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June 18, 2002

JUN 24 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. 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 first quarter 2002 groundwater monitoring program at ARCO 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.**

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



TLA (Lrp007.310.doc)  
Enclosures

- cc: Mr. Scott Seery – Alameda County Health Care Services Agency
- Mr. Chuck Headlee – California Regional Water Quality Control Board, San Francisco Bay Region
- Mr. Mike Bakaldin – City of San Leandro Fire Department

Date: June 18, 2002

### ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 2162 Address: 15135 Hesperian Boulevard, San Leandro, CA  
Atlantic Richfield Company Environmental Paul Supple 925-299-8891  
Engineer/Phone No.: \_\_\_\_\_  
Consulting Co./Contact Person Delta Environmental Consultants, Inc.  
Steven W. Meeks, P.E.  
Consultant Project No.: D000-310  
Primary Agency/Regulatory ID No. Alameda County Health Care Services Agency

#### WORK PERFORMED THIS QUARTER

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

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#### 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</u>
Frequency of Groundwater Sampling:	<u>Quarterly: MW-1, MW-2, MW-3, MW-4</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>None</u>
Bulk Soil Removed This Quarter:	<u>None</u>
Bulk Soil Removed to Date:	<u>None</u>
Current Remediation Techniques:	<u>Natural Attenuation</u>
Approximate Depth to Groundwater:	<u>7.81feet</u>
Groundwater Gradient:	<u>0.011 ft/ft toward southwest</u>

#### DISCUSSION:

- Methyl tertiary butyl ether (MTBE) was detected in samples collected from MW-1, MW-3 and MW-4 at concentrations of 170, 47 and 5.1 µg/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 Field Sampling Data

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-1	06/20/00	31.19	8.33	22.86	<0.5	0.8	<0.5	<1.0	<50	<10
	09/29/00		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
	03/23/01		8.19	23.00	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	06/20/01		8.97	22.22	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	09/22/01		9.56	21.63	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/28/01		8.40	22.79	<0.5	<0.5	<0.5	0.63	<50	<2.5
	03/14/02		8.05	23.14	<0.5	<0.5	<0.5	<0.5	<50	170
MW-2	06/20/00	30.38	7.38	23.00	NS	NS	NS	NS	NS	NS
	09/29/00		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
	03/23/01		7.23	23.15	<0.5	<0.5	0.912	<0.5	351	<2.5
	06/20/01		7.98	22.40	<0.5	<0.5	0.74	<0.5	360	<2.5
	09/22/01		8.55	21.83	<0.5	<0.5	<0.5	<0.5	190	<2.5
	12/28/01		7.53	22.85	<0.5	0.93	<0.5	0.51	130	<2.5
	03/14/02		7.17	23.21	<0.5	<0.5	<0.5	<0.5	<50	<2.5
MW-3	06/20/00	30.30	7.75	22.55	NS	NS	NS	NS	NS	NS
	09/29/00		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
	03/23/01		7.70	22.60	<0.5	<0.5	<0.5	<0.5	<50	26.8
	06/20/01		8.23	22.07	<0.5	<0.5	<0.5	<0.5	<50	30
	09/22/01		8.89	21.41	<0.5	<0.5	<0.5	<0.5	<50	12
	12/28/01		7.83	22.47	<0.5	<0.5	<0.5	<0.5	<50	6.2
	03/14/02		7.48	22.82	<0.5	<0.5	<0.5	<0.5	<50	47

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	06/20/00	30.39	8.87	21.52	NS	NS	NS	NS	NS	NS
	09/29/00		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
	03/23/01		8.70	21.69	<0.5	<0.5	<0.5	<0.5	<50	3.04
	06/20/01		9.51	20.88	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	09/22/01		10.06	20.33	<0.5	<0.5	<0.5	<0.5	<50	5.2
	12/28/01		8.86	21.53	<0.5	<0.5	<0.5	<0.5	<50	4.3
	03/14/02		8.52	21.87	<0.5	<0.5	<0.5	<0.5	<50	5.1

