Ro-452

CAMBRIA

March 29, 2002

APR 08 2002

Ms. eva chu
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Re: **Quarterly Groundwater Monitoring Report**
First Quarter 2002
ARCO Service Station No. 6041
7249 Village Parkway
Dublin, California
Cambria Project # 439-1811

Dear Ms. chu:

On behalf of ARCO, Cambria Environmental Technology, Inc. (Cambria) is submitting the attached report which presents the results of the first quarter 2002 groundwater monitoring program at ARCO Service Station No. 6041, located at 7249 Village Parkway, Dublin, California. The monitoring program complies with the ACHCSA requirements regarding underground tank investigations.

Please call if you have any questions.

Sincerely,
Cambria Environmental Technology, Inc.

Ron Scheele, RG
Senior Project Manager

Attachment: Quarterly Groundwater Monitoring Report, First Quarter 2002

cc: Mr. Paul Supple, ARCO, PO Box 6549, Moraga, California 94570
Ms. Karen Petryna, Equiva Services, LLC, PO Box 7869, Burbank, California 91510-7869

Oakland, CA
San Ramon, CA
Sonoma, CA

Cambria Environmental Technology, Inc.

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

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Quarterly Groundwater Monitoring Report

First Quarter 2002

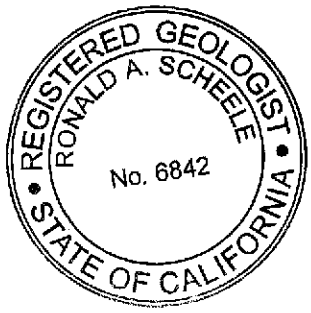
ARCO Service Station No. 6041
7249 Village Parkway
Dublin, California
Cambria Project # 439-1811

Prepared For:

Mr. Paul Supple
ARCO

March 29, 2002

Prepared By:
Cambria Environmental Technology, Inc.
6262 Hollis Street
Emeryville, California 94608



Written by:

Sara Dwight
Staff Environmental Scientist

Ron Scheele, RG
Senior Project Manager

CAMBRIA

Date: March 29, 2002
Quarter: 1st Quarter, 2002

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 6041	Address: 7249 Village Parkway, Dublin, California
ARCO Environmental Engineer/Phone No.:	Paul Supple / (925) 299-8891
Consulting Co./Contact Person:	Cambria Environmental Technology, Inc. / Ron Scheele, RG
Consultant Project No.:	439-1811
Primary Agency/Regulatory ID No.:	ACHCSA

WORK PERFORMED THIS QUARTER (FIRST - 2002):

1. Submitted quarterly groundwater monitoring report for fourth quarter, 2001.
2. Performed quarterly groundwater monitoring and sampling on March 6, 2002.

WORK PROPOSED FOR NEXT QUARTER (SECOND – 2002):

1. Prepare and submit quarterly groundwater monitoring report for first quarter 2002.
2. Perform quarterly groundwater monitoring and sampling for second quarter 2002.

MONITORING:

Current Phase of Project:	Monitoring
Frequency of Groundwater Sampling	Quarterly: MW-2, MW-3, MW-4, Shell MW-6, Shell MW-7 Annual: MW-5, MW-6
Frequency of Groundwater Monitoring	Quarterly
Is Free Product (FP) Present On-site:	No
Bulk Soil Removed to Date :	3,208 cubic yards of TPH impacted soil
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	Removed approximately 3,192 cubic yards of hydrocarbon impacted soil and approximately 25,600 gallons of hydrocarbon impacted groundwater during station remodel and UST upgrade activities performed during the third quarter 2001.
Average Depth to Groundwater:	8.73 feet
Groundwater Flow Direction and Gradient	0.003 ft/ft toward east

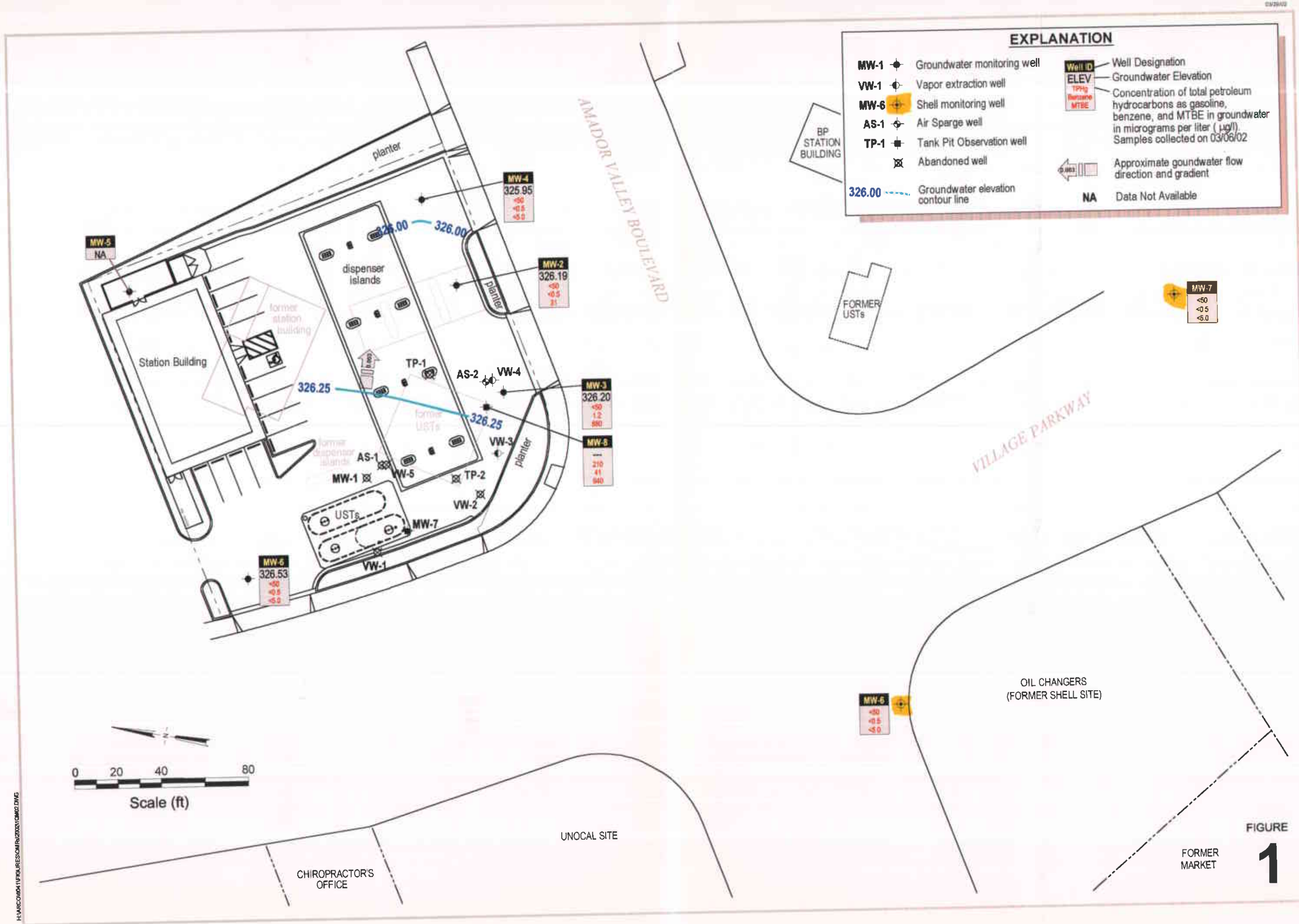
DISCUSSION:

