CAMBRIA

October 10, 2000

ENVIRONMENTAL PROTECTION
00 OCT 17 PM 2:40

Mr. Amir Gholami,
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

STID 3942

Re: **Third Quarter 2000 Monitoring Report**
Former ARCO Service Station No. 6002
6235 Seminary Avenue
Oakland, California
Cambria Project #436-1609

Dear Mr. Gholami:

On behalf of ARCO, Cambria Environmental Technology, Inc. (Cambria) is submitting the attached report which presents the results of the third quarter 2000 groundwater monitoring program at former ARCO Service Station No. 6002, located at 6235 Seminary Avenue, Oakland, California. The monitoring program complies with the Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

Please call if you have questions.

Sincerely,
Cambria Environmental Technology, Inc.

Darryk Ataide, REA
Senior Project Manager

Attachment: Quarterly Groundwater Monitoring Report, Third Quarter 2000

cc: Mr. Paul Supple, ARCO, PO Box 6549 Moraga, CA 94570

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

Cambria Environmental Technology, Inc.

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

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CAMBRIA

Quarterly Groundwater Monitoring Report

Third Quarter 2000

Former Arco Service Station 6002
6235 Seminary Avenue
Oakland, California
Cambria Project #436-1609

Prepared For:

Mr. Paul Supple
ARCO

October 10, 2000

Prepared By:
Cambria Environmental Technology, Inc.
1144 65th Street, Suite B
Oakland, California 94608

REGISTERED GEOLOGIST • RONALD A. SCHEELE • No. 6842 • STATE OF CALIFORNIA

Written by:

Jason D. Olson
Staff Environmental Scientist

Ron Scheele, RG
Senior Project Manager

CAMBRIA

Date: October 10, 2000
Quarter: 3rd Quarter, 2000

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.:	6002	Address:	6235 Seminary Avenue, Oakland, California
ARCO Environmental Engineer			Paul Supple
Consulting Co./Contact Person:			Cambria Environmental Technology, Inc./Ron Scheele, RG
Consultant Project No.:			436-1609
Primary Agency/Regulatory ID No.:			ACHCSA

WORK PERFORMED THIS QUARTER (THIRD - 2000):

1. Submitted quarterly groundwater monitoring report for second quarter.
2. Performed third quarter groundwater monitoring and sampling on August 17, 2000.

WORK PROPOSED FOR NEXT QUARTER (FOURTH - 2000):

1. Prepare and submit quarterly groundwater monitoring report for third quarter 2000.
2. Perform quarterly groundwater monitoring and sampling for fourth quarter 2000.

QUARTERLY MONITORING:

Current Phase of Project:	Quarterly Groundwater Monitoring
Frequency of Sampling:	Annual (1st Quarter): MW-3, MW-6 Quarterly: MW-4, MW-5, MW-7, MW-8, VW-1, VW-4
Frequency of Monitoring:	Quarterly (groundwater)
Is Floating Product (FP) Present On-site:	No
Bulk Soil Removed to Date :	approximately 370 cubic yards of TPH impacted soil
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	Natural Attenuation
Average Depth to Groundwater:	9.56 ft
Groundwater Flow Direction and Gradient (Average):	0.087 ft/ft toward West

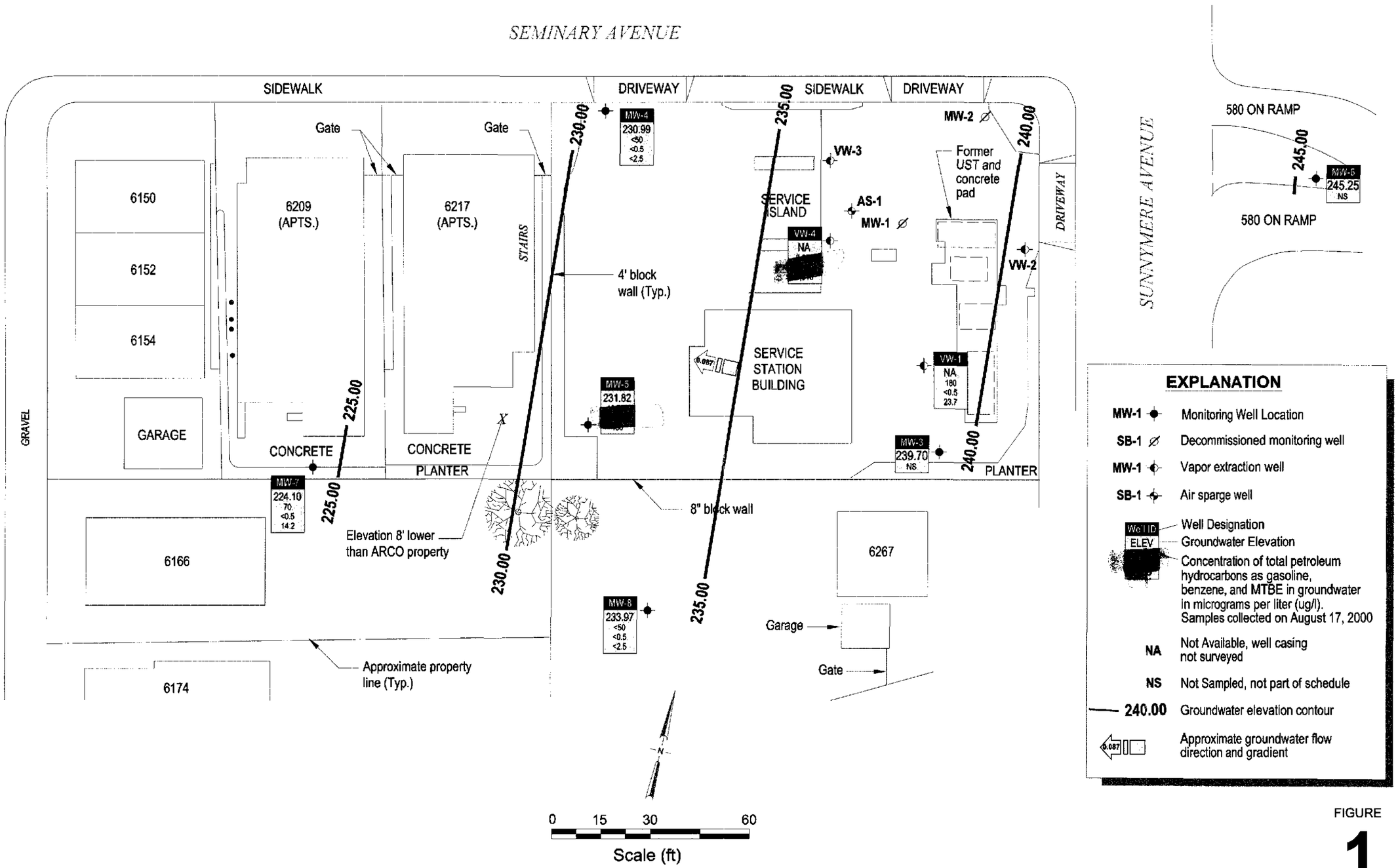
ATTACHMENTS:

