

September 24, 2001

Mr. Paul Supple

P.O. Box 6549

ARCO Products Company

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

Moraga, CA 94570

Subject: Quarterly Groundwater Monitoring Report, Second Quarter 2001

ARCO Service Station No. 2162 15135 Hesperian Boulevard San Leandro, California Project No. D000-310

Dear Mr. Supple:

Delta Environmental Consultants, Inc. is submitting the attached report that presents the results of the second quarter 2001 groundwater monitoring program at ARCO Products Company Service Station No. 2162, located at 15135 Hesperian Boulevard, San Leandro, 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.

Trevor L. Atkinson

Brett Bardsley

Project Engineer

Steven W. Meeks, P.E.

Project Manager

California Registered Civil Engineer No. C057461

TLA (Lrp005.310.doc) Enclosures

cc: Mr. Scott Seery - Alameda County Health Care Services Agency

Mr. John Jang - California Regional Water Quality Control Board, San Francisco Bay Region

Mr. Mike Bakaldin - City of San Leandro Fire Department

Date: September 24, 2001

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 2162 Address: 15135 Hesperian Boulevard, San Leandro, CA
ARCO Environmental Engineer/Phone No.:
Consulting Co./Contact Person
Consultant Project No.:
Primary Agency/Regulatory ID No.

Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER

1. Performed quarterly groundwater monitoring for second quarter 20001

2. Prepared quarterly groundwater monitoring report for first quarter 2001.

WORK PROPOSED FOR NEXT QUARTER

1. Prepare and submit quarterly groundwater monitoring report for second quarter 2001.

2. Perform quarterly groundwater monitoring and sampling for third quarter 2001.

QUARTERLY MONITORING:

Current Phase of Project	Monitoring
Frequency of Groundwater Sampling:	Quarterly: MW-1, MW-2, MW-3, MW-4
Frequency of Groundwater Monitoring:	Quarterly
Is Free Product (FP) Present On-Site:	No
FP Recovered this Quarter:	N/A
Cumulative FP Recovered to Date:	None
Bulk Soil Removed This Quarter:	None
Bulk Soil Removed to Date:	None
Current Remediation Techniques:	Natural Attenuation
Approximate Depth to Groundwater:	8.67 feet
Groundwater Gradient:	0.013 ft/ft toward southwest

DISCUSSION:

- Ethylbenzene was detected in a sample collected from MW-2 at 0.74 μg/L.
- Total petroleum hydrocarbons as gasoline were detected in a sample collected from MW-2 at 360 μg/L.
- MTBE was detected in samples collected from MW-3 at a concentration of 30 µg/L.

ATTACHMENTS:

•	Table 1	Groundwater Elevation and Analytical Data
٠	Table 2	Groundwater Flow Direction and Gradient
•	Figure 1	Groundwater Analytical Summary Map
٠	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 Field Sampling Data

TABLE 1
GROUNDWATER ANALYTICAL DATA

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)
MW-1	6/20/00	31.19	8.33	22.86	<0.5	0.8	<0.5	<1.0	<50	<10
	9/29/00		9.07	22.12	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/17/00		8.69	22.50	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	3/23/01		8.19	23.00	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	6/20/01		8.97	22.22	<0.5	<0.5	<0.5	<0.5	<50	<2.5
MW-2	6/20/00	30.38	7.38	23.00	NS	NS	NS	NS	NS	NS
	9/29/00		8.08	22.30	<0.5	<0.5	<0.5	<0.5	266	<2.5
	12/17/00		7.80	22.58	<0.5	<0.5	0.659	<0.5	175	<2.5
	3/23/01		7,23	23.15	<0.5	<0.5	0.912	<0.5	351	<2.5
	6/20/01		7.98	22.40	<0.5	<0.5	0.74	<0.5	360	<2.5
MW-3	6/20/00	30.30	7.75	22.55	NS	NS	NS	NS	NS	NS
	9/29/00		8.46	21.84	<0.5	<0.5	<0.5	<0.5	<50	128
	12/17/00		8.01	22.29	<0.5	<0.5	<0.5	<0.5	<50	46.7
	3/23/01		7.70	22.60	<0.5	<0.5	<0.5	<0.5	<50	26.8
	6/20/01		8.23	22.07	<0.5	< 0.5	<0.5	<0.5	<50	30