Based on field measurements collected on March 6, 2002, groundwater beneath the site flows towards the east at a gradient of 0.003 ft/ft. This is inconsistent with the historic groundwater flow direction and gradient, which has typically been to the southwest, and may be related to the lack of monitoring data from well MW-5.

Hydrocarbon and MTBE concentrations detected this quarter were similar to the previous sampling event, except in wells MW-3 and MW-8, where MTBE concentrations decreased. The maximum TPHg, benzene, and MTBE concentrations were detected in well MW-8 at 210, 41, and 940 micrograms per liter (µg/L), respectively.

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 - Sampling and Analysis Procedures
- Appendix B - Certified Analytical Reports and Chain-of-Custody Documentation
- Appendix C - Field Data Sheets



Groundwater Elevation Contour and Analytical Summary Map

March 6, 2002

ARCO Service Station 6041

7249 Village Parkway
Dublin, California

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FIGURE **1**

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
MW-1	02-15-95	336.56	8.53	0.00	328.03	02-15-95	820	15	<1	5.2	1.4	--	--		
MW-1	05-24-95	336.56	9.00	0.00	327.56	05-24-95	640	12	<1	7.3	<1	--	--		
MW-1	08-25-95	336.56	10.30	0.00	326.26	08-25-95	780	2	<1	2	2	2,500	--		
MW-1	11-28-95	336.56	11.01	0.00	325.55	11-28-95	570	2.2	<0.5	1.4	0.9	--	--		
MW-1	02-26-96	336.56	7.35	0.00	329.21	03-13-96	1,100	28	<7	13	7	3,400	--		
MW-1	05-23-96	336.56	8.73	0.00	327.83	05-23-96	560	8.5	<1	1.1	<1	3,900	--		
MW-1	08-23-96	336.56	10.25	0.00	326.31	08-23-96	860	<1	<1	<4	2	5,600	--		
MW-1	03-21-97	336.56	9.35	0.00	327.21	03-21-97	520	12	<0.5	2.7	1.5	6,200	--		
MW-1	08-20-97	336.56	10.75	0.00	325.81	08-20-97	<5,000	<50	<50	<50	<50	7,400	--		
MW-1	11-21-97	336.56	11.10	0.00	325.46	11-21-97	<5,000	<50	<50	<50	<50	8,500	--		
MW-1	02-12-98	336.56	7.05	0.00	329.51	02-12-98	210	<0.5	<0.5	<0.5	<0.5	8,900	--	1.71	P
MW-1	07-31-98	336.56	10.04	0.00	326.52	07-31-98	<20,000	<200	<200	<200	<200	18,000	--	2.43	P
MW-1	02-17-99	336.56	8.50	0.00	328.06	02-17-99	<20,000	<200	<200	<200	<200	16,000	--	1.0	
MW-1	08-24-99	336.56	10.40	0.00	326.16	08-24-99	190	<0.5	4.4	<0.5	1.1	15,000	--		P
MW-1	03-01-00	336.56	8.85	0.00	327.71	03-01-00	310	20	0.5	7.6	4	80,000	--	1.57	P
MW-1	08-18-00	336.56	9.35	0.00	327.21	08-18-00	<10,000	<100	<100	<100	<100	48,400	63,700	1.50	P
MW-1	12-27-00	336.56	10.81	0.00	325.75	12-27-00	<10,000	309	<100	<100	289	44,400	--	0.51	P
MW-1	02-09-01	336.56	10.65	0.00	325.91	02-09-01	2,820	368	<25.0	116	176	23,300	--	0.58	P
DUP	02-09-01	NR	NR	NR	NR	02-09-01	3,490	432	9.56	146	235	31,800	--		
MW-1	04-17-01	336.56	11.09	0.00	325.47	04-17-01	2,900	66.0	<10.0	33.2	25.1	46,500	--	0.63	P
DUP	04-17-01	NR	NR	NR	NR	04-17-01	2,600	70.1	<20.0	32.7	30.6	45,400	--		
MW-1	07-17-01	336.56	11.07	0.00	325.49	07-17-01	<10,000	<100	<100	130	520	42,000	--	0.69	P
MW-1	12-21-01	Well abandoned during station upgrade activities													
MW-2	02-15-95	334.80	6.75	0.00	328.05	02-15-95	730	110	1.7	25	66	--	--		
MW-2	05-24-95	334.80	6.88	0.00	327.92	05-24-95	370	110	<1	17	1.9	--	--		
MW-2	08-25-95	334.80	7.91	0.00	326.89	08-25-95	150	6	<1	<1	<1	2,700	--		
MW-2	11-28-95	334.80	9.06	0.00	325.74	11-28-95	<50	<0.5	<0.5	<0.5	0.8	--	--		
MW-2	02-26-96	334.80	6.65	0.00	328.15	03-13-96	350	66	<0.5	11	1.7	<3	--		
MW-2	05-23-96	334.80	6.90	0.00	327.90	05-23-96	540	140	<2.5	13	<2.5	4,600	--		
MW-2	08-23-96	334.80	8.45	0.00	326.35	08-23-96	180	0.8	2	0.7	2.6	4,000	--		
MW-2	03-21-97	334.80	7.28	0.00	327.52	03-21-97	410	90	<1	14	4	3,800	--		
MW-2	08-20-97	334.80	8.87	0.00	325.93	08-20-97	<5,000	<50	<50	<50	<50	3,100	--		