- Figure 1 - Groundwater Elevation Contour and Analytical Summary Map
- Table 1 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- 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

08/19/00

Groundwater Elevation Contours

August 17, 2000



EXPLANATION

MW-1	Monitoring Well Location
SB-1	Decommissioned monitoring well
MW-1	Vapor extraction well
SB-1	Air sparge well
Well ID / ELEV	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 August 17, 2000
NA	Not Available, well casing not surveyed
NS	Not Sampled, not part of schedule
240.00	Groundwater elevation contour
0.087	Approximate groundwater flow direction and gradient

FIGURE

1

Basemap from IT Corporation

CAMBRIA

ARCO Service Station 6002

6235 Seminary Avenue

Oakland, California

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

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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	03-15-95	247.06	7.37	ND	239.69	03-15-95	13,000	1,200	44	770	1,100	--	--		
MW-1	05-30-95	247.06	8.48	ND	238.58	05-30-95	19,000	1,600	30	890	1,400	--	--		
MW-1	09-01-95	247.06	9.47	ND	237.59	09-01-95	14,000	1,300	28	480	780	24,000	--		
MW-1	11-13-95	247.06	8.78	0.01	238.29[1]	11-13-95	11,000	570	17	260	410	--	25,000[2]		
MW-1	02-23-96	247.06	Well was decommissioned on 2-12-96												
MW-2	03-15-95	249.30	8.25	ND	241.05	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-2	05-30-95	249.30	9.93	ND	239.37	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-2	09-01-95	249.30	10.69	ND	238.61	09-01-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-2	11-13-95	249.30	10.32	ND	238.98	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-2	02-23-96	249.30	Well was decommissioned on 2-12-96												
MW-3	03-15-95	248.35	6.76	ND	241.59	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-3	05-30-95	248.35	7.81	ND	240.54	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-3	09-01-95	248.35	8.65	ND	239.70	09-01-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-3	11-13-95	248.35	8.25	ND	240.10	11-13-95	120	45	0.7	<0.5	6.2	--	--		
MW-3	02-23-96	248.35	6.64	ND	241.71	03-01-96	<50	<0.5	<0.5	0.6	1.9	<3	--		
MW-3	05-10-96	248.35	7.95	ND	240.40	05-10-96	Not sampled: well sampled annually, during the first quarter								
MW-3	08-09-96	248.35	8.06	ND	240.29	08-09-96	Not sampled: well sampled annually, during the first quarter								
MW-3	11-08-96	248.35	Not surveyed: inaccessible			11-11-96	Not sampled: inaccessible								
MW-3	03-21-97	248.35	8.21	ND	240.14	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-3	05-27-97	248.35	8.25	ND	240.10	05-27-97	Not sampled: well sampled annually, during the first quarter								
MW-3	08-05-97	248.35	8.29	ND	240.06	08-05-97	Not sampled: well sampled annually, during the first quarter								
MW-3	10-29-97	248.35	8.58	ND	239.77	10-29-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-3	02-25-98	248.35	7.69	ND	240.66	02-25-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-3	05-12-98	248.35	8.20	ND	240.15	05-12-98	Not sampled: well sampled annually, during the first quarter								
MW-3	07-28-98	248.35	8.55	ND	239.80	07-28-98	Not sampled: well sampled annually, during the first quarter								
MW-3	10-27-98	248.35	8.30	ND	240.05	10-27-98	Not sampled: well sampled annually, during the first quarter								
MW-3	02-08-99	248.35	7.90	ND	240.45	02-08-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-3	06-01-99	248.35	8.40	ND	239.95	06-01-99	Not sampled: well sampled annually, during the first quarter								
MW-3	08-25-99	248.35	8.49	ND	239.86	08-25-99	Not sampled: well sampled annually, during the first quarter							1.67	
MW-3	10-29-99	248.35	8.52	ND	239.83	10-29-99	Not sampled: well sampled annually, during the first quarter							6.90	
MW-3	02-16-00	248.35	8.03	ND	240.32	02-16-00	<50	<0.5	0.8	<0.5	<1	<3	--	8.51	NP