TABLE 1 GROUNDWATER ANALYTICAL DATA

ARCO Service Station No. 2162 15135 Hesperian Boulevard San Leandro, 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)
MW-4	6/20/00	30.39	8.87	21.52	N\$	NS	NS	NS	NS	NS
	9/29/00		9.61	20.78	1.02	<0.5	<0.5	<0.5	<50	12.2
	12/17/00		9.17	21.22	<0.5	<0.5	<0.5	<0.5	<50	5.81
	3/23/01		8.70	21.69	<0.5	<0.5	<0.5	<0.5	<50	3.04
	6/20/01		9.51	20.88	<0.5	<0.5	<0.5	<0.5	<50	<2.5

TPH = Total Petroleum Hydrocarbons

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

μg/L = Micrograms per liter

NS = Not sampled

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

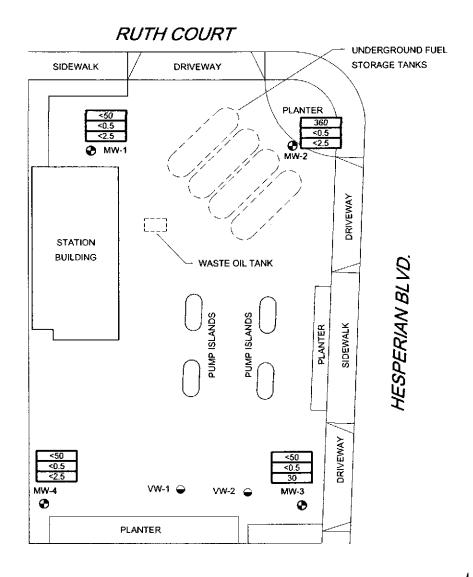
TABLE 2

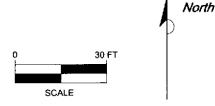
GROUNDWATER FLOW DIRECTION AND GRADIENT

ARCO Service Station No. 2162 15135 Hesperian Boulevard San Leandro, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
06/20/00	Southwest	0.010
09/29/00	Southwest	0.010
12/17/00	Southwest	0.010
03/23/01	Southwest	0.011
06/20/01	Southwest	0.013

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





LEGEND:

→ MW-1

MONITORING WELL LOCATION

→ VW-1

SOIL VAPOR EXTRACTION WELL LOCATION



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.

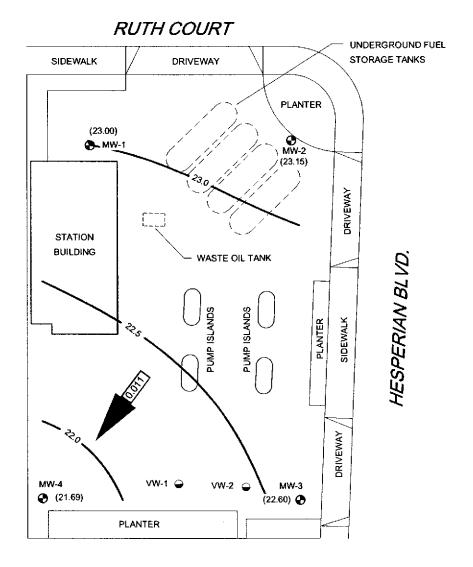
FIGURE 1

GROUND WATER ANALYTICAL SUMMARY SECOND QUARTER 2001 (6/20/01)

ARCO STATION NO. 2162 15135 HESPERIAN BOULEVARD SAN LEANDRO, CALIFORNIA

PROJECT NO.	ORAWN BY
D000-310	TLA 7/20/01
FILE NO.	PREPARED BY
2162-1	TLA
REVISION NO.	REVIEWED BY







LEGEND:

MONITORING WELL LOCATION MW-1

VW-1 SOIL VAPOR EXTRACTION WELL LOCATION

GROUND WATER ELEVATION IN FEET ABOVE MEAN (23.00)

SEA LEVEL (MSL)

WATER TABLE CONTOUR IN FEET ABOVE MSL

GROUND WATER FLOW DIRECTION

APPROXIMATE GROUND WATER FLOW GRADIENT

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

FIGURE 2

GROUND WATER ELEVATION CONTOUR MAP FIRST QUARTER 2001 (3/23/01)

> ARCO STATION NO. 2162 15135 HESPERIAN BOULEVARD SAN LEANDRO, CALIFORNIA

PROJECT NO.	DRAWN BY
D000-310	TLA 5/29/01
FILE NO.	PREPARED BY
2162-1	TLA
REVISION NO: 1	REVIEWED BY



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.

