GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

92 JAN 21 PM 3:15

January 16, 1992

County of Alameda
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Attention: Ms. Susan L. Hugo Certified Mail

Reference: ARCO Service Station #4931
731 W. MacArthur Street
Oakland, California 94611

Ms. Hugo:

As requested of ARCO Products Company, we are forwarding the Quarter Monitoring Report dated January 16, 1992 for the above referenced location. This report presents the results of the fourth quarter 1991 ground-water sampling conducted October 21, 1991 at this site.

If you should have any questions or comments, please call.

Sincerely,

John F. Vargas

JFV/nsm

Enclosure

cc: Mr. Charles Carmel, ARCO Products Company
Mr. H. C. Winsor, ARCO Products Company
Mr. Tom Callaghan, Regional Water Quality Control Board (Certified Mail)

GeoStrategies Inc.

QUARTERLY MONITORING REPORT

ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California

790901-14

January 16, 1992

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

January 16, 1992

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

Attn: Mr. Charles Carmel

Re: QUARTERLY MONITORING REPORT
ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California

Gentlemen:

This Quarterly Monitoring Report by GeoStrategies Inc. (GSI) presents results of the 1991 fourth quarter ground-water sampling performed on October 21, 1991, by Gettler-Ryan Inc. (G-R) for the above referenced location (Plates 1 and 2). The scope of work presented in this document was performed at the request of ARCO Products Company. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board (SWRCB) guidelines. G-R ground-water sampling procedures are presented in the GSI Site Update report dated October 4, 1990.

SITE BACKGROUND

There are currently eleven monitoring wells at the site; Wells A-2 through A-12 (Plate 2). These wells were installed between 1982 and 1987 by Groundwater Technology, Inc. and Pacific Environmental Group. Wells A-2 through A-10 are onsite and Wells A-11 and A-12 are offsite. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soil and groundwater beneath the site.

Quarterly monitoring and sampling of wells began in 1989. Ground-water samples have been analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) according to EPA Method 8020.

CURRENT QUARTERLY SAMPLING RESULTS

Potentiometric Data

Prior to ground-water sampling, water-levels were measured in each of the monitoring wells using an electronic oil-water interface probe (Table 1). Static water-levels were measured from the surveyed top of well box and recorded to the nearest $\pm$0.01 foot. Elevations corresponding to Mean Sea Level (MSL) are presented in Table 1. The potentiometric contour map presented on Plate 3 was prepared from the water-level measurement data. The local hydraulic gradient in the first water bearing zone was calculated to be 0.01 with ground-water flow approximately to the southwest.

Floating Product Measurements

Each monitoring well was checked for the presence of floating product with an electronic oil-water interface probe. A clear acrylic bailer was used to confirm interface probe results. Floating product was observed in monitoring well A-8 at a measured thickness of 0.11 feet and well A-4 at measured thickness of 0.03 feet.

Groundwater Analytical Data

Prior to collecting samples, the monitoring wells were purged until ground-water parameters stabilized. Purge volumes and physical parameter values are presented in Table 1. Ground-water samples were collected on October 21, 1991. The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020 by Sequoia Analytical Laboratories Inc., a State - certified laboratory located in Redwood City, California.

Detectable TPH-Gasoline was reported in monitoring wells A-2 (26,000 parts per billion (ppb)), A-3 (56 ppb), A-9 (240 ppb). Wells A-5 through A-7 and A-10 through A-12 were ND for TPH-Gasoline. Benzene was detected in monitoring wells A-2 (1100 ppb), A-3 (0.44 ppb), A-9 (63 ppb). Wells A-5 through A-7 and A-10 through A-12 were reported as ND. Quality Control (QC) samples were not submitted for this quarter's ground-water sampling. The chemical analytical data are summarized in Table 2. Historical chemical data are summarized in Table 3. TPH-Gasoline and benzene chemical analytical data have been used to prepare a concentration map (Plate 4). The laboratory analytical report and Chain-of-Custody forms are presented in Appendix A and field data sheets are presented in Appendix B.

PLANNED ACTIVITIES

The following activities have been proposed by ARCO Products Company for this site.

- Install one off-site upgradient ground-water monitoring well to further delineate the extent of the hydrocarbon plume.
- Install two 6-inch-diameter recovery wells to enhance hydraulic control of the hydrocarbon plume. Refer to Plate 2 for location of the proposed ground-water monitoring well and recovery wells.

If you have any questions, please call.

