

R0710

JUN 20 2002



3164 Gold Camp Drive
Suite 200
Rancho Cordova, CA 95670-6021
U S A
916/638-2085
FAX: 916/638-8385

June 18, 2002

JUN 20 2002

Mr. Paul Supple
Atlantic Richfield Company
P.O. Box 6549
Moraga, CA 94570

Subject: *Quarterly Groundwater Monitoring Report, First Quarter 2002*
ARCO Service Station No. 4931
Oakland, California
Project No. D000-313

Dear Mr. Supple:

Delta Environmental Consultants, Inc. is submitting the attached report that presents the results of the first quarter 2002 groundwater monitoring program at ARCO Service Station No. 4931, located at 731 West MacArthur Boulevard, Oakland, California. The monitoring program complies with the Alameda County Health Care Services Agency requirements regarding underground tank investigations.

The interpretations contained in this report represent our professional opinions and are based, in part, on information supplied by the client. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeological and engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions concerning this project, please contact Steven W. Meeks at (916) 536-2613.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Steven W. Meeks, P.E.
Project Manager
California Registered Civil Engineer No. C057461



TLA (Lrp007.313.doc)
Enclosures

cc: Ms. Susan Hugo – Alameda County Health Care Services Agency
Mr. Chuck Headlee – California Regional Water Quality Control Board, San Francisco Bay Region

JUN 20 2002

Date: June 18, 2002

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 4931 Address: 731 West MacArthur Boulevard, Oakland, CA
ARCO Environmental Engineer/Phone No.: Paul Supple 925-299-8891
Consulting Co./Contact Person Delta Environmental Consultants, Inc.
Steven W. Meeks, P.E.
Consultant Project No.: D000-313
Primary Agency/Regulatory ID No. Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER

1. Performed quarterly groundwater monitoring for the first quarter 2002.
2. Prepared quarterly groundwater monitoring for the fourth quarter 2001.

WORK PROPOSED FOR NEXT QUARTER

1. Prepare and submit quarterly groundwater monitoring report for first quarter 2002.
2. Perform quarterly groundwater monitoring and sampling for second quarter 2002.
3. Site will be transferred to new consultant (URS) during second quarter 2002.

QUARTERLY MONITORING:

Current Phase of Project	<u>Monitoring/Remediation</u>
Frequency of Groundwater Sampling:	<u>Annual (2nd Quarter): A-7, A-13</u>
	<u>Semi-Annual (2nd/4th Quarter): A-3, A-5, A-11, A-12</u>
	<u>Quarterly: A-2, A-4, A-6, A-8, A-9</u>
Frequency of Groundwater Monitoring:	<u>Quarterly</u>
Is Free Product (FP) Present On-Site:	<u>No</u>
FP Recovered this Quarter:	<u>N/A</u>
Cumulative FP Recovered to Date:	<u>Unknown</u>
Bulk Soil Removed This Quarter:	<u>None</u>
Bulk Soil Removed to Date:	<u>Unknown</u>
Current Remediation Techniques:	<u>Intrinsic Bioremediation Enhancement using ORC</u>
Approximate Depth to Groundwater:	<u>6.04 feet</u>
Groundwater Gradient:	<u>0.047 ft/ft West</u>
Cumulative TPHg/Benzene Removed:	<u>0.45/0.06 gallons</u>

DISCUSSION:

- Bioremediation enhancement is ongoing using oxygen release compound (ORC) in wells A-4, A-8, A-9 and AR-1.
- Benzene was detected at 1,400 micrograms per liter ($\mu\text{g/L}$) in a sample collected from monitoring well A-8.
- Total petroleum hydrocarbons as gasoline were detected at 6,600 $\mu\text{g/L}$ in a sample collected from monitoring well A-8.
- Methyl tertiary butyl ether was detected in samples collected from monitoring wells A-4 and A-8 at 1,400 $\mu\text{g/L}$ and 2,700 $\mu\text{g/L}$, respectively.

ATTACHMENTS:

- Table 1 Groundwater Elevation and Analytical Data
- Table 2 Groundwater Flow Direction and Gradient
- Figure 1 Groundwater Analytical Summary Map
- Figure 2 Groundwater Elevation Contour Map
- Appendix A Sampling and Analysis Procedures
- Appendix B Historical Data Tables (IT Corporation)
- Appendix C Certified Analytical Reports with Chain-of-Custody Documentation
- Appendix D Remedial System Performance Summary
- Appendix E Field Sample Data

TABLE 1

GROUNDWATER ANALYTICAL DATA

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

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
A-2	06/21/00	55.48	6.85	48.63	<0.5	<0.5	<0.5	<1.0	<50	<3.0
	09/20/00		10.45	45.03	< 0.5	< 0.5	<0.5	<0.5	<50	<2.5
	12/26/00		6.27	49.21	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	03/20/01		4.57	50.91	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	06/12/01		9.27	46.21	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	09/23/01		10.75	44.73	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	12/31/01		4.13	51.35	< 0.5	< 0.5	1	3.2	<50	<2.5
	03/21/02		3.26	52.22	<0.5	<0.5	<0.5	<0.5	<50	<2.5
A-3	06/21/00	54.66	9.48	45.18	<0.5	<0.5	<0.5	<1.0	<50	46
	09/20/00		10.24	44.42	< 0.5	< 0.5	<0.5	<0.5	<50	89.6
	12/26/00		9.58	45.08	< 0.5	< 0.5	< 0.5	<0.5	< 50	7.11
	03/20/01		6.34	48.32	NS	NS	NS	NS	NS	NS
	06/12/01		9.76	44.90	< 0.5	< 0.5	< 0.5	<0.5	< 50	86
	09/23/01		10.55	44.11	NS	NS	NS	NS	NS	NS
	12/31/01		3.70	50.96	< 0.5	< 0.5	< 0.5	1	<50	60
	03/21/02		5.75	48.91	NS	NS	NS	NS	NS	NS
A-4	06/21/00	54.73	9.49	45.24	110	2.1	11	5.9	2,100	2,000
	09/20/00		10.33	44.40	127	<5.0	9.07	7.42	1,540	1,940
	12/26/00		9.34	45.39	42.7	<5.0	11	10.9	1,550	1,210
	03/20/01		7.56	47.17	40.9	<5.0	15.5	14.6	913	<25
	06/12/01		9.83	44.90	230	<20	21	<20	2,000	4,700
	09/23/01		10.54	44.19	35	<10	<10	<10	1,600	3,000
	12/31/01		5.42	49.31	<5.0	<5.0	<5.0	<5.0	<500	880
	03/21/02		6.18	48.55	<50	<50	<50	<50	<5,000	1,400

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Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
A-5	06/21/00	54.17	9.29	44.88	<0.5	<0.5	<0.5	<1.0	980	2,000
	09/20/00		10.23	43.94	NS	NS	NS	NS	NS	NS
	12/26/00		9.65	44.52	<0.5	<0.5	<0.5	<0.5	525	1,200
	03/20/01		8.05	46.12	NS	NS	NS	NS	NS	NS
	06/12/01		9.81	44.36	<5.0	<5.0	<5.0	<5.0	830	3,200
	09/23/01		10.42	43.75	NS	NS	NS	NS	NS	NS
	12/31/01		6.03	48.14	<0.5	<0.5	<0.5	<0.5	320	60
	03/21/02		6.71	47.46	NS	NS	NS	NS	NS	NS
A-6	06/21/00	55.17	8.67	46.50	<0.5	<0.5	<0.5	<1.0	<50	<3.0
	09/20/00		9.34	45.83	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/26/00		8.65	46.52	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	03/20/01		6.84	48.33	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	06/12/01		8.93	46.24	<0.5	<0.5	<0.5	<0.5	<50	7
	09/23/01		9.74	45.43	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/31/01		4.81	50.36	<0.5	<0.5	<0.5	<0.5	<50	3.2
	03/21/02		5.44	49.73	<0.5	<0.5	<0.5	<0.5	<50	<2.5
A-7	06/21/00	54.71	8.58	46.13	<0.5	<0.5	<0.5	<1.0	<50	<3.0
	09/20/00		9.19	45.52	NS	NS	NS	NS	NS	NS
	12/26/00		8.50	46.21	NS	NS	NS	NS	NS	NS
	03/20/01		6.75	47.96	NS	NS	NS	NS	NS	NS
	06/12/01		8.80	45.91	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	09/23/01		9.59	45.12	NS	NS	NS	NS	NS	NS
	12/31/01		4.78	49.93	NS	NS	NS	NS	NS	NS
	03/21/02		5.35	49.36	NS	NS	NS	NS	NS	NS

