

**EMCON**

1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

ENVIRONMENTAL
PROTECTION

97 MAR 24 PM 4:09

Date March 21, 1997Project 20805-121.003

4/17/97

SOS

To:

Mr. Scott Seery
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502

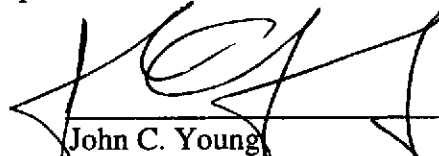
We are enclosing:

Copies	Description
<u>1</u>	<u>Fourth quarter 1996 groundwater monitoring results</u>
<u> </u>	<u>for ARCO service station 601, San Leandro, California</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

For your:	<u> X </u>	Use	Sent by:	<u> X </u>	Regular Mail
	<u> </u>	Approval		<u> </u>	Standard Air
	<u> </u>	Review		<u> </u>	Courier
	<u> </u>	Information		<u> </u>	Other: <u>Cert. Mail</u>

Comments:

The enclosed groundwater monitoring report is being sent to you per the request of ARCO Products Company. Please call if you have questions or comments.


John C. Young
Project Manager

cc: Kevin Graves, RWQCB - SFBR
Mike Bakaldin, SLFD
Paul Supple, ARCO Products Company
File





Date: March 14, 1997

Re: ARCO Station #

601 • 712 Lewelling Boulevard • San Leandro, CA
Fourth Quarter 1996 Groundwater Monitoring Results

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached proposal or report are true and correct."

Submitted by:

A handwritten signature in black ink, appearing to read "Paul Supple". The signature is written in a cursive, flowing style.

Paul Supple
Environmental Engineer

**EMCON**

1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

March 17, 1997
Project 20805-121.003

Mr. Paul Supple
ARCO Products Company
P.O. Box 6549
Moraga, California 94570

Re: Fourth quarter 1996 groundwater monitoring program results, ARCO service station 601, San Leandro, California

Dear Mr. Supple:

This letter presents the results of the fourth quarter 1996 groundwater monitoring program at ARCO Products Company (ARCO) service station 601, 712 Lewelling Boulevard, San Leandro, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

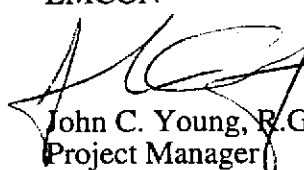
LIMITATIONS

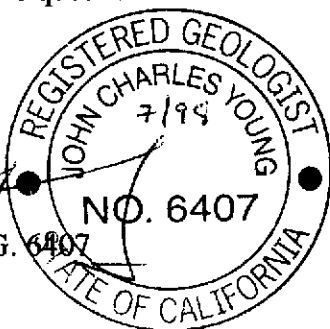
No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the scope, limitations, and cost of work performed during the monitoring event.

Please call if you have questions.

Sincerely,

EMCON


John C. Young, R.G. 6407
Project Manager



March 17, 1997

ARCO QUARTERLY REPORT

Station No.: 601 Address: 712 Lewelling Boulevard, San Leandro, California
EMCON Project No. 20805-121.003
ARCO Environmental Engineer/Phone No.: Paul Supple /(510) 299-8891
EMCON Project Manager/Phone No.: John C. Young /(408) 453-7300
Primary Agency/Regulatory ID No.: ACHCSA /Scott Seery

WORK PERFORMED THIS QUARTER (Fourth- 1996):

1. Performed quarterly groundwater monitoring for fourth quarter 1996.
2. Prepared and submitted quarterly groundwater monitoring report for third quarter 1996.
3. Installed oxygen releasing compounds (ORCs) into groundwater monitoring well MW-8.

WORK PROPOSED FOR NEXT QUARTER (First- 1997):

1. Perform quarterly groundwater monitoring and sampling for first quarter 1997.
2. Prepare and submit quarterly groundwater monitoring report for fourth quarter 1996.
3. Continue to monitor dissolved oxygen in groundwater monitoring wells MW-2, MW-3, MW-5, and MW-8.
4. Evaluate potential off-site plume migration.
5. Prepare and submit a risk-based corrective action evaluation.

QUARTERLY MONITORING:

Current Phase of Project: Quarterly Groundwater Monitoring
Frequency of Sampling: Quarterly (groundwater)
Frequency of Monitoring: Quarterly (groundwater)
Is Floating Product (FP) Present On-site: ☐ Yes ☒ No
Cumulative FP Recovered to Date : 3.45 gallons, Well MW-1
FP Recovered This Quarter : None
Bulk Soil Removed to Date : 1,565 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: Enhanced bioremediation
Approximate Depth to Groundwater: 7.01 feet
Groundwater Gradient (Average): 0.004 ft/ft toward south-southeast (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Fourth Quarter 1996
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Table 3 - Historical Groundwater Analytical Data, Metals
- Table 4 - Historical Groundwater Analytical Data, Volatile and Semivolatile Organic Compounds
- Table 5 - Approximate Cumulative Floating Product Recovered, Monitoring Well MW-1
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Fourth Quarter 1996

- Appendix A - Analytical Results and Chain of Custody Documentation, Fourth Quarter 1996
Groundwater Monitoring Event

cc: Scott Seery, ACHCSA
Kevin Graves, RWQCB-SFBR
Mike Bakaldin, SLFD

Table 1
Groundwater Monitoring Data
Fourth Quarter 1996

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method			
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
MW-1	11-20-96	22.26	7.84	14.42	ND	SSE	0.004	11-20-96	62000	5900	77	2000	7700	<300*	--	--	--			
MW-2	11-20-96	21.33	7.28	14.05	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-3	11-20-96	20.11	6.26	13.85	ND	SSE	0.004	11-20-96	190000	3200	5800	3300	20000	<1000*	--	--	--			
MW-4	11-20-96	20.75	7.89	12.86	ND	SSE	0.004	11-20-96	420	55	17	11	62	<3	--	--	--			
MW-5	11-20-96	20.90	6.88	14.02	ND	SSE	0.004	11-20-96	53000	8700	5700	920	4400	<500*	--	--	--			
MW-6	11-20-96	22.08	8.02	14.06	ND	SSE	0.004	11-20-96	11000	3300	<50*	480	370	<300*	--	--	--			
MW-7	11-20-96	22.89	9.17	13.72	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-8	11-20-96	20.97	7.01	13.96	ND	SSE	0.004	11-20-96	3900	<2.5*	<2.5*	12	<2.5*	930	--	--	--			
MW-9	11-20-96	20.89	7.06	13.83	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-10	11-20-96	21.12	7.81	13.31	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-11	11-20-96	22.38	8.37	14.01	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-12	11-20-96	22.77	8.38	14.39	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-13	11-20-96	22.45	7.76	14.69	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-14	11-20-96	22.99	8.95	14.04	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter											
MW-15	11-20-96	19.19	5.46	13.73	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters											