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

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TABLE 2

GROUNDWATER FLOW DIRECTION AND GRADIENT

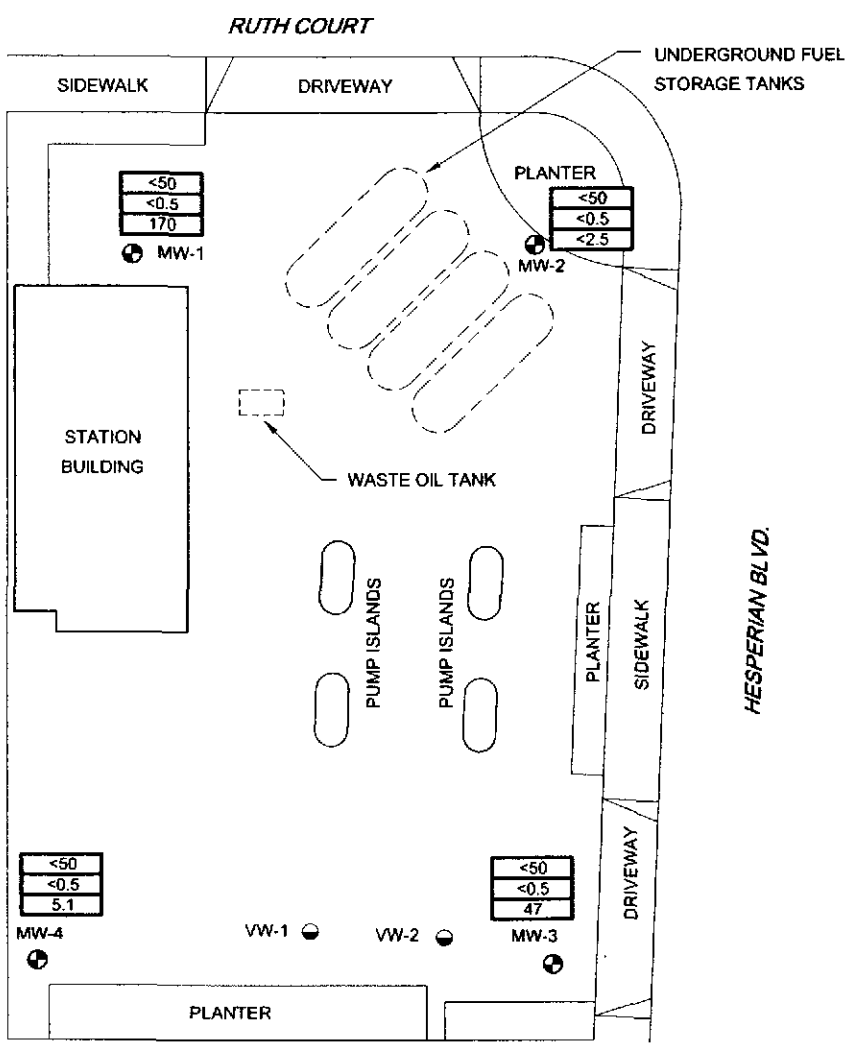
ARCO Service Station No. 2162  
15135 Hesperian Boulevard  
San Leandro, California

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
09/22/01	Southwest	0.012
12/28/01	Southwest	0.010
03/14/02	Southwest	0.011

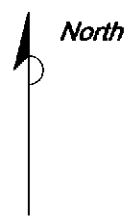
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Note: Please refer to Appendix B for Historical Groundwater Elevation and Analytical Data Tables developed by IT Corporation

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HESPERIAN BLVD.