GeoStrategies Inc. by,

Cliff Garratt
Hydrogeologist

John F. Vargas
Senior Geologist
R.G. 5046

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

CG/JFV/mlg

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-Gasoline/Benzene Concentration Map

Appendix A: Analytical Laboratory Report and Chain-of-Custody Form
Appendix B: Field Data Sheets

QC Review: DJV

790901-14

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
A-2	21-Oct-91	4	18.5	55.38	11.54	----	43.84	2	6.20	66.9	790
A-3	21-Oct-91	4	19.3	54.48	11.51	----	42.97	2	6.31	68.5	1035
A-4	21-Oct-91	4	----	54.62	11.76	0.03	42.88	----	----	----	----
A-5	21-Oct-91	3	24.0	54.15	11.48	----	42.67	3	6.34	69.6	544
A-6	21-Oct-91	3	25.0	55.13	10.30	----	44.83	5	6.61	69.2	454
A-7	21-Oct-91	3	22.7	54.67	10.12	----	44.55	3	6.39	70.3	458
A-8	21-Oct-91	4	----	53.61	10.98	0.11	42.72	----	----	----	----
A-9	21-Oct-91	6	38.7	52.96	10.39	----	42.57	5	6.49	68.1	536
A-10	21-Oct-91	3	28.1	54.16	11.79	----	42.37	9	6.47	66.6	546
A-11	21-Oct-91	3	28.1	53.75	11.24	----	42.51	5	6.63	68.9	503
A-12	21-Oct-91	3	29.0	52.05	10.62	----	41.43	2	6.36	67.0	533

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. pH values reported in pH units.
4. Static water-levels corrected for floating product (conversion factor = 0.80).

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
A-2	21-Oct-91	25-Oct-91	26000	1100	560	81	3900
A-3	21-Oct-91	25-Oct-91	56	0.44	0.77	0.41	1.3
A-5	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
A-6	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
A-7	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
A-9	21-Oct-91	25-Oct-91	240	63	0.65	5.1	1.6
A-10	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
A-11	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
A-12	21-Oct-91	25-Oct-91	<30	<0.30	<0.30	<0.30	<0.30

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1. ppb Xylenes 1,750. ppb Ethylbenzene 680. ppb

CURRENT DHS ACTION LEVELS
Toluene 100.0 ppb

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. DHS Action Levels and MCLs are subject to change pending State review.

TABLE 3

HISTORICAL GROUND WATER 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
21-Mar-86	A-3	1000.	----	----	----	----
07-Jan-88	A-3	250.	2.3	8.	----	21.
20-Mar-89	A-3	230.	1.6	<1.	3.	3.
24-May-89	A-3	170.	0.9	2.	1.	<3.
18-Aug-89	A-3	180.	0.7	1.	<1.	<3.
27-Oct-89	A-3	120.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-3	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-3	88.	1.2	2.0	0.8	4.
30-Jul-90	A-3	120.	8.3	2.9	2.3	12.
29-Oct-90	A-3	780.	10.	27.	18.	85.
16-Jan-91	A-3	69.	2.0	3.5	<0.5	9.6
12-Apr-91	A-3	<30	<0.30	<0.30	<0.30	<0.30
10-Jul-91	A-3	59	<0.30	<0.30	0.50	0.51
21-Oct-91	A-3	56	0.44	0.77	0.41	1.3

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
20-Mar-89	A-4	360000.	1500.	3700.	6500.	35000.
24-May-89	A-4	1500000.	1000.	2000.	6000.	23000.
04-Apr-90	A-4	40000.	680.	320.	1400.	4900.
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-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.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-5	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-5	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-5	280.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-5	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-5	<30	<0.30	<0.30	<0.30	0.84
10-Jul-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-5	<30	<0.30	<0.30	<0.30	<0.30
21-Mar-86	A-6	<10.	----	----	----	----
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.

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
30-Jul-90	A-6	<50.	2.6	<0.5	<0.5	1.2
29-Oct-90	A-6	<50.	0.7	<0.5	<0.5	<0.5
16-Jan-91	A-6	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-6	430	24	5.1	9.4	32
10-Jul-91	A-6	<30	1.4	0.39	0.47	1.5
21-Oct-91	A-6	<30	<0.30	<0.30	<0.30	<0.30
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
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

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
07-Jan-88	A-10	<50.	0.6	11.	----	4.
20-Mar-89	A-10	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-10	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-10	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-10	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-10	<50.	<0.5	<0.5	<0.5	<1.
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
07-Jan-88	A-11	<50.	1.1	2.	----	5.
20-Mar-89	A-11	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-11	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-11	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-11	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-11	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-11	<50.	<0.5	0.6	<0.5	0.5
29-Oct-90	A-11	<50.	0.6	2.4	0.6	1.5
16-Jan-91	A-11	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-11	<30	<0.30	0.37	<0.30	<0.30
10-Jul-91	A-11	<30	0.61	0.46	<0.30	1.0
21-Oct-91	A-11	<30	<0.30	<0.30	<0.30	<0.30