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
MW-2	11-21-97	334.80	9.28	0.00	325.52	11-21-97	<2,000	<20	<20	<20	<20	2,600	--		
MW-2	02-12-98	334.80	5.90	0.00	328.90	02-12-98	310	54	<0.5	6.2	1.1	3,800	--	3.76	P
MW-2	07-31-98	334.80	8.12	0.00	326.68	07-31-98	6,100	52	220	110	1100	7,700	--	2.96	P
MW-2	02-17-99	334.80	7.18	0.00	327.62	02-17-99	<5,000	<50	<50	<50	<50	4,200	--	1.0	P
MW-2	08-24-99	334.80	8.68	0.00	326.12	08-24-99	200	1.8	16	3.0	32	3,100	--		P
MW-2	03-01-00	334.80	7.02	0.00	327.78	03-01-00	760	24	12	13	59	6,300	--	1.92	P
MW-2	08-18-00	334.80	7.75	0.00	327.05	08-18-00	<500	<5.00	<5.00	<5.00	<5.00	1,610	1,980	2.03	P
MW-2	12-27-00	334.80	8.85	0.00	325.95	Not Sampled: Well sampled during first and third quarters									
MW-2	02-09-01	334.80	8.50	0.00	326.30	02-09-01	<50.0	<0.500	<0.500	<0.500	<0.500	9.11	--	0.53	P
MW-2	04-17-01	334.80	9.12	0.00	325.68	Not Sampled: Well sampled during first and third quarters									
MW-2	07-17-01	334.80	8.99	0.00	325.81	07-17-01	1,200	<10	<10	<10	<10	4,200	--	0.69	P
DUP	07-17-01	NR	NR	NR	NR	07-17-01	3,500	<10	<10	<10	<10	3,500	--		
MW-2	12-21-01	334.80	8.65	0.00	326.15	12-21-01	65	<0.50	1.2	0.61	6.7	11	6.5	0.48	NP
MW-2	**03-06-02**	**334.80**	**8.61**	**0.00**	**326.19**	**03-06-02**	**<50**	**<0.50**	**<0.50**	**<0.50**	**1.8**	**31**	**--**	**0.35**	**NP**
MW-3	02-15-95	335.53	8.55	0.00	326.98	02-15-95	100	14	<0.5	6.3	<0.5	--	--		
MW-3	05-24-95	335.53	8.17	0.00	327.36	05-24-95	110	8	<0.5	2.7	<0.5	--	--		
MW-3	08-25-95	335.53	9.27	0.00	326.26	08-25-95	210	3.6	<0.5	2.9	0.6	20,000	--		
MW-3	11-28-95	335.53	9.91	0.00	325.62	11-28-95	81	1.5	<0.5	1.4	<0.5	--	15,000		
MW-3	02-26-96	335.53	8.42	0.00	327.11	03-13-96	16,000	1,600	1,200	300	2,000	9,500	--		
MW-3	05-23-96	335.53	7.70	0.00	327.83	05-23-96	6,500	690	<10	120	14	8,600	--		
MW-3	08-23-96	335.53	9.25	0.00	326.28	08-23-96	1,700	85	2	61	5.3	11,000	--		
MW-3	03-21-97	335.53	8.72	0.00	326.81	03-21-97	100	2	<1	1	<1	6,600	--		
MW-3	08-20-97	335.53	9.73	0.00	325.80	08-20-97	<5,000	<50	<50	<50	<50	7,700	--		
MW-3	11-21-97	335.53	10.10	0.00	325.43	11-21-97	<5,000	<50	<50	<50	<50	9,700	--		
MW-3	02-12-98	335.53	6.68	0.00	328.85	02-12-98	110	11	<0.5	<0.5	1.9	10,000	--	1.02	P
MW-3	07-31-98	335.53	7.98	0.00	327.55	07-31-98	<10,000	<100	<100	<100	<100	13,000	--	2.59	P
MW-3	02-17-99	335.53	8.40	0.00	327.13	02-17-99	<20,000	<200	<200	<200	<200	23,000	--	1.0	P