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

MWN: ground-water flow direction and gradient apply to the entire monitoring well network

ft/ft: foot per foot

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method

µg/L: micrograms per liter

EPA: United States Environmental Protection Agency

MTBE: methyl-tert-butyl ether

TRPH: total recoverable petroleum hydrocarbons

TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method

SSE: south-southeast

--: not analyzed

ND: none detected

*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1994 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	02-14-94	22.26	7.72	14.54	Sheen	NR	NR	02-14-94	Not sampled: well contained floating product								
MW-1	05-05-94	22.26	8.47	13.79	Sheen	NR	NR	05-05-94	Not sampled: well contained floating product								
MW-1	08-04-94	22.26	8.72	13.54	Sheen	SW	0.004	08-04-94	Not sampled: well contained floating product								
MW-1	11-20-94	22.26	7.81	14.45	Sheen	SW	0.002	11-20-94	Not sampled: well contained floating product								
MW-1	03-17-95	22.26	6.57	15.69	ND	WSW	0.006	03-17-95	120000	5300	370	1500	13000	--	--	48000	6200^
MW-1	06-01-95	22.26	7.87	14.39	ND	SW	0.003	06-01-95	250000	7100	950	3500	21000	--	--	38000	190000^
MW-1	08-31-95	22.26	8.12	** 14.15	0.01	SSW	0.005	08-31-95	Not sampled: well contained floating product								
MW-1	11-27-95	22.26	8.42	13.84	Sheen	SSW	0.004	11-27-95	310000	4600	770	5700	21000	--	--	--	--
MW-1	02-22-96	22.26	6.01	** 16.26	0.01	NW	0.007	03-14-96	100000	6200	320	2500	12000	<1000*	--	--	--
MW-1	05-20-96	22.26	7.03	15.23	ND	SW	0.007	05-21-96	340000	6600	240	4500	22000	<1000*	--	150	<2500^
MW-1	08-26-96	22.26	8.16	14.10	ND	SSW	0.004	08-26-96	210000	7900	320	3400	15000	<1000*	--	--	--
MW-1	11-20-96	22.26	7.84	14.42	ND	SSE	0.004	11-20-96	62000	5900	77	2000	7700	<300*	--	--	--
MW-2	02-14-94	21.33	6.88	14.45	ND	NR	NR	02-14-94	8700	670	370	50	1400	--	--	--	--
MW-2	05-05-94	21.33	7.51	13.82	ND	NR	NR	05-05-94	5600	390	140	120	480	--	--	--	--
MW-2	08-04-94	21.33	8.00	13.33	ND	SW	0.004	08-04-94	2300	180	<2.5*	<2.5*	230	--	--	--	--
MW-2	11-20-94	21.33	6.86	14.47	ND	SW	0.002	11-20-94	4900	170	150	120	390	--	--	--	--
MW-2	03-17-95	21.33	6.12	15.21	ND	WSW	0.006	03-17-95	10000	460	77	260	550	--	--	--	--
MW-2	06-01-95	21.33	6.56	14.77	ND	SW	0.003	06-01-95	13000	400	78	210	410	--	--	--	--
MW-2	08-31-95	21.33	7.18	14.15	ND	SSW	0.005	08-31-95	5000	280	18	120	140	<50*	--	--	--
MW-2	11-27-95	21.33	7.39	13.94	ND	SSW	0.004	11-27-95	3200	230	12	77	90	--	--	--	--
MW-2	02-22-96	21.33	5.78	15.55	ND	NW	0.007	03-14-96	11000	290	67	190	330	<50*	--	--	--
MW-2	05-20-96	21.33	6.27	15.06	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-2	08-26-96	21.33	7.30	14.03	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-2	11-20-96	21.33	7.28	14.05	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1994 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method				
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				
MW-3	02-14-94	20.11	5.81	14.30	ND	NR	NR	02-14-94	85000	4200	12000	2500	16000	--	--	--	--				
MW-3	05-05-94	20.11	6.81	13.30	ND	NR	NR	05-05-94	560000	4600	14000	5300	40000	--	--	--	--				
MW-3	08-04-94	20.11	7.31	12.80	ND	SW	0.004	08-04-94	64000	4200	7600	1700	12000	--	--	--	--				
MW-3	11-20-94	20.11	5.88	14.23	ND	SW	0.002	11-20-94	80000	4700	9700	2400	15000	--	--	--	--				
MW-3	03-17-95	20.11	5.46	14.65	ND	WSW	0.006	03-17-95	370000	4800	12000	5800	34000	--	--	--	--				
MW-3	06-01-95	20.11	6.34	13.77	ND	SW	0.003	06-01-95	270000	6000	11000	5200	28000	--	--	--	--				
MW-3	08-31-95	20.11	6.60	** 13.52	0.02	SSW	0.005	08-31-95	Not sampled: well contained floating product												
MW-3	11-27-95	20.11	6.76	** 13.36	0.01	SSW	0.004	11-27-95	150000	5100	8800	3900	21000	--	--	--	--				
MW-3	02-22-96	20.11	5.14	** 14.98	0.01	NW	0.007	03-14-96	150000	4400	7600	4100	22000	<3000*	--	--	--				
MW-3	05-20-96	20.11	5.17	14.94	ND	SW	0.007	05-21-96	410000	4700	8000	6300	36000	<3000*	--	--	--				
MW-3	08-26-96	20.11	7.04	13.07	ND	SSW	0.004	08-26-96	260000	4000	6100	4200	24000	<2000*	--	--	--				
MW-3	11-20-96	20.11	6.26	13.85	ND	SSE	0.004	11-20-96	190000	3200	5800	3300	20000	<1000*	--	--	--				
MW-4	02-14-94	20.75	DRY	DRY	ND	DRY	DRY	02-14-94	Not sampled: dry well												
MW-4	05-05-94	20.75	7.73	13.02	ND	NR	NR	05-05-94	1900	510	78	31	150	--	--	--	--				
MW-4	08-04-94	20.75	7.83	12.92	ND	SW	0.004	08-04-94	1300	360	17	<5*	190	--	--	--	--				
MW-4	11-20-94	20.75	7.73	13.02	ND	SW	0.002	11-20-94	<50	2.9	0.5	<0.5	1.4	--	--	--	--				
MW-4	03-17-95	20.75	6.65	14.10	ND	WSW	0.006	03-17-95	16000	1800	970	310	2500	--	--	--	--				
MW-4	06-01-95	20.75	7.25	13.50	ND	SW	0.003	06-01-95	16000	2800	870	380	2700	--	--	--	--				
MW-4	08-31-95	20.75	7.75	13.00	ND	SSW	0.005	08-31-95	9000	2000	270	270	1400	<100*	--	--	--				
MW-4	11-27-95	20.75	7.87	12.88	ND	SSW	0.004	11-27-95	3800	890	130	130	550	--	--	--	--				
MW-4	02-22-96	20.75	7.29	13.46	ND	NW	0.007	03-14-96	940	150	82	19	130	<20*	--	--	--				
MW-4	05-20-96	20.75	7.30	13.45	ND	SW	0.007	05-21-96	6700	1100	330	120	1100	<100*	--	--	--				
MW-4	08-26-96	20.75	7.57	13.18	ND	SSW	0.004	08-26-96	14000	2400	510	350	2100	<100*	--	--	--				
MW-4	11-20-96	20.75	7.89	12.86	ND	SSE	0.004	11-20-96	420	55	17	11	62	<3	--	--	--				