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

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
A-8	06/21/00	53.77	9.07	44.70	<0.5	<0.5	<0.5	810	810	1,500
	09/20/00		9.72	44.05	2,680	46	439	370	10,800	4,410
	12/26/00		9.20	44.57	1,440	<50	202	106	7,700	2,230
	03/20/01		7.51	46.26	1,280	<50	53.9	<50	<5,000	2,880
	06/12/01		9.53	44.24	1,700	<50	61	54	5,600	2,900
	09/23/01		10.08	43.69	3,500	<50	110	64	10,000	6,500
	12/31/01		4.34	49.43	610	<10	60	24	4,300	520
	03/21/02		6.67	47.10	1400	<50	130	<50	6,600	2,700
A-9	06/21/00	53.04	8.56	44.48	<0.5	<0.5	<0.5	<1.0	<50	5.0
	09/20/00		9.05	43.99	< 0.5	< 0.5	<0.5	<0.5	<50	<2.5
	12/26/00		8.49	44.55	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	03/20/01		6.95	46.09	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	06/12/01		8.67	44.37	< 0.5	< 0.5	< 0.5	<0.5	< 50	4.8
	09/23/01		9.21	43.83	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	12/31/01		4.57	48.47	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	03/21/02		5.60	47.44	<0.5	<0.5	<0.5	<0.5	<50	<2.5
A-10	06/21/00	54.26	10.47	43.79	NS	NS	NS	NS	NS	NS
	09/20/00		10.76	43.50	NS	NS	NS	NS	NS	NS
	12/26/00		NM	NC	NS	NS	NS	NS	NS	NS
	03/20/01		NM	NC	NS	NS	NS	NS	NS	NS
	09/23/01		NM	NC	NS	NS	NS	NS	NS	NS
	12/31/01		NM	NC	NS	NS	NS	NS	NS	NS
	03/21/02		NM	NC	NS	NS	NS	NS	NS	NS

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

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
A-11	06/21/00	53.74	9.54	44.20	<0.5	<0.5	<0.5	<1.0	<50	4.0
	09/20/00		10.62	43.12	NS	NS	NS	NS	NS	NS
	12/26/00		10.03	43.71	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	03/20/01		8.49	45.25	NS	NS	NS	NS	NS	NS
	06/12/01		10.21	43.53	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	09/23/01		10.77	42.97	NS	NS	NS	NS	NS	NS
	12/31/01		6.06	47.68	< 0.5	< 0.5	< 0.5	<0.5	< 50	<2.5
	03/21/02		7.14	46.60	NS	NS	NS	NS	NS	NS
A-12	06/21/00	52.05	9.28	42.77	<0.5	<0.5	<0.5	<1.0	<50	18
	09/20/00		9.55	42.50	NS	NS	NS	NS	NS	NS
	12/26/00		9.05	43.00	< 0.5	< 0.5	< 0.5	<0.5	< 50	17.3
	03/20/01		7.92	44.13	NS	NS	NS	NS	NS	NS
	06/12/01		9.26	42.79	< 0.5	< 0.5	< 0.5	<0.5	< 50	25
	09/23/01		9.68	42.37	NS	NS	NS	NS	NS	NS
	12/31/01		5.74	46.31	< 0.5	< 0.5	< 0.5	<0.5	< 50	9.5
	03/21/02		6.64	45.41	NS	NS	NS	NS	NS	NS
A-13	06/21/00	55.11	NM	NC	NS	NS	NS	NS	NS	NS
	09/20/00		NM	NC	NS	NS	NS	NS	NS	NS
	12/26/00		NM	NC	NS	NS	NS	NS	NS	NS
	03/20/01		NM	NC	NS	NS	NS	NS	NS	NS
	06/12/01		NM	NC	NS	NS	NS	NS	NS	NS
	09/23/01		NM	NC	NS	NS	NS	NS	NS	NS
	12/31/01		NM	NC	NS	NS	NS	NS	NS	NS
	03/21/02		6.70	48.41	NS	NS	NS	NS	NS	NS

TABLE 1

GROUNDWATER ANALYTICAL DATA

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

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
AR-1	06/21/00	54.72	NM	NC	NS	NS	NS	NS	NS	NS
	09/20/00		NM	NC	NS	NS	NS	NS	NS	NS
	12/26/00		9.95	44.77	NS	NS	NS	NS	NS	NS
	03/20/01		8.34	46.38	NS	NS	NS	NS	NS	NS
	06/12/01		10.17	44.55	NS	NS	NS	NS	NS	NS
	09/23/01		10.72	44.00	NS	NS	NS	NS	NS	NS
	12/31/01		5.91	48.81	NS	NS	NS	NS	NS	NS
	03/21/02		7.00	47.72	NS	NS	NS	NS	NS	NS
AR-2	06/21/00	54.77	NM	NC	NS	NS	NS	NS	NS	NS
	09/20/00		NM	NC	NS	NS	NS	NS	NS	NS
	12/26/00		NM	NC	NS	NS	NS	NS	NS	NS
	03/20/01		3.13	51.64	NS	NS	NS	NS	NS	NS
	06/12/01		4.51	50.26	NS	NS	NS	NS	NS	NS
	09/23/01		6.05	48.72	NS	NS	NS	NS	NS	NS
	12/31/01		2.79	51.98	NS	NS	NS	NS	NS	NS
	03/21/02		7.75	47.02	NS	NS	NS	NS	NS	NS

TABLE 1

GROUNDWATER ANALYTICAL DATA

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

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
AR-3	06/21/00	54.19	NM	NC	NS	NS	NS	NS	NS	NS
	09/20/00		NM	NC	NS	NS	NS	NS	NS	NS
	12/26/00		9.70	44.49	NS	NS	NS	NS	NS	NS
	03/20/01		NM	NC	NS	NS	NS	NS	NS	NS
	06/12/01		NM	NC	NS	NS	NS	NS	NS	NS
	09/23/01		10.43	43.76	NS	NS	NS	NS	NS	NS
	12/31/01		5.18	49.01	NS	NS	NS	NS	NS	NS
	03/21/02		6.78	47.41	NS	NS	NS	NS	NS	NS

* Well appears to have been paved over

µg/L = Micrograms per liter

TPH = Total Petroleum Hydrocarbons

NM = Not measured

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

NC = Not calculated

NS = Not sampled

Note: Please refer to Appendix B for Historical Groundwater Elevation and Analytical Data Tables developed by IT Corporation

TABLE 2

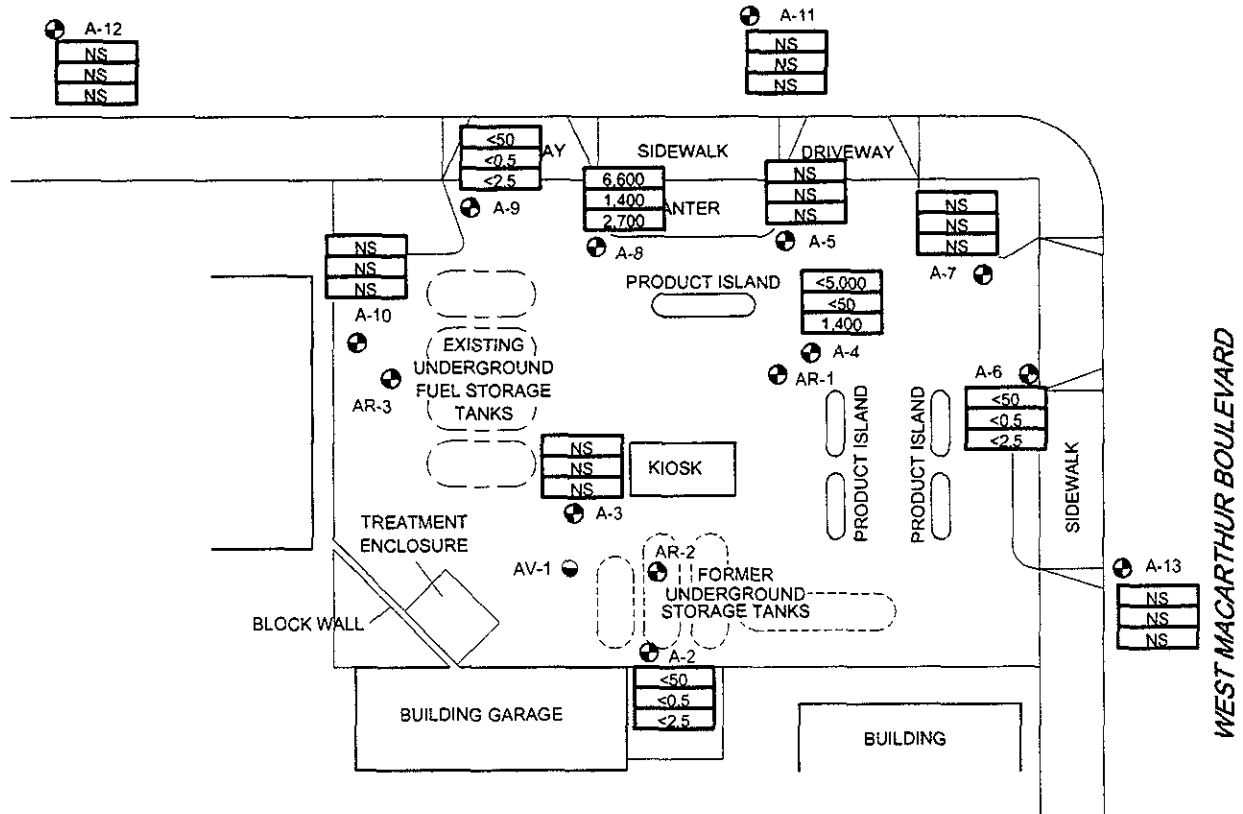
FLOW DIRECTION AND GRADIENT

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

<i>Date Measured</i>	<i>Average Flow Direction</i>	<i>Average Hydraulic Gradient</i>
06/21/00	West-Southwest	0.031
09/20/00	Southwest	0.013
12/26/00	West	0.028
03/20/01	West	0.046
06/12/01	West	0.014
09/23/01	West	0.012
12/31/01	West	0.024
03/21/02	West	0.047

