

DTW dropping to lowest levels since  
monitoring began in 1995

October 15, 2001

C A M B R I A

OCT 19 2001

Eva Chu  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, 2nd Floor  
Alameda, California 94502

Re: **Quarterly Groundwater Monitoring Report  
Third Quarter 2001**  
ARCO Service Station No. 6113  
785 East Stanley Boulevard  
Livermore, California  
Cambria Project #438-1611



Dear Ms. Chu:

On behalf of ARCO, Cambria Environmental Technology, Inc. (Cambria) is submitting the attached report which presents the results of the third quarter 2001 groundwater monitoring program at ARCO Service Station No. 6113, located at 785 East Stanley Boulevard, Livermore, California. The monitoring program complies with the Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

Please call if you have any questions.

Sincerely,  
**Cambria Environmental Technology, Inc.**

*Ron Scheele*

Ron Scheele, RG  
Senior Project Manager

Attachment: Quarterly Groundwater Monitoring Report, Third Quarter 2001

cc: Ms. Danielle Stefani, City of Livermore Fire Department, 4550 East Ave, Livermore, CA 94550  
Mr. Paul Supple, ARCO, PO Box 6549 Moraga, CA 94570

Oakland, CA  
San Ramon, CA  
Sonoma, CA

**Cambria  
Environmental  
Technology, Inc.**

1144 65th Street  
Suite B  
Oakland, CA 94608  
Tel (510) 420-0700  
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C A M B R I A

## Quarterly Groundwater Monitoring Report

### Third Quarter 2001

Arco Service Station 6113  
785 East Stanley Boulevard  
Livermore, California  
Cambria Project #438-1611



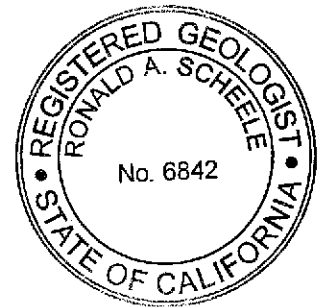
Prepared For:

Mr. Paul Supple  
ARCO

October 15, 2001

Prepared By:

Cambria Environmental Technology, Inc.  
1144 65<sup>th</sup> Street, Suite B  
Oakland, California 94608



Written by:

Sara Dwight.  
Sara Dwight  
Staff Environmental Scientist

Ron Scheele  
Ron Scheele, RG  
Senior Project Manager

**ARCO QUARTERLY GROUNDWATER MONITORING REPORT**

Station No.: 6113 Address: 785 East Stanley Boulevard, Livermore, California  
 ARCO Environmental Engineer: Paul Supple  
 Consulting Co./Contact Person: Cambria Environmental Technology Inc. / Ron Scheele, RG  
 Consultant Project No.: 438-1611  
 Primary Agency/Regulatory ID No.: ACHCSA

**WORK PERFORMED THIS QUARTER (THIRD - 2001):**

1. Prepared and submitted semi-annual groundwater monitoring report for second quarter 2001.
2. Performed third quarter groundwater monitoring and sampling on August 15, 2001.

**WORK PROPOSED FOR NEXT QUARTER (FOURTH - 2001):**

1. Prepare and submit quarterly groundwater monitoring report for third quarter 2001.
2. Install replacement well as outlined in Cambria's *Well Replacement Workplan*, dated June 15, 2001.

**MONITORING:**

Current Phase of Project:	<u>Semi-Annual Groundwater Monitoring</u>
Frequency of Sampling:	<u>Annual (4th Quarter): MW-1, MW-2, MW-3, MW-8, MW-9, MW-10</u> <u>Semi-Annual (2nd/4th Quarter): MW-4, MW-6, MW-7, MW-11, MW-12</u> <u>Onetime event (3<sup>rd</sup> Quarter): MW-6, MW-7, VW-1</u>
Frequency of Monitoring:	<u>Semi-Annual (groundwater)</u>
Is Free Product (FP) Present On-site:	<u>No</u>
Bulk Soil Removed This Quarter :	<u>None</u>
Bulk Soil Removed to Date :	<u>288 cubic yards of TPH impacted soil</u>
Water Wells or Surface Waters, within 2001 ft., impacted by site:	<u>None</u>
Current Remediation Techniques:	<u>Natural attenuation</u>
Average Depth to Groundwater	<u>26.86 feet</u>
Groundwater Flow Direction and Gradient :	<u>0.047 ft/ft toward Northeast</u>

**DISCUSSION:**

Based on field measurements collect on August 15, 2001, groundwater beneath the site flows towards the northeast, at a gradient of 0.047 ft/ft. This is consistent with the historic groundwater flow direction and gradient.

Hydrocarbon concentrations detected this quarter are consistent with the previous sampling event with the exception of well MW-6, which showed a decrease in TPHg, benzene, and MTBE. The maximum TPHg and benzene concentrations were detected in well VW-1 at 1,200 and 6.3 micrograms per liter (µg/L), respectively. The maximum MTBE concentration was detected in well MW-6 at 25 µg/L.



# C A M B R I A

Date: October 15, 2001  
Quarter: 3<sup>rd</sup> Quarter, 2001

## ATTACHMENTS:

- Figure 1 – Groundwater Elevation Contour and Analytical Summary Map
- Table 1 – Historical Groundwater Elevation and Analytical Data
- Table 2 – Groundwater Flow Direction and Gradient
- Appendix A – Field and Laboratory Procedures
- Appendix B – Certified Analytical Report, Chain-of-Custody Documentation
- Appendix C – Field Data Sheets



**EXPLANATION**

- MW-1 ● Monitoring well location
- VW-1 ◀ Vapor Extraction Well Location
- MW-5 ✕ Abandoned Well Location
- Well ID  
ELEV  
TPHg  
Benzene  
MTBE
- Well Designation
- Groundwater Elevation
- Concentration of total petroleum hydrocarbons as gasoline, benzene, and MTBE in groundwater in micrograms per liter (ug/l). Samples collected on 08/15/01
- NA Well Not Accessible
- NS Well Not Sampled
- 434.00 Groundwater elevation contour
- ← 0.047 Approximate groundwater flow direction and gradient