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Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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	06-23-00	248.35	7.55	ND	240.80	06-23-00	Not sampled: well sampled annually, during the first quarter							2.10	
MW-3	**08-17-00**	**248.35**	**8.65**	**ND**	**239.70**	**08-17-00**	**Not sampled: well sampled annually, during the first quarter**							**1.10**	
MW-4	03-15-95	242.91	9.37	ND	233.54	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	- -	- -		
MW-4	05-30-95	242.91	11.47	ND	231.44	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	- -	- -		
MW-4	09-01-95	242.91	12.28	ND	230.63	09-01-95	78	<0.5	0.7	<0.5	<0.5	<3	- -		
MW-4	11-13-95	242.91	11.75	ND	231.16	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	- -	- -		
MW-4	02-23-96	242.91	8.51	ND	234.40	03-01-96	59	1.2	7.4	1.6	9.3	3	- -		
MW-4	05-10-96	242.91	11.35	ND	231.56	05-10-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	08-09-96	242.91	9.70	ND	233.21	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	11-08-96	242.91	11.79	ND	231.12	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	03-21-97	242.91	10.94	ND	231.97	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	81	- -		
MW-4	05-27-97	242.91	11.51	ND	231.40	05-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	08-05-97	242.91	11.90	ND	231.01	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	10-29-97	242.91	12.00	ND	230.91	10-29-97	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	02-25-98	242.91	8.34	ND	234.57	02-25-98	<50	<0.5	0.9	<0.5	0.9	4	- -		
MW-4	05-12-98	242.91	10.93	ND	231.98	05-12-98	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	07-28-98	242.91	12.08	ND	230.83	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	10-27-98	242.91	11.40	ND	231.51	10-27-98	<5,000	<50	<50	160	64	6,400	- -		
MW-4	02-08-99	242.91	8.40	ND	234.51	02-08-99	<50	<0.5	<0.5	<0.5	<0.5	<3	- -		
MW-4	06-01-99	242.91	11.93	ND	230.98	06-01-99	<50	<0.5	<0.5	<0.5	<0.5	<3	- -	4.0	NP
MW-4	08-25-99	242.91	12.21	ND	230.70	08-25-99	<50	<0.5	<0.5	<0.5	<0.5	<3	- -	1.29	NP
MW-4	10-29-99	242.91	12.37	ND	230.54	10-29-99	<50	<0.5	<0.5	<0.5	<1	<3	- -	1.50	NP
MW-4	02-16-00	242.91	7.45	ND	235.46	02-16-00	<50	<0.5	<0.5	<0.5	<1	<3	- -	2.38	NP
MW-4	06-23-00	242.91	12.31	ND	230.60	06-23-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	- -	2.80	NP
DUP	**08-17-00**	- -	- -	- -	- -	**08-17-00**	**<50.0**	**<0.500**	**<0.500**	**<0.500**	**<0.500**	**<2.50**	**- -**	- -	- -
MW-4	**08-17-00**	**242.91**	**11.92**	**ND**	**230.99**	**08-17-00**	**<50.0**	**<0.500**	**<0.500**	**<0.500**	**<0.500**	**<2.50**	**- -**	**2.38**	**NP**
MW-5	03-15-95	244.82	11.99	ND	232.83	03-15-95	21,000	870	22	1,600	1,900	- -	- -		
MW-5	05-30-95	244.82	12.97	ND	231.85	05-30-95	17,000	2,100	250	1,000	520	- -	- -		
MW-5	09-01-95	244.82	14.03	ND	230.79	09-01-95	19,000	1,500	25	1,600	880	8,300	- -		
MW-5	11-13-95	244.82	13.65	ND	231.17	11-13-95	21,000	1,300	22	1,400	630	- -	- -		
MW-5	02-23-96	244.82	11.93	ND	232.89	03-01-96	27,000	1,300	<50	1,600	1,500	730	- -		

