	Cadmium	Chromium	Nickel
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser
Reporting Units:	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jan 26, 1993	Jan 26, 1993	Jan 26, 1993	Jan 26, 1993
QC Sample #:	BLK012593	BLK012593	BLK012593	BLK012593
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	1000	1000	1000	1000
Conc. Matrix Spike:	1100	1000	1000	1000
Matrix Spike % Recovery:	110	100	100	100
Conc. Matrix Spike Dup.:	990	970	980	980
Matrix Spike Duplicate % Recovery:	99	97	98	98
Relative % Difference:	11	3.0	2.0	2.0

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

4931-93-5

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4493-92

Chain of Custody

ARCO Facility no: 4493 4931	City (Facility): Oakland	Project manager (Consultant): John Vargas - Dana Lanalysis	Laboratory name: SEQ
ARCO engineer: Mike Whelan	Telephone no. (ARCO):	Telephone no. (Consultant):	Fax no. (Consultant):	Contract number: 07-072
Consultant name: Geotler Ryan Inc	Address (Consultant): 2150 W. Winan Ave Hayward CA			Method of shipment: C/C

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 ☐	Priority Pollutant Metals
A		3		✓		✓	✓	1-20-93	13:20						X		9312S9-01				X
B		5		✓		✓	✓	↓	13:22		X				X			↓	02		X
D		3		✓		✓	✓	↓	13:24						X				03		X
TB		2		✓		✓	✓	—	—		X				X			↓	04		-

Special detection Limit/reporting: Standard

Special QA/QC: Stnd

Remarks: C/R #

9909.1C

Lab number:

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

	Date	Time	Received by	Date	Time
Relinquished by sampler	1-21-93	1600			
Relinquished by					
Relinquished by			Received by laboratory	1-21-93	1600

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

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Project: ARCO 4931 - OAKLAND

Enclosed are the results from 3 water samples received at Sequoia Analytical on February 10,1993. The requested analyses are listed below.

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3B66101	Water, A	2/10/93	EPA 5030/8010 Priority Pollutants
3B66102	Water, B	2/10/93	EPA 5030/8010 Priority Pollutants
3B66103	Water, D	2/10/93	EPA 5030/8010 Priority Pollutants

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

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A	Received:	Feb 10, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 17, 1993
Attention: John Vargas	Lab Number:	3B66101	Reported:	Feb 24, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B	Received:	Feb 10, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 17, 1993
Attention: John Vargas	Lab Number:	3B66102	Reported:	Feb 24, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript:	Water, D	Received:	Feb 10, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 17, 1993
Attention: John Vargas	Lab Number:	3B66103	Reported:	Feb 24, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	1.9
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	1.3
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	1.0
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	21
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A	Received:	Feb 10, 1993
Hayward, CA 94545			Analyzed:	2/17,18,22/93
Attention: John Vargas	Lab Number.	3B66101	Reported:	Feb 24, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	16
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	92

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

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	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B	Received:	Feb 10, 1993
Hayward, CA 94545			Analyzed:	2/17,18,22/93
Attention: John Vargas	Lab Number:	3B66102	Reported:	Feb 24, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	7.4
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	N.D.

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

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	Client Project ID:	ARCO 4931 - OAKLAND	Sampled:	Feb 10, 1993
2150 W. Winton Avenue	Sample Descript.	Water, D	Received:	Feb 10, 1993
Hayward, CA 94545			Analyzed:	2/17,18,22/93
Attention: John Vargas	Lab Number:	3B66103	Reported:	Feb 24, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	N.D.
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	34

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

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
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: ARCO 4931 - OAKLAND