Table 2
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Petroleum Hydrocarbons and Their Constituents
1994 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TPPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-5	02-14-94	20.90	6.49	14.41	ND	NR	NR	02-14-94	46000	7300	5300	940	5200	--	--	--	--
MW-5	05-05-94	20.90	7.18	13.72	ND	NR	NR	05-05-94	54000	9700	4700	1000	6400	--	--	--	--
MW-5	08-04-94	20.90	7.83	13.07	ND	SW	0.004	08-04-94	57000	14000	3200	1200	7200	--	--	--	--
MW-5	11-20-94	20.90	6.34	14.56	ND	SW	0.002	11-20-94	33000	5700	1800	720	4700	--	--	--	--
MW-5	03-17-95	20.90	5.51	15.39	ND	WSW	0.006	03-17-95	48000	6400	2000	740	5100	--	--	--	--
MW-5	06-01-95	20.90	6.55	14.35	ND	SW	0.003	06-01-95	76000	11000	5400	1400	7700	--	--	--	--
MW-5	08-31-95	20.90	6.80	14.10	ND	SSW	0.005	08-31-95	53000	12000	1600	1000	6000	<500*	--	--	--
MW-5	11-27-95	20.90	7.13	13.77	ND	SSW	0.004	11-27-95	43000	7900	3300	950	4900	--	--	--	--
MW-5	02-22-96	20.90	5.12	15.78	ND	NW	0.007	03-14-96	52000	9100	3300	940	5000	<500*	--	--	--
MW-5	05-20-96	20.90	5.87	15.03	ND	SW	0.007	05-21-96	55000	9300	3800	1100	5400	<500*	--	--	--
MW-5	08-26-96	20.90	7.15	13.75	ND	SSW	0.004	08-26-96	47000	5300	2100	780	3200	<300*	--	--	--
MW-5	11-20-96	20.90	6.88	14.02	ND	SSE	0.004	11-20-96	53000	8700	5700	920	4400	<500*	--	--	--
MW-6	02-14-94	22.08	7.78	14.30	ND	NR	NR	02-14-94	47000	14000	390	1000	5100	--	--	--	--
MW-6	05-05-94	22.08	8.24	13.84	ND	NR	NR	05-05-94	45000	14000	<200*	1300	4500	--	--	--	--
MW-6	08-04-94	22.08	DRY	DRY	ND	DRY	DRY	08-04-94	Not sampled, dry well								
MW-6	11-20-94	22.08	7.41	14.67	ND	SW	0.002	11-20-94	30000	11000	<100*	1200	2300	--	--	--	--
MW-6	03-17-95	22.08	6.66	15.42	ND	WSW	0.006	03-17-95	45000	9300	<100*	1900	3600	--	--	--	--
MW-6	06-01-95	22.08	7.60	14.48	ND	SW	0.003	06-01-95	23000	5600	<50*	1300	1900	--	--	--	--
MW-6	08-31-95	22.08	7.92	14.16	ND	SSW	0.005	08-31-95	26000	8000	<100*	1900	900	<500*	--	--	--
MW-6	11-27-95	22.08	8.21	13.87	ND	SSW	0.004	11-27-95	6700	1800	<20*	480	230	--	--	--	--
MW-6	02-22-96	22.08	6.21	15.87	ND	NW	0.007	03-14-96	17000	3100	69	810	1500	<300*	--	--	--
MW-6	05-20-96	22.08	7.07	15.01	ND	SW	0.007	05-21-96	16000	3700	<50*	1100	1100	<300*	--	--	--
MW-6	08-26-96	22.08	7.93	14.15	ND	SSW	0.004	08-26-96	23000	5800	<50*	2000	560	<300*	--	--	--
MW-6	11-20-96	22.08	8.02	14.06	ND	SSE	0.004	11-20-96	11000	3300	<50*	480	370	<300*	--	--	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1994 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHC LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-7	02-14-94	22.89	8.80	14.09	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	05-05-94	22.89	9.11	13.78	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	08-04-94	22.89	DRY	DRY	ND	DRY	DRY	08-04-94	Not sampled: dry well								
MW-7	11-20-94	22.89	8.72	14.17	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	03-17-95	22.89	7.68	15.21	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	06-01-95	22.89	8.40	14.49	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	08-31-95	22.89	9.09	13.80	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	0.6	<0.5	<3	--	--	--
MW-7	11-27-95	22.89	9.15	13.74	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	0.9	<0.5	--	--	--	--
MW-7	02-22-96	22.89	7.44	15.45	ND	NW	0.007	03-14-96	110	1.4	<0.5	3.8	3	<3	--	--	--
MW-7	05-20-96	22.89	8.47	14.42	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-7	08-26-96	22.89	8.81	14.08	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-7	11-20-96	22.89	9.17	13.72	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								
MW-8	02-14-94	20.97	7.00	13.97	ND	NR	NR	02-14-94	3600	3	<1*	72	<1*	--	--	2000	3900^
MW-8	05-05-94	20.97	7.46	13.51	ND	NR	NR	05-05-94	2100	<2.5*	<2.5*	8.3	<2.5*	--	--	700	440^
MW-8	08-04-94	20.97	8.17	12.80	ND	SW	0.004	08-04-94	1200	1.5	<1*	6.7	<1*	--	--	700	<50
MW-8	11-20-94	20.97	6.78	14.19	ND	SW	0.002	11-20-94	2300	1.2	1.1	20	2.2	--	--	<500	2100^
MW-8	03-17-95	20.97	6.14	14.83	ND	WSW	0.006	03-17-95	5400	<5*	<5*	35	<5*	--	--	--	--
MW-8	06-01-95	20.97	6.50	14.47	ND	SW	0.003	06-01-95	2600	<2.5*	<2.5*	15	<2.5*	--	--	--	--
MW-8	08-31-95	20.97	7.35	13.62	ND	SSW	0.005	08-31-95	1400	<3*	<3*	5	<3*	220	--	900	--
MW-8	11-27-95	20.97	7.60	13.37	ND	SSW	0.004	11-27-95	620	<0.5	<0.5	<0.5	0.5	250	250	900	510^
MW-8	02-22-96	20.97	5.35	15.62	ND	NW	0.007	03-14-96	5800	<5*	<5*	28	<5*	110	--	1900	6800^
MW-8	05-20-96	20.97	5.92	15.05	ND	SW	0.007	05-21-96	6100	<5*	<5*	26	<5*	240	--	--	--
MW-8	08-26-96	20.97	7.08	13.89	ND	SSW	0.004	08-26-96	970	<1*	<1*	3	<1*	710	--	--	--
MW-8	11-20-96	20.97	7.01	13.96	ND	SSE	0.004	11-20-96	3900	<2.5*	<2.5*	12	<2.5*	930	--	--	--