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ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
MW-3	08-24-99	335.53	9.45	0.00	326.08	08-24-99	200	0.6	5.6	0.6	1.7	22,000	- -		P
MW-3	03-01-00	335.53	8.32	0.00	327.21	03-01-00	320	32	1.0	6.1	4	58,000	- -	2.42	P
MW-3	08-18-00	335.53	8.35	0.00	327.18	08-18-00	<10,000	<100	<100	<100	<100	46,200	55,600	1.59	P
DUP	08-18-00	NR	NR	NR	NR	08-18-00	<10,000	<100	<100	<100	<100	45,500	51,700		
MW-3	12-27-00	335.53	9.75	0.00	325.78	12-27-00	29,700	1,620	1,730	<250	6,230	62,600	- -	1.59	P
MW-3	02-09-01	335.53	9.61	0.00	325.92	02-09-01	29,300	2,590	3,530	440	7,080	85,500	- -	0.51	P
MW-3	04-17-01	335.53	9.94	0.00	325.59	04-17-01	16,400	1,680	<25.0	310	2,290	48,700	- -	0.41	P
MW-3	07-17-01	335.53	9.93	0.00	325.60	07-17-01	21,000	1,500	<100	1,100	690	82,000	- -	0.51	P
MW-3	12-21-01	335.53	9.40	0.00	326.13	12-21-01	<5,000	<50	<50	<50	<50	4,300	3,800	0.40	P
DUP	12-21-01	NR	NR	NR	NR	12-21-01	<5,000	<50	<50	<50	<50	4,500	3,500		
MW-3	**03-06-02**	**335.53**	**9.33**	**0.00**	**326.20**	**03-06-02**	**<50**	**1.2**	**<0.50**	**1.1**	**13**	**880**	**- -**	**0.43**	**P**
MW-4	02-15-95	334.22	7.85	0.00	326.37	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	- -	- -		
MW-4	05-24-95	334.22	6.68	0.00	327.54	Not sampled: well sampled semi-annually, during the first and third quarters									
MW-4	08-25-95	334.22	6.93	0.00	327.29	08-25-95	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	11-28-95	334.22	8.21	0.00	326.01	Not sampled: well sampled semi-annually, during the first and third quarters									
MW-4	02-26-96	334.22	6.65	0.00	327.57	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	05-23-96	334.22	6.47	0.00	327.75	Not sampled: well sampled semi-annually, during the first and third quarters									
MW-4	08-23-96	334.22	7.66	0.00	326.56	Not sampled: well not part of sampling program									
MW-4	03-21-97	334.22	6.84	0.00	327.38	Not sampled: well not part of sampling program									
MW-4	08-20-97	334.22	8.32	0.00	325.90	Not sampled: well not part of sampling program									
MW-4	11-21-97	334.22	8.65	0.00	325.57	Not sampled: well not part of sampling program									
MW-4	02-12-98	334.22	6.35	0.00	327.87	Not sampled: well not part of sampling program									
MW-4	07-31-98	334.22	6.84	0.00	327.38	Not sampled: well not part of sampling program									
MW-4	02-17-99	334.22	7.50	0.00	326.72	Not sampled: well not part of sampling program									
MW-4	08-24-99	334.22	9.50	0.00	324.72	Not sampled: well not part of sampling program									
MW-4	03-01-00	334.22	6.93	0.00	327.29	Not sampled: well not part of sampling program									
MW-4	08-18-00	334.22	7.03	0.00	327.19	Not sampled: well not part of sampling program									
MW-4	12-27-00	334.22	8.10	0.00	326.12	Not sampled: well not part of sampling program									
MW-4	02-09-01	334.22	7.97	0.00	326.25	Not sampled: well not part of sampling program									
MW-4	04-17-01	334.22	8.90	0.00	325.32	Not sampled: well not part of sampling program									
MW-4	07-17-01	334.22	8.59	0.00	325.63	Not sampled: well not part of sampling program									
MW-4	12-21-01	334.22	8.31	0.00	325.91	12-21-01	<50	<0.50	<0.50	<0.50	<0.50	4.1	2.0	0.68	NP
MW-4	**03-06-02**	**334.22**	**8.27**	**0.00**	**325.95**	**03-06-02**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	**- -**	**0.37**	**P**

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
MW-5	02-15-95	335.87	7.80	0.00	328.07	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-5	05-24-95	335.87	8.10	0.00	327.77	Not sampled: well sampled annually, during the first quarter									
MW-5	08-25-95	335.87	9.43	0.00	326.44	Not sampled: well sampled annually, during the first quarter									
MW-5	11-28-95	335.87	10.12	0.00	325.75	Not sampled: well sampled annually, during the first quarter									
MW-5	02-26-96	335.87	6.73	0.00	329.14	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-5	05-23-96	335.87	7.87	0.00	328.00	Not sampled: well sampled annually, during the first quarter									
MW-5	08-23-96	335.87	9.46	0.00	326.41	Not sampled: well not part of sampling program									
MW-5	03-21-97	335.87	8.23	0.00	327.64	Not sampled: well not part of sampling program									
MW-5	08-20-97	335.87	9.92	0.00	325.95	Not sampled: well not part of sampling program									
MW-5	11-21-97	335.87	10.18	0.00	325.69	Not sampled: well not part of sampling program									
MW-5	02-12-98	335.87	6.45	0.00	329.42	Not sampled: well not part of sampling program									
MW-5	07-31-98	335.87	8.98	0.00	326.89	Not sampled: well not part of sampling program									
MW-5	02-17-99	335.87	7.65	0.00	328.22	Not sampled: well not part of sampling program									
MW-5	08-24-99	335.87	8.10	0.00	327.77	Not sampled: well not part of sampling program									
MW-5	03-01-00	335.87	7.31	0.00	328.56	Not sampled: well not part of sampling program									
MW-5	08-18-00	335.87	8.65	0.00	327.22	Not sampled: well not part of sampling program									
MW-5	12-27-00	335.87	9.80	0.00	326.07	Not sampled: well not part of sampling program									
MW-5	02-09-01	335.87	9.65	0.00	326.22	Not sampled: well not part of sampling program									
MW-5	04-17-01	335.87	9.92	0.00	325.95	Not sampled: well not part of sampling program									
MW-5	07-17-01	335.87	9.95	0.00	325.92	Not sampled: well not part of sampling program									
MW-5	12-21-01	335.87	Well inaccessible												
MW-5	**03-06-02**	**335.87**	**Well inaccessible**												
MW-6	02-15-95	335.84	7.81	0.00	328.03	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	05-24-95	335.84	8.35	0.00	327.49	Not sampled: well sampled annually, during the first quarter									
MW-6	08-25-95	335.84	9.71	0.00	326.13	Not sampled: well sampled annually, during the first quarter									
MW-6	11-28-95	335.84	10.28	0.00	325.56	Not sampled: well sampled annually, during the first quarter									
MW-6	02-26-96	335.84	6.60	0.00	329.24	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-23-96	335.84	8.05	0.00	327.79	Not sampled: well sampled annually, during the first quarter									
MW-6	08-23-96	335.84	9.58	0.00	326.26	Not sampled: well not part of sampling program									
MW-6	03-21-97	335.84	8.39	0.00	327.45	Not sampled: well not part of sampling program									