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6235 Seminary Avenue, Oakland, 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	05-10-96	244.82	13.05	ND	231.77	05-10-96	17,000	460	21	760	480	1,000	--		
MW-5	08-09-96	244.82	13.22	ND	231.60	08-09-96	16,000	420	14	870	390	1,500	--		
MW-5	11-08-96	244.82	Not surveyed: inaccessible			11-11-96	Not sampled: well inaccessible								
MW-5	03-21-97	244.82	13.24	ND	231.58	03-21-97	18,000	110	<50	730	1,500	1,800	--		
MW-5	05-27-97	244.82	13.10	ND	231.72	05-27-97	21,000	86	<20	810	610	1,700	--		
MW-5	08-05-97	244.82	13.14	ND	231.68	08-05-97	340	2.2	<0.5	15	8.8	39	--		
MW-5	10-29-97	244.82	13.03	ND	231.79	10-29-97	19,000	130	<20	1,400	620	1,700	--		
MW-5	02-25-98	244.82	11.33	ND	233.49	02-25-98	8,500	19	13	190	100	170	--		
MW-5	05-12-98	244.82	12.81	ND	232.01	05-12-98	10,000	34	<10	390	220	610	--		
MW-5	07-28-98	244.82	13.12	ND	231.70	07-28-98	15,000	68	<10	690	620	1,000	--		
MW-5	10-27-98	244.82	12.90	ND	231.92	10-27-98	15,000	60	<10	770	400	890	--		
MW-5	02-08-99	244.82	11.08	ND	233.74	02-08-99	8,200	23	<10	290	120	<60	--		
MW-5	06-01-99	244.82	12.95	ND	231.87	06-01-99	11,000	33	3.3	340	180	580	--	1.0	NP
MW-5	08-25-99	244.82	12.99	ND	231.83	08-25-99	9,200	26	14	420	270	1,100	--	0.37	NP
MW-5	10-29-99	244.82	13.10	ND	231.72	10-29-99	11,000	19	9.8	260	150	590	--	1.27	NP
MW-5	02-16-00	244.82	8.21	ND	236.61	02-16-00	12,000	8.1	10	340	160	130	--	1.42	NP
MW-5	06-23-00	244.82	12.90	ND	231.92	06-23-00	9,680	38.0	<20.0	212	114	930	--	1.40	NP
MW-5	**08-17-00**	**244.82**	**13.00**	**ND**	**231.82**	**08-17-00**	**10,500**	**15.0**	**7.98**	**223**	**118**	**430**	**--**	**0.68**	**NP**
MW-6	06-29-95	NR	6.63	ND	NR	06-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	09-01-95	NR	Not surveyed			09-01-95	Not sampled								
MW-6	11-13-95	NR	7.70	ND	NR	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	02-23-96	NR	9.82	ND	NR	03-01-96	<50	<0.5	0.8	<0.5	0.6	<3	--		
MW-6	05-10-96	NR	15.25	ND	NR	05-10-96	Not sampled: well sampled annually, during the first quarter								
MW-6	08-09-96	252.20	11.11	ND	241.09	08-09-96	Not sampled: well sampled annually, during the first quarter								
MW-6	11-08-96	252.20	9.31	ND	242.89	11-11-96	Not sampled: well sampled annually, during the first quarter								
MW-6	03-21-97	252.20	9.40	ND	242.80	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-27-97	252.20	7.08	ND	245.12	05-27-97	Not sampled: well sampled annually, during the first quarter								
MW-6	08-05-97	252.20	7.12	ND	245.08	08-05-97	Not sampled: well sampled annually, during the first quarter								
MW-6	10-29-97	252.20	7.42	ND	244.78	10-29-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	02-25-98	252.20	10.35	ND	241.85	02-25-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-12-98	252.20	15.83	ND	236.37	05-12-98	Not sampled: well sampled annually, during the first quarter								
MW-6	07-28-98	252.20	11.84	ND	240.36	07-28-98	Not sampled: well sampled annually, during the first quarter								

Table 1
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Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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	10-27-98	252.20	9.73	ND	242.47	10-27-98	Not sampled: well sampled annually, during the first quarter								
MW-6	02-08-99	252.20	8.10	ND	244.10	02-08-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	06-01-99	252.20	17.84	ND	234.36	06-01-99	Not sampled: well sampled annually, during the first quarter								
MW-6	08-25-99	252.20	11.00	ND	241.20	08-25-99	Not sampled: well sampled annually, during the first quarter							0.77	
MW-6	10-29-99	252.20	9.03	ND	243.17	10-29-99	Not sampled: well sampled annually, during the first quarter							3.42	
MW-6	02-16-00	252.20	7.71	ND	244.49	02-16-00	<50	<0.5	<0.5	<0.5	<1	<3	--	2.42	P
MW-6	06-23-00	252.20	6.69	ND	245.51	06-23-00	Not sampled: well sampled annually, during the first quarter							2.30	
MW-6	**08-17-00**	**252.20**	**6.95**	**ND**	**245.25**	**08-17-00**	**Not sampled: well sampled annually, during the first quarter**							**2.51**	
MW-7	08-09-96	235.95	Not surveyed: well was dry			08-09-96	Not sampled: well was dry								
MW-7	11-08-96	235.95	Not surveyed: well was dry			11-11-96	Not sampled: well was dry								
MW-7	01-27-97	235.95	NR	ND	NR	01-27-97	2,900	29	<5	<5	580	220	--		
MW-7	03-21-97	235.95	7.13	ND	228.82	03-21-97	590	3.5	<0.5	<0.5	1.3	90	--		
MW-7	05-27-97	235.95	9.02	ND	226.93	05-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	08-05-97	235.95	12.33	ND	223.62	08-05-97	110	0.5	<0.5	<0.5	0.8	81	--		
MW-7	10-29-97	235.95	Not surveyed: well was dry			10-29-97	Not sampled: well was dry								
MW-7	02-25-98	235.95	8.04	ND	227.91	02-25-98	<50	<0.5	0.6	<0.5	0.7	<3	--		
MW-7	05-12-98	235.95	8.88	ND	227.07	05-12-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	07-28-98	235.95	10.50	ND	225.45	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	10-27-98	235.95	8.75	ND	227.20	10-27-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	02-08-99	235.95	9.35	ND	226.60	02-08-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	06-01-99	235.95	9.85	ND	226.10	06-01-99	250	<0.5	0.6	<0.5	1.6	18	--	1.0	NP
MW-7	08-25-99	235.95	11.31	ND	224.64	08-25-99	119	<0.5	5.7	<0.5	<0.5	11	--	0.41	NP
MW-7	10-29-99	235.95	9.08	ND	226.87	10-29-99	<50	<0.5	<0.5	<0.5	<1	<3	--	1.29	NP
MW-7	02-25-00	235.95	8.02	ND	227.93	02-25-00	<50	<0.5	<0.5	<0.5	<1	38	--	2.10	NP
MW-7	06-23-00	235.95	10.68	ND	225.27	06-23-00	<50.0	<0.500	<0.500	<0.500	<0.500	14.4	--	1.60	NP
MW-7	**08-17-00**	**235.95**	**11.85**	**ND**	**224.10**	**08-17-00**	**70.0**	**<0.500**	**0.678**	**<0.500**	**1.07**	**14.2**	**--**	**1.59**	**NP**
MW-8	08-09-96	240.37	9.41	ND	230.96	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	11-08-96	240.37	9.19	ND	231.18	11-11-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	03-21-97	240.37	8.55	ND	231.82	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	05-27-97	240.37	11.06	ND	229.31	05-27-97	91	0.6	<0.5	<0.5	0.6	66	--		
MW-8	08-05-97	240.37	9.32	ND	231.05	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		