TABLE 3

HISTORICAL GROUND WATER QUALITY DATABASE

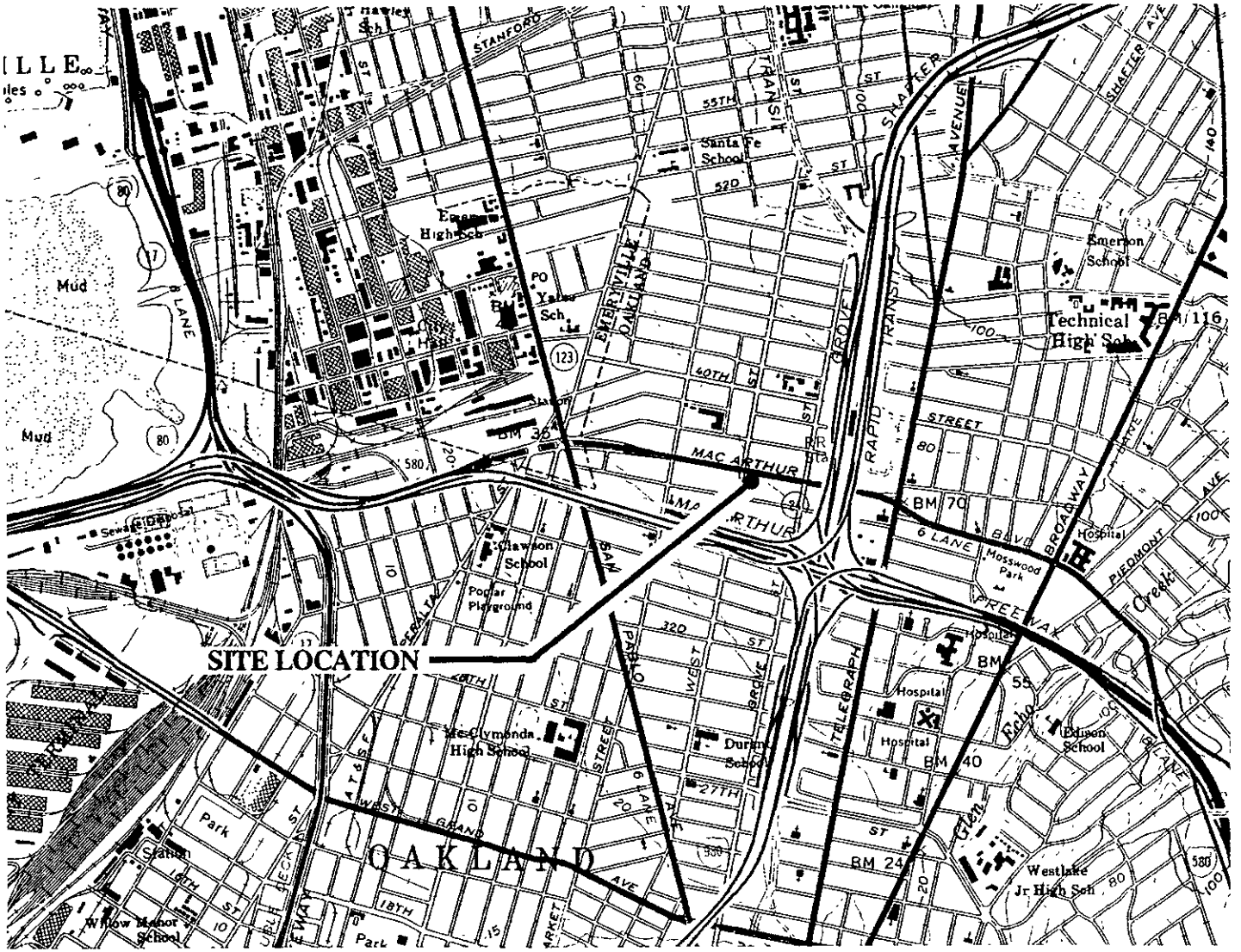
SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
07-Jan-88	A-12	<50.	<0.5	2.	----	<4.
20-Mar-89	A-12	<50.	<0.5	<1.	<1.	<3.
24-May-89	A-12	<50.	<0.5	<1.	<1.	<3.
18-Aug-89	A-12	<50.	<0.5	<1.	<1.	<3.
27-Oct-89	A-12	<50.	<0.5	<0.5	<0.5	<1.
15-Jan-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
04-Apr-90	A-12	<50.	<0.5	<0.5	<0.5	<1.
30-Jul-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
29-Oct-90	A-12	<50.	<0.5	<0.5	<0.5	<0.5
16-Jan-91	A-12	<50.	<0.5	<0.5	<0.5	<0.5
12-Apr-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
10-Jul-91	A-12	<30	<0.30	<0.30	<0.30	<0.30
21-Oct-91	A-12	<30	<0.30	<0.30	<0.30	<0.30

Current Regional Water Quality Control Board Mazimum Contaminant Levels
Benzene 1. ppb Xylenes 1750. ppb Ethylbenzene 680.ppb

Current DHS Action Levels Toluene 100.0 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion
NOTE 1. All data shown as <X are reported as ND (none detected).
2. Ethylbenzene & Xylenes were combined in 1986 and 1988.

ILLUSTRATIONS



Base Map: USGS Topographic Map

GeoStrategies Inc.