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
MW-6	08-20-97	335.84	9.98	0.00	325.86	Not sampled: well not part of sampling program									
MW-6	11-21-97	335.84	10.31	0.00	325.53	Not sampled: well not part of sampling program									
MW-6	02-12-98	335.84	3.15	0.00	332.69	Not sampled: well not part of sampling program									
MW-6	07-31-98	335.84	9.29	0.00	326.55	Not sampled: well not part of sampling program									
MW-6	02-17-99	335.84	7.72	0.00	328.12	Not sampled: well not part of sampling program									
MW-6	08-24-99	335.84	9.65	0.00	326.19	Not sampled: well not part of sampling program									
MW-6	03-01-00	335.84	7.35	0.00	328.49	Not sampled: well not part of sampling program									
MW-6	08-18-00	335.84	8.65	0.00	327.19	Not sampled: well not part of sampling program									
MW-6	12-27-00	335.84	9.83	0.00	326.01	Not sampled: well not part of sampling program									
MW-6	02-09-01	335.84	9.62	0.00	326.22	Not sampled: well not part of sampling program									
MW-6	04-17-01	335.84	10.03	0.00	325.81	Not sampled: well not part of sampling program									
MW-6	07-17-01	335.84	9.95	0.00	325.89	Not sampled: well not part of sampling program									
MW-6	12-21-01	335.84	9.47	0.00	326.37	12/21/01	<50	<0.50	<0.50	<0.50	0.57	<2.5	- -	0.55	NP
MW-6	**03-06-02**	**335.84**	**9.31**	**0.00**	**326.53**	**03-06-02**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	**- -**	**0.33**	**P**
MW-7	12-21-01	NR	NR	NR	NR	Not sampled: well dry									
MW-7	**03-06-02**	**NR**	**NR**	**NR**	**NR**	**Not sampled: well dry**									
MW-8	12-21-01	NR	8.70	0.00	NR	12/21/01	<5,000	67	<50	<50	<50	2,400	1,300	0.60	NP
MW-8	**03-06-02**	**NR**	**8.63**	**0.00**	**NR**	**03-06-02**	**210**	**41**	**0.64**	**0.79**	**2.0**	**940**	**- -**	**0.25**	**P**
DUP	**03-06-02**	**NR**	**NR**	**NR**	**NR**	**03-06-02**	**170**	**37**	**0.67**	**0.70**	**1.9**	**740**	**- -**		
VW-2	03-21-97	NR	8.22	0.00	NR	03-21-97	150	8.9	<0.5	<0.5	0.6	270	- -		
VW-2	08-20-97	NR	9.16	0.00	NR	08-20-97	Not sampled: well not part of sampling program								
VW-2	11-21-97	NR	8.27	0.00	NR	11-21-97	<200	3	<2	<2	<2	180	- -		
VW-2	02-12-98	NR	6.65	0.00	NR	02-12-98	200	19	<0.5	0.6	<0.5	2,200	- -		
VW-2	07-31-98	NR	7.01	0.00	NR	07-31-98	Not sampled: well not part of sampling program								
VW-2	02-17-99	NR	8.47	0.00	NR	02-17-99	Not sampled: well not part of sampling program								
VW-2	08-24-99	NR	8.20	0.00	NR	08-24-99	Not sampled: well not part of sampling program								
VW-2	03-01-00	NR	8.72	0.00	NR	03-01-00	Not sampled: well not part of sampling program								
VW-2	08-18-00	NR	8.40	0.00	NR	08-18-00	<250	<2.50	<2.50	<2.50	<2.50	537	- -	1.59	NP
VW-2	12-27-00	NR	8.95	0.00	NR	Not sampled: Well Dry									
VW-2	02-09-01	NR	8.87	0.00	NR	Not sampled: Well Dry									
VW-2	04-17-01	NR	9.00	0.00	NR	Not sampled: Well Dry									
VW-2	07-17-01	NR	8.97	0.00	NR	Not sampled: Well Dry									
VW-2	12-21-01	Well abandoned during station upgrade activities													

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	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)
Shell MW-6	12-27-00	NR	9.13	0.00	NR	12-27-00	74.7	<0.500	<0.500	<0.500	<0.500	<2.50	- -	1.30	P
DUP	12-27-00	NR	NR	NR	NR	12-27-00	79.3	<0.500	<0.500	<0.500	<0.500	<2.50	- -		
Shell MW-6	02-09-01	NR	9.05	0.00	NR	02-09-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	- -	1.29	P
Shell MW-6	04-17-01	NR	10.17	0.00	NR	04-17-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	- -	0.95	P
Shell MW-6	07-17-01	NR	9.50	0.00	NR	07-17-01	<50	<0.50	<0.50	<0.50	<0.50	4.2	- -	1.03	P
Shell MW-6	12-21-01	NR	9.98	0.00	NR	12-21-01	<50	<0.50	<0.50	<0.50	<0.50	<2.5	- -	0.97	P
Shell MW-6	**03-06-02**	**NR**	**9.90**	**0.00**	**NR**	**03-06-02**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	- -	**0.97**	**P**
Shell MW-7	12-27-00	NR	6.45	0.00	NR	12-27-00	<50.0	<0.500	0.696	<0.500	0.795	<2.50	- -	1.33	P
Shell MW-7	02-09-01	NR	6.39	0.00	NR	02-09-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	- -	1.13	P
Shell MW-7	04-17-01	NR	7.22	0.00	NR	04-17-01	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	- -	1.12	P
Shell MW-7	07-17-01	NR	6.93	0.00	NR	07-17-01	<50	<0.50	<0.50	<0.50	<0.50	<2.5	- -	1.05	P
Shell MW-7	12-21-01	NR	7.15	0.00	NR	12-21-01	<50	<0.50	<0.50	<0.50	<0.50	<2.5	- -		P
Shell MW-7	**03-06-02**	**NR**	**7.03**	**0.00**	**NR**	**03-06-02**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	- -	**0.95**	**P**

Notes:
TOC: top of casing
ft-MSL: elevation in feet, relative to mean sea level
TPH: total petroleum hydrocarbons, California DHS LUFT Method
BTEX: benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 03/01/00).
MTBE: Methyl tert-butyl ether
EPA: United States Environmental Protection Agency
*: EPA method 8020 prior to 03/01/00
µg/L: micrograms per liter
mg/L: milligrams per liter
NR: not reported; data not available or not measurable
- -: not analyzed or not applicable
<: denotes concentration not present at or above 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 6041, Dublin, California, *(EMCON, February 26, 1996).*
DUP: duplicate