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		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-9	02-14-94	20.89	7.47	13.42	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	05-05-94	20.89	8.04	12.85	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	08-04-94	20.89	8.78	12.11	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	11-20-94	20.89	6.83	14.06	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	03-17-95	20.89	6.94	13.95	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	06-01-95	20.89	8.15	12.74	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	08-31-95	20.89	8.10	12.79	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	11-27-95	20.89	8.38	12.51	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	02-22-96	20.89	7.36	13.53	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	05-20-96	20.89	7.81	13.08	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-9	08-26-96	20.89	8.00	12.89	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	11-20-96	20.89	7.06	13.83	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-10	02-14-94	21.12	7.13	13.99	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	05-05-94	21.12	8.08	13.04	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	08-04-94	21.12	8.84	12.28	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	11-20-94	21.12	7.05	14.07	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	03-17-95	21.12	6.26	14.86	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	06-01-95	21.12	7.63	13.49	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	08-31-95	21.12	8.17	12.95	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	11-27-95	21.12	8.38	12.74	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	02-22-96	21.12	5.41	15.71	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	05-20-96	21.12	6.78	14.34	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-10	08-26-96	21.12	8.00	13.12	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	11-20-96	21.12	7.81	13.31	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters								

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Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-11	02-14-94	22.38	7.94	14.44	ND	NR	NR	02-14-94	650	<1*	<1*	2	4	--	--	--	--
MW-11	05-05-94	22.38	8.55	13.83	ND	NR	NR	05-05-94	210	<0.5	<0.5	2.5	0.6	--	--	--	--
MW-11	08-04-94	22.38	9.13	13.25	ND	SW	0.004	08-04-94	390	<0.5	<0.7*	1.9	2.2	--	--	--	--
MW-11	11-20-94	22.38	7.73	14.65	ND	SW	0.002	11-20-94	1300	1.3	0.5	1.5	21	--	--	--	--
MW-11	03-17-95	22.38	6.94	15.44	ND	WSW	0.006	03-17-95	100	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	06-01-95	22.38	7.90	14.48	ND	SW	0.003	06-01-95	210	<0.5	<0.5	0.9	0.7	--	--	--	--
MW-11	08-31-95	22.38	8.18	14.20	ND	SSW	0.005	08-31-95	680	<0.5	<0.5	4	1.8	<3	--	--	--
MW-11	11-27-95	22.38	8.48	13.90	ND	SSW	0.004	11-27-95	340	<0.5	<0.5	2.2	1.6	--	--	--	--
MW-11	02-22-96	22.38	6.63	15.75	ND	NW	0.007	03-14-96	150	<0.5	<0.5	<0.8*	0.8	<3	--	--	--
MW-11	05-20-96	22.38	7.25	15.13	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-11	08-26-96	22.38	8.22	14.16	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-11	11-20-96	22.38	8.37	14.01	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								
MW-12	02-14-94	22.77	8.24	14.53	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	05-05-94	22.77	8.97	13.80	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	08-04-94	22.77	9.57	13.20	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	11-20-94	22.77	8.06	14.71	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	03-17-95	22.77	7.09	15.68	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	06-01-95	22.77	8.40	14.37	ND	SW	0.003	06-01-95	Not sampled: not scheduled for chemical analysis								
MW-12	08-31-95	22.77	8.55	14.22	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	11-27-95	22.77	8.95	13.82	ND	SSW	0.004	11-27-95	Not sampled: not scheduled for chemical analysis								
MW-12	02-22-96	22.77	6.81	15.96	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	05-20-96	22.77	7.56	15.21	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-12	08-26-96	22.77	8.63	14.14	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-12	11-20-96	22.77	8.38	14.39	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								