QC Sample Group: 3B66101-03

Reported: Feb 24, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloroethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	V. Nunzir	V. Nunzir	V. Nunzir
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Feb 17, 1993	Feb 17, 1993	Feb 17, 1993
QC Sample #:	VBLK021793	VBLK021793	VBLK021793
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	.25	.25	25
Conc. Matrix Spike:	29	22	22
Matrix Spike % Recovery:	116	88	88
Conc. Matrix Spike Dup.:	29	22	22
Matrix Spike Duplicate % Recovery:	116	88	88
Relative % Difference:	0.0	0.0	0.0

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: ARCO 4931 - OAKLAND

QC Sample Group: 3B66101-03

Reported: Feb 24, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Lead	Mercury	Antimony	Arsenic	Selenium	Thallium
Method:	EPA 239.2	EPA 245.1	EPA 204.2	EPA 206.2	EPA 270.2	EPA 279.2
Analyst:	S. Chin	J. Martinez	T. Pham	F. Contreras	F. Contreras	F. Contreras
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 17, 1993	Feb 17, 1993	Feb 18, 1993	Feb 22, 1993	Feb 22, 1993	Feb 22, 1993
QC Sample #:	9302629-1B	930266103C	9302601-01E	BLK021693	BLK021693	BLK021793
Sample Conc.:	6.1	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	50	2.0	50	50	50	50
Conc. Matrix Spike:	54	2.0	49	45	42	44
Matrix Spike % Recovery:	96	100	98	90	84	88
Conc. Matrix Spike Dup.:	54	2.1	50	47	45	47
Matrix Spike Duplicate % Recovery:	96	105	100	94	90	94
Relative % Difference:	0.0	4.9	2.0	4.3	6.9	6.6

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	Conc. of M.S - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: ARCO 4931 - OAKLAND

QC Sample Group: 3B66101-03

Reported: Feb 24, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Beryllium	Cadmium	Chromium	Nickel
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 17, 1993	Feb 17, 1993	Feb 17, 1993	Feb 17, 1993
QC Sample #:	BLK021693	BLK021693	BLK021693	BLK021693
Sample Conc.:	N.D.	N.D.	N.D.	0.10
Spike Conc. Added:	1000	1000	1000	1000
Conc. Matrix Spike:	1000	940	950	1000
Matrix Spike % Recovery:	100	94	95	90
Conc. Matrix Spike Dup.:	1000	960	970	1100
Matrix Spike Duplicate % Recovery:	100	96	97	100
Relative % Difference:	0.0	2.1	2.1	9.5

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

SEQUOIA ANALYTICAL

Nokowhai D. Herrera
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S - Conc. of M.S.D.}}{\text{(Conc of M.S + Conc. of M.S.D.) / 2}}$	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4931-93-5

Chain of Custody

ARCO Facility no: 4931	City (Facility): Oakland	Project manager (Consultant): John Vargas	Laboratory name: STL
ARCO engineer: Mike Whelan	Telephone no. (ARCO):	Telephone no. (Consultant): 510-783-7500	Fax no. (Consultant): 783-1089
Consultant name: Cottler Ryan	Address (Consultant): 2150 W. Winton Hayward CA		Contract number: 07.073

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 ☐	Priority Pollutant Metals	
A		3		X		X	X	2/10/93	9:58						X				9302661			01
B		3		X		X	X		10:00						X							02
D		3		X		X	X		10:20						X							03

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: 9909.20

Lab number:

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

	Date	Time		Date	Time
Relinquished by sampler	2-10-93	18:30	Received by		
Relinquished by			Received by		
Relinquished by			Received by laboratory	2/10/93	1855

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

Enclosed are the results from 4 water samples received at Sequoia Analytical on March 15,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3C81301	Water, A-Effluent	3/14/93	Priority Pollutants Metals EPA 601
3C81302	Water, B-Midpoint	3/14/93	Priority Pollutants Metals EPA 601
3C81303	Water, D-Influent	3/14/93	Priority Pollutants Metals EPA 601
3C81304	Water, Trip Blank	3/14/93	EPA 601