Table 2
Groundwater Flow Direction and Gradient

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
02-15-95	NR	NR
05-24-95	East-Southeast	0.002
08-25-95	Northwest	0.006
11-28-95	North	0.006
02-26-96	East	0.012
05-23-96	Flat Gradient	Flat Gradient
08-23-96	Flat Gradient	Flat Gradient
03-21-97	South-Southeast	0.005
08-20-97	South-Southwest	0.001
11-21-97	South-Southwest	0.002
02-12-98	East	0.024
07-31-98	Northwest	0.01
02-17-99	Southeast	0.007
08-24-99	South-Southwest	0.013
03-01-00	South-Southeast	0.005
09-26-00	South-Southeast	0.002
12-27-00	West-Southwest	0.003
02-09-01	West-Southwest	0.003
04-17-01	South-Southwest	0.015
07-17-01	South-Southwest	0.003
12-21-01	East	0.002
03-06-02	**East**	**0.003**

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
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of 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

1551 Industrial Road
San Carlos, CA 94070
(650) 232-9600
FAX (650) 232-9612
www.sequoialabs.com

26 March, 2002

Ron Scheele
Cambria Environmental [1]
6262 Hollis St.
Emeryville, CA 94608

RE: ARCO
Sequoia Report: L203046

Enclosed are the results of analyses for samples received by the laboratory on 03/12/02 10:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Wayne Stevenson
Project Manager

CA ELAP Certificate #2360

Sequoia Analytical

1551 Industrial Road
San Carlos CA 94070
(650) 232-9600
FAX (650) 232-9612
www.sequoialabs.com

Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Shell MW-6	L203046-01	Water	03/06/02 08:00	03/12/02 10:50
Shell MW-7	L203046-02	Water	03/06/02 08:30	03/12/02 10:50
MW-2	L203046-03	Water	03/06/02 09:30	03/12/02 10:50
MW-3	L203046-04	Water	03/06/02 10:00	03/12/02 10:50
MW-4	L203046-05	Water	03/06/02 09:00	03/12/02 10:50
MW-6	L203046-06	Water	03/06/02 10:30	03/12/02 10:50
MW-8	L203046-07	Water	03/06/02 11:00	03/12/02 10:50
DUP	L203046-08	Water	03/06/02 00:00	03/12/02 10:50

Sequoia Analytical - San Carlos

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.

Wayne Stevenson, Project Manager

Sequoia Analytical

1551 Industrial Road
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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Shell MW-6 (L203046-01) Water Sampled: 03/06/02 08:00 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030049	03/19/02	03/20/02	EPA 8021B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*98.5 %*	*70-130*		"	"	"	"	
Shell MW-7 (L203046-02) Water Sampled: 03/06/02 08:30 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030049	03/19/02	03/20/02	EPA 8021B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*88.1 %*	*70-130*		"	"	"	"	
MW-2 (L203046-03) Water Sampled: 03/06/02 09:30 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030052	03/20/02	03/20/02	EPA 8021B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	**1.8**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**31**	5.0	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*119 %*	*70-130*		"	"	"	"	

Sequoia Analytical

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (L203046-04) Water Sampled: 03/06/02 10:00 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030052	03/19/02	03/20/02	EPA 8021B	
Benzene	**1.2**	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	**1.1**	0.50	"	"	"	"	"	"	
Xylenes (total)	**13**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**880**	50	"	10	"	"	03/19/02	"	M-04
Surrogate: a,a,a-Trifluorotoluene		*116 %*	*70-130*		"	"	*03/20/02*	"	
MW-4 (L203046-05) Water Sampled: 03/06/02 09:00 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030049	03/19/02	03/20/02	EPA 8021B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*88.2 %*	*70-130*		"	"	"	"	
MW-6 (L203046-06) Water Sampled: 03/06/02 10:30 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	ND	50	ug/l	1	2030049	03/19/02	03/20/02	EPA 8021B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*95.0 %*	*70-130*		"	"	"	"	

Sequoia Analytical

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (L203046-07) Water Sampled: 03/06/02 11:00 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	**210**	50	ug/l	1	2030052	03/19/02	03/20/02	EPA 8021B	P-01
Benzene	**41**	0.50	"	"	"	"	"	"	
Toluene	**0.64**	0.50	"	"	"	"	"	"	
Ethylbenzene	**0.79**	0.50	"	"	"	"	"	"	
Xylenes (total)	**2.0**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**940**	50	"	10	"	"	03/19/02	"	M-04
Surrogate: a,a,a-Trifluorotoluene		*124 %*	*70-130*		"	"	*03/20/02*	"	
DUP (L203046-08) Water Sampled: 03/06/02 00:00 Received: 03/12/02 10:50									
Purgeable Hydrocarbons as Gasoline	**170**	50	ug/l	1	2030048	03/19/02	03/20/02	EPA 8021B	P-01
Benzene	**37**	0.50	"	"	"	"	"	"	
Toluene	**0.67**	0.50	"	"	"	"	"	"	
Ethylbenzene	**0.70**	0.50	"	"	"	"	"	"	
Xylenes (total)	**1.9**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**740**	50	"	10	"	"	"	"	M-04
Surrogate: a,a,a-Trifluorotoluene		*123 %*	*70-130*		"	"	"	"	

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B - Quality Control

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2030048 - EPA 5030B (P/T)										
Blank (2030048-BLK1)				Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	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	5.0	"							
Surrogate: a,a,a-Trifluorotoluene	*8.69*		"	*10.0*		*86.9*	*70-130*			
LCS (2030048-BS1)				Prepared & Analyzed: 03/19/02						
Benzene	9.85	0.50	ug/l	10.0		98.5	70-130			
Toluene	10.4	0.50	"	10.0		104	70-130			
Ethylbenzene	10.9	0.50	"	10.0		109	70-130			
Xylenes (total)	32.9	0.50	"	30.0		110	70-130			
Surrogate: a,a,a-Trifluorotoluene	*11.6*		"	*10.0*		*116*	*70-130*			
LCS (2030048-BS2)				Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	232	50	ug/l	250		92.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	*10.4*		"	*10.0*		*104*	*70-130*			
Matrix Spike (2030048-MS1)	**Source: L203023-04**			Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	244	50	ug/l	250	ND	97.6	60-140			
Surrogate: a,a,a-Trifluorotoluene	*13.1*		"	*10.0*		*131*	*70-130*			*S-04*
Matrix Spike Dup (2030048-MSD1)	**Source: L203023-04**			Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	241	50	ug/l	250	ND	96.4	60-140	1.24	25	
Surrogate: a,a,a-Trifluorotoluene	*12.6*		"	*10.0*		*126*	*70-130*			