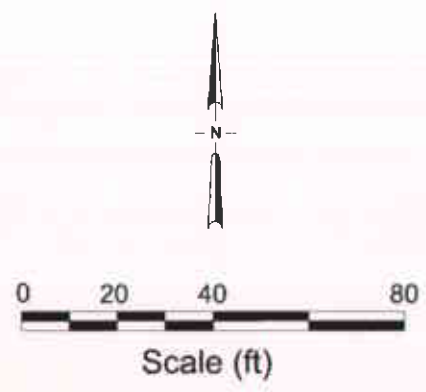
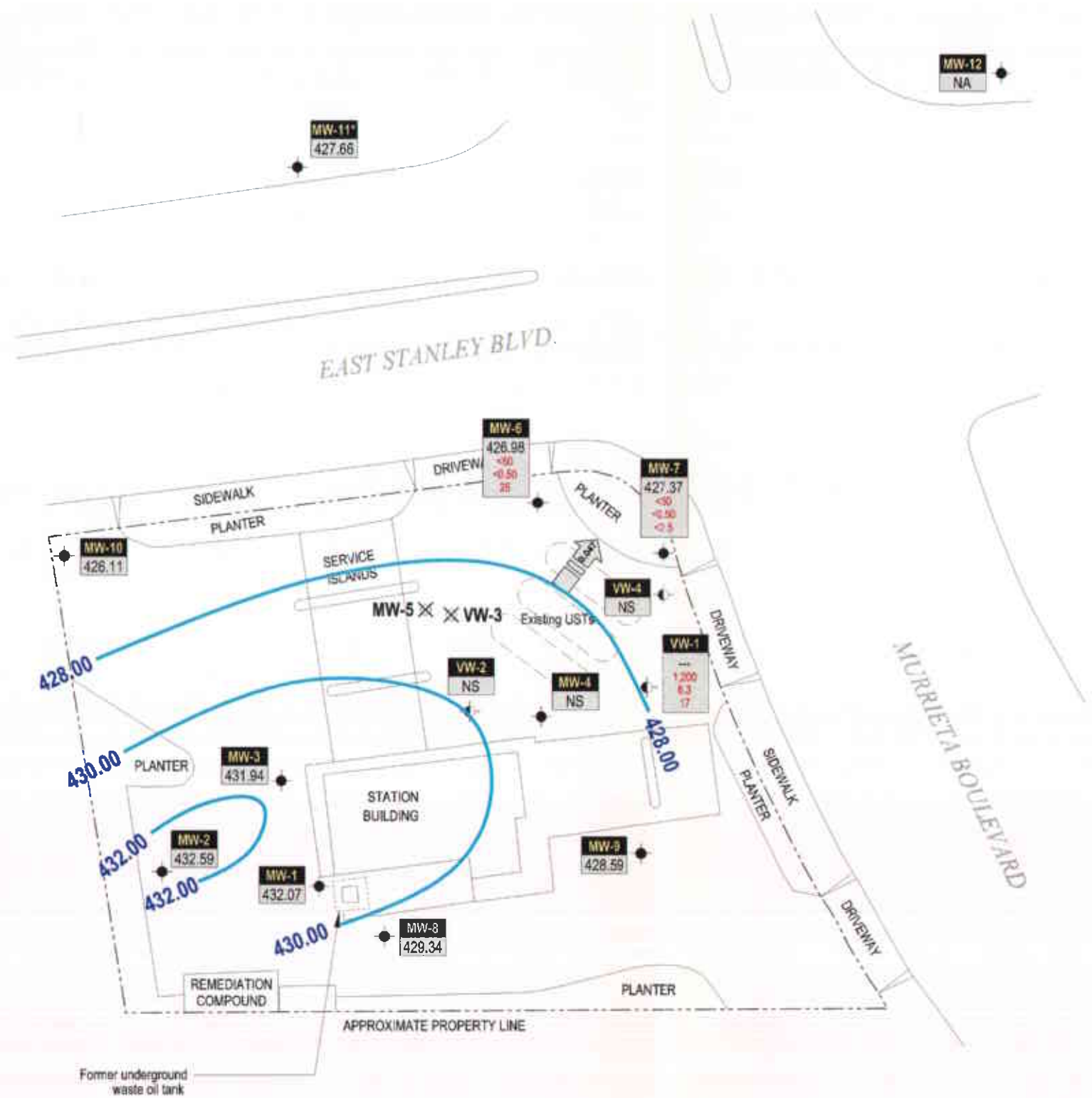


FIGURE 1

**Table 1**  
**Historical Groundwater Elevation and Analytical Data**  
**Petroleum Hydrocarbons and Their Constituents**  
**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
						Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
MW-1	03-23-95	457.04	14.12	442.92	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-1	05-31-95	457.04	14.45	442.59	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-1	08-31-95	457.04	17.12	439.92	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-1	11-28-95	457.04	16.34	440.70	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-1	02-22-96	457.04	13.23	443.81	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-1	05-23-96	457.04	14.02	443.02	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-1	08-08-96	457.04	16.13	440.91	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-1	11-07-96	457.04	17.28	439.76	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-1	03-27-97	457.04	14.91	442.13	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-1	05-19-97	457.04	16.47	440.57	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-1	05-18-98	457.04	14.69	442.35	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-1	11-02-98	457.04	25.94	431.10	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-1	06-04-99	457.04	17.38	439.66	06-04-99	Not sampled: well sampled annually, during the fourth quarter								
MW-1	11-11-99	457.04	18.63	438.41	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3	1.03	P	
MW-1	06-20-00	457.04	17.09	439.95	06-20-00	Not sampled: well sampled annually, during the fourth quarter						3.1		
MW-1	08-29-00	457.04	18.20	438.84	08-29-00	Not sampled: well sampled annually, during the fourth quarter						2.66		
MW-1	11-29-00	457.04	20.30	436.74	11-29-00	<50.0	<0.500	<0.500	<0.500	1.36	<2.50	0.71	P	
MW-1	05-02-01	457.04	22.39	434.65	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
MW-1	08-15-01	457.04	24.97	432.07	08-15-01	Not sampled: well sampled annually, during the fourth quarter								
MW-2	03-23-95	457.74	14.15	443.59	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-2	05-31-95	457.74	14.67	443.07	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-2	08-31-95	457.74	17.24	440.50	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-2	11-28-95	457.74	16.40	441.34	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-2	02-22-96	457.74	13.55	444.19	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-2	05-23-96	457.74	14.29	443.45	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-2	08-08-96	457.74	16.19	441.55	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-2	11-07-96	457.74	17.50	440.24	11-07-96	65	0.6	7.4	2.1	12	5			
MW-2	03-27-97	457.74	15.32	442.42	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-2	05-19-97	457.74	16.62	441.12	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-2	05-18-98	457.74	15.12	442.62	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-2	11-02-98	457.74	26.66	431.08	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-2	06-04-99	457.74	17.74	440.00	06-04-99	Not sampled: well sampled annually, during the fourth quarter								