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

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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-8	10-29-97	240.37	9.35	ND	231.02	10-29-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	02-25-98	240.37	7.08	ND	233.29	02-25-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	05-12-98	240.37	8.61	ND	231.76	05-12-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	07-28-98	240.37	9.63	ND	230.74	07-28-98	<50	<0.5	<0.5	<0.5	<0.5	4	--		
MW-8	10-27-98	240.37	9.30	ND	231.07	10-27-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	02-08-99	240.37	5.56	ND	234.81	02-17-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-8	06-01-99	240.37	Not surveyed: inaccessible			06-01-99	Not sampled: well inaccessible								
MW-8	08-25-99	240.37	Not surveyed: inaccessible			08-25-99	Not sampled: well inaccessible								
MW-8	10-29-99	240.37	Not surveyed: inaccessible			10-29-99	Not sampled: well inaccessible								
MW-8	02-16-00	240.37	Not surveyed: inaccessible			02-16-00	Not sampled: well inaccessible								
MW-8	06-23-00	240.37	9.45	ND	230.92	06-23-00	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50		1.90	NP
MW-8	**08-17-00**	**240.37**	**6.40**	**ND**	**233.97**	**08-17-00**	**<50.0**	**<0.500**	**<0.500**	**<0.500**	**<0.500**	**<2.50**		**2.56**	**NP**
AS-1	06-29-95	NR	9.20	ND	NR	06-30-95	<50	1.6	<0.5	0.9	0.9	--	--		
VW-1	02-23-96	NR	5.29	ND	NR	03-01-96	21,000	490	57	520	1,500	240	--		
VW-1	05-10-96	NR	6.80	ND	NR	05-10-96	3,700	61	<5	100	50	200	--		
VW-1	08-09-96	NR	7.03	ND	NR	08-09-96	970	2.7	<2.5	2.7	3.7	180	--		
VW-1	11-08-96	NR	Not surveyed: inaccessible			11-11-96	Not sampled: well inaccessible								
VW-1	03-21-97	NR	7.51	ND	NR	03-21-97	640	<4	<1	1	3	194	--		
VW-1	05-27-97	NR	7.51	ND	NR	05-27-97	Not sampled: well sampled semi-annually, during the first and third quarters								
VW-1	08-05-97	NR	7.51	ND	NR	08-05-97	630	<1	<1	3	2	120	--		
VW-1	10-29-97	NR	7.53	ND	NR	10-29-97	600	<0.5	<0.5	<0.5	1.6	84	--		
VW-1	02-25-98	NR	6.77	ND	NR	02-25-98	230	<4	<0.7	1.2	0.5	27	--		
VW-1	05-12-98	NR	7.43	ND	NR	05-12-98	340	<0.5	0.5	2.3	0.8	29	--		
VW-1	07-28-98	NR	7.00	ND	NR	07-28-98	240	<0.5	<0.5	<0.5	1.1	54	--		
VW-1	10-27-98	NR	7.52	ND	NR	10-27-98	230	<0.5	<0.5	<0.5	<0.5	65	--		
VW-1	02-08-99	NR	7.05	ND	NR	02-08-99	<50	<0.5	<0.5	<0.5	<0.5	<3	36[3]		
VW-1	06-01-99	NR	7.55	ND	NR	06-01-99	180	<0.5	<0.5	<0.5	<0.5	23	--	1.0	NP
VW-1	08-25-99	NR	7.66	ND	NR	08-25-99	130	<0.5	5.6	<0.5	<0.5	40	--	0.39	NP
VW-1	10-29-99	NR	7.59	ND	NR	10-29-99	200	1.0	<0.5	0.6	1.6	36	--	0.89	NP
VW-1	02-16-00	NR	7.03	ND	NR	02-16-00	210	<0.5	0.9	2.2	1.9	11	--	1.41	NP
VW-1	06-23-00	NR	7.71	ND	NR	06-23-00	175	1.04	<0.500	<0.500	<0.500	14.4	--	1.90	NP