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

LEGEND:

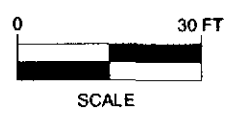
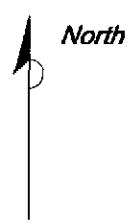
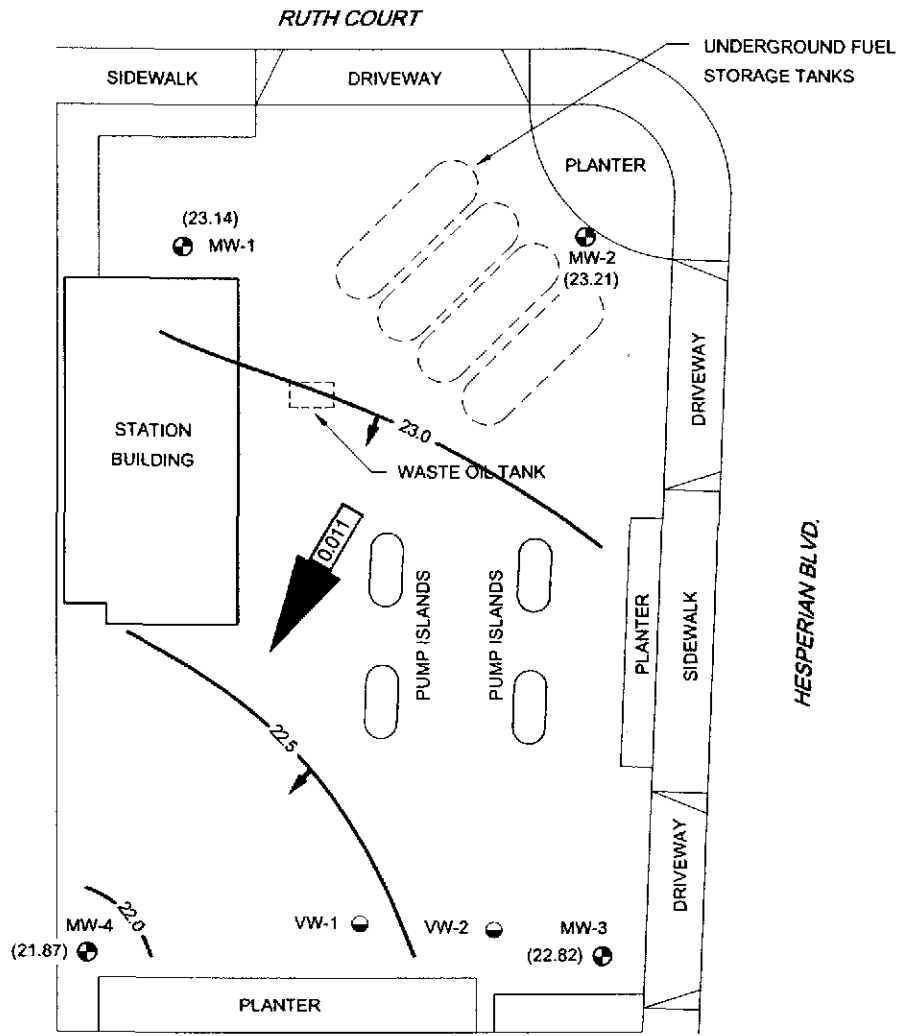
- ⊕ MW-1 MONITORING WELL LOCATION
- ⊙ VW-1 SOIL VAPOR EXTRACTION WELL LOCATION
- |      |
|------|
| <50  |
| <0.5 |
| <2.5 |

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

<b>FIGURE 1</b> <b>GROUND WATER ANALYTICAL SUMMARY</b> FIRST QUARTER 2002 (3/14/02) ARCO STATION NO. 2162 15135 HESPERIAN BOULEVARD SAN LEANDRO, CALIFORNIA	
PROJECT NO. D000-310	DRAWN BY TLA 6/2/02
FILE NO. 2162-1	PREPARED BY TLA
REVISION NO. 1	REVIEWED BY

**Delta**  
 Environmental  
 Consultants, Inc.

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

LEGEND:

- ⊕ MW-1 MONITORING WELL LOCATION
- ⊖ VW-1 SOIL VAPOR EXTRACTION WELL LOCATION
- (23.14) GROUND WATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
- 22.5 - WATER TABLE CONTOUR IN FEET ABOVE MSL
- GROUND WATER FLOW DIRECTION
- 0.011 → APPROXIMATE GROUND WATER FLOW GRADIENT