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**Petroleum Hydrocarbons and Their Constituents**  
**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH					MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)				
MW-2	11-11-99	457.74	18.75	438.99	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		0.82	P
MW-2	06-20-00	457.74	17.21	440.53	06-20-00	Not sampled: well sampled annually, during the fourth quarter							2.6	
MW-2	08-29-00	457.74	18.25	439.49	08-29-00	Not sampled: well sampled annually, during the fourth quarter							2.65	
MW-2	11-29-00	457.74	20.69	437.05	11-29-00	<50.0	<0.500	0.581	0.827	4.38	<2.50		0.88	P
MW-2	05-02-01	457.74	22.69	435.05	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
MW-2	08-15-01	457.74	25.15	432.59	08-15-01	Not sampled: well sampled annually, during the fourth quarter								
MW-3	03-23-95	456.97	14.13	442.84	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-3	05-31-95	456.97	14.46	442.51	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-3	08-31-95	456.97	17.06	439.91	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-3	11-28-95	456.97	16.27	440.70	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-3	02-22-96	456.97	13.14	443.83	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-3	05-23-96	456.97	13.95	443.02	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-3	08-08-96	456.97	16.03	440.94	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-3	11-07-96	456.97	17.26	439.71	11-07-96	<50	<0.5	0.9	<0.5	1.5	<3			
MW-3	03-27-97	456.97	14.85	442.12	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-3	05-19-97	456.97	16.40	440.57	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-3	05-18-98	456.97	14.66	442.31	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-3	11-02-98	456.97	25.85	431.12	11-02-98	<1,000	<10	<10	<10	<10	1,700			
MW-3	06-04-99	456.97	17.35	439.62	06-04-99	Not sampled: well sampled annually, during the fourth quarter								
MW-3	11-11-99	456.97	18.58	438.39	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		0.79	P
MW-3	06-20-00	456.97	17.03	439.94	06-20-00	Not sampled: well sampled annually, during the fourth quarter							2.8	
MW-3	08-29-00	456.97	18.25	438.72	08-29-00	Not sampled: well sampled annually, during the fourth quarter							3.39	
MW-3	11-29-00	456.97	20.27	436.70	11-29-00	<50.0	<0.500	<0.500	1.08	3.34	<2.50		0.67	
MW-3	05-02-01	456.97	22.33	434.64	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
MW-3	08-15-01	456.97	25.03	431.94	08-15-01	Not sampled: well sampled annually, during the fourth quarter								

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Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
MW-4	03-23-95	456.55	15.39	441.16	03-23-95	210	2.1	0.6	0.8	2.1	--			
MW-4	05-31-95	456.55	15.32	441.23	05-31-95	190	1.6	<0.5	0.7	0.9	--			
MW-4	08-31-95	456.55	17.86	438.69	08-31-95	160	1.2	0.7	<0.5	<2	<3			
MW-4	11-28-95	456.55	17.18	439.37	11-29-95	150	0.7	<0.5	0.7	1.4	<3			
MW-4	02-22-96	456.55	14.80	441.75	02-22-96	100	<0.5	<0.5	<0.6	0.8	<3			
MW-4	05-23-96	456.55	14.43	442.12	05-23-96	86	<0.5	<0.5	<0.5	<0.7	<3			
MW-4	08-08-96	456.55	16.80	439.75	08-08-96	98	<0.5	<0.5	<0.5	1.3	<3			
MW-4	11-07-96	456.55	17.90	438.65	11-13-96	140	<0.5	<0.5	<0.9	1.3	<3			
MW-4	03-27-97	456.55	15.22	441.33	03-28-97	<50	1.1	<0.5	<0.5	1.6	<3			
MW-4	05-19-97	456.55	16.98	439.57	05-19-97	62	<0.5	<0.5	<0.5	0.6	<3			
MW-4	05-18-98	456.55	14.99	441.56	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	64			
MW-4	11-02-98	456.55	25.29	431.26	11-02-98	74	<0.5	<0.5	<0.5	<0.5	96			
MW-4	06-04-99	456.55	17.95	438.60	06-04-99	100	<0.5	<0.5	<0.5	<0.5	38		P	
MW-4	11-11-99	456.55	19.25	437.30	11-11-99	88	<0.5	<0.5	<0.5	<1	10	0.77	P	
DUP 1	06-20-00	NR	NR	NR	06-20-00	<50.0	<0.500	<0.500	<0.500	<0.500	62.3			
MW-4	06-20-00	456.55	17.79	438.76	06-20-00	<50.0	<0.500	<0.500	<0.500	<0.500	82.4	1.3	P	
MW-4	08-29-00	456.55	18.90	437.65	08-29-00	56.0	<0.500	<0.500	<0.500	<0.500	47.9	0.97	P	
MW-4	11-29-00	456.55	20.50	436.05	11-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	9.88	10.4	P	
MW-4	05-02-01	456.55	22.65	433.90	05-02-01	<50.0	<0.500	<0.500	<0.500	<0.500	61.1	70.9	0.74	P
DUP 1	05-02-01	NR	NR	NR	05-02-01	<50.0	<0.500	<0.500	<0.500	<0.500	59.4	68.4		
MW-4	08-15-01	NR	NR	NR	08-15-01	Not sampled: well dry								
MW-5	03-23-95	455.84	13.97	441.87	03-23-95	68	4.2	3.4	2.3	12	--			
MW-5	05-31-95	455.84	NR	NR	05-31-95	Not sampled: well was inaccessible								
MW-5	08-31-95	455.84	NR	NR	08-31-95	Not sampled: well was inaccessible								
MW-5	11-28-95	455.84	16.46	439.38	11-29-95	960	41	24	38	210	<5			
MW-5	02-22-96	455.84	13.34	442.50	02-22-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-5	05-23-96	455.84	14.36	441.48	05-23-96	7,100	440	180	270	1,700	<50			
MW-5	08-08-96	455.84	16.38	439.46	08-08-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-5	11-07-96	455.84	17.26	438.58	11-13-96	5,600	230	86	210	1,100	<80			