Note: Please refer to Appendix B for Historical Groundwater Elevation and Analytical Data Tables developed by IT Corporation

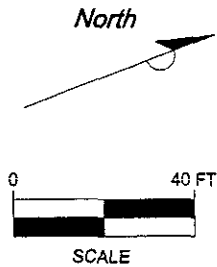
WEST STREET



LEGEND:

- ⊕ A-2 MONITORING WELL LOCATION
- ⊙ AV-1 SOIL VAPOR EXTRACTION WELL LOCATION
- | |
|------|
| <50 |
| <0.5 |
| <2.5 |

 TPH AS GASOLINE IN MICROGRAMS PER LITER
 BENZENE IN MICROGRAMS PER LITER
 MTBE IN MICROGRAMS PER LITER
- NS NOT SAMPLED

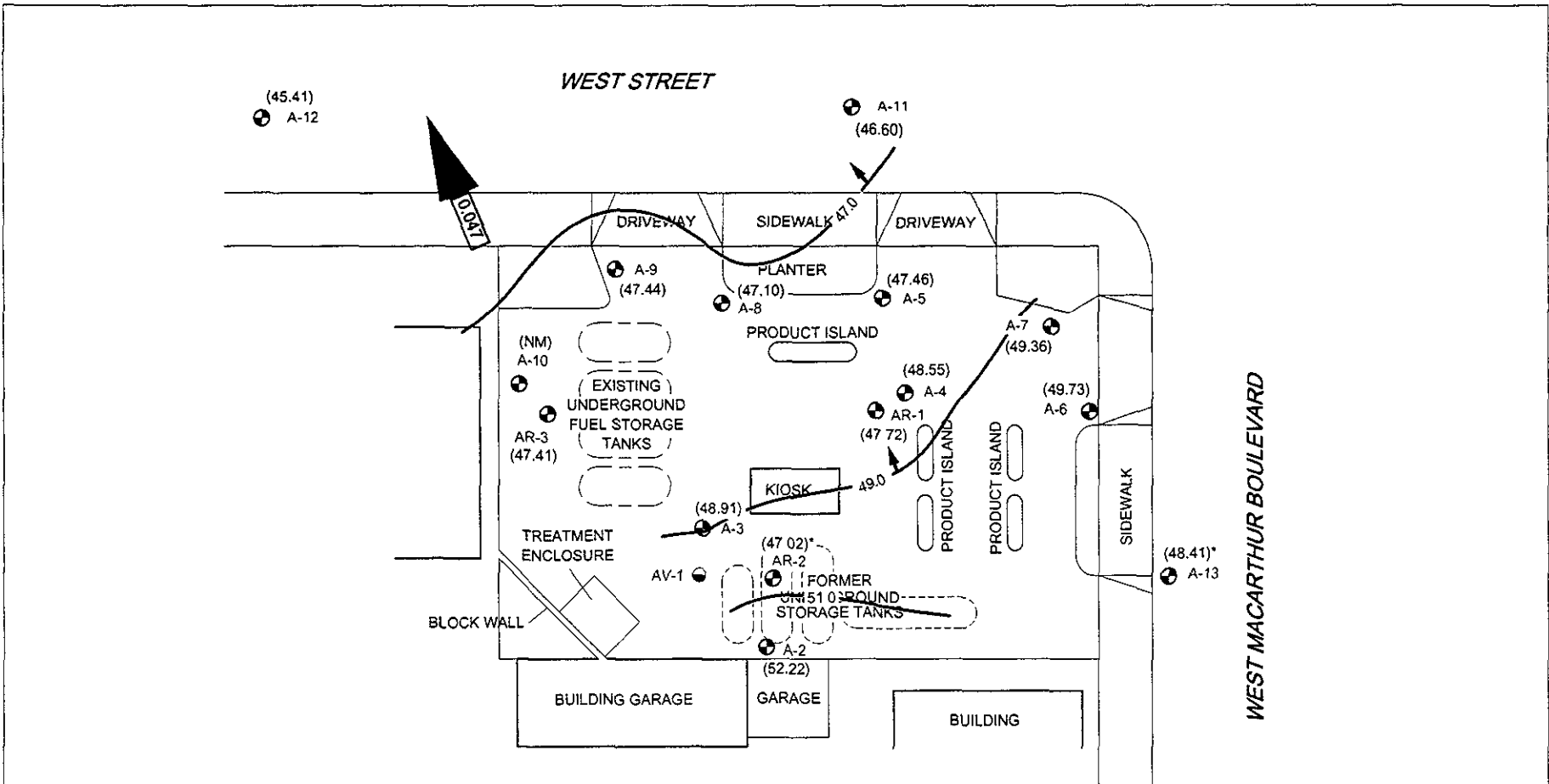


NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

FIGURE 1
GROUND WATER ANALYTICAL SUMMARY
FIRST QUARTER 2002 (3/21/02)
ARCO STATION NO. 4931
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

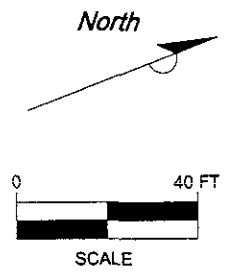
PROJECT NO. D000-313	DRAWN BY TLA 6/2/02
FILE NO. 4931-1	PREPARED BY TLA
REVISION NO. 1	REVIEWED BY





LEGEND:

- ⊕ A-2 MONITORING WELL LOCATION
- ⊖ AV-1 SOIL VAPOR EXTRACTION WELL LOCATION
- (52.22) GROUND WATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
- 49.0 - WATER TABLE CONTOUR IN FEET ABOVE MSL
- GROUND WATER FLOW DIRECTION
- 0.047 → APPROXIMATE GROUND WATER FLOW GRADIENT
- * WELL(S) NOT USED IN CONTOUR MAP CONSTRUCTION



NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

FIGURE 2
GROUND WATER ELEVATION CONTOUR MAP
FIRST QUARTER 2002 (3/21/02)
ARCO STATION NO. 4931
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

PROJECT NO D000-313	DRAWN BY TLA 6/2/02
FILE NO. 4931-1	PREPARED BY TLA
REVISION NO 1	REVIEWED BY

Delta
Environmental
Consultants, Inc.

APPENDIX A

Sampling and Analysis Procedures

FIELD METHODS AND PROCEDURES

1.0 GROUND WATER AND LIQUID-PHASE HYDROCARBON DEPTH ASSESSMENT

A water/liquid-phase hydrocarbon (LPH) interface probe was used to assess the thickness of LPH, if present, and a water level indicator was used to measure ground water depth in monitoring wells that did not contain LPH. Depth to ground water was measured from the top of each monitoring well casing. The tip of the water level indicator was subjectively analyzed for LPH sheen. All measurements and physical observations were recorded in the field.

2.0 SUBJECTIVE ANALYSIS OF GROUND WATER

Prior to purging, a water sample was collected from the monitoring well for subjective analysis. The sample was retrieved by gently lowering a clean, disposable bailer to approximately *one-half the bailer length* past the air/liquid interface. The bailer was then retrieved and the sample contained within the bailer was examined for LPH and the appearance of a LPH sheen.

3.0 MONITORING WELL PURGING AND SAMPLING

Monitoring wells were purged using a centrifugal pump or disposable bailers until pH, temperature, and conductivity of the purge water had stabilized and a minimum of three to four well volumes of water had been removed. Ground water removed from the wells was stored in 55-gallon barrels at the site. The barrels were labeled with corresponding monitoring well numbers and the date of purging. After purging, ground water levels were allowed to stabilize. A ground water sample was then removed from each of the wells using a dedicated disposable bailer. If the well was purged dry, it was allowed to sufficiently recharge and a sample was collected. Samples were collected in air-tight vials, appropriately labeled, and stored on ice from the time of collection through the time of delivery to the laboratory. A chain-of-custody form was completed to document possession of the samples. Ground water samples were transported to the laboratory and analyzed within the EPA-specified holding times for the requested analyses. Purge water will be collected from the storage barrels in a vacuum truck and transported to an appropriate facility for treatment and/or disposal.