**FIGURE 2**  
**GROUND WATER ELEVATION CONTOUR MAP**  
**FIRST QUARTER 2002 (3/14/02)**  
**ARCO STATION NO. 2162**  
**15135 HESPERIAN BOULEVARD**  
**SAN LEANDRO, CALIFORNIA**

PROJECT NO. D000-310	DRAWN BY TLA 6/2/02
FILE NO. 2162-1	PREPARED BY TLA
REVISION NO. 1	REVIEWED BY



**Delta**  
Environmental  
Consultants, Inc.

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**APPENDIX A**

**Sampling and Analysis Procedures**



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## 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.

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**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 2162  
15135 Hesperian Boulevard, San Leandro, California**

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-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-1	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	NA	
MW-2	08/21/96	30.38	7.80	22.58	170	<0.5	<0.5	21	6.3	<2.5	NA	NA	
MW-2	11/20/96	30.38	7.73	22.65	88	<0.5	<0.5	7.9	1.1	<2.5	NA	NA	
MW-2	04/01/97	30.38	7.83	22.55	66	<0.5	<0.5	3.6	0.56	33	NA	NA	
MW-2	06/10/97	30.38	7.52	22.86	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	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	0.6	NP
MW-2	12/12/97	30.38	7.10	23.28	<50	<0.5	<0.5	<0.5	<0.5	<3.0	NA	1.2	NP
MW-2	03/25/98	30.38	6.27	24.11	<50	<0.5	<0.5	0.7	0.5	55	NA	1.0	
MW-2	05/14/98	30.38	6.54	23.84	210	<0.5	<0.5	3.3	<0.5	42	NA	1.47	P
MW-2	07/31/98	30.38	7.14	23.24	230	<0.5	<0.5	3.9	<0.5	6	NA	1.0	P

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

**ARCO Service Station 2162  
15135 Hesperian Boulevard, San Leandro, California**

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	

JUN 24 2002

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

**ARCO Service Station 2162**  
**15135 Hesperian Boulevard, San Leandro, California**

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-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	NA	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

JUN 24 2002

**Table 2**  
**Groundwater Flow Direction and Gradient**

*JUN 24 2002*

**ARCO Service Station 2162**  
**15135 Hesperian Boulevard, San Leandro, California**

Date Measured	Average Flow Direction	Average 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
<b>02/09/00</b>	<b>Southwest</b>	<b>0.01</b>

JUN 24 2002

**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

28 March, 2002

**JUN 24 2002**

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: S203295

Enclosed are the results of analyses for samples received by the laboratory on 03/19/02 14:06. 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





JUN 24 2002

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

Project: ARCO 2162, San Leandro, CA  
Project Number: 2162, San Leandro, CA  
Project Manager: Steven Meeks

Reported:  
03/28/02 13:33

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	S203295-01	Water	03/14/02 17:25	03/19/02 14:06
MW-2	S203295-02	Water	03/14/02 17:50	03/19/02 14:06
MW-3	S203295-03	Water	03/14/02 17:10	03/19/02 14:06
MW-4	S203295-04	Water	03/14/02 17:18	03/19/02 14:06
TB	S203295-05	Water	03/14/02 06:00	03/19/02 14:06

Sequoia Analytical - Sacramento

Ron Chew, Client Services Representative

*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.*



**JUN 24 2002**

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

Project: ARCO 2162, San Leandro, CA  
Project Number: 2162, San Leandro, CA  
Project Manager: Steven Meeks