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

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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)
VW-1	**08-17-00**	**NR**	**7.75**	**ND**	**NR**	**08-17-00**	**180**	**<0.500**	**<0.500**	**0.622**	**0.760**	**23.7**	--	**0.63**	**NP**
VW-2	02-23-96	NR	6.92	ND	NR	03-01-96	Not sampled: well not part of sampling program								
VW-4	05-10-96	NR	8.58	ND	NR	05-10-96	13,000	2,500	41	420	660	43,000	--		
VW-4	08-09-96	NR	11.70	ND	NR	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	6,200	--		
VW-4	11-08-96	NR	9.38	ND	NR	11-08-96	7,800	510	7	180	370	21,000	--		
VW-4	03-21-97	NR	9.11	ND	NR	03-21-97	10,000	290	10	270	230	8,900	--		
VW-4	05-27-97	NR	9.34	ND	NR	05-27-97	Not sampled: well sampled semi-annually, during the first and third quarters								
VW-4	08-05-97	NR	9.47	ND	NR	08-05-97	<10,000	180	<100	<100	110	12,000	--		
VW-4	10-29-97	NR	9.35	ND	NR	10-29-97	9,800	200	69	260	360	4,900	--		
VW-4	02-25-98	NR	7.08	ND	NR	02-25-98	<50	2.5	<0.5	<0.5	0.7	<3	--		
VW-4	05-12-98	NR	9.17	ND	NR	05-12-98	3,200	<20	22	29	52	2,100	--		
VW-4	07-28-98	NR	9.55	ND	NR	07-28-98	<10,000	<100	<100	<100	<100	5,100	--		
VW-4	10-27-98	NR	9.92	ND	NR	10-27-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
VW-4	02-08-99	NR	7.50	ND	NR	02-08-99	<2,500	<25	<25	28	<25	2,400	3,100[3]		
VW-4	06-01-99	NR	9.87	ND	NR	06-01-99	2,100	2.5	1.1	2.5	15	3,300	--	2.0	NP
VW-4	08-25-99	NR	9.78	ND	NR	08-25-99	1,300	4.4	4.9	1.7	2.9	4,600	--	0.36	NP
VW-4	10-29-99	NR	9.93	ND	NR	10-29-99	1,400	<0.5	1.8	1.6	3.0	4,200	--	1.18	NP
VW-4	02-16-00	NR	7.45	ND	NR	02-16-00	1,800	<0.5	2.9	15	10	3,400	--	1.01	NP
DUP 1	06-23-00	--	--	--	--	06-23-00	1,260	<2.00	<2.00	<2.00	2.73	2,720	--	--	--
VW-4	06-23-00	NR	9.74	ND	NR	06-23-00	1,360	<2.00	2.26	<2.00	2.25	4,900	--	1.50	NP
VW-4	**08-17-00**	**NR**	**9.95**	**ND**	**NR**	**08-17-00**	**2,230**	**<10.0**	**<10.0**	**<10.0**	**<10.0**	**5,310**	--	**1.13**	**NP**

TPH: Total petroleum hydrocarbons by modified EPA method 8015

BTEX: Benzene, toluene, ethylbenzene, xylenes by EPA method 8021B. (EPA method 8020 prior to 10/29/99).

MTBE: Methyl tert-butyl ether

*: EPA method 8020 prior to 10/29/99

TOC: Top of Casing

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

µg/L: micrograms per liter

mg/L: milligrams per liter

ND: none detected

NR: not reported; data not available or not measurable

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

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, 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)

- -: not analyzed or not applicable

<: less than laboratory detection limit stated to the right

[1]: [corrected elevation (Z')] = Z + (h * 0.73) where: Z: measured elevation, h: floating product thickness, 0.73: density ratio of oil to water

[2]: analyzed by EPA method 8240

[3]: also analyzed for fuel oxygenates

**: For previous historical groundwater elevation data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6002, Oakland, California, (EMCON, February 23, 1996)*

Table 2
Groundwater Flow Direction and Gradient

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03-15-95	West-Southwest	0.08
05-30-95	West-Southwest	0.08
09-01-95	West-Southwest	0.09
11-13-95	West-Southwest	0.08
02-23-96	West-Southwest	0.08
05-10-96	West-Southwest	0.08
08-09-96	Southwest	0.08
11-08-96	Southwest	0.055
03-21-97	West-Southwest	0.051
05-27-97	West-Southwest	0.069
08-05-97	West	0.076
10-29-97	West-Southwest	0.036
02-25-98	West-Southwest	0.052
05-12-98	West	0.07
07-28-98	West	0.07
10-27-98	West-Southwest	0.06
02-08-99	West-Southwest	0.07
06-01-99	West-Northwest	0.07
08-25-99	West-Southwest	0.07
10-29-99	West	0.07
02-16-00	Southwest	0.05
06-23-00	West	0.042
08-17-00	**West**	**0.087**

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 24 hours 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

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342
www.sequoialabs.com

August 31, 2000

Ron Scheele
Cambria Environmental - Oakland
1144 65th St., Suite C
Oakland, CA 94608

RE: ARCO/P008459

Dear Ron Scheele

Enclosed are the results of analyses for sample(s) received by the laboratory on August 21, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Richard Stover
Project Manager