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Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH				Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)					
MW-5	03-27-97	455.84	15.95	439.89	03-28-97	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-5	05-19-97	455.84	16.64	439.20	05-20-97	7,600	480	140	400	1,200	<40			
MW-5	05-18-98	455.84	14.75	441.09	05-18-98	990	46	13	45	180	4			
MW-5	11-02-98	455.84	27.83	428.01	11-02-98	14,000	690	140	550	2,200	100			
MW-5	06-04-99	455.84	17.47	438.37	06-04-99	8,300	690	370	90	440	1,400			P
MW-5	11-11-99	455.84	18.80	437.04	11-11-99	18,000	900	190	1,100	3,200	72	0.86		P
MW-5	06-20-00	455.84	17.14	438.70	06-20-00	10,200	618	122	832	2,020	<50.0	1.6		P
MW-5	08-29-00	455.84	18.60	437.24	08-29-00	12,300	436	166	711	2,120	517	0.79		P
MW-5	11-29-00	455.84	20.57	435.27	11-29-00	26,000	491	149	1,090	3,810	671	<20.0	0.51	P
MW-5	05-02-01	NR	NR	NR	05-02-01	Well Abandoned								
MW-6	03-23-95	454.93	13.38	441.55	03-23-95	<50	1.5	<0.5	<0.5	0.9	--			
MW-6	05-31-95	454.93	13.96	440.97	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	--			
MW-6	08-31-95	454.93	16.71	438.22	08-31-95	150	9	1.8	4	12	<3			
MW-6	11-28-95	454.93	15.65	439.28	11-29-95	<50	0.6	<0.5	<0.5	0.8	<3			
MW-6	02-22-96	454.93	12.53	442.40	02-22-96	<50	1.9	<0.5	0.8	2.1	<3			
MW-6	05-23-96	454.93	13.24	441.69	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-6	08-08-96	454.93	16.65	438.28	08-08-96	<50	0.5	<0.5	<0.5	0.5	<3			
MW-6	11-07-96	454.93	16.65	438.28	11-08-96	110	5.3	1.3	3.1	6.6	<3			
MW-6	03-27-97	454.93	14.25	440.68	03-28-97	<50	2.3	<0.5	0.9	3.5	4			
MW-6	05-19-97	454.93	15.87	439.06	05-20-97	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-6	05-18-98	454.93	14.00	440.93	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-6	11-02-98	454.93	24.95	429.98	11-02-98	<50	1.2	<0.5	<0.5	<0.5	3			
MW-6	06-04-99	454.93	16.68	438.25	06-04-99	310	41	3.8	11	19	33			P
MW-6	11-11-99	454.93	16.12	438.81	11-11-99	<50	0.5	<0.5	<0.5	<1	<3	0.92		P
MW-6	06-20-00	454.93	16.63	438.30	06-20-00	<50.0	<0.500	<0.500	<0.500	<0.500	17.3	1.9		P
DUP	08-29-00	NR	NR	NR	08-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50			
MW-6	08-29-00	454.93	17.91	437.02	08-29-00	<50.0	<0.500	0.551	<0.500	<0.500	<2.50	1.67		P
MW-6	11-29-00	454.93	20.30	434.63	11-29-00	<50.0	<0.500	<0.500	<0.500	1.03	<2.50	0.79		P
MW-6	05-02-01	454.93	22.20	432.73	05-02-01	3,230	1,300	33.6	89.4	136	1,810	2,310	0.95	P
MW-6	08-15-01	454.93	27.95	426.98	08-15-01	<50	<0.50	<0.50	<0.50	<0.50	21	25	0.63	P

**Table 1**  
**Historical Groundwater Elevation and Analytical Data**  
**Petroleum Hydrocarbons and Their Constituents**  
**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
MW-7	03-23-95	454.92	13.29	441.63	03-23-95	<50	<0.5	<0.5	<0.5	<0.5	--			
MW-7	05-31-95	454.92	13.72	441.20	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	--			
MW-7	08-31-95	454.92	16.53	438.39	08-31-95	<50	<0.5	<0.5	<0.5	1.2	<3			
MW-7	11-28-95	454.92	15.50	439.42	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	02-22-96	454.92	12.30	442.62	02-22-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	05-23-96	454.92	13.02	441.90	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	08-08-96	454.92	NR	NR	08-08-96	Not sampled: unable to locate well								
MW-7	11-07-96	454.92	16.50	438.42	11-08-96	<50	<0.5	<0.5	<0.5	0.8	<3			
MW-7	03-27-97	454.92	14.22	440.70	03-28-97	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	05-19-97	454.92	15.74	439.18	05-20-97	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	05-18-98	454.92	13.82	441.10	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-7	11-02-98	454.92	24.80	430.12	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	4			
MW-7	06-04-99	454.92	16.55	438.37	06-04-99	<50	<0.5	<0.5	<0.5	<0.5	<3			P
MW-7	11-11-99	454.92	18.02	436.90	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		1.03	P
MW-7	06-20-00	454.92	16.50	438.42	06-20-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		1.3	P
MW-7	08-29-00	454.92	17.80	437.12	08-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		1.67	P
MW-7	11-29-00	454.92	19.61	435.31	11-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		0.51	P
MW-7	05-02-01	454.92	22.05	432.87	05-02-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	2.66	0.9	P
MW-7	08-15-01	454.92	27.55	427.37	08-15-01	<50	<0.50	<0.50	<0.50	<0.50	<2.5		0.84	P
MW-8	03-23-95	456.97	11.55	445.42	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-8	05-31-95	456.97	12.37	444.60	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-8	08-31-95	456.97	15.68	441.29	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-8	11-28-95	456.97	14.15	442.82	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-8	02-22-96	456.97	10.97	446.00	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-8	05-23-96	456.97	11.90	445.07	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-8	08-08-96	456.97	13.85	443.12	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-8	11-07-96	456.97	15.08	441.89	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-8	03-27-97	456.97	12.96	444.01	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-8	05-19-97	456.97	14.35	442.62	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-8	05-18-98	456.97	12.97	444.00	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-8	11-02-98	456.97	26.01	430.96	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	<3			

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**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH					MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)				
MW-8	06-04-99	456.97	15.53	441.44	06-04-99	Not sampled: well sampled annually, during the fourth quarter								
MW-8	11-11-99	456.97	16.67	440.30	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		1.01	P
MW-8	06-20-00	456.97	15.29	441.68	06-20-00	Not sampled: well sampled annually, during the fourth quarter							2.4	
MW-8	08-29-00	456.97	16.59	440.38	08-29-00	Not sampled: well sampled annually, during the fourth quarter							3.37	
MW-8	11-29-00	456.97	19.80	437.17	11-29-00	<50.0	<0.500	<0.500	<0.500	0.772	<2.50		1.35	P
MW-8	05-02-01	456.97	22.12	434.85	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
<b>MW-8</b>	<b>08-15-01</b>	<b>456.97</b>	<b>27.63</b>	<b>429.34</b>	<b>08-15-01</b>	<b>Not sampled: well sampled annually, during the fourth quarter</b>								
MW-9	03-23-95	456.18	13.18	443.00	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-9	05-31-95	456.18	12.66	443.52	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-9	08-31-95	456.18	14.40	441.78	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-9	11-28-95	456.18	14.26	441.92	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-9	02-22-96	456.18	12.05	444.13	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-9	05-23-96	456.18	12.07	444.11	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-9	08-08-96	456.18	14.12	442.06	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-9	11-07-96	456.18	15.42	440.76	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-9	03-27-97	456.18	13.01	443.17	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-9	05-19-97	456.18	14.60	441.58	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-9	05-18-98	456.18	12.60	443.58	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-9	11-02-98	456.18	25.08	431.10	11-02-98	Not sampled								
MW-9	06-04-99	456.18	15.87	440.31	06-04-99	<50	<0.5	<0.5	<0.5	<0.5	<3			P
MW-9	11-11-99	456.18	17.02	439.16	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		0.96	P
MW-9	06-20-00	456.18	15.54	440.64	06-20-00	Not sampled: well sampled annually, during the fourth quarter							2.1	
MW-9	08-29-00	456.18	16.81	439.37	08-29-00	Not sampled: well sampled annually, during the fourth quarter							2.59	
MW-9	11-29-00	456.18	18.81	437.37	11-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		0.81	P
MW-9	05-02-01	456.18	22.09	434.09	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
<b>MW-9</b>	<b>08-15-01</b>	<b>456.18</b>	<b>27.59</b>	<b>428.59</b>	<b>08-15-01</b>	<b>Not sampled: well sampled annually, during the fourth quarter</b>								