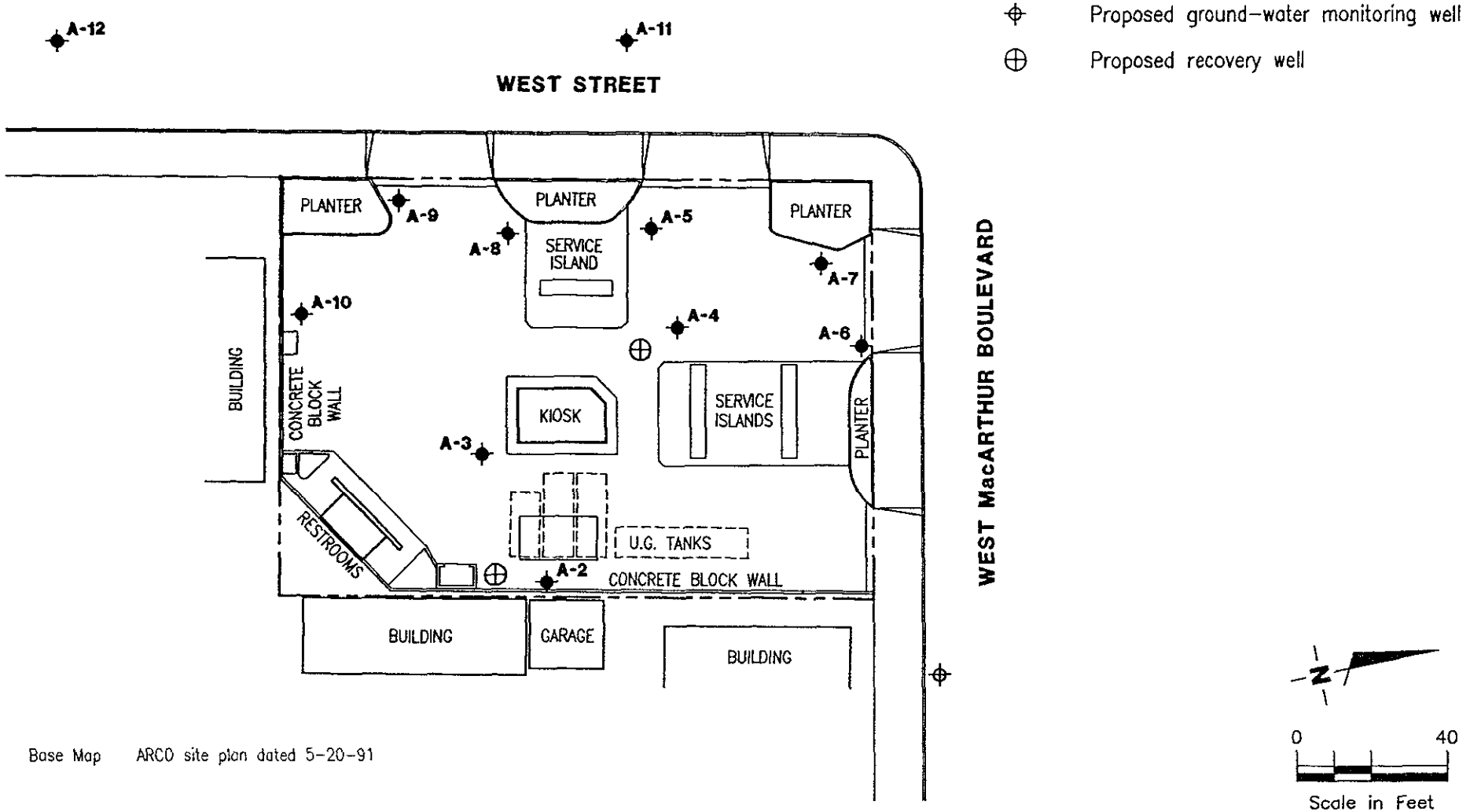
VICINITY MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/91	

EXPLANATION

- Ground-water monitoring well
- Proposed ground-water monitoring well
- Proposed recovery well