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B - Quality Control

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2030049 - EPA 5030B (P/T)										
Blank (2030049-BLK1)				Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	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	5.0	"							
Surrogate: a,a,a-Trifluorotoluene	*9.32*		"	*10.0*		*93.2*	*70-130*			
LCS (2030049-BS1)				Prepared & Analyzed: 03/19/02						
Benzene	9.01	0.50	ug/l	10.0		90.1	70-130			
Toluene	8.68	0.50	"	10.0		86.8	70-130			
Ethylbenzene	9.08	0.50	"	10.0		90.8	70-130			
Xylenes (total)	27.2	0.50	"	30.0		90.7	70-130			
Surrogate: a,a,a-Trifluorotoluene	*10.3*		"	*10.0*		*103*	*70-130*			
LCS (2030049-BS2)				Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	220	50	ug/l	250		88.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	*8.23*		"	*10.0*		*82.3*	*70-130*			
Matrix Spike (2030049-MS1)		**Source: L203064-06**		Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	215	50	ug/l	250	ND	86.0	60-140			
Surrogate: a,a,a-Trifluorotoluene	*8.94*		"	*10.0*		*89.4*	*70-130*			
Matrix Spike Dup (2030049-MSD1)		**Source: L203064-06**		Prepared & Analyzed: 03/19/02						
Purgeable Hydrocarbons as Gasoline	225	50	ug/l	250	ND	90.0	60-140	4.55	25	
Surrogate: a,a,a-Trifluorotoluene	*9.21*		"	*10.0*		*92.1*	*70-130*			

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Total Purgeable Hydrocarbon (C6-C12) by EPA 8015M and BTEX/MTBE by EPA 8021B - Quality Control

Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2030052 - EPA 5030B (P/T)										
Blank (2030052-BLK1)				Prepared & Analyzed: 03/20/02						
Purgeable Hydrocarbons as Gasoline	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	5.0	"							
Surrogate: a,a,a-Trifluorotoluene	*11.8*		"	*10.0*		*118*	*70-130*			
LCS (2030052-BS1)				Prepared & Analyzed: 03/20/02						
Benzene	11.7	0.50	ug/l	10.0		117	70-130			
Toluene	11.6	0.50	"	10.0		116	70-130			
Ethylbenzene	11.7	0.50	"	10.0		117	70-130			
Xylenes (total)	35.0	0.50	"	30.0		117	70-130			
Surrogate: a,a,a-Trifluorotoluene	*12.1*		"	*10.0*		*121*	*70-130*			
LCS (2030052-BS2)				Prepared & Analyzed: 03/20/02						
Purgeable Hydrocarbons as Gasoline	235	50	ug/l	250		94.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	*12.3*		"	*10.0*		*123*	*70-130*			
Matrix Spike (2030052-MS1)		**Source: L203031-05**		Prepared: 03/20/02 Analyzed: 03/21/02						
Benzene	8.98	0.50	ug/l	10.0	ND	89.8	60-140			
Toluene	9.66	0.50	"	10.0	ND	96.6	60-140			
Ethylbenzene	10.1	0.50	"	10.0	ND	101	60-140			
Xylenes (total)	29.7	0.50	"	30.0	ND	99.0	60-140			
Surrogate: a,a,a-Trifluorotoluene	*11.3*		"	*10.0*		*113*	*70-130*			
Matrix Spike Dup (2030052-MSD1)		**Source: L203031-05**		Prepared: 03/20/02 Analyzed: 03/21/02						
Benzene	9.12	0.50	ug/l	10.0	ND	91.2	60-140	1.55	25	
Toluene	9.91	0.50	"	10.0	ND	99.1	60-140	2.55	25	
Ethylbenzene	10.3	0.50	"	10.0	ND	103	60-140	1.96	25	
Xylenes (total)	31.4	0.50	"	30.0	ND	105	60-140	5.56	25	
Surrogate: a,a,a-Trifluorotoluene	*10.8*		"	*10.0*		*108*	*70-130*			

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Cambria Environmental [1]	Project: ARCO	
6262 Hollis St.	Project Number: ARCO#6041, Dublin	**Reported:**
Emeryville CA, 94608	Project Manager: Ron Scheele	03/26/02 15:13

Notes and Definitions

M-04	MTBE was reported from second analysis.
P-01	Chromatogram Pattern: Gasoline C6-C12
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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 Products Company
Division of Atlantic Richfield Company

RAT 118 — Task Order No. WAR# 28857.00

Chain of Custody

ARCO Facility no. 6041	City (Facility) Dublin	Project manager (Consultant) Ron Scheels	Laboratory name Sequoia
ARCO engineer Paul Supple	Telephone no. (ARCO) 925-299-8891	Telephone no. (Consultant) 510-450-1983	Fax no. (Consultant) 510-450-8295
Consultant name Cambria Env.	Address (Consultant) 6262 Hollis St. Emeryville Ca		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 8021/EPA 8020	BTEX/TPH$_g$ EPA M8020/8015 (M)	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM5520E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi ☐	CAM METALS EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
Shell MW-6	01	4		X		X	X	3-6-02	8:00		X											
Shell MW-7	02	4		X		X	X	3-6-02	8:30		X											
MW-2	03	4		X		X	X	3-6-02	9:30		X											
MW-3	04	4		X		X	X	3-6-02	10:00		X											
MW-4	05	4		X		X	X	3-6-02	9:00		X											
MW-6	06	4		X		X	X	3-6-02	10:30		X											
MW-8	07	4		X		X	X	3-6-02	11:00		X											
Dup	08	4		X		X	X	3-6-02			X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC