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**Petroleum Hydrocarbons and Their Constituents**  
**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH					MTBE 8021B ( $\mu\text{g/L}$ )	MTBE 8260 ( $\mu\text{g/L}$ )	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl-benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )				
MW-10	03-23-95	456.85	14.86	441.99	03-23-95	Not sampled: well sampled annually, during the fourth quarter								
MW-10	05-31-95	456.85	15.63	441.22	05-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-10	08-31-95	456.85	14.40	442.45	08-31-95	Not sampled: well sampled annually, during the fourth quarter								
MW-10	11-28-95	456.85	17.24	439.61	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-10	02-22-96	456.85	14.30	442.55	02-22-96	Not sampled: well sampled annually, during the fourth quarter								
MW-10	05-23-96	456.85	14.93	441.92	05-23-96	Not sampled: well sampled annually, during the fourth quarter								
MW-10	08-08-96	456.85	17.20	439.65	08-08-96	Not sampled: well sampled annually, during the fourth quarter								
MW-10	11-07-96	456.85	18.25	438.60	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-10	03-27-97	456.85	15.77	441.08	03-28-97	Not sampled: well sampled annually, during the fourth quarter								
MW-10	05-19-97	456.85	17.38	439.47	05-19-97	Not sampled: well sampled annually, during the fourth quarter								
MW-10	05-18-98	456.85	15.47	441.38	05-18-98	Not sampled: well sampled annually, during the fourth quarter								
MW-10	11-02-98	456.85	26.94	429.91	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-10	06-04-99	456.85	17.19	439.66	06-04-99	Not sampled: well sampled annually, during the fourth quarter								
MW-10	11-11-99	456.85	19.35	437.50	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3		0.68	P
MW-10	06-20-00	456.85	17.92	438.93	06-20-00	Not sampled: well sampled annually, during the fourth quarter							2.9	
MW-10	08-29-00	456.85	19.15	437.70	08-29-00	Not sampled: well sampled annually, during the fourth quarter							1.54	
MW-10	11-29-00	456.85	21.30	435.55	11-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		0.95	P
MW-10	05-02-01	456.85	29.95	426.90	05-02-01	Not sampled: well sampled annually, during the fourth quarter								
MW-10	08-15-01	456.85	30.74	426.11	08-15-01	Not sampled: well sampled annually, during the fourth quarter								
MW-11	03-23-95	455.07	17.34	437.73	03-23-95	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-11	05-31-95	455.07	16.68	438.39	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	--			
MW-11	08-31-95	455.07	20.20	434.87	08-31-95	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-11	11-28-95	455.07	17.80	437.27	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-11	02-22-96	455.07	15.97	439.10	02-22-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-11	05-23-96	455.07	15.50	439.57	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-11	08-08-96	455.07	17.77	437.30	08-08-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-11	11-07-96	455.07	17.45	437.62	11-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-11	03-27-97	455.07	15.77	439.30	03-28-97	Not sampled: well sampled semi-annually, during the second and fourth quarters								

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**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
MW-11	05-19-97	455.07	16.80	438.27	05-19-97	<50	1.1	4.5	<0.5	2.2	<3			
MW-11	05-18-98	455.07	15.38	439.69	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-11	11-02-98	455.07	24.15	430.92	11-02-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-11	06-04-99	455.07	18.39	436.68	06-04-99	<50	<0.5	<0.5	<0.5	<0.5	<3		P	
MW-11	11-11-99	455.07	18.62	436.45	11-11-99	<50	<0.5	<0.5	<0.5	<1	<3	1.01	P	
MW-11	06-20-00	455.07	17.82	437.25	06-20-00	<50.0	0.631	<0.500	<0.500	<0.500	<2.50	4.1	P	
MW-11	08-29-00	455.07	19.50	435.57	08-29-00	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-11	11-29-00	455.07	20.60	434.47	11-29-00	<50.0	<0.500	<0.500	<0.500	1.63	<2.50	0.97	P	
MW-11	05-02-01	455.07	22.42	432.65	05-02-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.04	P	
<b>MW-11</b>	<b>08-15-01</b>	<b>455.07</b>	<b>27.41</b>	<b>427.66</b>	<b>08-15-01</b>	<b>Not sampled: well sampled semi-annually, during the second and fourth quarters</b>								
MW-12	03-23-95	455.04	15.54	439.50	03-23-95	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-12	05-31-95	455.04	15.66	439.38	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	--			
MW-12	08-31-95	455.04	18.23	436.81	08-31-95	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-12	11-28-95	455.04	17.53	437.51	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-12	02-22-96	455.04	14.45	440.59	02-22-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-12	05-23-96	455.04	14.88	440.16	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-12	08-08-96	455.04	17.30	437.74	08-08-96	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-12	11-07-96	455.04	18.30	436.74	11-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-12	03-27-97	455.04	15.69	439.35	03-28-97	Not sampled: well sampled semi-annually, during the second and fourth quarters								
MW-12	05-19-97	455.04	17.41	437.63	05-19-97	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-12	05-18-98	455.04	15.21	439.83	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3			
MW-12	11-02-98	455.04	NR	NR	11-02-98	Not sampled: unable to locate well								
MW-12	06-04-99	455.04	NR	NR	06-04-99	Not sampled: unable to locate well								
MW-12	11-11-99	455.04	NR	NR	11-11-99	Not sampled: unable to locate well								
MW-12	06-20-00	455.04	NR	NR	06-20-00	Not sampled: unable to locate well								
MW-12	08-29-00	455.04	NR	NR	08-29-00	Not sampled: unable to locate well								
MW-12	11-29-00	455.04	NR	NR	11-29-00	Not sampled: unable to locate well								
MW-12	05-02-01	455.04	NR	NR	05-02-01	Not sampled: unable to locate well								
<b>MW-12</b>	<b>08-15-01</b>	<b>455.04</b>	<b>NR</b>	<b>NR</b>	<b>08-15-01</b>	<b>Not sampled: unable to locate well</b>								