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

	Date	Well	Depth to	Groundwater	TPPH as			Ethyl-		MTBE	MTBE	Dissolved	Purged/
Well	Gauged/	Elevation	Water	Elevation	Gasoline	Benzene	Toluene	benzene	Xylenes	8021B*	8260	Oxygen	Not Purged
Number	Sampled	(feet, MSL)	(feet, TOC)	(feet, MSL)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppm)	(P/NP)
MW-1	02/26/96	31.19	7.14	24.05	< 50	< 0.5	< 0.5	<0.5	<0.5	NA	NA	NA	
MW-1	05/23/96	31.19	7.70	23.49	<50	< 0.5	< 0.5	< 0.5	< 0.5	NA	NA	NA	
MW-1	08/21/96	31.19	8.75	22.44	210	< 0.5	< 0.5	< 0.5	< 0.5	<2.5	NA	NA	
MW-1	11/20/96	31.19	8.62	22.57	91	< 0.5	< 0.5	<0.5	< 0.5	2.6	NA	NA	
MW-1	04/01/97	31.19	8.70	22.49	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<2.5	NA	NA	NP
MW-1	06/10/97	31.19	8.45	22.74	94	< 0.5	< 0.5	0.68	0.56	6.4	NA	NA	NP
MW-1	09/17/97	31.19	9.20	21.99	<50	< 0.5	< 0.5	< 0.5	< 0.5	10	NA	1.0	NP
MW-1	12/12/97	31.19	8.00	23.19	<200	<2	<2	<2	<2	180	NA	2.0	NP
MW-1	03/25/98	31.19	7.00	24.19	<200	<2	<2	3	<2	180	NA	2.0	
MW-1	05/14/98	31.19	7.46	23.73	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	1.17	P
MW-1	07/31/98	31.19	8.10	23.09	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	2.0	NP
MW-1	10/12/98	31.19	8.60	22.59	< 50	< 0.5	< 0.5	< 0.5	< 0.5	9	NA	2.5	NP
MW-I	02/11/99	31.19	7.32	23.87	<50	< 0.5	< 0.5	< 0.5	< 0.5	25	NA	1.0	P
MW-1	06/23/99	31.19	8.40	22.79	55	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	1.36	NP
MW-1	08/23/99	31.19	8.85	22.34	< 50	< 0.5	0.6	< 0.5	< 0.5	5	NA	1.42	NP
MW-1	10/27/99	31.19	8.50	22.69	< 50	< 0.5	< 0.5	<0.5	<1	90	NA	0.83	NP
MW-1	02/09/00	31.19	8.11	23.08	<50	< 0.5	<0.5	<0.5	<1	9	NA	0.77	NP
MW-2	02/26/96	30.38	6.41	23.97	770	<0.5	<0.5	45	28	NA	NA	NA	
MW-2	05/23/96	30.38	6.80	23.58	590	0.50	< 0.5	35	18	NA	NA		
MW-2	08/21/96	30.38	7.80	22.58	170	<0.5	< 0.5	21	6.3	<2.5	NA		
MW-2	11/20/96	30.38	7.73	22.65	88	<0.5	<0.5	7.9	1.1	<2.5	NA		
MW-2	04/01/97	30.38	7.83	22.55	66	< 0.5	<0.5	3.6		33	NA		
MW-2	06/10/97	30.38	7.52	22.86	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA		NP
MW-2	09/17/97	30.38	8.24	22.14	<50	< 0.5	<0.5	<0.5	<0.5	<3.0	NA		NP
MW-2	12/12/97	30.38	7.10	23.28	<50	< 0.5	< 0.5	<0.5	<0.5	<3.0	NA		NP
MW-2	03/25/98	30.38	6.27	24.11	<50	<0.5	<0.5	0.7	0.5	55	NA		111
MW-2	05/14/98	30.38	6.54	23.84	210	<0.5	<0.5	3.3	<0.5	42	NA NA		P
MW-2	07/31/98	30.38	7.14	23.24	230		<0.5	3.9	<0.5	6	NA		P