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MW-13	02-14-94	22.45	7.78	14.67	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	05-05-94	22.45	8.38	14.07	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	08-04-94	22.45	8.78	13.67	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	11-20-94	22.45	7.68	14.77	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	03-17-95	22.45	6.91	15.54	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	06-01-95	22.45	7.72	14.73	ND	SW	0.003	06-01-95	Not sampled: not scheduled for chemical analysis								
MW-13	08-31-95	22.45	7.58	14.87	ND	SSW	0.005	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-13	11-27-95	22.45	7.98	14.47	ND	SSW	0.004	11-27-95	Not sampled: not scheduled for chemical analysis								
MW-13	02-22-96	22.45	6.71	15.74	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-13	05-20-96	22.45	6.98	15.47	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-13	08-26-96	22.45	7.85	14.60	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-13	11-20-96	22.45	7.76	14.69	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								
MW-14	02-14-94	22.99	8.80	14.19	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	05-05-94	22.99	9.49	13.50	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	08-04-94	22.99	10.11	12.88	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	11-20-94	22.99	8.66	14.33	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	03-17-95	22.99	8.17	14.82	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	06-01-95	22.99	8.57	14.42	ND	SW	0.003	06-01-95	Not sampled: not scheduled for chemical analysis								
MW-14	08-31-95	22.99	9.05	13.94	ND	SSW	0.005	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-14	11-27-95	22.99	9.19	13.80	ND	SSW	0.004	11-27-95	Not sampled: not scheduled for chemical analysis								
MW-14	02-22-96	22.99	6.52	16.47	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-14	05-20-96	22.99	7.88	15.11	ND	SW	0.007	05-21-96	Not sampled: not scheduled for chemical analysis								
MW-14	08-26-96	22.99	8.83	14.16	ND	SSW	0.004	08-26-96	Not sampled: not scheduled for chemical analysis								
MW-14	11-20-96	22.99	8.95	14.04	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the third quarter								

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MW-15	02-14-94	19.19	5.44	13.75	ND	NR	NR	02-14-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	05-05-94	19.19	6.18	13.01	ND	NR	NR	05-05-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	08-04-94	19.19	6.84	12.35	ND	SW	0.004	08-04-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	11-20-94	19.19	5.31	13.88	ND	SW	0.002	11-20-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	03-17-95	19.19	5.21	13.98	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	06-01-95	19.19	5.84	13.35	ND	SW	0.003	06-01-95	Not sampled; not scheduled for chemical analysis				<0.5	--	--	--	--
MW-15	08-31-95	19.19	6.18	13.01	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-15	11-27-95	19.19	6.42	12.77	ND	SSW	0.004	11-27-95	Not sampled; not scheduled for chemical analysis				<0.5	--	--	--	--
MW-15	02-22-96	19.19	4.84	14.35	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	12	--	--	--
MW-15	05-20-96	19.19	5.31	13.88	ND	SW	0.007	05-21-96	Not sampled; not scheduled for chemical analysis				<0.5	--	--	--	--
MW-15	08-26-96	19.19	6.05	13.14	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	8	--	--	--
MW-15	11-20-96	19.19	5.46	13.73	ND	SSE	0.004	11-20-96	Not sampled; well sampled semi-annually, during the first and third quarters								

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		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L

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

MWN: ground-water flow direction and gradient apply to the entire monitoring well network

ft/ft: foot per foot

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method

µg/L: micrograms per liter

EPA: United States Environmental Protection Agency

MTBE: Methyl-tert-butyl ether

TRPH: total recoverable petroleum hydrocarbons

TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method

NR: not reported; data not available or not measurable

ND: none detected

SW: southwest

WSW: west-southwest

SSW: south-southwest

SSE: south-southeast

NW: northwest

DRY: dry well; groundwater was not detected

--: not analyzed

^: chromatogram fingerprint is not characteristic of diesel

*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

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

***: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

Table 3
Historical Groundwater Analytical Data
Metals*
1994 - Present**

ARCO Service Station 601

712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Sample Field Date	Cadmium EPA 6010 µg/L	Chromium EPA 6010 µg/L	Lead EPA 7421 µg/L	Nickel EPA 6010 µg/L	Zinc EPA 6010 µg/L
MW-1	02-14-94	Not sampled: well contained floating product				
MW-1	05-05-94	Not sampled: well contained floating product				
MW-1	08-04-94	Not sampled: well contained floating product				
MW-1	11-20-94	Not sampled: well contained floating product				
MW-1	03-17-95	<5	20	20	<40	60
MW-1	06-01-95	<5	20	22	70	100
MW-1	08-31-95	Not sampled: well contained floating product				
MW-1	11-27-95	Not sampled: well contained floating product				
MW-1	03-14-96	Not sampled: well contained floating product				
MW-1	05-21-96	6	<10	<5	<20	<20
MW-2	03-23-92	Not analyzed: sampling for additional parameters was discontinued				
MW-3	03-23-92	Not analyzed: sampling for additional parameters was discontinued				
MW-4	06-10-91	Not analyzed: sampling for additional parameters was not initiated				
MW-5	06-08-92	Not analyzed: sampling for additional parameters was discontinued				
MW-6	06-10-91	Not analyzed: sampling for additional parameters was not initiated				
MW-7	06-10-91	Not analyzed: sampling for additional parameters was not initiated				
MW-8	02-14-94	<5	<10	4	<40	20
MW-8	05-05-94	<3	<5	4	<20	60
MW-8	08-04-94	<3	6	3	<20	27
MW-8	11-20-94	<3	<5	<2	<20	14
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-8	08-31-95	<5	40	16	50	90
MW-8	11-27-95	<5	130	77	170	280
MW-8	03-14-96	<5	30	7	40	60
MW-8	05-21-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8				
MW-9	06-11-93	Not analyzed: sampling for additional parameters was not initiated				
MW-10	06-11-93	Not analyzed: sampling for additional parameters was not initiated				
MW-11	11-16-92	Not analyzed: sampling for additional parameters was not initiated				
MW-12	11-16-92	Not analyzed: sampling for additional parameters was not initiated				
MW-13	11-16-92	Not analyzed: sampling for additional parameters was not initiated				
MW-14	09-15-92	Not analyzed: sampling for additional parameters was not initiated				
MW-15	05-13-93	Not analyzed: sampling for additional parameters was not initiated				