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol previously stated in the first paragraph of this sub-section. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

APPENDIX B

Historical Data Tables

IT Corporation

Table 1
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
A-2	03/26/96	55.48	5.37	50.11	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
A-2	05/22/96	55.48	5.25	50.23	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
A-2	08/22/96	55.48	10.45	45.03	<50	1.1	1.8	<0.5	1.3	<2.5	NA	NM	
A-2	12/19/96	55.48	5.53	49.95	<50	<0.5	<0.5	<0.5	<0.5	2.7	NA	NM	
A-2	04/01/97	55.48	8.77	46.71	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NM	
A-2	05/27/97	55.48	9.87	45.61	<50	<0.5	<0.5	<0.5	<0.5	4.6	NA	NM	
A-2	08/12/97	55.48	11.11	44.37	<50	<0.5	<0.5	<0.5	<0.5	5.6	NA	NM	
A-2	11/14/97	55.48	10.63	44.85	<50	0.9	2.8	<0.5	2.4	27	NA	2.6	
A-2	03/18/98	55.48	3.58	51.90	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	NM	
A-2	05/19/98	55.48	4.82	50.66	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.30	P
A-2	07/29/98	55.48	8.94	46.54	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.2	NP
A-2	10/09/98	55.48	10.82	44.66	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	0.5	NP
A-2	02/19/99	55.48	4.46	51.02	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	3.0	P
A-2	06/02/99	55.48	5.59	49.89	<50	<0.5	0.6	<0.5	<0.5	<3	NA	5.35	NP
A-2	08/26/99	55.48	10.67	44.81	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	0.79	NP
A-2	10/26/99	55.48	4.61	50.87	<50	<0.5	<0.5	<0.5	<1	<3	NA	2.14	P
A-2	02/25/00	55.48	3.10	52.38	<50	<0.5	<0.5	<0.5	<1	<3	NA	4.21	NP
A-3	03/26/96	54.66	7.20	47.46	Not Sampled: Well Sampled Semiannually								
A-3	05/22/96	54.66	7.70	46.96	<50	1.2	1.9	0.7	1.3	NA	NA	NM	
A-3	08/22/96	54.66	10.88	43.78	Not Sampled: Well Sampled Semiannually								
A-3	12/19/96	54.66	7.70	46.96	5,900	<25	<25	<25	<25	NA	5,300	NM	
A-3	04/01/97	54.66	9.78	44.88	Not Sampled: Well Sampled Semiannually								
A-3	05/27/97	54.66	10.55	44.11	2,300	<20	<20	<20	<20	3,800	NA	NM	
A-3	08/12/97	54.66	11.12	43.54	Not Sampled: Well Sampled Semiannually								
A-3	11/14/97	54.66	8.24	46.42	<1,000	<10	<10	<10	<10	1,500	NA	3.8	
A-3	03/18/98	54.66	5.05	49.61	Not Sampled: Well Sampled Semiannually								
A-3	05/19/98	54.66	9.00	45.66	<250	<2.5	<2.5	<2.5	<2.5	220	NA	4.60	P
A-3	07/29/98	54.66	9.86	44.80	Not Sampled: Well Sampled Semiannually								
A-3	10/09/98	54.66	11.36	43.30	<250	<2.5	<2.5	<2.5	<2.5	260	NA	1.0	NP
A-3	02/19/99	54.66	6.19	48.47	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	2.5	NP
A-3	06/02/99	54.66	10.82	43.84	120	<1	<1	<1	<1	160	NA	2.78	NP

Table 1
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Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)	
A-3	08/26/99	54.66	10.73	43.93	Not Sampled: Well Sampled Semiannually								0.95	
A-3	10/26/99	54.66	6.58	48.08	<50	<0.5	<0.5	<0.5	<1	32	NA	2.06	NP	
A-3	02/25/00	54.66	5.41	49.25	Not Sampled: Well Sampled Semiannually									
A-4	03/26/96	54.73	7.95	46.78	8,900	1,200	21	200	220	NA	NA	NM		
A-4	05/22/96	54.73	8.35	46.38	5,300	700	<10	170	130	NA	NA	NM		
A-4	08/22/96	54.73	11.03	43.70	3,000	480	<5.0	75	26	150	NA	NM		
A-4	12/19/96	54.73	8.67	46.06	<2,000	<20	<20	<20	<20	NA	15,000	NM		
A-4	04/01/97	54.73	11.95	42.78	8,900	1,700	22	310	260	6,900	NA	NM		
A-4	05/27/97	54.73	10.80	43.93	7,100	960	<20	150	74	7,900	NA	NM		
A-4	08/12/97	54.73	11.38	43.35	4,300	670	12	51	27	2,800	NA	NM		
A-4	11/14/97	54.73	7.74	46.99	<20,000	300	500	<200	<200	27,000	NA	2.2		
A-4	03/18/98	54.73	6.80	47.93	4,700	600	<20	99	94	1,200	NA	1.0		
A-4	05/19/98	54.73	9.06	45.67	<2000	<20	<20	<20	720	2,000	NA	1.28	P	
A-4	07/29/98	54.73	10.05	44.68	8,400	1,300	<20	290	130	1,800	NA	0.7	NP	
A-4	10/09/98	54.73	11.20	43.53	3,500	400	<20	54	<20	1,700	NA	1.0	NP	
A-4	02/19/99	54.73	6.85	47.88	<1,000	<10	<10	<10	12	650	NA	0.1	NP	
A-4	06/02/99	54.73	11.00	43.73	6,100	760	16	260	89	2,300	NA	1.12	NP	
A-4	08/26/99	54.73	10.80	43.93	1,100	68	5	8	4	1,400	NA	1.15	NP	
A-4	10/26/99	54.73	10.11	44.62	1,500	39	2.3	9.0	5	1,700	NA	10.12	NP	
A-4	02/25/00	54.73	5.90	48.83	870	53	1.1	4.6	20	600	NA	1.72	NP	
A-5	03/26/96	54.17	7.93	46.24	Not Sampled: Well Sampled Semiannually									
A-5	05/22/96	54.17	8.20	45.97	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM		
A-5	08/22/96	54.17	10.70	43.47	Not Sampled: Well Sampled Semiannually									
A-5	12/19/96	54.17	8.39	45.78	9,900	1,100	330	230	700	NA	24	NM		
A-5	04/01/97	54.17	10.83	43.34	Not Sampled: Well Sampled Semiannually									
A-5	05/27/97	54.17	10.65	43.52	100	<0.5	<0.5	<0.5	<0.5	120	NA	NM		
A-5	08/12/97	54.17	11.05	43.12	Not Sampled: Well Sampled Semiannually									
A-5	11/14/97	54.17	10.51	43.66	<50	<0.5	<0.5	<0.5	<0.5	41	NA	4.8		
A-5	03/18/98	54.17	8.10	46.07	Not Sampled: Well Sampled Semiannually									
A-5	05/19/98	54.17	9.31	44.86	590	<5	<5	<5	<5	710	NA	2.48	P	

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ARCO Service Station 4931
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Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)	
A-5	07/29/98	54.17	9.89	44.28	Not Sampled: Well Sampled Semiannually									
A-5	10/09/98	54.17	11.02	43.15	690	<5	<5	<5	<5	710	NA	1.0	NP	
A-5	02/19/99	54.17	6.82	47.35	<2,000	<20	<20	<20	<20	2,300	NA	0.6	NP	
A-5	06/02/99	54.17	10.82	43.35	1,500	<0.5	2.3	<0.5	<0.5	2,400	NA	2.81	NP	
A-5	08/26/99	54.17	10.65	43.52	Not Sampled: Well Sampled Semiannually									0.49
A-5	10/26/99	54.17	10.35	43.82	380	<0.5	<0.5	<0.5	<1	440	NA	1.55	NP	
A-5	02/25/00	54.17	6.89	47.28	Not Sampled: Well Sampled Semiannually									
A-6	03/26/96	55.17	7.15	48.02	52	2.7	<0.5	1.1	2.0	NA	NA	NM		
A-6	05/22/96	55.17	7.35	47.82	<50	2.4	<0.5	0.88	1.7	NA	NA	NM		
A-6	08/22/96	55.17	10.12	45.05	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NM		
A-6	12/19/96	55.17	7.43	47.74	<50	1.7	<0.5	0.78	1.5	<2.5	NA	NM		
A-6	04/01/97	55.17	9.97	45.20	<50	4.7	<0.5	1.9	3.2	<2.5	NA	NM		
A-6	05/27/97	55.17	9.66	45.51	<50	0.69	<0.5	<0.5	<0.5	<2.5	NA	NM		
A-6	08/12/97	55.17	10.43	44.74	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NM		
A-6	11/14/97	55.17	9.76	45.41	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	<1.0		
A-6	03/18/98	55.17	7.00	48.17	<50	6.2	0.5	2.3	2.6	<3	NA	3.0		
A-6	05/19/98	55.17	8.27	46.90	<50	<0.5	<0.5	1.3	4.7	<3	NA	2.16	P	
A-6	07/29/98	55.17	8.96	46.21	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	0.8	NP	
A-6	10/09/98	55.17	10.23	44.94	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.0	NP	
A-6	02/19/99	55.17	5.79	49.38	<50	<0.5	<0.5	<0.5	<0.5	5	NA	0.4	NP	
A-6	06/02/99	55.17	9.71	45.46	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	2.00	NP	
A-6	08/26/99	55.17	9.79	45.38	<50	<0.5	<0.5	<0.5	0.7	<3	NA	0.66	NP	
A-6	10/26/99	55.17	9.70	45.47	<50	<0.5	<0.5	<0.5	<1	<3	NA	1.66	NP	
A-6	02/25/00	55.17	5.68	49.49	<50	<0.5	<0.5	<0.5	<1	<3	NA	1.22	NP	
A-7	03/26/96	54.71	6.90	47.81	Not Sampled: Well Sampled Semiannually									
A-7	05/22/96	54.71	8.27	46.44	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM		
A-7	08/22/96	54.71	9.80	44.91	Not Sampled: Well Sampled Semiannually									
A-7	12/19/96	54.71	7.19	47.52	Not Sampled: Well Sampled Annually									
A-7	04/01/97	54.71	9.63	45.08	Not Sampled: Well Sampled Annually									
A-7	05/27/97	54.71	9.34	45.37	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NM		