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**1995 - Present\***

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Well Number	Date Gauged	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	Groundwater		TPH			Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B (µg/L)	MTBE 8260 (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
				Elevation (ft-MSL)	Date Sampled	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
VW-1	08-29-00	NR	17.40	NR	08-29-00	2,360	27.6	11.6	26.3	33.2	110		4.47	P
VW-1	11-29-00	NR	18.75	NR	11-29-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		0.46	P
VW-1	05-02-01	NR	21.59	NR	05-02-01	Well not sampled								
<b>VW-1</b>	<b>08-15-01</b>	<b>NR</b>	<b>24.62</b>	<b>NR</b>	<b>08-15-01</b>	<b>1,200</b>	<b>6.3</b>	<b>4.3</b>	<b>1.7</b>	<b>1.3</b>	<b>20</b>	<b>17</b>		<b>P</b>
<b>DUP</b>	<b>08-15-01</b>	<b>NR</b>	<b>NR</b>	<b>NR</b>	<b>08-15-01</b>	<b>1,200</b>	<b>6.2</b>	<b>4.1</b>	<b>1.8</b>	<b>1.1</b>	<b>20</b>	<b>17</b>		
VW-2	08-29-00	NR	NR	NR	08-29-00	Well inaccessible								
VW-2	11-29-00	NR	NR	NR	11-29-00	Well inaccessible								
VW-2	05-02-01	NR	NR	NR	05-02-01	Well not sampled								
<b>VW-2</b>	<b>05-02-01</b>	<b>NR</b>	<b>NR</b>	<b>NR</b>	<b>08-15-01</b>	<b>Well not sampled</b>								
VW-3	08-29-00	NR	17.93	NR	08-29-00	25,400	3,540	10,600	1,280	43,000	44,700			P
VW-3	11-29-00	NR	19.75	NR	11-29-00	54,200	9,450	1,870	2,350	9,400	12,300	15,100	0.47	P
VW-3	05-02-01	NR	NR	NR	05-02-01	Well abandoned								
VW-4	08-29-00	NR	NR	NR	08-29-00	Well inaccessible								
VW-4	11-29-00	NR	19.45	NR	11-29-00	37,500	4,510	206	2,100	9,030	6,770	7,880	0.42	P
DUP	11-29-00	NR	NR	NR	11-29-00	36,100	3,700	206	1,850	7,890	6,430	8,460		
VW-4	05-02-01	NR	21.66	NR	05-02-01	Well not sampled								
<b>VW-4</b>	<b>08-15-01</b>	<b>NR</b>	<b>NR</b>	<b>NR</b>	<b>08-15-01</b>	<b>Well not sampled</b>								

Notes:

--: Not analyzed, not applicable

NR: not reported; data not available or not measurable

TPH: Total petroleum hydrocarbons by modified EPA method 8015

BTEX: Benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 11/11/99)

MTBE: Methyl tert-butyl ether by EPA method 8021B. (EPA method 8020 prior to 11/11/99). Any MTBE Detection by 8021B was confirmed by EPA method 8260 beginning Third Quarter 2000 (08-29-00 Results)

ft-MSL: elevation in feet, relative to mean sea level

µg/L: micrograms per liter

mg/L: milligrams per liter

<: less than laboratory detection limit stated to the right

\*: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6113,*

*Livermore, California, (EMCON, February 26, 1996).*

DUP: duplicate

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

**ARCO Service Station 6113**  
**785 East Stanley Boulevard, Livermore, California**

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03-23-95	Northwest	0.035
05-31-95	North-Northwest	0.028
08-31-95	North-Northwest	0.03
11-28-95	North-Northwest	0.025
02-22-96	North-Northwest	0.031
05-23-96	North-Northwest	0.025
08-08-96	North	0.019
11-07-96	North-Northeast	0.019
03-27-97	North-Northwest	0.021
05-19-97	North	0.019
05-18-98	North	0.02
11-02-98	North	0.02
06-04-99	North	0.02
11-11-99	North	0.03
06-20-00	North-Northeast	0.014
08-29-00	North-Northeast	0.013
11-29-00	North-Northwest	0.026
05-02-01	Northeast	0.026
<b>08-15-01</b>	<b>Northeast</b>	<b>0.047</b>

**APPENDIX A**

**SAMPLING AND ANALYSIS PROCEDURES**



## **APPENDIX A**

### **SAMPLING AND ANALYSIS PROCEDURES**

---

The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

#### **Sample Collection**

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

#### **Equipment Cleaning**

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with tap water. During field sampling, equipment surfaces that were placed in the well or came into

contact with groundwater during field sampling were washed with detergent and double rinsed with tap water before the next well was purged or sampled.

## **Water Level, Floating Hydrocarbon, and Total Well Depth Measurements**

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness and total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated after each use. A bottom-filling, clear disposable bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

## **Well Purging**

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged, otherwise non-purge groundwater samples were collected. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or disposable bailer was used to purge standing water in the casing and gravel pack from the monitoring well. 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.

Groundwater purged from the monitoring wells was transported in a 240-gallon truck-mounted tank to Integrated Waste Management's Milpitas storage facility for disposal.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

## **Well Sampling**

A disposable bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the disposable bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed. Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

## **Sample Preservation and Handling**

The following section specifies sample containers, preservation methods, and sample handling procedures.

### **Sample Containers and Preservation**

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

### **Sample Handling**

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs or ice until received by the laboratory. At the time of

sampling, each sample was logged on an ARCO chain-of-custody record that accompanied the sample to the laboratory. Samples that required overnight storage prior to shipping to the laboratory were kept cool (4° C) in a refrigerator.

Samples were transferred from Cambria to an ARCO-approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from Cambria to laboratories performing the selected analyses routinely occurred within two to three days of sample collection.

## Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Labels to identify individual samples
- Laboratory analysis request sheets for documenting analyses to be performed

## Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure A-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

## **Labels**

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

## **Sampling and Analysis Chain-of-Custody Record**

The ARCO chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the ARCO chain-of-custody record was returned to Cambria with the analytical results.

## **Groundwater Sampling and Analysis Request Form**

A groundwater sampling and analysis request form (see Figure A-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)

**APPENDIX B**

**CERTIFIED ANALYTICAL REPORTS  
AND CHAIN-OF-CUSTODY DOCUMENTATION**



**Sequoia  
Analytical**

1455 McDowell Blvd, North Ste D  
Petaluma, CA 94954  
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[www.sequoialabs.com](http://www.sequoialabs.com)

---

29 August, 2001

Ron Scheele  
Cambria Environmental - Emeryville  
6262 Hollis Street  
Emeryville, CA 94608

RE: ARCO  
Sequoia Report: P108287

Enclosed are the results of analyses for samples received by the laboratory on 08/16/01 14:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angelee Cari  
Client Services Representative

CA ELAP Certificate #2374



Cambria Environmental - Emeryville  
6262 Hollis Street  
Emeryville CA, 94608

Project: ARCO  
Project Number: 6113/Livermore  
Project Manager: Ron Scheele

**Reported:**  
08/29/01 17:00

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VW-1	P108287-01	Water	08/15/01 09:00	08/16/01 14:30
MW-6	P108287-02	Water	08/15/01 08:00	08/16/01 14:30
MW-7	P108287-03	Water	08/15/01 06:30	08/16/01 14:30
DUP	P108287-04	Water	08/15/01 00:00	08/16/01 14:30