EPA: United States Environmental Protection Agency

µg/L: micrograms per liter

- - : not analyzed

*: Historically samples were analyzed for total metals. Since March 14, 1996, the samples were filtered and analyzed for dissolved metals

**: For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1994 - Present**

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Sample Field Date	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240							Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloro-ethane µg/L	1,1-Dichloro-ethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methyl-naphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L	2,4-Di-methyl-phenol µg/L
MW-1	02-14-94	Not sampled: well contained floating product											
MW-1	05-05-94	Not sampled: well contained floating product											
MW-1	08-04-94	Not sampled: well contained floating product											
MW-1	11-20-94	Not sampled: well contained floating product											
MW-1	03-17-95	--	--	--	--	--	--	--	1300	730	<50	ND	150
MW-1	06-01-95	--	--	--	--	--	--	--	2200	1700	<100	240	<100
MW-1	08-31-95	Not sampled: well contained floating product											
MW-1	11-27-95	Not sampled: well contained floating product											
MW-1	03-14-96	Not sampled: well contained floating product											
MW-1	05-21-96	--	--	--	--	--	--	--	1200	860	<50	<50	<50
MW-1	08-26-96	--	--	--	--	--	--	--	2300	1800	<500	<500	<1000
MW-1	11-20-96	--	--	--	--	--	--	--	590	250	91	<50	<100
MW-2	03-23-92	Not analyzed: sampling for additional parameters was discontinued											
MW-8	02-14-94	--	--	--	--	--	--	--	350	65	ND	ND	ND
MW-8	05-05-94	<0.5	<0.5	0.7	--	--	--	--	23	<10	<10	ND	ND
MW-8	08-04-94	--	--	--	--	--	--	--	11	<10	10	ND	ND
MW-8	12-13-94	--	--	--	--	--	--	--	14	<10	14	ND	ND
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-31-95	--	--	--	--	--	--	--	62	8	<5	<5	<5
MW-8	11-27-95	--	--	--	--	--	--	--	15	<5	<5	<5	<5
MW-8	03-14-96	--	--	--	--	--	--	--	400	55	<50	<50	<50
MW-8	05-21-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-26-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	11-20-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1994 - Present**

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 02-06-97

Well Designation	Water Sample Field Date	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240							Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloro- ethane µg/L	1,1-Dichloro- ethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methyl- naphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L	2,4-Di-methyl- phenol µg/L

EPA: United States Environmental Protection Agency

µg/L: micrograms per liter

- : not analyzed

ND: not detected at or above the method detection limit

*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

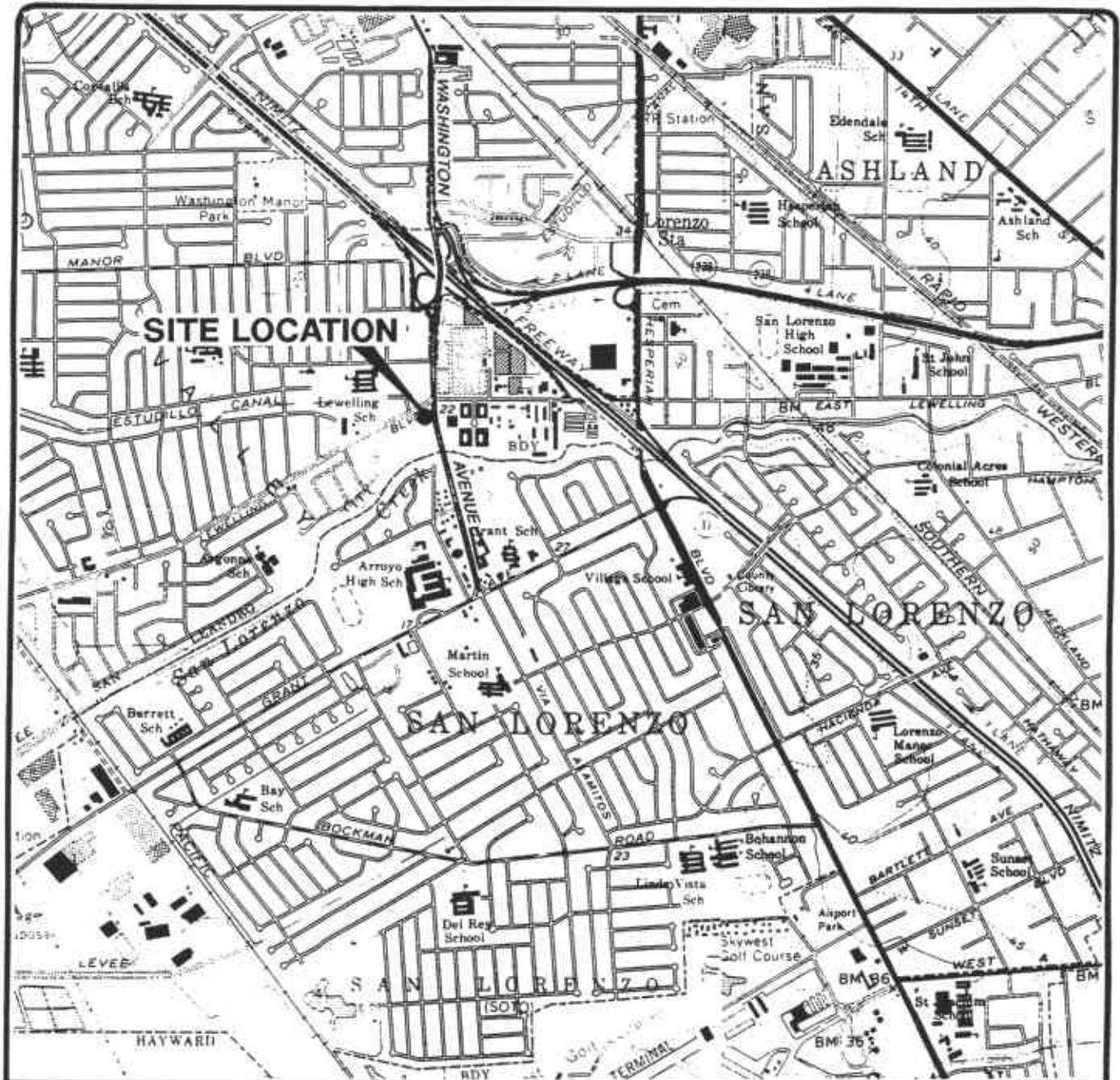
**: For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*.
(EMCON, March 14, 1996).