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

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Xylenes (ppb)	MTBE 8021B* (ppb)	MTBE 8260 (ppb)	Dissolved Oxygen (ppm)	Purged/ Not Purged (P/NP)
MW-2	10/12/98	30.38	7.65	22.73	110	<0.5	<0.5	1.5	<0.5	<3	NA	1.0	P
MW-2	02/11/99	30.38	6.55	23.83	660	< 0.5	< 0.5	6.7	0.7	3	NA	1.0	P
MW-2	06/23/99	30.38	7.48	22.90	270	< 0.5	<0.5	2.2	0.8	<3	NA	NM	P
MW-2	08/23/99	30.38	7.89	22.49	200	< 0.5	0.9	1.8	< 0.5	<3	NA	1.17	P
MW-2	10/27/99	30.38	8.30	22.08	2,100	1.0	2.5	14	3	3	NA	0.75	NP
MW-2	02/09/00	30.38	8.02	22.36	<50	<0.5	<0.5	< 0.5	<1	5	NA	0.69	NP
MW-3	02/26/96	30.30	6.72	23.58	120	5.0	<0.5	<0.5	<0.5	NA	NA	NA	
MW-3	05/23/96	30.30	7.18	23.12	140	12	<0.5	< 0.5	< 0.5	NA	NA	NA	
MW-3	08/21/96	30.30	8.17	22.13	< 50	1.1	< 0.5	< 0.5	< 0.5	130	NA	NA	
MW-3	11/20/96	30.30	8.03	22.27	55	< 0.5	< 0.5	< 0.5	< 0.5	59	NA	NA	
MW-3	04/01/97	30.30	8.09	22.21	<50	< 0.5	<0.5	<0.5	< 0.5	180	NA	NA	NP
MW-3	06/10/97	30.30	7.97	22.33	<50	<0.5	< 0.5	< 0.5	< 0.5	1,900	NA	NA	NP
MW-3	09/17/97	30,30	8.54	21,76	<5,000	< 50	< 50	<50	<50	1,100	860	2.2	NP
MW-3	12/12/97	30.30	7.50	22.80	560	<5.0	<5.0	< 5.0	5.0	370	NA	1.4	NP
MW-3	03/25/98	30.30	6.60	23.70	< 500	<5	<5	<5	<5	470	NA	1.0	
MW-3	05/14/98	30.30	7.13	23.17	750	<5	<5	<5	<5	630	NA	1.97	P
MW-3	07/31/98	30.30	7.58	22.72	<500	<5	<5	<5	<5	590	NA	1.0	P
MW-3	10/12/98	30.30	8.00	22.30	<500	<5	<5	<5	<5	600	NA	2.0	P
MW-3	02/11/99	30.30	6.90	23.40	<500	<5	<5	<5	<5	280	NA	1.0	P
MW-3	06/23/99	30.30	7.82	22.48	220	< 0.5	3.2	< 0.5	< 0.5	740	NA	1.98	P
MW-3	08/23/99	30.30	8.28	22.02	<50	< 0.5	1.1	< 0.5	< 0.5	230	NA	1.20	P
MW-3	10/27/99	30.30	9.27	21.03	< 50	< 0.5	< 0.5	< 0.5	<1	<3	NA	0.81	NP
MW-3	02/09/00	30.30	7.45	22.85	<50	<0.5	<0.5	<0.5	<1	80	NA	0.81	P
MW-4	02/26/96	30.39	7.59	22.80	110	9.9	<0.5	<0.5	<0.5	NA	NA	NA	
MW-4	05/23/96	30.39	8.22	22.17	69	8.0	< 0.5	<0.5	< 0.5	NA	NA	NA	
MW-4	08/21/96	30.39	9.28	21.11	<50	6.8	< 0.5	< 0.5	< 0.5	<2.5	NA	NA	
MW-4	11/20/96	30.39	9.12	21.27	95	10	0.59	< 0.5	0.52	3.8	NA	NA	

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

	Date	Well	Depth to	Groundwater	TPPH as			Ethyl-		MTBE	MTBE	Dissolved	Purged/
Well	Gauged/	Elevation	Water	Elevation	Gasoline	Benzene	Toluene	benzene	Xylenes	8021B*	8260	Oxygen	Not Purged
Number	Sampled	(feet, MSL)	(feet, TOC)	(feet, MSL)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppm)	(P/NP)
MW-4	04/01/97	30.39	8.45	21.94	73	5.7	< 0.5	<0.5	< 0.5	<2.5	NA	NA	
MW-4	06/10/97	30.39	9.00	21.39	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<2.5	NA	NA	NP
MW-4	09/17/97	30.39	9.76	20.63	< 50	3.2	< 0.5	< 0.5	< 0.5	8.0	NA	0.2	NP
MW-4	12/12/97	30.39	8.45	21.94	<50	2.9	< 0.5	< 0.5	< 0.5	14	NA	1.0	NP
MW-4	03/25/98	30.39	7.52	22.87	58	2.8	< 0.5	< 0.5	< 0.5	<3	NA	3.0	
MW-4	05/14/98	30.39	8.03	22,36	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	3.24	NP
MW-4	07/31/98	30.39	8.67	21.72	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	2.0	NP
MW-4	10/12/98	30.39	9.15	21.24	<50	< 0.5	< 0.5	< 0.5	< 0.5	4	ŃΑ	1.5	NP
MW-4	02/11/99	30.39	7.80	22.59	61	2.5	< 0.5	< 0.5	< 0.5	6	NA	1.0	P
MW-4	06/23/99	30.39	9.00	21.39	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<3	NA	1.42	NP
MW-4	08/23/99	30.39	9.31	21.08	< 50	<0.5	< 0.5	<0.5	< 0.5	6	NA	1.53	NP
MW-4	10/27/99	30.39	9.80	20.59	<50	<0.5	<0.5	<0.5	<1	6	NA	0.98	NP
MW-4	02/09/00	30.39	8.63	21.76	<50	< 0.5	< 0.5	<0.5	<1	7	NA	0.74	NP

TPPH = Total purgeable petroleum hydrocarbons by modified EPA method 8015

BTEX = Benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 10/27/99).