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731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
A-7	08/12/97	54.71	10.10	44.61	Not Sampled: Well Sampled Annually								
A-7	11/14/97	54.71	9.35	45.36	Not Sampled: Well Sampled Annually								
A-7	03/18/98	54.71	6.75	47.96	Not Sampled: Well Sampled Annually								
A-7	05/19/98	54.71	8.85	45.86	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.82	P
A-7	07/29/98	54.71	8.84	45.87	Not Sampled: Well Sampled Annually								
A-7	10/09/98	54.71	10.05	44.66	Not Sampled: Well Sampled Annually								
A-7	02/19/99	54.71	5.57	49.14	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	4.7	NP
A-7	06/02/99	54.71	9.56	45.15	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	2.17	NP
A-7	08/26/99	54.71	9.66	45.05	Not Sampled: Well Sampled Annually								
A-7	10/26/99	54.71	9.54	45.17	Not Sampled: Well Sampled Annually								
A-7	02/25/00	54.71	5.60	49.11	Not Sampled: Well Sampled Annually								
A-8	03/26/96	53.77	7.10	46.67	48,000	2,600	<100	650	1,100	NA	NA	NM	
A-8	05/22/96	53.77	7.20	46.57	14,000	2,800	160	320	190	NA	NA	NM	
A-8	08/22/96	53.77	11.57	42.20	8,000	1,000	76	150	96	4,300	NA	NM	
A-8	12/19/96	53.77	8.04	45.73	12,000	450	110	210	230	<500	NA	NM	
A-8	04/01/97	53.77	9.98	43.79	Not Sampled: Well Sampled Semiannually								
A-8	05/27/97	53.77	11.45	42.32	11,000	1,600	100	220	210	2,300	NA	NM	
A-8	08/12/97	53.77	11.59	42.18	Not Sampled: Well Sampled Semiannually								
A-8	11/14/97	53.77	9.85	43.92	26,000	2,300	<200	400	400	4,100	NA	2.2	
A-8	03/18/98	53.77	7.80	45.97	Not Sampled: Well Sampled Semiannually								
A-8	05/19/98	53.77	8.78	44.99	88,000	4,200	150	640	600	6,700	NA	1.36	P
A-8	07/29/98	53.77	9.59	44.18	46,000	4,900	160	620	580	13,000	NA	0.5	NP
A-8	10/09/98	53.77	11.23	42.54	130,000	3,700	110	500	770	7,300	NA	1.0	NP
A-8	02/19/99	53.77	6.51	47.26	<1,000	39	<10	<10	<10	840	NA	0.2	NP
A-8	06/02/99	53.77	10.68	43.09	8,500	1,300	32	180	110	6,700	NA	1.31	NP
A-8	08/26/99	53.77	10.43	43.34	6,200	870	17	64	60	3,700	NA	0.69	NP
A-8	10/26/99	53.77	10.23	43.54	15,000	2,800	140	370	360	480	NA	0.62	NP
A-8	02/25/00	53.77	5.93	47.84	2,600	330	6.6	18	26	1,100	NA	1.43	NP
A-9	03/26/96	53.04	7.05	45.99	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
A-9	05/22/96	53.04	7.20	45.84	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	

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Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH			Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
					Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)						
A-9	08/22/96	53.04	9.68	43.36	<50	<0.5	<0.5	<0.5	<0.5	8.5	NA	NM	
A-9	12/19/96	53.04	7.43	45.61	<50	<0.5	<0.5	<0.5	<0.5	2.6	NA	NM	
A-9	04/01/97	53.04	9.95	43.09	Not Sampled: Well Sampled Semiannually								
A-9	05/27/97	53.04	9.56	43.48	<50	2.3	<0.5	<0.5	<0.5	45	NA	NM	
A-9	08/12/97	53.04	10.15	42.89	Not Sampled: Well Sampled Semiannually								
A-9	11/14/97	53.04	8.64	44.40	<200	<2.0	<2.0	<2.0	<2.0	190	NA	9.6	
A-9	03/18/98	53.04	6.45	46.59	Not Sampled: Well Sampled Semiannually								
A-9	05/19/98	53.04	8.35	44.69	<50	<0.5	<0.5	<0.5	<0.5	7	NA	1.27	P
A-9	07/29/98	53.04	8.74	44.30	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	0.99	NP
A-9	10/09/98	53.04	10.05	42.99	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.0	NP
A-9	02/19/99	53.04	6.91	46.13	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	2.0	NP
A-9	06/02/99	53.04	9.72	43.32	<50	<0.5	<0.5	<0.5	<0.5	16	NA	2.32	NP
A-9	08/26/99	53.04	9.48	43.56	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	0.71	NP
A-9	10/26/99	53.04	9.17	43.87	1,500	6.2	0.7	78	11	91	NA	2.15	NP
A-9	02/25/00	53.04	5.84	47.20	<50	<0.5	<0.5	<0.5	<1	<3	NA	1.55	NP
A-10	03/26/96	54.26	8.28	45.98	Not Sampled: Well Removed from Sampling Program								
A-10	05/22/96	54.26	8.60	45.66	Not Sampled: Well Removed from Sampling Program								
A-10	08/22/96	54.26	10.98	43.28	Not Sampled: Well Removed from Sampling Program								
A-10	12/19/96	54.26	8.80	45.46	Not Sampled: Well Removed from Sampling Program								
A-10	04/01/97	54.26	11.15	43.11	Not Sampled: Well Removed from Sampling Program								
A-10	05/27/97	54.26	10.90	43.36	Not Sampled: Well Removed from Sampling Program								
A-10	08/12/97	54.26	11.30	42.96	Not Sampled: Well Removed from Sampling Program								
A-10	11/14/97	54.26	10.80	43.46	Not Sampled: Well Removed from Sampling Program								
A-10	03/18/98				----- Well Removed from Survey Program -----								
A-11	03/26/96	53.74	8.10	45.64	Not Sampled: Well Sampled Semiannually								
A-11	05/22/96	53.74	8.25	45.49	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
A-11	08/22/96	53.74	10.58	43.16	Not Sampled: Well Sampled Semiannually								
A-11	12/19/96	53.74	8.37	45.37	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	NM	
A-11	04/01/97	53.74	10.95	42.79	Not Sampled: Well Sampled Semiannually								
A-11	05/27/97	53.74	10.60	43.14	<50	<0.5	<0.5	<0.5	<0.5	3.1	NA	NM	