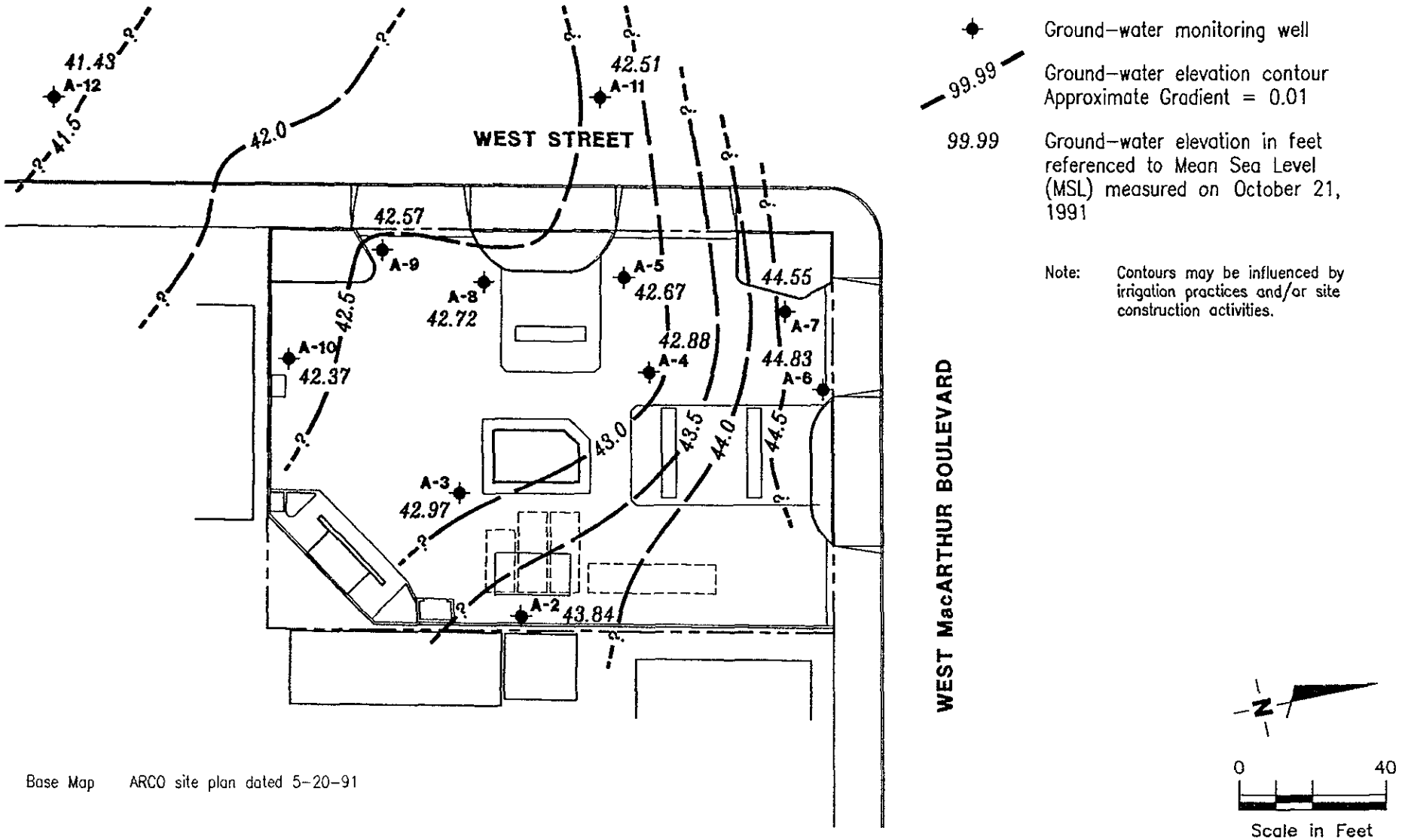


Base Map ARCO site plan dated 5-20-91

GeoStrategies Inc.