MTBE = Methyl tert -Butyl Ether

EPA method 8020 prior to 10/27/99

MSL = Mean sea level

TOC = Top of casing

ppb = Parts per billion

ppm = Parts per million

NA = Not analyzed

NM = Not measured

= Denotes concentration not present above laboratory detection limited stated to the right

Table 2
Groundwater Flow Direction and Gradient

Date	Average	Average
Measured	Flow Direction	Hydraulic Gradient
02/26/96	Southwest	0.009
05/23/96	South-Southwest	0.010
08/21/96	South-Southwest	0.01
11/20/96	South-Southwest	0.011
04/01/97	South-Southwest	0.004
06/10/97	South-Southwest	0.010
09/17/97	South-Southwest	0.01
12/12/97	Southwest	0.01
03/25/98	South-Southwest	0.008
05/14/98	Southwest	0.01
07/31/98	Southwest	0.01
10/12/98	Southwest	0.01
02/11/99	Southwest	0.008
06/23/99	Southwest	0.02
08/23/99	Southwest	0.013
10/27/99	South-Southwest	0.02
02/09/00	Southwest	0.01

APPPENDIX C

Certified Analytical Reports And Chain-of-Custody Documentation



5 July, 2001

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

RE: ARCO 2162, San Leandro, CA Sequoia Report: S106396

Enclosed are the results of analyses for samples received by the laboratory on 06/25/01 13:51. 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



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

Delta Environmental Consultants(Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported: 07/05/01 13:11

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1-8	\$106396-01	Water	06/20/01 20:34	06/25/01 13:51
MW-2-7	S106396-02	Water	06/20/01 20:50	06/25/01 13:51
MW-3-8	\$106396-03	Water	06/20/01 21:09	06/25/01 13:51
MW-4-9	S106396-04	Water	06/20/01 21:20	06/25/01 13:51
ТВ	S106396-05	Water	06/20/01 06:00	06/25/01 13:51

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.





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported: 07/05/01 13:11

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
					Dukii	, , , , , , , , , , , , , , , , , , , ,	1 mary 2.24	377001170	170145
MW-1-8 (S106396-01) Water		Received:	06/25/01	13:51					
Purgeable Hydrocarbons	ND	50	ug/l	1	1070003	07/02/01	07/02/01	DHS LUFT	
Benzene	ND	0.50	**	19	11	H	**	11	
Toluene	ND	0.50	**	77	n	H	**	0	
Ethylbenzene	ND	0.50	**	**	11	н	"	"	
Xylenes (total)	ND	0.50	H		II .	п	**	*	
Methyl tert-butyl ether	ND ND	2.5	P	"	1)	н	**	*	
Surrogate: a,a,a-Trifluorotoluen	e	118%	60-	-140	"	B	n	"	
MW-2-7 (S106396-02) Water	Sampled: 06/20/01 20:50	Received:	06/25/01	13:51					
Purgeable Hydrocarbons	360	50	ug/l	1	1070003	07/02/01	07/02/01	DHS LUFT	zP-04
Benzene	ND	0.50	н	**	11	"	II	n	
Toluene	ND	0.50	I)	н	**	n	п	*	
Ethylbenzene	0.74	0.50	н	n	11	n	п	**	
Xylenes (total)	ND	0.50	15	U	**		II .	**	
Methyl tert-butyl ether	ND	2.5	н	"	**	19	11	Ħ	
Surrogate: a,a,a-Trifluorotoluen	e	118%	60-	140	"	"	n	u	
MW-3-8 (S106396-03) Water	Sampled: 06/20/01 21:09	Received:	06/25/01	13:51					
Purgeable Hydrocarbons	ND	50	ug/l	1	1070019	07/02/01	07/02/01	DHS LUFT	
Benzene	ND	0.50	15	II .	**	11	n	•	
Toluene	ND	0.50	n	0	••	h	u ,	*	
Ethylbenzene	ylbenzene ND		11	n	•	17	11	**	
Xylenes (total)	enes (total) ND		11	II .	H	**	11	*	
Methyl tert-butyl ether	30	2.5	"	π	#	**		H	
Surrogate: a,a,a-Trifluorotoluen	e	103 %	60-	140	"	"	"	n	