CA ELAP Certificate Number 2374

Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342
www.sequoialabs.com

Cambria Environmental - Oakland	Project:	ARCO	Sampled:	8/17/00
1144 65th St., Suite C	Project Number:	6002-Oakland	Received:	8/21/00
Oakland, CA 94608	Project Manager:	Ron Scheele	Reported:	8/31/00

ANALYTICAL REPORT FOR P008459

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-4	P008459-01	Water	8/17/00
MW-5	P008459-02	Water	8/17/00
MW-7	P008459-03	Water	8/17/00
MW-8	P008459-04	Water	8/17/00
VW-1	P008459-05	Water	8/17/00
VW-4	P008459-06	Water	8/17/00
DUP	P008459-07	Water	8/17/00

Sequoia Analytical

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Cambria Environmental - Oakland	Project:	ARCO	Sampled: 8/17/00
1144 65th St., Suite C	Project Number:	6002-Oakland	Received: 8/21/00
Oakland, CA 94608	Project Manager:	Ron Scheele	Reported: 8/31/00

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

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-4			**P008459-01**				**Water**	
Gasoline	0080549	8/23/00	8/23/00		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*103*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*92.7*	*"*	
MW-5			**P008459-02**				**Water**	
Gasoline	0080549	8/23/00	8/23/00		250	**10500**	ug/l	
Benzene	"	"	"		2.50	**15.0**	"	1
Toluene	"	"	"		2.50	**7.98**	"	
Ethylbenzene	"	"	"		2.50	**223**	"	
Xylenes (total)	"	"	"		2.50	**118**	"	
Methyl tert-butyl ether	"	"	"		12.5	**430**	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*95.3*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*92.3*	*"*	
MW-7			**P008459-03**				**Water**	
Gasoline	0080549	8/23/00	8/23/00		50.0	**70.0**	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	**0.678**	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	**1.07**	"	
Methyl tert-butyl ether	"	"	"		2.50	**14.2**	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*101*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*90.3*	*"*	
MW-8			**P008459-04**				**Water**	
Gasoline	0080549	8/23/00	8/24/00		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*101*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*90.3*	*"*	
VW-1			**P008459-05**				**Water**	
Gasoline	0080549	8/23/00	8/24/00		50.0	**180**	ug/l	

Sequoia Analytical

1455 McDowell Blvd. North, Ste. D
Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342
www.sequoialabs.com

Cambria Environmental - Oakland	Project:	ARCO	Sampled: 8/17/00
1144 65th St., Suite C	Project Number:	6002-Oakland	Received: 8/21/00
Oakland, CA 94608	Project Manager:	Ron Scheele	Reported: 8/31/00

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

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
VW-1 (continued)			**P008459-05**				**Water**	
Benzene	0080549	8/23/00	8/24/00		0.500	ND	ug/l	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	**0.622**	"	
Xylenes (total)	"	"	"		0.500	**0.760**	"	
Methyl tert-butyl ether	"	"	"		2.50	**23.7**	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*101*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*92.7*	"	
VW-4			**P008459-06**				**Water**	
Gasoline	0080549	8/24/00	8/24/00		1000	**2230**	ug/l	
Benzene	"	"	"		10.0	ND	"	
Toluene	"	"	"		10.0	ND	"	
Ethylbenzene	"	"	"		10.0	ND	"	
Xylenes (total)	"	"	"		10.0	ND	"	
Methyl tert-butyl ether	"	"	"		50.0	**5310**	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*101*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*95.7*	"	
DUP			**P008459-07**				**Water**	
Gasoline	0080549	8/23/00	8/24/00		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		0.500	ND	"	
Methyl tert-butyl ether	"	"	"		2.50	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	*65.0-135*		*100*	*%*	
Surrogate: 4-Bromofluorobenzene	"	"	"	*65.0-135*		*91.3*	"	

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Petaluma, CA 94954
(707) 792-1865
FAX (707) 792-0342
www.sequoialabs.com

Cambria Environmental - Oakland	Project:	ARCO	Sampled: 8/17/00
1144 65th St., Suite C	Project Number:	6002-Oakland	Received: 8/21/00
Oakland, CA 94608	Project Manager:	Ron Scheele	Reported: 8/31/00

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

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0080549	**Date Prepared: 8/23/00**					**Extraction Method: EPA 5030 waters**				
Blank	**0080549-BLK1**									
Gasoline	8/23/00			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**0.500**				
Methyl tert-butyl ether	"			**ND**	"	**2.50**				
Surrogate: a,a,a-Trifluorotoluene	"	*300*		*305*	"	*65.0-135*	*102*			
Surrogate: 4-Bromofluorobenzene	"	*300*		*283*	"	*65.0-135*	*94.3*			
Blank	**0080549-BLK2**									
Gasoline	8/24/00			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**0.500**				
Methyl tert-butyl ether	"			**ND**	"	**2.50**				
Surrogate: a,a,a-Trifluorotoluene	"	*300*		*287*	"	*65.0-135*	*95.7*			
Surrogate: 4-Bromofluorobenzene	"	*300*		*252*	"	*65.0-135*	*84.0*			
LCS	**0080549-BS1**									
Gasoline	8/23/00	1000		952	ug/l	65.0-135	95.2			
Surrogate: 4-Bromofluorobenzene	"	*300*		*290*	"	*65.0-135*	*96.7*			
LCS	**0080549-BS2**									
Benzene	8/24/00	100		95.7	ug/l	65.0-135	95.7			
Toluene	"	100		95.5	"	65.0-135	95.5			
Ethylbenzene	"	100		94.8	"	65.0-135	94.8			
Xylenes (total)	"	300		282	"	65.0-135	94.0			
Methyl tert-butyl ether	"	100		86.3	"	65.0-135	86.3			
Surrogate: a,a,a-Trifluorotoluene	"	*300*		*294*	"	*65.0-135*	*98.0*			
Matrix Spike	**0080549-MS1**		**P008459-01**							
Gasoline	8/23/00	1000	ND	912	ug/l	65.0-135	**91.2**			
Surrogate: 4-Bromofluorobenzene	"	*300*		*267*	"	*65.0-135*	*89.0*			
Matrix Spike Dup	**0080549-MSD1**		**P008459-01**							
Gasoline	8/23/00	1000	ND	925	ug/l	65.0-135	**92.5**	20.0	**1.42**	
Surrogate: 4-Bromofluorobenzene	"	*300*		*276*	"	*65.0-135*	*92.0*			