Remarks: Report Results in EDF format

Lab number: L203046

Turnaround time

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

Condition of sample:

Temperature received:

Relinquished by sampler: L. Mull	Date 3/12/02	Time 1030	Received by: Hutton Seq. SC
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by — Date — Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APC-3292 (2-91)

APPENDIX C

FIELD DATA SHEETS

CAMBRIA

WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-1		does not exist				
MW-2			8.61			
MW-3			9.33			
MW-4			8.27			
MW-5		buried under pavement				
MW-6			9.31			
MW-7			no water		8.00	
MW-8			8.63		12.70	
VW-2		does not exist				
Shell-MW-6			9.90			
Shell-MW-7			7.03			

Project Name: Arco 6041

Project Number: _____

Measured By: S. Hill

Date: 3-6-02

F:\TEMPLATE\FORMS\FIELD\GW-DEPTH.WPD

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Darryk Ataide**	Well ID: MW-2
Project Number: **436 - 1610**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" **pvc**
		Technician(s): SG
Initial Depth to Water: 8.61	Total Well Depth:	Water Column Height:
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purge/No Purge:		
Purging Device: **Submersible Pump**	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

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
					DO = 0.35 mg/L
		ND purge			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-2	3-6-02	9:30	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8020**

D:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD
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CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Darryk Ataide**	Well ID: MW-3
Project Number: **436 - 1610**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 9.33	Total Well Depth: 14.70	Water Column Height: 5.37
Volume/ft: 0.65	1 Casing Volume: 3.49	3 Casing Volumes: 10.47
Purge/No Purge: purge		
Purging Device: ~~Submersible Pump~~ 4" pvc bailer	Did Well Dewater?: no	Total Gallons Purged: 10
Start Purge Time: 9:40	Stop Purge Time: 9:54	Total Time: 14 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
9:45	3	16.9	7.20	2170	
9:50	6	16.7	7.25	2395	
9:55	10	16.8	7.24	2370	
					DO = 0.43 mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-3	3-6-02	10:00	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8020**

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CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Ron Scheele**	Well ID: MW-4
Project Number: **438 - 1643**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 8.27	Total Well Depth: 14.40	Water Column Height: 6.13
Volume/ft: 0.65	1 Casing Volume: 3.98	3 Casing Volumes: 11.95
Purge/No Purge: purge		
Purging Device: ~~Submersible Pump~~ 4" pvc bailer	Did Well Dewater?: no	Total Gallons Purged: 12
Start Purge Time: 8:40	Stop Purge Time: 8:54	Total Time: 14 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
8:45	4	16.9	7.31	3999	
8:50	8	16.8	7.45	3999	
8:55	12	16.8	7.40	3999	DO = 0.37 mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4	3-6-02	9:00	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8020**

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NSM 5/31/94

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Ron Scheele**	Well ID: MW-6
Project Number: **438 - 1643**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 9.31	Total Well Depth: 12.25	Water Column Height: 2.94
Volume/ft: 0.65	1 Casing Volume: 1.91	3 Casing Volumes: 5.73
Purge/No Purge:		
Purging Device: **Submersible Pump**	Did Well Dewater?: yes	Total Gallons Purged: 5
Start Purge Time:	Stop Purge Time:	Total Time:

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
					DO = 0.33 mg/L
		purged 5 gallons dewatered			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-6	3-6-02	10:30	4 VOA	HCL	TPHg, BTEX, MTBE	8020

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Ron Scheele**	Well ID: MW-8
Project Number: **438 - 1643**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 8.63	Total Well Depth: 12.70	Water Column Height: 4.05
Volume/ft: 0.65	1 Casing Volume: 2.63	3 Casing Volumes: 7.89
Purge/No Purge:		
Purging Device: **Submersible Pump**	Did Well Dewater?: yes	Total Gallons Purged: 2
Start Purge Time:	Stop Purge Time:	Total Time:

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
		@ purged 2gallons dewatered			DO=0.25mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-8	3-6-02	11:00	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8020**
DUP						

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NSM 5/31/94

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Darryk Ataide**	Well ID: Shell MW-6
Project Number: **436 - 1610**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 9.90	Total Well Depth: 22.70	Water Column Height: 12.80
Volume/ft: 0.65	1 Casing Volume: 8.32	3 Casing Volumes: 24.96
Purge/No Purge: purge		
Purging Device: ~~Submersible Pump~~ 4" pvc bailer	Did Well Dewater?: no	Total Gallons Purged: 24
Start Purge Time: 7:40	Stop Purge Time: 7:54	Total Time: 14 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
7:45	8	16.7	7.01	2570	
7:50	16	16.9	7.03	2911	
7:55	24	17.1	7.01	3015	
					DO = 0.97 mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
Shell MW-6	3-6-02	8:00	4 VOA	HCL	TPHg, BTEX, MTBE	8020

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WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Darryk Ataide**	Well ID: Shell-MW-7
Project Number: **436 - 1610**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 7.03	Total Well Depth: 16.30	Water Column Height: 9.27
Volume/ft: 0.65	1 Casing Volume: 6.02	3 Casing Volumes: 18.06
Purge/No Purge: purge		
Purging Device: **Submersible Pump**	Did Well Dewater?: no	Total Gallons Purged: 18
Start Purge Time: 8:10	Stop Purge Time: 8:24	Total Time: 14 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
8:15		16.9	7.47	1391	
8:20		16.7	7.31	1355	
8:25		16.7	7.29	1401	DO 0.95 mg/L

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-7	3-6-02	8:30	4 VOA	HCL	TPHg, BTEX, MTBE	8020

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6041**	Cambria Mgr: **Darryk Ataide**	Well ID: Shell-MW-7
Project Number: **436 - 1610**	Date: 3-6-02	Well Yield:
Site Address: **7249 Village Pkwy, Dublin**	Sampling Method: **Disposable bailer**	Well Diameter: 4" pvc
		Technician(s): SG
Initial Depth to Water: 7.03	Total Well Depth: 16.30	Water Column Height: 9.27
Volume/ft: 0.65	1 Casing Volume: 6.02	3 Casing Volumes: 18.06
Purge/No Purge: purge		
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Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-7	3-6-02	8:30	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8020**

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