3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported: 07/05/01 13:11

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4-9 (S106396-04) Water S:	ampled: 06/20/01 21:20	Received:	06/25/01	13:51					
Purgeable Hydrocarbons	ND	50	ug/l	1	1070019	07/02/01	07/02/01	DHS LUFT	
Benzene	ND	0.50	u	н	н	II	**	IF.	
Toluene	ND	0.50	н	н	11	II	**	u	
Ethylbenzene	ND	0.50	n	n	**	н	**	н	
Xylenes (total)	ND	0.50	τí	н	11	п	"	n	
Methyl tert-butyl ether	ND	2.5	0	н	n	n	*	tr	
Surrogate: a,a,a-Trifluorotoluene		107 %	60-	140	,,	"	"	TT	
TB (S106396-05) Water Sample	ed: 06/20/01 06:00 Rec	eived: 06/2:	5/01 13:5	1					
Purgeable Hydrocarbons	70	50	ug/l	1	1070019	07/02/01	07/02/01	DHS LUFT	zP-02
Benzene	ND	0.50	77	n	n	н	n	"	
Toluene	3.1	0.50	**	**	п	n	n	•	
Ethylbenzene	ND	0.50	**	P	n	H	н	H	
Xylenes (total)	ND	0.50	"	et .	ū	**	п	**	
Methyl tert-butyl ether	ND	2.5	**	**	н	**	п	"	
Surrogate: a,a,a-Trifluorotoluene		107 %	60-	140	n	"	μ	#	



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported: 07/05/01 13:11

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

A	nt	Reporting	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte	Result	Limit	Units	Level	Result	76KEC	Limits	KFD	Limit	140608
Batch 1070003 - EPA 5030B (P/T)										
Blank (1070003-BLK1)				Prepared	& Analyze	ed: 07/02/	01			
Purgeable Hydrocarbons	ND	50	ug/l							
Велгеле	ND	0.50	"							
Toluene	ND	0.50	11							
Ethylbenzene	ND	0.50	**							
Xylenes (total)	ND	0.50	**							
Methyl tert-butyl ether	ND	2.5	**							
Surrogate: a,a,a-Trifluorotoluene	12.9		**	10.0		129	60-140			
LCS (1070003-BS1)				Prepared	& Analyza	ed: 07/02/	01			
Benzene	8.99	0.50	ug/l	10.0		89.9	70-130			
Toluene .	10.4	0.50	н	10.0		104	70-130			
Ethylbenzene	10.9	0.50	n	10.0		109	70-130			
Xylenes (total)	30.5	0.50	n	30.0		102	70-130			
Methyl tert-butyl ether	9.38	2.5	H	10.0		93.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	12.9		"	10.0		129	60-140			
Matrix Spike (1070003-MS1)	So	urce: S10632	9-02	Prepared	& Analyz	ed: 07/02/	01		<u></u>	
Benzene	8.78	0.50	ug/l	10.0	ND	87.8	60-140			
Toluene	10.2	0.50	u u	10.0	ND	102	60-140			
Ethylbenzene	10.7	0.50	п	10.0	ND	107	60-140			
Xylenes (total)	30.0	0.50		30.0	ND	100	60-140			
Methyl tert-butyl ether	10.2	2.5		10.0	ND	102	60-140			
Surrogate: a,a,a-Trifluorotoluene	12.2		n	10.0		122	60-140			
Matrix Spike Dup (1070003-MSD1)	So	urce: S10632	9-02	Prepared	& Analyz	ed: 07/02/	01			
Benzene	8.87	0.50	ug/l	10.0	ND	88.7	60-140	1.02	25	
Foluene	10.3	0.50	n	10.0	ND	103	60-140	0.976	25	
Ethylbenzene	10.8	0.50	н	10.0	ND	108	60-140	0.930	25	
Xylenes (total)	30.3	0.50	н	30.0	ND	101	60-140	0.995	25	
Methyl tert-butyl ether	11.1	2.5	н	10.0	ND	111	60-140	8.45	25	
Surrogate: a,a,a-Trifluorotoluene	12.7		,,	10.0		127	60-140			