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

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-14	JFV	12/91	

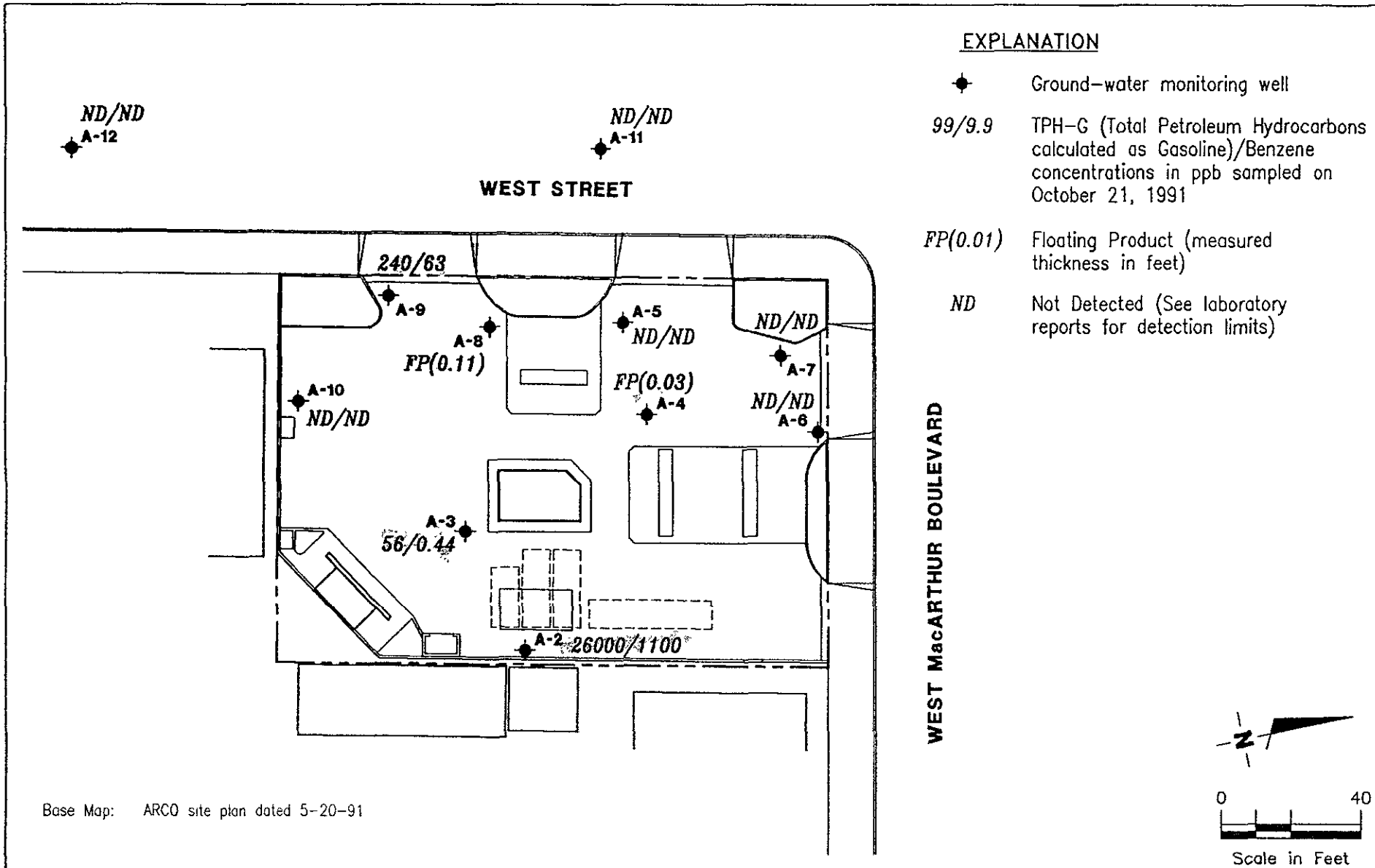


GeoStrategies Inc.

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

PLATE **3**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-14	JPA	12/91	



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 4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-14	JPV	12/91	

APPENDIX A
ANALYTICAL LABORATORY REPORT AND CHAIN-OF-CUSTODY FORM

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: Tom Paulson

Client Project ID: #3909.01, Arco, 4931
Matrix Descript: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 110-4252

Sampled: Oct 21, 1991
Received: Oct 23, 1991
Analyzed: Oct 25, 1991
Reported: Nov 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
110-4252	A-2	26,000	1,100	560	81	3,900
110-4253	A-3	56	0.44	0.77	0.41	1.3
110-4254	A-5	N.D.	N.D.	N.D.	N.D.	N.D.
110-4255	A-6	N.D.	N.D.	N.D.	N.D.	N.D.
110-4256	A-7	N.D.	N.D.	N.D.	N.D.	N.D.
110-4257	A-9	240	63	0.65	5.1	1.6
110-4258	A-10	N.D.	N.D.	N.D.	N.D.	N.D.
110-4259	A-11	N.D.	N.D.	N.D.	N.D.	N.D.
110-4260	A-12	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Amended report dated: 11/15/91

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: Tom Paulson

Client Project ID: #3909.01, Arco, 4931

QC Sample Group: 1104252, 54-60

Reported: Nov 5, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L.Laikhtman	L.Laikhtman	L.Laikhtman	L.Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 25, 1991	Oct 25, 1991	Oct 25, 1991	Oct 25, 1991
QC Sample #:	GBLK102591	GBLK102591	GBLK102591	GBLK102591
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.9	9.9	9.8	30
Matrix Spike % Recovery:	99	99	98	100
Conc. Matrix Spike Dup.:	10	10	10	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	1.0	1.0	2.0	3.3

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Amended report dated: 11/15/91
Relative % Difference:

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

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

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: Tom Paulson

Client Project ID: #3909.01, Arco, 4931

QC Sample Group: 110-4253

Reported: Nov 5, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J.Jenks	J.Jenks	J.Jenks	J.Jenks
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991	Oct 23, 1991
QC Sample #:	GBLK102891B	GBLK102891B	GBLK102891B	GBLK102891B
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.6	9.4	29
Matrix Spike % Recovery:	96	96	94	97
Conc. Matrix Spike Dup.:	9.7	9.7	9.6	29
Matrix Spike Duplicate % Recovery:	97	97	96	97
Relative % Difference:	1.0	1.0	2.1	0.0

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Amended report dated: 11/15/91

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

(Conc. of M.S. - Conc. of M.S.D.) / (Conc. of M.S. + Conc. of M.S.D.) / 2 x 100

1104252.GET <3>

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 4931-91-5

Chain of Custody

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) Tom Paulson	Laboratory name Sequoia
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) (510) 783-7500	Fax no. (Consultant)
Consultant name Gettler + Ryan Inc.	Address (Consultant) 2150 W. Winton, Hayward CA 94542		Contract number 07-073

Method of shipment: Sequoia courier

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH (gas) 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 Semi Metals ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
A-2		2		X		X	HCl	10-21-91	1210		X									
A-3									1056		X									
A-5									1115		X									
A-6									1000		X									
A-7									1100		X									
A-9									1045		X									
A-10									1138		X									
A-11									0922		X									
A-12		↓		↓		↓	↓	↓	0915		X									