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

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A- Effluent	Received: Mar 15, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed: Mar 25, 1993
Attention: John Vargas	Lab Number:	3C81301	Reported: Mar 29, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B- Midpoint	Received: Mar 15, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed: Mar 25, 1993
Attention: John Vargas	Lab Number:	3C81302	Reported: Mar 29, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, D-Influent	Received: Mar 15, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed: Mar 27, 1993
Attention: John Vargas	Lab Number:	3C81303	Reported: Mar 29, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	**0.50**	**1.8**
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	**0.50**	**1.2**
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	**0.50**	**0.74**
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	**0.50**	**14**
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, Trip Blank	Received: Mar 15, 1993
Hayward, CA 94545	Analysis Method:	EPA 601	Analyzed: Mar 25, 1993
Attention: John Vargas	Lab Number:	3C81304	Reported: Mar 29, 1993

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A-Effluent	Received: Mar 15, 1993
Hayward, CA 94545			Analyzed: Mar 22, 1993
Attention: John Vargas	Lab Number:	3C81301	Reported: Mar 29, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	21
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	25

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled: Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, B-Midpoint	Received: Mar 15, 1993
Hayward, CA 94545			Analyzed: Mar 22, 1993
Attention: John Vargas	Lab Number:	3C81302	Reported: Mar 29, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	89
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	29

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

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	Client Project ID:	4931-93-5, Arco 4931-Oakland	Sampled:	Mar 14, 1993
2150 W. Winton Avenue	Sample Descript:	Water, D-Influent	Received:	Mar 15, 1993
Hayward, CA 94545			Analyzed:	Mar 22, 1993
Attention: John Vargas	Lab Number:	3C81303	Reported:	Mar 29, 1993

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	10	82
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	10	13q

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

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
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 4931-93-5, Arco 4931-Oakland
Matrix: Water
QC Sample Group: 3C81301 - 02, 04

Reported: Mar 29, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloroethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	B.Samra	B.Samra	B.Samra	B.Samra	B.Samra	B.Samra
Conc. Spiked:	25	25	25	25	25	25
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	VBLK032593	VBLK032593	VBLK032593	VBLK032593	VBLK032593	VBLK032593
Date Prepared:	-	-	-	-	-	-
Date Analyzed	3/25/93	3/25/93	3/25/93	3/25/93	3/25/93	3/25/93
Instrument I.D.#:	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9
LCS % Recovery:	128	96	96	116	116	128
Control Limits:	61-145	71-120	75-130	76-127	76-125	75-130
MS/MSD Batch #:	V3C83903	V3C83903	V3C83903	V3C83903	V3C83903	V3C83903
Date Prepared:	-	-	-	-	-	-
Date Analyzed	3/25/93	3/25/93	3/25/93	3/25/93	3/25/93	3/25/93
Instrument I.D.#:	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9
Matrix Spike % Recovery:	132	96	96	112	112	132
Matrix Spike Duplicate % Recovery:	128	100	100	116	116	132
Relative % Difference:	3.1	4.1	4.1	3.5	3.5	0.0

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 4931-93-5, Arco 4931-Oakland
Matrix: Water

QC Sample Group: 3C81303

Reported: Mar 29, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloroethene	Chloro-benzene	Benzene	Toluene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.Laikhtman	M.Laikhtman	M.Laikhtman	M.Laikhtman	M.Laikhtman	M.Laikhtman
Conc. Spiked:	25	25	25	25	25	25
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK032793	BLK032793	BLK032793	BLK032793	BLK032793	BLK032793
Date Prepared:	-	-	-	-	-	-
Date Analyzed	3/27/93	3/27/93	3/27/93	3/27/93	3/27/93	3/27/93
Instrument I.D.#:	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9
LCS % Recovery:	88	88	100	112	112	128
Control Limits:	61-145	71-120	75-130	76-127	76-125	75-130
MS/MSD Batch #:	V3C75317	V3C75317	V3C75317	V3C75317	V3C75317	V3C75317
Date Prepared:	-	-	-	-	-	-
Date Analyzed	3/27/93	3/27/93	3/27/93	3/27/93	3/27/93	3/27/93
Instrument I.D.#:	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9	GCHP-9
Matrix Spike % Recovery:	88	92	96	112	112	128
Matrix Spike Duplicate % Recovery:	84	88	88	108	108	124
Relative % Difference:	4.7	4.5	8.7	3.6	3.6	3.2