Table 5
Approximate Cumulative Floating Product Recovered

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

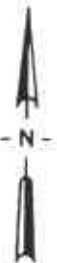
Date: 02-06-97

Well Desig- nation	Date	Floating Product Recovered gallons
MW-1	1991	3.43
MW-1	1992	0.02
MW-1	1993	0.00
MW-1	1994	0.00
MW-1	1995	0.00
MW-1	1996	0.00
1991 to 1996 Total:		3.45



Base map from USGS 7.5' Quad. Maps:
Hayward and San Leandro, California.
Photorevised 1980.

Scale : 0 2000 4000 Feet



emcon

ARCO PRODUCTS COMPANY
SERVICE STATION 601, 712 LEWELLING BLVD.
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

SITE LOCATION

FIGURE

1

PROJECT NO.
805-121.03

APPENDIX A

**ANALYTICAL RESULTS AND CHAIN OF CUSTODY
DOCUMENTATION, FOURTH QUARTER 1996
GROUNDWATER MONITORING EVENT**

**Columbia
Analytical
Services^{inc.}**

December 5, 1996

Service Request No.: S9601971

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 601 SAN LEANDRO/20805-121.003/TO#19350.00

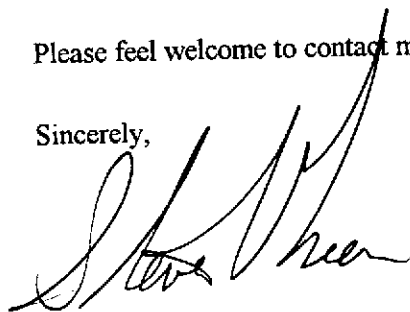
Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on November 20, 1996. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 14, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,



Steven L. Green
Project Chemist



Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: 11/22/96

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9601971-005 D	S961122-WB1
Date Analyzed:	12/5/96	12/4/96

Base Neutral Analyte	MRL		
N-Nitrosodimethylamine	5	<50	ND
Aniline	5	<50	ND
Bis(2-chloroethyl) Ether	5	<50	ND
1,2-Dichlorobenzene	5	<50	ND
1,3-Dichlorobenzene	5	<50	ND
1,4-Dichlorobenzene	5	<50	ND
Bis(2-chloroisopropyl) Ether	5	<50	ND
N-Nitrosodi-n-propylamine	5	<50	ND
Hexachloroethane	10	<100	ND
Nitrobenzene	5	<50	ND
Isophorone	5	<50	ND
Bis(2-chloroethoxy)methane	5	<50	ND
1,2,4-Trichlorobenzene	5	<50	ND
Naphthalene	5	590	ND
4-Chloroaniline	5	<50	ND
Hexachlorobutadiene	10	<100	ND
2-Methylnaphthalene	5	250	ND
Hexachlorocyclopentadiene	10	<100	ND
2-Chloronaphthalene	5	<50	ND
2-Nitroaniline	20	<200	ND
Dimethyl Phthalate	5	<50	ND
Acenaphthylene	5	<50	ND
3-Nitroaniline	20	<200	ND
Acenaphthene	5	<50	ND
Dibenzofuran	5	<50	ND
2,4-Dinitrotoluene	5	<50	ND

D The MRL is elevated because of matrix interferences and because the sample required diluting.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: 11/22/96

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9601971-005 D	S961122-WB1
Date Analyzed:	12/5/96	12/4/96

Base Neutral Analyte	MRL		
2,6-Dinitrotoluene	5	<50	ND
Diethyl Phthalate	5	<50	ND
4-Chlorophenyl Phenyl Ether	5	<50	ND
Fluorene	5	<50	ND
4-Nitroaniline	20	<200	ND
N-Nitrosodiphenylamine	5	<50	ND
4-Bromophenyl Phenyl Ether	5	<50	ND
Hexachlorobenzene	5	<50	ND
Phenanthrene	5	<50	ND
Anthracene	5	<50	ND
Di-n-butyl Phthalate	5	<50	ND
Fluoranthene	5	<50	ND
Pyrene	5	<50	ND
Butylbenzyl Phthalate	5	<50	ND
3,3'-Dichlorobenzidine	20	<200	ND
Benzo(a)anthracene	5	<50	ND
Bis(2-ethylhexyl) Phthalate	5	91	ND
Chrysene	5	<50	ND
Di-n-octyl Phthalate	5	<50	ND
Benzo(b)fluoranthene	5	<50	ND
Benzo(k)fluoranthene	5	<50	ND
Benzo(a)pyrene	5	<50	ND
Indeno(1,2,3-c,d)pyrene	5	<50	ND
Dibenz(a,h)anthracene	5	<50	ND
Benzo(g,h,i)perylene	5	<50	ND
Pyridine	10	<100	ND

D The MRL is elevated because of matrix interferences and because the sample required diluting.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: 11/22/96

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9601971-005 D	S961122-WB1
Date Analyzed:	12/5/96	12/4/96

Acid Analyte	MRL		
Phenol	5	<50	ND
2-Chlorophenol	5	<50	ND
Benzyl Alcohol	10	<100	ND
2-Methylphenol	5	<50	ND
3- and 4-Methylphenol ^a	5	<50	ND
2-Nitrophenol	5	<50	ND
2,4-Dimethylphenol	10	<100	ND
Benzoic Acid	50	<500	ND
2,4-Dichlorophenol	5	<50	ND
4-Chloro-3-methylphenol	5	<50	ND
2,4,6-Trichlorophenol	5	<50	ND
2,4,5-Trichlorophenol	5	<50	ND
2,4-Dinitrophenol	50	<500	ND
4-Nitrophenol	50	<500	ND
2-Methyl-4,6-dinitrophenol	20	<200	ND
Pentachlorophenol	30	<300	ND

^a Quantified as 4-Methylphenol.