Table 1
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH				Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
					Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)					
A-11	08/12/97	53.74	11.07	42.67	Not Sampled: Well Sampled Semiannually								
A-11	11/14/97	53.74	10.58	43.16	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.6	
A-11	03/18/98	53.74	8.14	45.60	Not Sampled: Well Sampled Semiannually								
A-11	05/19/98	53.74	9.40	44.34	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.13	P
A-11	07/29/98	53.74	10.32	43.42	Not Sampled: Well Sampled Semiannually								
A-11	10/09/98	53.74	10.91	42.83	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	2.0	NP
A-11	02/19/99	53.74	6.77	46.97	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	1.8	NP
A-11	06/02/99	53.74	10.95	42.79	<50	<0.5	<0.5	<0.5	<0.5	6	NA	1.38	NP
A-11	08/26/99	53.74	11.05	42.69	Not Sampled: Well Sampled Semiannually							0.49	
A-11	10/26/99	53.74	10.81	42.93	<50	<0.5	<0.5	<0.5	<1	4	NA	1.27	NP
A-11	02/25/00	53.74	6.70	47.04	Not Sampled: Well Sampled Semiannually								
A-12	03/26/96	52.05	7.83	44.22	Not Sampled: Well Sampled Semiannually								
A-12	05/22/96	52.05	7.80	44.25	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
A-12	08/22/96	52.05	9.97	42.08	Not Sampled: Well Sampled Semiannually								
A-12	12/19/96	52.05	8.18	43.87	85	<0.5	<0.5	<0.5	<0.5	170	NA	NM	
A-12	04/01/97	52.05	10.30	41.75	Not Sampled: Well Sampled Semiannually								
A-12	05/27/97	52.05	10.05	42.00	50	12	<0.5	<0.5	<0.5	96	NA	NM	
A-12	08/12/97	52.05	10.46	41.59	Not Sampled: Well Sampled Semiannually								
A-12	11/14/97	52.05	9.70	42.35	<50	<0.5	<0.5	<0.5	<0.5	75	NA	7.0	
A-12	03/18/98	52.05	8.15	43.90	Not Sampled: Well Sampled Semiannually								
A-12	05/19/98	52.05	9.15	42.90	<50	<0.5	<0.5	<0.5	<0.5	29	NA	1.47	P
A-12	07/29/98	52.05	9.38	42.67	Not Sampled: Well Sampled Semiannually								
A-12	10/09/98	52.05	10.21	41.84	<50	<0.5	<0.5	<0.5	<0.5	7	NA	2.0	NP
A-12	02/19/99	52.05	6.96	45.09	<50	<0.5	<0.5	<0.5	<0.5	<3	NA	5.2	NP
A-12	06/02/99	52.05	10.25	41.80	<50	<0.5	<0.5	<0.5	<0.5	7	NA	1.38	NP
A-12	08/26/99	52.05	9.91	42.14	Not Sampled: Well Sampled Semiannually							0.51	
A-12	10/26/99	52.05	9.73	42.32	<50	<0.5	<0.5	<0.5	<1	12	NA	1.09	NP
A-12	02/25/00	52.05	6.97	45.08	Not Sampled: Well Sampled Semiannually								
A-13	03/26/96	55.11			Well Inaccessible								
A-13	05/22/96	55.11			Well Inaccessible								

Table 1
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
A-13	08/22/96	55.11											
A-13	12/19/96	55.11											
A-13	04/01/97	55.11											
A-13	05/27/97	55.11											
A-13	08/12/97	55.11											
A-13	11/14/97	55.11											
A-13	03/18/98	55.11											
A-13	05/19/98	55.11											
A-13	07/29/98	55.11											
A-13	10/09/98	55.11											
A-13	02/19/99	55.11											
A-13	06/02/99	55.11											
A-13	08/26/99	55.11											
A-13	10/26/99	55.11											
A-13	02/25/00	55.11											
AR-1	03/26/96	54.72	8.13	46.59	6,200	110	64	38	520	NA	NA	NM	
AR-1	05/22/96	54.72	8.57	46.15	NS	NS	NS	NS	NS	NS	NS	NM	
AR-1	08/22/96	54.72	10.97	43.75	5,600	100	28	29	310	960	NA	NM	
AR-1	12/19/96	54.72	8.93	45.79	Not Sampled: Well Removed from Sampling Program								
AR-1	04/01/97	54.72	11.78	42.94	Not Sampled: Well Removed from Sampling Program								
AR-1	05/27/97	54.72	10.76	43.96	Not Sampled: Well Removed from Sampling Program								
AR-1	08/12/97	54.72	11.40	43.32	Not Sampled: Well Removed from Sampling Program								
AR-1	11/14/97	54.72	10.80	43.92	Not Sampled: Well Removed from Sampling Program								
AR-1	03/18/98	54.72	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-1	05/19/98	54.72	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-1	07/29/98	54.72	10.17	44.55	Not Sampled: Well Removed from Sampling Program								
AR-1	10/09/98	54.72	11.25	43.47	Not Sampled: Well Removed from Sampling Program								
AR-1	02/19/99	54.72	7.02	47.70	Not Sampled: Well Removed from Sampling Program								
AR-1	06/02/99	54.72	11.00	43.72	Not Sampled: Well Removed from Sampling Program								
AR-1	08/26/99	54.72	10.96	43.76	Not Sampled: Well Removed from Sampling Program								0.39
AR-1	10/26/99	54.72	10.68	44.04	Not Sampled: Well Removed from Sampling Program								1.39

Table 1
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
AR-1	02/25/00	54.72	7.15	47.57	Not Sampled: Well Removed from Sampling Program								
AR-2	03/26/96	54.77	4.93	49.84	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
AR-2	05/22/96	54.77	5.65	49.12	NS	NS	NS	NS	NS	NS	NS	NM	
AR-2	08/22/96	54.77	7.27	47.50	<50	<0.5	<0.5	<0.5	<0.5	200	NA	NM	
AR-2	12/19/96	54.77	7.78	46.99	Not Sampled: Well Removed from Sampling Program								
AR-2	04/01/97	54.77	6.80	47.97	Not Sampled: Well Removed from Sampling Program								
AR-2	05/27/97	54.77	6.32	48.45	Not Sampled: Well Removed from Sampling Program								
AR-2	08/12/97	54.77	7.43	47.34	Not Sampled: Well Removed from Sampling Program								
AR-2	11/14/97	54.77	8.95	45.82	Not Sampled: Well Removed from Sampling Program								
AR-2	03/18/98	54.77	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-2	05/19/98	54.77	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-2	07/29/98	54.77	4.47	50.30	Not Sampled: Well Removed from Sampling Program								
AR-2	10/09/98	54.77	6.90	47.87	Not Sampled: Well Removed from Sampling Program								
AR-2	02/19/99	54.77	3.80	50.97	Not Sampled: Well Removed from Sampling Program								
AR-2	06/02/99	54.77	4.61	50.16	Not Sampled: Well Removed from Sampling Program								
AR-2	08/26/99	54.77	5.22	49.55	Not Sampled: Well Removed from Sampling Program								
AR-2	10/26/99	54.77	3.20	51.57	Not Sampled: Well Removed from Sampling Program								
AR-2	02/25/00	54.77	2.33	52.44	Not Sampled: Well Removed from Sampling Program								
AR-3	03/26/96	54.19	7.95	46.24	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NM	
AR-3	05/22/96	54.19	8.30	45.89	NS	NS	NS	NS	NS	NS	NS	NM	
AR-3	08/22/96	54.19	10.84	43.35	Not Sampled: Well Removed from Sampling Program								
AR-3	12/19/96	54.19	8.56	45.63	Not Sampled: Well Removed from Sampling Program								
AR-3	04/01/97	54.19	11.24	42.95	Not Sampled: Well Removed from Sampling Program								
AR-3	05/27/97	54.19	10.67	43.52	Not Sampled: Well Removed from Sampling Program								
AR-3	08/12/97	54.19	11.10	43.09	Not Sampled: Well Removed from Sampling Program								
AR-3	11/14/97	54.19	10.60	43.59	Not Sampled: Well Removed from Sampling Program								
AR-3	03/18/98	54.19	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-3	05/19/98	54.19	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-3	07/29/98	54.19	9.95	44.24	Not Sampled: Well Removed from Sampling Program								
AR-3	10/09/98	54.19	11.20	42.99	Not Sampled: Well Removed from Sampling Program								

Table 1
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MTBE)

ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPH Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
AR-3	02/19/99	54.19	6.98	47.21	Not Sampled: Well Removed from Sampling Program								
AR-3	06/02/99	54.19	10.80	43.39	Not Sampled: Well Removed from Sampling Program								
AR-3	08/26/99	54.19	10.69	43.50	Not Sampled: Well Removed from Sampling Program								0.40
AR-3	10/26/99	54.19	NM	NM	Not Sampled: Well Removed from Sampling Program								
AR-3	02/25/00	54.19	7.21	46.98	Not Sampled: Well Removed from Sampling Program								

TPH	= Total petroleum hydrocarbons by modified EPA method 8015
BTEX	= Benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 10/26/99).
MTBE	= Methyl tert-butyl ether
*	= EPA method 8020 prior to 10/26/99
MSL	= Mean sea level
TOB	= Top of box
ppb	= Parts per billion
ppm	= Parts per million
<	= Less than laboratory detection limit stated to the right
NA	= Not analyzed
NM	= Not measured
NS	= Not sampled

**Table 2
Groundwater Flow Direction and Gradient**

**ARCO Service Station 4931
731 West MacArthur Boulevard, Oakland, California**

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03/26/96	Southwest	0.03
05/22/96	Southwest	0.04
08/22/96	Southwest	0.02
12/19/96	Southwest	0.03
04/01/97	Southwest	0.03
05/27/97	Southwest	0.04
08/12/97	Southwest	0.02
11/14/97	Southwest	0.02
03/18/98	West	0.03
05/19/98	West-Southwest	0.02
07/29/98	West-Southwest	0.02
10/09/98	Southwest	0.007
02/19/99	Southwest	0.04
06/02/99	West	0.04
08/26/99	West-Southwest	0.02
10/26/99	West-Northwest	0.13
02/25/00	West-Southwest	0.05