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: G/R ~~3907.01~~ 3909.01

Lab number: 1104252

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

Condition of sample: Cool

Temperature received: Cool

	Date	Time	Received by
Relinquished by sampler	10-21-91	1400	Refrig #1
Relinquished by Refrig #1	10-22-91	08:00	
Relinquished by	10-23-91	12:30	Received by laboratory: K. Wallace — Date 10-23-91 — Time 1200

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

APC-3292 (2-91)

APPENDIX B
FIELD DATA SHEETS

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3909.01

LOCATION MacArthur/West DATE 10-21-91

CITY Oakland TIME

Well ID. A-2 Well Condition OK

Well Diameter 4 in. Hydrocarbon Thickness — ft.

Total Depth 18.5 ft.

Depth to Liquid- 11.54 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 6.96 x(VF) .66 = (Estimated Purge Volume) 22.9 / 4.5 gal.

Purging Equipment Bailer

Sampling Equipment "

Starting Time 1150 Purging Flow Rate — gpm.

(Estimated Purge Volume) — gal. / (Purging Flow Rate) — gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
1151	6.06	735	67.2	1 gl
1158	6.26	770	66.7	5 gl
1205	6.23	785	66.8	10 gl
1210	6.20	790	66.9	11 gl

Did well dewater? yes If yes, time 1205 Volume 10 gl

Sampling Time 1210 Weather Conditions Sunny

Analysis THC(gas) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN [signature] ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3909.9

LOCATION MacArthur & Crest DATE 10-21-91

CITY Oakland TIME

Well ID. A-3 Well Condition ok

Well Diameter 4 in. Hydrocarbon Thickness — ft.

Total Depth 19.3 ft.

Depth to Liquid- 11.51 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 7.79 x(VF) .66 = (Estimated Purge Volume) 25.8 gal. 5.1

Purging Equipment Bailer

Sampling Equipment "

Starting Time 1013 Purging Flow Rate — gpm.

(Estimated Purge Volume) — gal. / (Purging Flow Rate) — gpm. = (Anticipated Purging Time) — min.

Time	pH	Conductivity	Temperature	Volume
1015	6.35	996	69.8	1 gl
1025	6.27	1026	68.7	5 gl
1029	6.25	1042	68.6	9 gl
1056	6.31	1035	68.5	10 gl

Did well dewater? Yes If yes, time 1029 Volume 10 gl

Sampling Time 1056 Weather Conditions Sunny

Analysis THC$_{go}$ BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3909.01

LOCATION 731 W. MacArthur DATE 10.21-91

CITY Oakland TIME

Well ID. A-5 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness ft.

Total Depth 24.0 ft.

Depth to Liquid- 11.48 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 12.52 x(VF) .38 = (Estimated Purge Volume) 24.0 gal. (4.8)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 1024 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 24 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 8 min.

Time	pH	Conductivity	Temperature	Volume
1025	6.25	623	70.9	3 gal
1028	6.28	611	70.0	12 gal
1115	6.34	544	69.6	13 gal

Did well dewater? Yes If yes, time 1028 Volume 12 gal

Sampling Time 1115 Weather Conditions Sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3909.01

LOCATION 731 W. MacArthur DATE 10-21-91

CITY Oakland TIME

Well ID. A-6 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness - ft.

Total Depth 25.0 ft.

Depth to Liquid- 10.30 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 14.70 x(VF) .38 = (Estimated Purge Volume) 28.0 gal. (5.6)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 0945 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 28 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 9.3 min.

Time	pH	Conductivity	Temperature	Volume
0946	7.02	449	69.0	3 gal
0948	6.84	458	69.7	9 gal
0951	6.73	451	69.2	18 gal
0954	6.64	452	69.0	27 gal
1000	6.61	454	69.2	28 gal

Did well dewater? no If yes, time Volume

Sampling Time 1000 Weather Conditions ~~OK~~ Sun

Analysis TPH (gas) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sand ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3909.01

LOCATION 731 W. MacArthur DATE 10-21-91

CITY Oakland TIME

Well ID. A-7 Well Condition ok

Well Diameter 3 in. Hydrocarbon Thickness – ft.

Total Depth 22.7 ft.

Depth to Liquid- 10.12 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 12.58 x(VF) .38 = (Estimated Purge Volume) 24.0 gal. (4.8)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 1010 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 24.0 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 8 min.

Time	pH	Conductivity	Temperature	Volume
1011	6.50	452	71.0	3 gal
1014	6.45	457	70.7	12 gal
1015	6.46	457	70.2	15 gal
1100	6.39	458	70.3	16 gal

Did well dewater? Yes If yes, time 1015 Volume 15 gal

Sampling Time 1100 Weather Conditions sun

Analysis TPH (gas) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sand ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3909.01

LOCATION MacArthur/West DATE 10-21-91

CITY Oakland TIME

Well ID. A-9 Well Condition OK

Well Diameter 6 in. Hydrocarbon Thickness — ft.