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

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

QC Sample Group: 3C81301 - 03

Reported: Mar 29, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Lead	Mercury	Arsenic	Selenium
Method:	EPA 239.2	EPA 245.1	EPA 206.2	EPA 270.2
Analyst:	S.Chin	J.Martinez	F.Contreras	F.Contreras
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Mar 22, 1993	Mar 19, 1993	Mar 23, 1993	Mar 23, 1993
QC Sample #:	3C81001	3C81303	BLK032293	BLK032293
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	50	2.0	50	50
Conc. Matrix Spike:	49	2.1	52	47
Matrix Spike % Recovery:	98	105	104	94
Conc. Matrix Spike Dup.:	44	2.0	50	49
Matrix Spike Duplicate % Recovery:	88	100	100	98
Relative % Difference:	11	4.9	3.9	4.2

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S - Conc of M.S.D.}}{(\text{Conc. of M.S + Conc. of M.S.D.}) / 2} \times 100$$

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 4931-93-5, Arco 4931-Oakland
Matrix: Water

QC Sample Group. 3C81301 - 03

Reported: Mar 29, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Antimony	Thallium	Beryllium	Cadmium	Chromium	Nickel
Method:	EPA 204.2	EPA 279.2	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	F.Contreras	F.Contreras	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser
Conc. Spiked:	50	50	1.0	1.0	1.0	1.0
Units:	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
LCS Batch#:	BLK031893	BLK031893	BLK031893	BLK031893	BLK031893	BLK031893
Date Prepared:	3/18/93	3/18/93	3/18/93	3/18/93	3/18/93	3/18/93
Date Analyzed	3/14/93	3/25/93	3/22/93	3/22/93	3/22/93	3/22/93
Instrument I.D.#:	TJA-1	TJA-1	MTJA-2	MTJA-2	MTJA-2	MTJA-2
LCS % Recovery:	113	100	106	103	101	104
Control Limits:	75-125	75-125	75-125	75-125	75-125	75-125
MS/MSD Batch #:	3C81001	3C81001	3C81001	3C81001	3C81001	3C81001
Date Prepared:	3/18/93	3/18/93	3/18/93	3/18/93	3/18/93	3/18/93
Date Analyzed	3/24/93	3/25/93	3/22/93	3/22/93	3/22/93	3/22/93
Instrument I.D.#:	TJA-1	TJA-1	MTJA-2	MTJA-2	MTJA-2	MTJA-2
Matrix Spike % Recovery:	116	56	106	100	99	102
Matrix Spike Duplicate % Recovery:	114	60	109	104	102	104
Relative % Difference:	1.7	6.9	2.9	3.9	3.0	1.9

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No. 4931-93-5

Chain of Custody

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) John Vargas	Laboratory name SEQ
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 510-783-7552	Fax no. (Consultant) 783-1089
Consultant name Cortter Ryan	Address (Consultant) 2150 W. Winton Hayward CA		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Priority Metal
1-EM		3		X		X	X	3-14-93	15:00	X	X	X	O&G	TPH	X						X
3-MW		3		X		X	X	"	15:05			"	O&G	"	X						X
2 Inf		3		X		X	X	"	15:10			"	O&G	"	X						X
Trip Blank		1		X		X	X	—	—		X		O&G	"	X						

Method of shipment: Col

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: Col #: 9909.70

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	3-15-93	12:10	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory: Date 3/15/93 Time 1210

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