D The MRL is elevated because of matrix interferences and because the sample required diluting.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method
 Units: ug/L (ppb)

Sample Name:	MW-8 (10)	MW-4 (8)	MW-6 (8)
Lab Code:	S9601971-001	S9601971-002	S9601971-003
Date Analyzed:	12/3/96	12/4/96	12/3/96

Analyte	MRL			
TPH as Gasoline	50	3,900	420	11,000
Benzene	0.5	<2.5 C	55	3,300
Toluene	0.5	<2.5 C	17	<50 C
Ethylbenzene	0.5	12	11	480
Total Xylenes	0.5	<2.5	62	370
Methyl <i>tert</i> -Butyl Ether	3	930	ND	<300 C

C The MRL is elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	MW-5 (10)	MW-1 (11)	MW-3 (11)
Lab Code:	S9601971-004	S9601971-005	S9601971-006
Date Analyzed:	12/3/96	12/3/96	12/3/96

Analyte	MRL			
TPH as Gasoline	50	53,000	62,000	190,000
Benzene	0.5	8,700	5,900	3,200
Toluene	0.5	5,700	77	5,800
Ethylbenzene	0.5	920	2,000	3,300
Total Xylenes	0.5	4,400	7,700	20,000
Methyl <i>tert</i> -Butyl Ether	3	<500 C	<300 C	<1000 C

C The MRL is elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	Method Blank	Method Blank
Lab Code:	S961203-WB1	S961204-WB1
Date Analyzed:	12/3/96	12/4/96

Analyte	MRL		
TPH as Gasoline	50	ND	ND
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: 11/22/96
Date Analyzed: NA

Surrogate Recovery Summary
 Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B

Sample Name	Lab Code	2FP	P e r c e n t		R e c o v e r y		
			PHL	TBP	NBZ	FBP	TPH
MW-1 (11)	S9601971-005	4*	4	2*	80	14*	114
LCS	S961122-LCS	37	25	72	67	67	76
LCSD	S961122-LCSD	37	24	69	69	66	74
Method Blank	S961122-WB1	37	25	71	69	62	73

CAS Acceptance Limits:	13-49	4-38	3-99	50-92	51-103	44-134
------------------------	-------	------	------	-------	--------	--------

2FP	2-Fluorophenol
PHL	Phenol-D6
TBP	2,4,6-Tribromophenol
NBZ	Nitrobenzene-D5
FBP	2-Fluorobiphenyl
TPH	Terphenyl-D14

* Outside of acceptance limits because of matrix effects.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: 11/22/96
Date Analyzed: 12/4/96

Matrix Spike/Duplicate Matrix Spike Summary
 Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: µg/L (ppb)

Sample Name: LCS,LCSD
Lab Code: S961122-LCS,LCSD

Analyte	Percent Recovery								Relative Percent Difference
	Spike Level		Sample Result	Spike Result		CAS Acceptance Limits			
	MS	DMS		MS	DMS	MS	DMS		
Phenol	100	100	ND	30	30	30	30	12-89	<1
2-Chlorophenol	100	100	ND	77	75	77	75	27-123	3
1,4-Dichlorobenzene	50	50	ND	40	39	80	78	36-97	3
N-Nitrosodi-n-propylamine	50	50	ND	27	26	54	52	41-116	4
1,2,4-Trichlorobenzene	50	50	ND	42	42	84	84	39-98	<1
4-Chloro-3-methylphenol	100	100	ND	80	81	80	81	23-97	1
Acenaphthene	50	50	ND	42	42	84	84	46-118	<1
4-Nitrophenol	100	100	ND	32	31	32	31	10-80	3
2,4-Dinitrotoluene	50	50	ND	43	42	86	84	24-96	2
Pentachlorophenol	100	100	ND	72	84	72	84	9-103	15
Pyrene	50	50	ND	55	53	110	106	26-127	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00
Sample Matrix: Water

Service Request: S9601971
Date Collected: 11/20/96
Date Received: 11/20/96
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
 BTEX, MTBE and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	PID Detector Percent Recovery	FID Detector Percent Recovery
		4-Bromofluorobenzene	α,α,α -Trifluorotoluene
MW-8 (10)	S9601971-001	101	102
MW-4 (8)	S9601971-002	99	100
MW-6 (8)	S9601971-003	98	95
MW-5 (10)	S9601971-004	101	99
MW-1 (11)	S9601971-005	102	102
MW-3 (11)	S9601971-006	97	102
Batch QC (MS)	S9601984-002MS	105	100
Batch QC (DMS)	S9601984-002DMS	140	98
Method Blank	S961203-WB1	99	94
Method Blank	S961204-WB1	100	95

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	Service Request:	S9601971
Project:	601 SAN LEANDRO/20805-121.003/TO#19350.00	Date Collected:	11/20/96
Sample Matrix:	Water	Date Received:	11/20/96
	:	Date Extracted:	NA
		Date Analyzed:	12/3/96

Matrix Spike/Duplicate Matrix Spike Summary

BTE

EPA Methods 5030/8020

Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9601984-002MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS		
Benzene	25	25	ND	25.3	25.5	101	102	75-135	1
Toluene	25	25	ND	24.8	25.1	99	100	73-136	1
Ethylbenzene	25	25	ND	26.2	26.3	105	105	69-142	<1

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.003/TO#19350.00

Service Request: S9601971
Date Analyzed: 12/3/96

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.4	102	85-115
Toluene	25	25.0	100	85-115
Ethylbenzene	25	26.4	106	85-115
Xylenes, Total	75	74.6	99	85-115
Gasoline	250	235	94	90-110
Methyl <i>tert</i> -Butyl Ether	75	65	87	85-115