APPENDIX C

Certified Analytical Reports
And
Chain-of-Custody Documentation



**Sequoia
Analytical**

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

8 April, 2002

Steven Meeks
Della Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670

RE: ARCO 4931, Oakland, CA
Sequoia Report: S203429

Enclosed are the results of analyses for samples received by the laboratory on 03/26/02 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew
Client Services Representative

Lito Diaz
Laboratory Director

CA ELAP Certificate #1624

Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

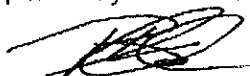
Project: ARCO 4931, Oakland, CA
Project Number: 4931, Oakland, CA
Project Manager: Steven Meeks

Reported:
04/08/02 15:09

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-2	S203429-01	Water	03/21/02 13:20	03/26/02 09:40
A-4	S203429-02	Water	03/21/02 13:25	03/26/02 09:40
A-6	S203429-03	Water	03/21/02 12:15	03/26/02 09:40
A-8	S203429-04	Water	03/21/02 12:45	03/26/02 09:40
A-9	S203429-05	Water	03/21/02 12:52	03/26/02 09 40
TB	S203429-06	Water	03/21/02 06:00	03/26/02 09:40

Sequoia Analytical - Sacramento



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Ron Chew, Client Services Representative

Page Page 1 of 6



Delta Environmental Consultants (Rancho Cordova)
 3164 Gold Camp Drive Ste. 200
 Rancho Cordova CA, 95670

Project: ARCO 4931, Oakland, CA
 Project Number: 4931, Oakland, CA
 Project Manager: Steven Meeks

Reported:
 04/08/02 15:09

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT
Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
A-2 (S203429-01) Water Sampled: 03/21/02 13:20 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040050	04/02/02	04/02/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		102 %	60-140		"	"	"	"	
A-4 (S203429-02) Water Sampled: 03/21/02 13:25 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	ND	5000	ug/l	100	2040087	04/03/02	04/03/02	DHS LUFT	
Benzene	ND	50	"	"	"	"	"	"	
Toluene	ND	50	"	"	"	"	"	"	
Ethylbenzene	ND	50	"	"	"	"	"	"	
Xylenes (total)	ND	50	"	"	"	"	"	"	
Methyl tert-butyl ether	1400	250	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		110 %	60-140		"	"	"	"	
A-6 (S203429-03) Water Sampled: 03/21/02 12:15 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040050	04/02/02	04/02/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		108 %	60-140		"	"	"	"	



Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

Project: ARCO 4931, Oakland, CA
Project Number: 4931, Oakland, CA
Project Manager: Steven Meeks

Reported:
04/08/02 15:09

**Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT
Sequoia Analytical - Sacramento**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
A-8 (S203429-04) Water Sampled: 03/21/02 12:45 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	6600	5000	ug/l	100	2040050	04/02/02	04/02/02	DHS LUFT	HC-12
Benzene	1400	50	"	"	"	"	"	"	"
Toluene	ND	50	"	"	"	"	"	"	"
Ethylbenzene	130	50	"	"	"	"	"	"	"
Xylenes (total)	ND	50	"	"	"	"	"	"	"
Methyl tert-butyl ether	2700	250	"	"	"	"	"	"	"
<i>Surrogate: a,a,a-Trifluorotoluene</i>		99.1 %	60-140	"	"	"	"	"	"
A-9 (S203429-05) Water Sampled: 03/21/02 12:52 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040050	04/02/02	04/02/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		100 %	60-140	"	"	"	"	"	
TB (S203429-06) Water Sampled: 03/21/02 06:00 Received: 03/26/02 09:40									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040050	04/02/02	04/02/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		98.4 %	60-140	"	"	"	"	"	



Delta Environmental Consultants (Rancho Cordova)
 3164 Gold Camp Drive Ste. 200
 Rancho Cordova CA, 95670

Project: ARCO 4931, Oakland, CA
 Project Number: 4931, Oakland, CA
 Project Manager: Steven Meeks

Reported:
 04/08/02 15:09

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control
Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2040050 - EPA 5030B (P/T)										
Blank (2040050-BLK1) Prepared & Analyzed: 04/02/02										
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
<i>Surrogate: a,a,a-Trifluorotoluene</i>	<i>10.0</i>		<i>"</i>	<i>10.0</i>		<i>100</i>	<i>60-140</i>			
LCS (2040050-BS1) Prepared & Analyzed: 04/02/02										
Benzene	7.77	0.50	ug/l	10.0		77.7	70-130			
Toluene	9.36	0.50	"	10.0		93.6	70-130			
Ethylbenzene	10.2	0.50	"	10.0		102	70-130			
Xylenes (total)	32.0	0.50	"	30.0		107	70-130			
Methyl tert-butyl ether	8.26	2.5	"	10.0		82.6	70-130			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	<i>10.7</i>		<i>"</i>	<i>10.0</i>		<i>107</i>	<i>60-140</i>			
Matrix Spike (2040050-MS1) Source: S203434-08 Prepared & Analyzed: 04/02/02										
Benzene	7.65	0.50	ug/l	10.0	ND	76.5	60-140			
Toluene	9.37	0.50	"	10.0	ND	93.7	60-140			
Ethylbenzene	10.3	0.50	"	10.0	ND	103	60-140			
Xylenes (total)	31.9	0.50	"	30.0	ND	106	60-140			
Methyl tert-butyl ether	14.4	2.5	"	10.0	5.4	90.0	60-140			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	<i>9.94</i>		<i>"</i>	<i>10.0</i>		<i>99.4</i>	<i>60-140</i>			
Matrix Spike Dup (2040050-MSD1) Source: S203434-08 Prepared & Analyzed: 04/02/02										
Benzene	8.20	0.50	ug/l	10.0	ND	82.0	60-140	6.94	25	
Toluene	10.0	0.50	"	10.0	ND	100	60-140	6.50	25	
Ethylbenzene	11.1	0.50	"	10.0	ND	111	60-140	7.48	25	
Xylenes (total)	34.2	0.50	"	30.0	ND	114	60-140	6.96	25	
Methyl tert-butyl ether	15.4	2.5	"	10.0	5.4	100	60-140	6.71	25	
<i>Surrogate: a,a,a-Trifluorotoluene</i>	<i>10.7</i>		<i>"</i>	<i>10.0</i>		<i>107</i>	<i>60-140</i>			

Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

Project: ARCO 4931, Oakland, CA
Project Number: 4931, Oakland, CA
Project Manager: Steven MEEKS

Reported:
04/08/02 15:09

**Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control
Sequoia Analytical - Sacramento**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2040087 - EPA 5030B (P/T)

Blank (2040087-BLK1)

Prepared & Analyzed: 04/03/02

Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
<i>Surrogate: a,a,a-Trifluorotoluene</i>	11.4		"	10.0		114	60-140			

LCS (2040087-BS1)

Prepared & Analyzed: 04/03/02

Benzene	8.68	0.50	ug/l	10.0		86.8	70-130			
Toluene	9.05	0.50	"	10.0		90.5	70-130			
Ethylbenzene	10.3	0.50	"	10.0		103	70-130			
Xylenes (total)	30.5	0.50	"	30.0		102	70-130			
Methyl tert-butyl ether	10.3	2.5	"	10.0		103	70-130			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	11.0		"	10.0		110	60-140			

Matrix Spike (2040087-MS1)

Source: S203456-01

Prepared & Analyzed: 04/03/02

Benzene	9.42	0.50	ug/l	10.0	0.70	87.2	60-140			
Toluene	10.5	0.50	"	10.0	1.5	90.0	60-140			
Ethylbenzene	10.7	0.50	"	10.0	ND	104	60-140			
Xylenes (total)	35.4	0.50	"	30.0	4.8	102	60-140			
Methyl tert-butyl ether	11.8	2.5	"	10.0	ND	96.0	60-140			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	11.4		"	10.0		114	60-140			

Matrix Spike Dup (2040087-MSD1)

Source: S203456-01

Prepared & Analyzed: 04/03/02

Benzene	9.57	0.50	ug/l	10.0	0.70	88.7	60-140	1.58	25	
Toluene	10.6	0.50	"	10.0	1.5	91.0	60-140	0.948	25	
Ethylbenzene	10.9	0.50	"	10.0	ND	106	60-140	1.85	25	
Xylenes (total)	35.8	0.50	"	30.0	4.8	103	60-140	1.12	25	
Methyl tert-butyl ether	11.6	2.5	"	10.0	ND	94.0	60-140	1.71	25	
<i>Surrogate: a,a,a-Trifluorotoluene</i>	10.7		"	10.0		107	60-140			



Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

Project ARCO 4931, Oakland, CA
Project Number: 4931, Oakland, CA
Project Manager: Steven Meeks

Reported:
04/08/02 15:09

Notes and Definitions

HC-12 Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



Work Authorization No.