Reported:  
03/28/02 13:33

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (S203295-01) Water</b> Sampled: 03/14/02 17:25 Received: 03/19/02 14:06									
Purgeable Hydrocarbons	ND	50	ug/l	1	2030356	03/26/02	03/26/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	170	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		95.4 %	60-140		"	"	"	"	
<b>MW-2 (S203295-02) Water</b> Sampled: 03/14/02 17:50 Received: 03/19/02 14:06									
Purgeable Hydrocarbons	ND	50	ug/l	1	2030356	03/26/02	03/26/02	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>		94.4 %	60-140		"	"	"	"	
<b>MW-3 (S203295-03) Water</b> Sampled: 03/14/02 17:10 Received: 03/19/02 14:06									
Purgeable Hydrocarbons	ND	50	ug/l	1	2030356	03/26/02	03/26/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	47	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		95.9 %	60-140		"	"	"	"	



JUN 24 2002

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

Project: ARCO 2162, San Leandro, CA  
Project Number: 2162, San Leandro, CA  
Project Manager: Steven Meeks

Reported:  
03/28/02 13:33

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-4 (S203295-04) Water Sampled: 03/14/02 17:18 Received: 03/19/02 14:06</b>									
Purgeable Hydrocarbons	ND	50	ug/l	1	2030356	03/26/02	03/26/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	5.1	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		97.7 %	60-140		"	"	"	"	
<b>TB (S203295-05) Water Sampled: 03/14/02 06:00 Received: 03/19/02 14:06</b>									
Purgeable Hydrocarbons	ND	50	ug/l	1	2030356	03/26/02	03/26/02	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>		97.6 %	60-140		"	"	"	"	

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

 Project: ARCO 2162, San Leandro, CA  
 Project Number: 2162, San Leandro, CA  
 Project Manager: Steven Meeks

 Reported:  
 03/28/02 13:33

JUN 24 2002

**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 2030356 - EPA 5030B (P/T)**
**Blank (2030356-BLK1)**

Prepared &amp; Analyzed: 03/26/02

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>	9.65		"	10.0		96.5	60-140			

**LCS (2030356-BS1)**

Prepared &amp; Analyzed: 03/26/02

Benzene	8.46	0.50	ug/l	10.0		84.6	70-130			
Toluene	9.16	0.50	"	10.0		91.6	70-130			
Ethylbenzene	9.52	0.50	"	10.0		95.2	70-130			
Xylenes (total)	29.6	0.50	"	30.0		98.7	70-130			
Methyl tert-butyl ether	9.63	2.5	"	10.0		96.3	70-130			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	10.4		"	10.0		104	60-140			

**Matrix Spike (2030356-MS1)**

Source: S203398-09

Prepared &amp; Analyzed: 03/26/02

Benzene	8.25	0.50	ug/l	10.0	ND	82.5	60-140			
Toluene	8.82	0.50	"	10.0	ND	86.4	60-140			
Ethylbenzene	9.22	0.50	"	10.0	ND	92.2	60-140			
Xylenes (total)	28.7	0.50	"	30.0	ND	95.7	60-140			
Methyl tert-butyl ether	31.3	2.5	"	10.0	22	93.0	60-140			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	9.85		"	10.0		98.5	60-140			

**Matrix Spike Dup (2030356-MSD1)**

Source: S203398-09

Prepared &amp; Analyzed: 03/26/02

Benzene	9.11	0.50	ug/l	10.0	ND	91.1	60-140	9.91	25	
Toluene	9.68	0.50	"	10.0	ND	95.0	60-140	9.30	25	
Ethylbenzene	10.1	0.50	"	10.0	ND	101	60-140	9.11	25	
Xylenes (total)	31.1	0.50	"	30.0	ND	104	60-140	8.03	25	
Methyl tert-butyl ether	32.1	2.5	"	10.0	22	101	60-140	2.52	25	
<i>Surrogate: a,a,a-Trifluorotoluene</i>	10.1		"	10.0		101	60-140			



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

Project: ARCO 2162, San Leandro, CA  
Project Number: 2162, San Leandro, CA  
Project Manager: Steven Meeks