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported: 07/05/01 13:11

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD		
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes	
Batch 1070019 - EPA 5030B (P/T)				<u>.</u>		· ———	•				
Blank (1070019-BLK1)				Prepared	& Analyze	ed: 07/02/	01				
Purgeable Hydrocarbons	ND	50	ug/l								
Benzene	ND	0.50	II								
Toluene	ND	0.50	н								
Ethylbenzene	ND	0.50	n								
Xylenes (total)	ND	0.50	Ħ								
Methyl tert-butyl ether	ND	2.5	н								
Surrogate: a,a,a-Trifluorotoluene	10.4		n	10.0		104	60-140				
LCS (1070019-BS1)				Prepared	& Analyza	d: 07/02/	01				
Benzene	8.37	0.50	ug/l	10.0		83.7	70-130				
Toluene	9.27	0.50	**	10.0		92.7	70-130				
Ethylbenzene	9.88	0.50	Ħ	10.0		98.8	70-130				
Xylenes (total)	29.9	0.50	**	30.0		99.7	70-130				
Methyl tert-butyl ether	7.38	2.5	**	10.0		73.8	70-130				
Surrogate: a,a,a-Trifluorotoluene	10.8		"	10.0		108	60-140				
Matrix Spike (1070019-MS1)	So	urce: S10639	96-04	Prepared & Analyzed: 07/02/01							
Benzene	8.03	0.50	սց/1	10.0	ND	80.3	60-140				
Toluene	8.96	0.50	77	10.0	ND	89.6	60-140				
Ethylbenzene	9.57	0.50	#	10.0	ND	95.7	60-140				
Xylenes (total)	27.1	0.50	19	30.0	ND	90.3	60-140				
Methyl tert-butyl ether	10.7	2.5	и	10.0	ND	107	60-140				
Surrogate: a,a,a-Trifluorotoluene	10.3		n	10.0		103	60-140				
Matrix Spike Dup (1070019-MSD1)	So	urce: S1063	96-04	Prepared	& Analyz	ed: 07/02/	01				
Benzene	8.26	0.50	ug/l	10.0	ND	82.6	60-140	2.82	25		
Toluene	9.20	0.50	Ħ	10.0	ND	92.0	60-140	2.64	25		
Ethylbenzene	9.86	0.50	**	10.0	ND	98.6	60-140	2.99	25		
Xylenes (total)	28.7	0.50	*	30.0	ND	95.7	60-140	5.73	25		
Methyl tert-butyl ether	13.5	2.5	H	0.01	ND	135	60-140	23.1	25		
Surrogate: a,a,a-Trifluorotoluene	10.5		rt	10.0	<u> </u>	105	60-140				



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

Delta Environmental Consultants(Rancho Cordova

3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2162, San Leandro, CA

Project Number: N/A

Project Manager: Steven Meeks

Reported:

07/05/01 13:11

Notes and Definitions

zP-02 Chromatogram Pattern: Weathered Gasoline C6-C12

zP-04 Chromatogram Pattern: Weathered Gasoline C6-C12 + Unidentified Hydrocarbons C6-C12

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

ARCO F	rodu	ICTS (Comp	any	(Task O	rder No.	250	997	700)									Chain of Custody
ARCO Facility	no. 2	162		Cit	y icillty) S	an o	Sean	dra		Project (Consul	manaç İtanti	ier L	tour	0 92	POR	ks						Laboratory name
ARCO engine	er Pa	ul	See		Če.		Telephor (ARCO)	ne no.		Telepho (Consul	one no.	638	20	16 m	<u>-</u>	Fax (Co	x no.	11) S	188	216		Reguosa. Contract number
ARCO engine	ime	Dal	ta					Address (Consult	ant) Ra	بهد	ho	- Co	3-1-0	lov	7 0							
				Matrix		Prese	ervation											E§	0000			Method of shipment
Sample 1.D.	Lab no.	Container no.	Soit	Water	Other	lce	Acid	Sampling date	Sampling time	BTEX 602/EPA 8026	BTEXTPH 7 A. 7. EPA M602/8020/80	TPH Modified 8015 Gas Diesel	Oil and Grease 413.1 C 413.2 C	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals □ VOA □ VOA	CAM Metals EPA 60 TTLC T STLC	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		Special detection
MW-1-3		٦ ع		W		X	7	620.01	2034		X						16					gnihoqervimi Limitraporting
4W-2-7									2050								. ~	$\lambda \gamma$				
nw-3.8									2109	Ĺ								03				
nw-49									2/20									04				Special QA/QC
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		ļ										<u> </u>										Lab number
																						Turnaround time
		 								1	1											Priority Rush 1 Business Day
Condition of	sample:	<u> </u>			<u> </u>	*****************			.· <u>·</u>	Temp	erature	receiv	ed: (¿	9				· ************************************		·		Rush
Relinquished	by sam	pler A	12	/2	-4.0		Date 6-15-	-01	Time			γ_{10}	Ω	12	WQ	2	 M	q	25 lu	() 17	351	2 Business Days
Relinquished	by	sva,	4-1X	end.			Date	- 1	Time	++	ived by	1.122.4	<u></u>			- T_A	<i>.</i> , <u> </u>	C	~~0		<u> </u>	Expedited 5 Business Days
Relinquished	by						Date		Time	Recei	ived by	laborat	lory				Date			Time		Standard 10 Business Days