Sequoia Analytical - Petaluma

*Angelee Cari*

Angelee Cari, 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.*





Cambria Environmental - Emeryville  
 6262 Hollis Street  
 Emeryville CA, 94608

Project: ARCO  
 Project Number: 6113/Livermore  
 Project Manager: Ron Scheele

Reported:  
 08/29/01 17:00

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M**

**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>VW-1 (P108287-01) Water Sampled: 08/15/01 09:00 Received: 08/16/01 14:30</b>									
Gasoline (C6-C12)	1200	50	ug/l	1	1080466	08/20/01	08/20/01	EPA 8015M/8020M	
Benzene	6.3	0.50	"	"	"	"	"	"	QR-04
Toluene	4.3	0.50	"	"	"	"	"	"	QR-04
Ethylbenzene	1.7	0.50	"	"	"	"	"	"	QR-04
Xylenes (total)	1.3	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	20	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		86.7 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.7 %	65-135		"	"	"	"	
<b>MW-6 (P108287-02) Water Sampled: 08/15/01 08:00 Received: 08/16/01 14:30</b>									
Gasoline (C6-C12)	ND	50	ug/l	1	1080466	08/20/01	08/20/01	EPA 8015M/8020M	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	21	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		103 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.0 %	65-135		"	"	"	"	
<b>MW-7 (P108287-03) Water Sampled: 08/15/01 06:30 Received: 08/16/01 14:30</b>									
Gasoline (C6-C12)	ND	50	ug/l	1	1080466	08/20/01	08/20/01	EPA 8015M/8020M	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		104 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.7 %	65-135		"	"	"	"	



Cambria Environmental - Emeryville  
6262 Hollis Street  
Emeryville CA, 94608

Project: ARCO  
Project Number: 6113/Livermore  
Project Manager: Ron Scheele

**Reported:**  
08/29/01 17:00

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M**

**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>DUP (P108287-04) Water</b> Sampled: 08/15/01 00:00 Received: 08/16/01 14:30									
Gasoline (C6-C12)	1200	50	ug/l	1	1080466	08/20/01	08/20/01	EPA 8015M/8020M	
Benzene	6.2	0.50	"	"	"	"	"	"	QR-04
Toluene	4.1	0.50	"	"	"	"	"	"	QR-04
Ethylbenzene	1.8	0.50	"	"	"	"	"	"	QR-04
Xylenes (total)	1.1	0.50	"	"	"	"	"	"	QR-04
Methyl tert-butyl ether	20	2.5	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		84.3 %		65-135	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.0 %		65-135	"	"	"	"	



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Cambria Environmental - Emeryville  
 6262 Hollis Street  
 Emeryville CA, 94608

Project: ARCO  
 Project Number: 6113/Livermore  
 Project Manager: Ron Scheele

**Reported:**  
 08/29/01 17:00

**Volatile Organic Compounds by EPA Method 8260B**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>VW-1 (P108287-01) Water Sampled: 08/15/01 09:00 Received: 08/16/01 14:30</b>									
Methyl tert-butyl ether	17	10	ug/l	20	1080631	08/28/01	08/29/01	EPA 8260B	
Surrogate: Dibromofluoromethane		97.2 %	88-118		"	"	"	"	
<b>MW-6 (P108287-02) Water Sampled: 08/15/01 08:00 Received: 08/16/01 14:30</b>									
Methyl tert-butyl ether	25	0.50	ug/l	1	1080631	08/28/01	08/29/01	EPA 8260B	
Surrogate: Dibromofluoromethane		98.4 %	88-118		"	"	"	"	
<b>DUP (P108287-04) Water Sampled: 08/15/01 00:00 Received: 08/16/01 14:30</b>									
Methyl tert-butyl ether	17	10	ug/l	20	1080631	08/28/01	08/29/01	EPA 8260B	
Surrogate: Dibromofluoromethane		101 %	88-118		"	"	"	"	



Cambria Environmental - Emeryville  
 6262 Hollis Street  
 Emeryville CA, 94608

Project: ARCO  
 Project Number: 6113/Livermore  
 Project Manager: Ron Scheele

Reported:  
 08/29/01 17:00

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 1080466 - EPA 5030, waters**

**Blank (1080466-BLK1)**

Prepared & Analyzed: 08/20/01

Gasoline (C6-C12)	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	"							
Surrogate: a,a,a-Trifluorotoluene	304		"	300		101	65-135			
Surrogate: 4-Bromofluorobenzene	282		"	300		94.0	65-135			

**LCS (1080466-BS1)**

Prepared & Analyzed: 08/20/01

Gasoline (C6-C12)	2270	50	ug/l	2750		82.5	65-135			
Benzene	36.0	0.50	"	33.0		109	65-135			
Toluene	193	0.50	"	198		97.5	65-135			
Ethylbenzene	42.2	0.50	"	46.0		91.7	65-135			
Xylenes (total)	214	0.50	"	230		93.0	65-135			
Methyl tert-butyl ether	59.5	2.5	"	52.5		113	65-135			
Surrogate: a,a,a-Trifluorotoluene	340		"	300		113	65-135			
Surrogate: 4-Bromofluorobenzene	294		"	300		98.0	65-135			

**Matrix Spike (1080466-MS1)**

Source: P108287-01

Prepared & Analyzed: 08/20/01

Gasoline (C6-C12)	3440	50	ug/l	2750	1200	81.5	65-135			
Benzene	35.3	0.50	"	33.0	6.3	87.9	65-135			
Toluene	168	0.50	"	198	4.3	82.7	65-135			
Ethylbenzene	36.1	0.50	"	46.0	1.7	74.8	65-135			
Xylenes (total)	173	0.50	"	230	1.3	74.7	65-135			
Methyl tert-butyl ether	83.4	2.5	"	52.5	20	121	65-135			
Surrogate: a,a,a-Trifluorotoluene	272		"	300		90.7	65-135			
Surrogate: 4-Bromofluorobenzene	311		"	300		104	65-135			





Cambria Environmental - Emeryville  
 6262 Hollis Street  
 Emeryville CA, 94608

Project: ARCO  
 Project Number: 6113/Livermore  
 Project Manager: Ron Scheele

**Reported:**  
 08/29/01 17:00

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 1080631 - EPA 5030 waters</b>										
<b>Blank (1080631-BLK1)</b>					Prepared & Analyzed: 08/28/01					
Methyl tert-butyl ether	ND	0.50	ug/l							
Surrogate: Dibromofluoromethane	4.91		"	5.00		98.2	88-118			
<b>LCS (1080631-BS1)</b>					Prepared & Analyzed: 08/28/01					
Methyl tert-butyl ether	4.53	0.50	ug/l	5.00		90.6	79-118			
Surrogate: Dibromofluoromethane	4.86		"	5.00		97.2	88-118			
<b>Matrix Spike (1080631-MS1)</b>					Source: P108287-01		Prepared: 08/28/01 Analyzed: 08/29/01			
Methyl tert-butyl ether	112	10	ug/l	100	17	95.0	79-118			
Surrogate: Dibromofluoromethane	4.85		"	5.00		97.0	88-118			
<b>Matrix Spike Dup (1080631-MSD1)</b>					Source: P108287-01		Prepared: 08/28/01 Analyzed: 08/29/01			
Methyl tert-butyl ether	112	10	ug/l	100	17	95.0	79-118	0.00	20	
Surrogate: Dibromofluoromethane	5.01		"	5.00		100	88-118			