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Cambria Environmental - Oakland	Project:	ARCO	Sampled:	8/17/00
1144 65th St., Suite C	Project Number:	6002-Oakland	Received:	8/21/00
Oakland, CA 94608	Project Manager:	Ron Scheele	Reported:	8/31/00

Notes and Definitions

#	Note
1	Results between the primary and confirmation columns varied by greater than 40% RPD.
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
Recov.	Recovery
RPD	Relative Percent Difference

ARCO Products Company
Division of Atlantic-Richfield Company

Rail #8 **Task Order No.** 26312.00

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	Project manager (Consultant) Ron Scheele	Laboratory name Seq
ARCO engineer Chuck Casmel	Telephone no. (ARCO)	Telephone no. (Consultant) 510-420-0700	Fax no. (Consultant) 510-420-9170
Consultant name Cambria Env. Tech	Address (Consultant) 1144 65th St Suite B Oakland, CA		Contract number 436-1609

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH (Gas) EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM METALS EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
MW-4		4		X			X	08-17-05	16:15		X						P0084569-01				
MW-5									16:45								-02				
MW-7									16:05								-03				
MW-8									15:55								-04				
VW-1									16:25								-05				
VW-4									16:35								-06				
DUP																					

COOLER CUSTODY SEALS INTACT ☐

NOT INTACT ☐

COOLER TEMPERATURE 3 °C

Special detection Limit/reporting: Lowest Possible

Special QA/QC

Remarks

Lab number

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: S. Hill	Date / Time	Received by	8-21-05 / 1530
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	Top of Screen	DTB	DTP	DTW	DOP	Casing Dia	Comments
2	MW-3	14:45	5'	24.4'		8.65		4"	DO = 1.10 mg/L
5	MW-4	15:05	4.5'	24'		11.92		4"	DO = 2.38 mg/L
8	MW-5	15:20	5'	24.4'		13.00		4"	DO = 0.68 mg/L
1	MW-6	14:40	17'	30'		6.95		2"	DO = 2.51 mg/L
4	MW-7	14:58	8.5'	13.3'		11.85		2"	DO = 1.59 mg/L
3	MW-8	14:53	5.5'	13.9'		6.40		2"	DO = 2.56 mg/L
6	VW-1	15:10	6'	14'		7.75		4"	DO = 0.63 mg/L
7	VW-4	15:15	6'	15'		9.95		4"	DO = 1.13 mg/L

Project Name: **ARCO 6002**

Project Number: **436-1609**

Measured By: J Dull

Date: 08-17-00

H:\ARCO\6002\Forms\ARCO_GW-DEPTH.WPD

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: MW-4
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: **" pvc** 4 "
		Technician(s): SG
Initial Depth to Water: 11.92	Total Well Depth: 24.00	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

NO PURGE

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4	08-17-00	16:15	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: MW-5
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: **" pvc** 4"
		Technician(s):
Initial Depth to Water: 13.00	Total Well Depth: 24.40	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
		NO PURGE			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-5	08-17-00	16:45	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: MW-7
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: **" pvc** 2"
		Technician(s): SC
Initial Depth to Water: 11.85	Total Well Depth: 13.30	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

no purge

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-7	08-17-00	16:05	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: MW-8
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: **" pvc** 2"
		Technician(s): SG
Initial Depth to Water: 6.40	Total Well Depth: 13.90	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
		NO PURGE			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-8	08-17-00	15:55	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: MW-1
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: **" pvc** 4"
		Technician(s): SG
Initial Depth to Water: 7.75	Total Well Depth: 14.00	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
		NO purge			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-1	08-17-00	16:25	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

CAMBRIA

WELL SAMPLING FORM

Project Name: **ARCO 6002**	Cambria Mgr: **Ron Scheele**	Well ID: VW-4
Project Number: **436 - 1609**	Date: 08-17-00	Well Yield:
Site Address: **6235 Seminary Ave, Oakland**	Sampling Method: **Disposable bailer**	Well Diameter: "pvc 4"
		Technician(s): SG
Initial Depth to Water: 9.95	Total Well Depth: 15.00	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
		NO Purge			

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
VW-4	08-17-00	16:35	**4 VOA**	**HCL**	**TPHg, BTEX, MTBE**	**8021B**

D:\TEMPLATE\FORMS\FIELD\WELLSAMP.WPD
NSM 5/31/94