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

Arco Site Address:	15135 Hesperian Blvd	Arco Site Number:	Arco 2162
	San Leandro, California	Delta Project No.:	D000-310
rco Project Manager:	Paul Supple	Delta Project PM:	Steve Meeks
Site Sampled By:	Doulos	Date Sampled:	06/20/01

Site Contact & Phone Number:

		Water Le	vel Data	· · · · · · · · · · · · · · · · · · ·		F	urge Vo	lume Cal	culation	S		Sam	oling An	alytes		San	nple Rec	ord
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 Freqency (A, S, Q)	Sample I.D.	Sample Time
MW-1	20:23	8.97	8.0	15.9	7	6.88	4 inch	2.0	13.8	NΡ	>	7	>		1.26	Q/2,5,8,11	MW-1	20:34
MW-2	20:26	7.98	8.0	15.9		7.89	4 inch	2.0	15.8	15.8	৲	<u>\</u>	>		0.68	Q/2,5,8,11	MW-2	20:50
MW-3	20:45	8,23	9.0	14.8		6.53	4 inch	2.0	13.1	13.1	হ	7	[>]		0.71	Q/2,5,8,11	MW-3	21:09
MW-4	20:19	9.51	8.0	17.5		7.94	4 inch	2.0	15.9	NP	ি	7	>		0.87	Q/2,5,8,11	MW-4	21:20
	•																	
		;																
										:								
	·																	

(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: Quarterly: MW-3, MW-4, MW-1, MW-2

Sampling Notes: List depth of Sample on C.

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.



Site Contact & Phone Number:

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

Arco Site Address:	15135 Hesperian Blvd

San Leandro, California

Doulos

Delta Project No.: D000-310

Arco Project Manager:

Site Sampled By:

Paul Supple Delta Project PM:

Arco Site Number:

etta Project PM: Steve Meeks

Date Sampled: 06/20/01

Arco 2162

Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons
MW-1	No Purge)															
				,													
												ľ					
			,, ,,														
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons
MW-2	20:38	70.0	7.14	733	5												
	20:42	68.2	6.98	724	10												
	20:45	68.1	6.91	716	15												
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons
MW-3	20:55	69.2	7.11	531	5												
	20:59	69.3	7.10	497	10												
	21:04	69.1	7.10	482	13										-	:	
Well ID	Time		pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons
MW-4	No Purge	}			_										ļ		
		<u> </u>		<u> </u>													
			<u> </u>														
	Time	L Tarra °C	مانا المنام	Sp. Cond.	Callana	AV-IIID	Time	Temp °C	nH Haita	Sp. Cond.	Gallons	Well ID	Time	Toma °C	l attituaita	Sp. Cond.	Gallons
Well ID	Time	1emp C	pri Units	Sp. Cona.	Gallons	Well ID	time	Temp C	ph units	Sp. Cona.	Gallons	Well ID	TIMe	Temp C	ph Units	Sp. Cond.	Gallons
	ļ		ļ			ľ		<u> </u>									
					<u> </u>						<u> </u>						
					<u> </u>					-				 			
Well ID	Time	Tomp °C	nH (Inite	Sp. Cond.	Gallons	Well ID	Time	Temp °C	nH Unite	Sp. Cond.	Gallons	Well ID	Time	Temp °C	nH Linite	Sp. Cond.	Gallons
WANTE	Time	Temp C	prionits	Op. Cosia.	Gallons	AAGU ITA	1 mine	I remp C	pri Onits	op. cond.	Gallons	VVeil 10	11110	T Temp C	Pri Onica	Op. Cond.	Calloris
				 										<u> </u>	ļ <u> </u>		
	 	 			<u> </u>			 	<u> </u>								
!					, ,			-						 	 		
Well ID	Time	L Temp °C	nH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	nH Units	Sp. Cond.	Gallons
Well ID	11110	, citip C) produits	Op. Ooilo.	Janons	710.110	11110	10111p 0	pri onito	op, cond.	1 34110110	7,00,10	IIII	101112	Priorito	-p. 00.101	30,101.0
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		L	<u> </u>		<u> </u>		L	1	<u> </u>	<u> </u>	<u> </u>	L		<u> </u>	<u> </u>	L	

Notes: NP = NO PURGE

Original Copies of Field Sampling Sheets are Located in Project File