Cambria Environmental - Emeryville  
6262 Hollis Street  
Emeryville CA, 94608

Project: ARCO  
Project Number: 6113/Livermore  
Project Manager: Ron Scheele

**Reported:**  
08/29/01 17:00

### Notes and Definitions

- QR-04 Primary and confirmation results varied by greater than 40% RPD. The results may still be useful for their intended purpose.
- 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 Facility no. <b>6113</b>	City (Facility) <b>Livermore</b>	Project manager (Consultant) <b>Ron Scheele</b>	Laboratory name <b>Sequoia</b>
ARCO engineer <b>Paul Supple</b>	Telephone no. (ARCO) <b>925-299-889</b>	Telephone no. (Consultant) <b>510-450-1983</b>	Contract number
Consultant name <b>Cambria Env Tech</b>	Address (Consultant) <b>6262 Hollis St. Emeryville, CA</b>		

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 802	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/SM603E	EPA 601/8010	EPA 624/8340	EPA 625/8270	Semi TCLP Metals <input type="checkbox"/> VOAC <input type="checkbox"/> VOAC <input type="checkbox"/>	CAN METALS EPA 8010/7000 TTL <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org./DHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	CONFIRM ALL MTSE BY 8260	Method of shipment	Special detection Limit/reporting Lowest possible		
			Soil	Water	Other	Ice	Acid																	
VW-1	4			X		X	X	8-15-01	9:00														X	
MW-6	4			X			X	8-15-01	8:00														X	
MW-7	4			X			X	8-15-01	6:30														X	
DUP	4			Y			X	8-15-01															X	

FULLER CUSTODY SEALS INTACT  
 FULLER TEMPERATURE NOT IMPACTED  
 3.0

Condition of sample:	Temperature received:	Priority Rush 1 Business Day
Relinquished by sample <b>S. Hill</b>	Date <b>8-15-01</b>	Time <b>7:00 PM</b>
Relinquished by <b>S. Hill</b>	Date <b>8-16-01</b>	Time <b>12:10</b>
Relinquished by <b>S. Hill</b>	Date <b>8-16-01</b>	Time <b>12:10</b>
Relinquished by	Date	Time
Relinquished by	Date	Time
Relinquished by	Date	Time
Standard 10 Business Days		X



**APPENDIX C**

**FIELD DATA SHEETS**

## WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-1	4:50		24.97			
MW-2	4:53		25.15			
MW-3	4:48		25.03			
MW-4	4:25		dry			at 26.60 no water
MW-5		well abandoned				
MW-6	4:35		27.95			purse
MW-7	4:33		<del>27.55</del> 27.55			purse
MW-8	4:45		27.63			
MW-9	4:38		27.59			
MW-10	4:55		30.74			
MW-11	5:00		27.41			
MW-12		unable to locate				
VW-1	4:30		24.62			purse
VW-2		unable to open				
VW-3		well abandoned				

Project Name: Arco 6113Project Number: 438-1611Measured By: S. HillDate: 8-15-01



WELL SAMPLING FORM

Project Name: ARCO 6113	Cambria Mgr: Ron Scheele	Well ID: MW-6
Project Number: 438 - 1611	Date: 8-15-01	Well Yield:
Site Address: 785 E Stanley Blvd, Livermore	Sampling Method:	Well Diameter: 4" pvc
	Disposable bailer	Technician(s): S4
Initial Depth to Water: 27.95	Total Well Depth: 68.00	Water Column Height: 40.05
Volume/ft: 0.65	1 Casing Volume: 26.03	3 Casing Volumes: 78.09
Purge/No Purge:		
Purging Device: <sup>4" PVC bailer</sup> Submersible Pump	Did Well Dewater?: NO	Total Gallons Purged: 78
Start Purge Time: 6:15	Stop Purge Time: 7:54	Total Time: 1hr 39mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
7:00	26	18.1	7.24	851	
7:25	52	17.9	7.07	790	
7:55	78	17.9	7.13	794	
					DO = 0.63 mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-6	8-15-01	8:00	4 VOA	HCL	TPHg, BTEX, MTBE	8021B

WELL SAMPLING FORM

Project Name: ARCO 6113	Cambria Mgr: Ron Scheele	Well ID: MW-7
Project Number: 438 - 1611	Date: 3-15-01	Well Yield:
Site Address: 785 E Stanley Blvd, Livermore	Sampling Method:  Disposable bailer	Well Diameter: 4 pvc
		Technician(s): SQ
Initial Depth to Water: 27.55	Total Well Depth: 6800	Water Column Height: 40.45
Volume/ft: 0.65	1 Casing Volume: 26.29	3 Casing Volumes: 788
Purge/No Purge:		
Purging Device: Submersible Pump	Did Well Dewater?: NO	Total Gallons Purged: 79
Start Purge Time: 5:20	Stop Purge Time: 6:19	Total Time: 59 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
5:20	26	17.5	7.16	770	
6:05	52	17.3	7.31	659	
6:20	79	17.9	7.38	672	
					DD = 0.74 mg/l

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-7	3-15-01	6:30	4 VOA	HCL	TPHg, BTEX, MTBE	8021B

WELL SAMPLING FORM

Project Name: ARCO 6113	Cambria Mgr: Ron Scheele	Well ID: VW-1
Project Number: 438 - 1611	Date: 8-15-01	Well Yield:
Site Address: 785 E Stanley Blvd, Livermore	Sampling Method:	Well Diameter: 4" pvc
	Disposable bailer	Technician(s): SG
Initial Depth to Water: 24.62	Total Well Depth: 45.00	Water Column Height: 20.38
Volume/ft: 0.65	1 Casing Volume: 13.24	3 Casing Volumes: 39.74
Purge/No Purge:		
Purging Device: Submersible Pump	Did Well Dewater?: NO	Total Gallons Purged: 40
Start Purge Time: 8:10	Stop Purge Time: 8:54	Total Time: 44 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. C	pH	Cond. uS	Comments
8:20	14	17.9	7.53	1024	
8:40	28	18.4	7.69	782	
8:55	40	18.7	7.66	871	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
VW-1	8-15-01	9:00	4 VOA	HCL	TPHg, BTEX, MTBE	8021B
DGP						