Chain of Custody

ARCO Facility No. **4931** City (Facility) **Oakland** Project Manager (Consultant) **STEVEN MEEKS**
 ARCO engineer **Paul Supple** Telephone no. (ARCO) Telephone no. (Consultant) **638-2085** Fax no. (Consultant) **638-8385**
 Company name (Consultant) **Delta** Address (Consultant) **Ranch Cordova**

Laboratory name **Sequoia**
 Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8021	BTEX/PH 47/B EPA 14632/8021/8015	TPH (modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 419.1 <input type="checkbox"/> 419.2 <input type="checkbox"/>	TPH EPA 418.1/MSGS02	BTEX + MTBE EPA 8260	BTEX + Standard Organicals EPA 8260	Semi TEL P MABIS <input type="checkbox"/> VOA <input type="checkbox"/> VOA C	Cov./Metals EPA 80107/300 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead D/D/PHS <input type="checkbox"/> Pb EPA 7462/7421 <input type="checkbox"/>		
			Soil	Water	Other	Ice	Acid														
A-2				X		X	X	3-21-02	13:20	X											
A-4				X					13:25												
A-6				X					12:15												
A-8				X					12:45												
A-9				X					12:52												
IB				X					600	X											

Method of shipment

Special detection limits/reporting

Special QA/QC

Remarks

- Type of Work
- Dispenser Work
 - Line Job
 - Routine Sampling
 - Site Acquisition
 - Site Assessment
 - UST Removal
 - UST Replacement
 - Other

Lab number

Turnaround time

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

Condition of sample: Retinquished by sampler *[Signature]* Date **03-21-02** Time **9:40** Temperature received: Received by **Monica Gregson** *[Signature]*
 Retinquished by *[Signature]* Date _____ Time _____ Received by _____
 Retinquished by _____ Date _____ Time _____ Received by laboratory _____ Date _____ Time _____

APPENDIX D

Remedial System Performance Summary

ARCO STATION NO. 4931
731 West MacArthur Boulevard
Oakland, California

REMEDIAL SYSTEM PERFORMANCE SUMMARY

GWE System

Groundwater extraction (GWE) was conducted intermittently between November 10, 1992 and July 5, 1995. The TWE system was comprised of electric GWE pumps in monitoring wells A-9, AR-1, AR-2, AR-3 and in three 1,500-pound granular activated carbon vessels arranged in series. The GWE system was permitted by East Bay Municipal Utility District Permit Account Number 502-62131. Based on Alameda County Health Care Services Agency authorization that GWE at the site was no longer required, the permit was relinquished during the second quarter 1996. Overall, 4.6 million gallons of groundwater were extracted and less than 0.06 gallon of benzene removed. Refer to the IT Corporation *Second Quarter 1997 Groundwater Monitoring Report* for historical GWE system performance and analytical data.

Intrinsic Bioremediation Evaluation

At the request of ARCO, intrinsic bioremediation indicator parameters (bioparameters) were monitored during the first quarter 1996 groundwater monitoring event. Groundwater samples from monitoring wells A-4, A-8 and A-12 were analyzed for biological oxygen demand (BOD), carbon dioxide (CO₂), chemical oxygen demand (DOD), methane, nitrate, sulfate, dissolved oxygen (DO) and ferrous iron. Monitoring wells A-4 and A-8 are located within the plume. Monitoring well A-12 is located outside the plume. Based on analysis of the collected data, intrinsic bioremediation was occurring at the site. Refer to the IT Corporation *First Quarter 1997 Groundwater Monitoring Report* for details.

Oxygen release compound (ORC) is currently being used in monitoring wells A-4, A-9 and AR-1 to enhance biodegradation of dissolved oxygen. ORC was scheduled for replacement during the second quarter 2002.

APPENDIX E

Field Sample Data



3164 Gold Camp Drive, Suite 200
 Rancho Cordova, California 95670
 Direct: (916) 638-2085
 Fax: (916) 638-8385

Arco Site Address: 731 West MacArthur Blvd
Oakland, California

Arco Site Number: Arco 4931

Arco Project Manager: Paul Supple

Delta Project No.: D000-313

Site Sampled By: Doulos

Delta Project PM: Steve Meeks

Date Sampled: 03/21/02

Site Contact & Phone Number: _____

Water Level Data						Purge Volume Calculations					Sampling Analytes					Sample Record		
Well ID	Time	Depth to Water (feet)	Top of Screen Interval (feet)	Total Depth of Well (feet)	Check if Purge Not Required	Casing Water Column (A)	Well Diameter (inches)	Multiplier Value (B)	Three Casing Volumes (gallons)	Actual Water Purged (gallons)	BTEX (8020) VOA	TPH-g (8015M) VOA	MTBE (8020) VOA	Other	Dissolved Oxygen (mg/L)	Sample Frequency (A, S, Q)	Sample I.D.	Sample Time
A-2	11:20	3.26	5.0	19.0	<input type="checkbox"/>	15.74	4 inch	2.0	31.5	31.4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.89	Q/2,5,8,11	A-2	13:20
A-3	11:43	5.75	5.0	19.3	<input type="checkbox"/>	13.55	4 inch	2.0	27.1	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
A-4	11:29	6.18	5.0	19.6	<input checked="" type="checkbox"/>	13.42	4 inch	2.0	26.8	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.95	Q/2,5,8,11	A-4	13:25
A-5	11:37	6.71	3.0	24.0	<input type="checkbox"/>	17.29	3 inch	1.1	19.0	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
A-6	11:23	5.44	2.0	25.0	<input checked="" type="checkbox"/>	19.56	3 inch	1.1	21.5	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.10	Q/2,5,8,11	A-6	12:15
A-7	11:26	5.35	3.0	22.6	<input type="checkbox"/>	17.25	3 inch	1.1	19.0	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	A/5		
A-8	11:58	6.67	2.0	20.0	<input type="checkbox"/>	13.33	3 inch	1.1	14.7	14.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.02	Q/2,5,8,11	A-8	12:45
A-9	12:05	5.60	5.0	38.0	<input checked="" type="checkbox"/>	32.40	6 inch	4.4	142.6	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.05	Q/2,5,8,11	A-9	12:52
A-11	11:54	7.14	5.0	28.0	<input type="checkbox"/>	20.86	3 inch	1.1	22.9	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
A-12	11:48	6.64	5.0	30.0	<input type="checkbox"/>	23.36	3 inch	1.1	25.7	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
A-13	11:50	6.70	10.0	29.5	<input type="checkbox"/>	N/A	3 inch	1.1	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	A/5		
AR-1	11:33	7.00	10.0	31.5	<input type="checkbox"/>	24.50	6 inch	4.4	107.8	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	NS		
AR-2	11:40	7.75	10.0	27.5	<input type="checkbox"/>	19.75	6 inch	4.4	86.9	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	NS		
AR-3	11:44	6.78	10.0	27.0	<input type="checkbox"/>	N/A	6 inch	4.4	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	NS		
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

(A)-Casing Water Column: Depth to Bottom - Depth to Water (B)-Multiplier Values: (2" Well: 0.5) (4" Well: 2.0) (6" Well: 4.4)

Sampling Sequence: Annual: A-7, A-13; Semi-Annual: A-3, A-5, A-11, A-12; Quarterly: A-6, A-8, A-9, A-2, A-4,

Sampling Notes: List depth of Sample on C.O.C. [I.e. MW-1(30)] Make Sure to Note on C O C. "Provide Lowest Reporting Limit Available." Original Copies of Field Sampling Sheets are Located in Project File
 If the water level is below the top of the screen, take a grab sample and check box for NO PURGE (NP). If the water level is above the screen, purge as normal



3164 Gold Camp Drive, Suite 200
 Rancho Cordova, California 95670
 Direct: (916) 638-2085
 Fax: (916) 638-8385

Arco Site Address: 731 West MacArthur Blvd
Oakland, California

Arco Site Number: Arco 4931

Delta Project No.: D000-313

Arco Project Manager: Paul Supple

Delta Project PM: Steve Meeks

Site Sampled By: Doulos

Date Sampled: 3/21/02

Site Contact & Phone Number: _____

Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons					
A-2	13:00	19.2	7.90	591	10	A-9	No Purge Required															
	13:03	21.5	7.13	291	20																	
	13:05	23.7	6.91	504	32																	
A-3	Not Sampled					A-11	NOT SAMPLED															
A-4	No Purge Required					A-12	NOT SAMPLED															
A-5	Not Sampled					A-13	Not Sampled															
A-6	No Purge Required					AR-1	Not Sampled															
A-7	Not Sampled					AR-2	Not Sampled															
A-8	12:15	20.5	7.4	1,373		AR-3	Not Sampled															
	12:14	23.0	7.09	722																		
	12:20	24.3	7.20	662																		

Notes: NP = NO PURGE

Original Copies of Field Sampling Sheets are Located in Project File