Reported:  
03/28/02 13:33

**Notes and Definitions**

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

*JUN 24 2002*



Work Authorization No. **2599700**

Chain of Custody

ARCO Facility No. <b>2162</b>	City (Facility) <b>SAN LEANDRO CA</b>	Project Manager (Consultant) <b>STEVEN MECKS</b>	Laboratory name <b>Sequoia</b>
ARCO engineer <b>Paul Supple</b>	Telephone no. (ARCO)	Telephone no. (Consultant) <b>638 2085</b>	Contract number
Company name (Consultant) <b>DELTA</b>		Address (Consultant) <b>Rancho Cordova</b>	

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602 EPA B22	STC/PH MTBE EPA 801/2002/815	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM60SE	BTEX + MTBE EPA 8260	BTEX + Standard Organics EPA 8215	TCLP Metalloid VOCs VOCs	Special Metals EPA 801/7000 TLCO STLCO	Lead EPA 7462/7471 <input type="checkbox"/>																					
			Soil	Water	Other	Ice	Acid																																	
MW-1		2		X		X	X	3-14-02	17:25		X																													
MW-2		1							17:50																															
MW-3		1							17:10																															
MW-4		1							17:18																															
TB		2							600																															

Method of shipment
Special detection Limit/Reporting
Special QA/QC
Remarks
Type of Work <input type="checkbox"/> Dispenser Work <input type="checkbox"/> Line Job <input type="checkbox"/> Routine Sampling <input type="checkbox"/> Site Acquisitions <input type="checkbox"/> Site Assessment <input type="checkbox"/> UST Removal <input type="checkbox"/> UST Replacement <input type="checkbox"/> Other
Lab number
Turnaround time Priority Rush <input type="checkbox"/> 1 Business Day <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 5 Business Days <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 10 Business Days

Condition of sample:	Temperature received: <b>7°C</b>
Relinquished by sampler <b>Dave Spurr</b>	Date <b>3-19-02</b> Time <b>1406</b>
Relinquished by	Received by <b>Monica Gregson</b> Date <b>3/19/02</b> Time <b>1406</b>
Relinquished by	Received by laboratory

3/22/2002  
 2  
 5  
 Standard  
 10

JUN 24 2002

**APPENDIX D**

Field Sampling Data



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

Arco Project Manager: Paul Supple

Site Sampled By: Doulos

Arco Site Number: Arco 2162

Delta Project No.: D000-310

Delta Project PM: Steve Meeks

Date Sampled: 03/14/02

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
MW-1	16:56	8.05	8.0	15.9	<input checked="" type="checkbox"/>	7.80	4 inch	2.0	15.6	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.23	Q/2,5,8,11	MW-1	17:25
MW-2	17:01	7.17	8.0	15.9	<input type="checkbox"/>	8.70	4 inch	2.0	17.4	16.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.96	Q/2,5,8,11	MW-2	17:50
MW-3	16:50	7.48	9.0	14.8	<input type="checkbox"/>	7.28	4 inch	2.0	14.6	13.9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.48	Q/2,5,8,11	MW-3	17:10
MW-4	16:54	8.52	8.0	17.5	<input checked="" type="checkbox"/>	8.93	4 inch	2.0	17.9	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.91	Q/2,5,8,11	MW-4	17:18
					<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"/>				
					<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"/>				
					<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"/>				

2002 # 2 MW

(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.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: 15135 Hesperian Blvd

San Leandro, California

Arco Project Manager: Paul Supple

Site Sampled By: Doulos

Arco Site Number: Arco 2162

Delta Project No.: D000-310

Delta Project PM: Steve Meeks

Date Sampled: 03/14/02

Site Contact & Phone Number: \_\_\_\_\_

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	<b>No Purge</b>																
MW-2	17:40	17.3	7.09	412	5.8												
	17:41	17.9	7.06	424	10.0												
	17:45	17.9	7.06	553	17.4												
MW-3	17:05	20.3	7.04	405	5.0												
	17:06	20.1	7.06	351	10.0												
	17:07	20.0	7.06	334	14.6												
MW-4	<b>No Purge</b>																

2002 MAR

Notes: NP = NO PURGE

Original Copies of Field Sampling Sheets are Located in Project File