Total Depth ~~48.7~~ 38.7 ft.

Depth to Liquid- ~~20.29~~ 10.39 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 28.31 x(VF) 1.5 = (Estimated Purge Volume) 212.3 / 42.5 gal.

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 1005 Purging Flow Rate 6 gpm.

(Estimated Purge Volume) 212 gal. / (Purging Flow Rate) 6 gpm. = (Anticipated Purging Time) 35.3 min.

Time	pH	Conductivity	Temperature	Volume
1006	6.91	535	66.1	6 gal
1012	6.69	534	66.0	42 gal
1020	6.65	542	66.2	90 gal
1030	6.63	535	66.2	150 gal
1040	6.66	530	66.3	210 gal
1045	6.49	536	68.1	211 gal

Did well dewater? No If yes, time — Volume —

Sampling Time 1045 Weather Conditions Sunny

Analysis TH C(gas) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN [signature] ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3909.01

LOCATION MacArthur/West DATE 10-21-91

CITY Oakland TIME

Well ID. A-10 Well Condition OK

Well Diameter 5 in. Hydrocarbon Thickness — ft.

Total Depth 28.1 ft.

Depth to Liquid- 11.79 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 16.31 x(VF) .38 = (Estimated Purge Volume) 30.9 gal.

6.2

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 1118 Purging Flow Rate 4 gpm.

(Estimated Purge Volume) 4 gal. / (Purging Flow Rate) gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
1119	6.43	526	66.8	4 gl
1122	6.46	521	66.0	16 gl
1126	6.54	526	66.1	32 gl
1132	6.50	529	66.2	36 gl
1138	6.47	546	66.6	57 gl

Did well dewater? No If yes, time — Volume —

Sampling Time 1138 Weather Conditions Sunny

Analysis THC gro BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN [signature] ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3909.01

LOCATION 731 W. MacArthur DATE 10-21-91

CITY Oakland TIME

Well ID. A-11 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness — ft.

Total Depth 28.1 ft.

Depth to Liquid- 11.24 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 16.86 x(VF) .38 = (Estimated Purge Volume) 32.0 gal. (6.4)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 0907 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 32.0 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 10.7 min.

Time	pH	Conductivity	Temperature	Volume
0908	6.88	529	68.7	3 gal
0912	6.68	495	68.3	15 gal
0915	6.66	497	68.5	24 gal
0918	6.67	496	68.6	33 gal
0922	6.63	503	68.9	34 gal

Did well dewater? NO If yes, time Volume

Sampling Time 0922 Weather Conditions Sun

Analysis TPH (ga) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sam ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3909.01

LOCATION Macarthur / West DATE 10-21-91

CITY Oakland TIME

Well ID. A-12 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness — ft.

Total Depth 29.0 ft.

Depth to Liquid- 10.62 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 18.38 x(VF) .38 = (Estimated Purge Volume) 35 gal.

7

Purging Equipment DD

Sampling Equipment Bailer

Starting Time 0905 Purging Flow Rate 4 gpm.

(Estimated Purge Volume) ____ gal. / (Purging Flow Rate) 4 gpm. = (Anticipated Purging Time) ____ min.

Time	pH	Conductivity	Temperature	Volume
0906	6.25	545	66.5	4 gal
0909	6.39	541	66.7	16 gal
0915	6.36	533	67.0	17 gal

Did well dewater? Yes If yes, time 0909 Volume 16 gal

Sampling Time 0915 Weather Conditions Sunny

Analysis TH (gas) BTXE Bottles Used 2-40ml

Chain of Custody Number

COMMENTS

FOREMAN [signature] ASSISTANT

GETTLER-RYAN, INC.

General and Environmental Contractors

Clarkie

OBSERVATION WELL
DAILY MONITOR RECORD

COMPANY Arco JOB # 3909.01

LOCATION 731 W/Macarthur/West DATE 10-21-91

CITY Oakland TIME

WELL	DEPTH TO LIQUID (DTH) OR (DTW)	HYDROCARBON THICKNESS (HT) BEFORE	HYDROCARBON THICKNESS (HT) AFTER	AMOUNT PUMPED	COMMENTS
A-2	11.54	∅	18.5		Sampled
A-3	11.51	∅	19.3		
A-4	11.73 / 11.76	.03	—		not sampled
A-5	11.48	∅	24.0		Sampled
A-6	10.30	∅	25.0		
A-7	10.12	∅	22.7		
A-8	10.87 / 10.98	.11	—		not sampled
A-9	20.39	∅	48.7		Sampled
A-10	11.79	∅	28.1		
A-11	11.74	∅	28.1		
A-12	10.62	∅	29.0		

PRODUCT TANK: TOTAL FLOWMETER

WATER OTHER

COMMENTS well A-10 has water with HC's and antifreeze in christie box - probably have leaked into well

FOREMAN Randall Hall ASSISTANT