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

Date December 29, 1994
Project 0805-135.01

To:

Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

We are enclosing:

Copies	Description
1	Third quarter 1994 groundwater monitoring report for ARCO service station 6148, Oakland, California

For your:	X	Use	Sent by:		Regular Mail
		Approval			Standard Air
		Review			Courier
		Information		X	Other Certified Mail

Comments:

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

David Larsen

ARCO Products Company
2000 Alameda de las Pulgas
Mailing Address: Box 5811
San Mateo, California 94402
Telephone 415 571 2400

Date:
December 29, 1994

Re: ARCO Station # 6148 • 5131 Shattuck Avenue • Oakland, CA
Third Quarter 1994 Groundwater Monitoring Report

" 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:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

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

December 29, 1994
Project 0805-135.01

Mr. Michael Whelan
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Re: Third quarter 1994 groundwater monitoring program results, ARCO service station 6148, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the third quarter 1994 groundwater monitoring program at ARCO Products Company (ARCO) service station 6148, 5131 Shattuck Avenue, Oakland, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

On June 1, 1987, a waste-oil tank was removed from the site by Crosby and Overton and Erico Construction. In December 1991, RESNA conducted an initial subsurface environmental investigation which included the installation of three groundwater monitoring wells (MW-1 through MW-3). In October 1992, a second phase of investigation was conducted by RESNA which included installation of four additional groundwater monitoring wells, MW-4 through MW-7. Between April 1993 and July 1993, a third phase of investigation was conducted by RESNA which included installation of one air-sparge well (AS-1), one combination air-sparge/vapor extraction well (AS-2/NW-2), and two vadose wells (VW-1 and VW-3). Combination air-sparge (AS) and soil-vapor extraction (SVE) pilot tests were performed at the site in February 1994.

Groundwater monitoring and sampling at this site were initiated in December 1991 and March 1992, respectively. Currently, seven groundwater monitoring wells, three vadose wells and two air sparge wells exist on site. For additional background information, please refer to "Report of Findings, Air Sparge Pilot Test at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California," RESNA Report 61035.11, dated June 7, 1994.

Currently, EMCON is evaluating results of the AS and SVE tests to select an appropriate off-gas abatement system for SVE and AS remediation at this site. Based on previous site investigations and pilot test results, it will be determined if additional wells are required to delineate the lateral extent of hydrocarbon-impacted soil and groundwater. EMCON is also evaluating previous site assessment data and results of the SVE/AS tests to design a SVE and AS remediation system at the site.

Wells MW-1 through MW-7 are monitored quarterly.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The third quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management, Inc. (IWM), on August 2, 1994. Field work performed by IWM during this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-7, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-7 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. The results of IWM's field work were transmitted to EMCON in a report dated August 31, 1994. These data are presented in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during third quarter monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and halogenated volatile organic compounds (VOC). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (EPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California EPA (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank (LUFT) Field Manual* (State Water Resources Control Board, May 1988, revised October 1989). Samples were analyzed for VOCs by EPA method 8010, and BTEX by EPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA, SW-846, November 1986, Third Edition). Groundwater samples collected from well MW-3 were also analyzed for Semivolatile Organic Compounds (SVOC) by EPA method 3520/8270, and total recoverable petroleum hydrocarbons (TRPH) by EPA method 418.1. These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the third quarter 1994 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG, BTEX, and TRPH analyses. Table 4 summarizes historical laboratory data for VOC and SVOC analyses. Historical laboratory data for diesel and metals analyses are summarized in Table 5. Copies of the third quarter 1994 certified analytical report and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on August 2, 1994, illustrate that groundwater beneath the site flows southwest at an approximate hydraulic gradient of 0.017 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the third quarter of 1994.

Groundwater samples collected from wells MW-6 and MW-7 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1, MW-2, MW-3, and MW-5 contained concentrations of TPHG from 210 to 17,000 parts per billion (ppb) and concentrations of benzene from 82 to 800 ppb. Groundwater samples collected from well MW-4 contained 3.8 ppb benzene, but did not contain detectable concentrations of TPHG (<50 ppb). Groundwater samples collected from well MW-3 contained 6.6 ppb TRPH. Similar analytical results were reported for these wells during previous monitoring events.

Groundwater samples collected from well MW-4 did not contain detectable concentrations of VOCs. Groundwater samples collected from wells MW-1, MW-2, MW-3, MW-5, MW-6, and MW-7 contained detectable levels of VOCs at concentrations similar to previous monitoring events. Groundwater samples collected from well MW-3 contained detectable levels of SVOCs at concentrations similar to previous monitoring events.

LIMITATIONS

Field procedures were performed by, and field data were acquired from, IWM. EMCON does not warrant the accuracy of data supplied by IWM. EMCON's scope of work was limited to interpreting field data, which included evaluating trends in the groundwater

gradient, groundwater flow direction, and dissolved-petroleum-hydrocarbon concentrations beneath the site.

No monitoring event is thorough enough to describe all geologic/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.

SITE STATUS UPDATE

This update reports site activities performed during the third quarter of 1994 and the anticipated site activities for the fourth quarter of 1994.

Third Quarter 1994 Activities

- Prepared and submitted quarterly groundwater monitoring report for second quarter 1994.
- Performed quarterly groundwater monitoring for third quarter 1994.

Work Anticipated Fourth Quarter 1994

- Prepare and submit quarterly groundwater monitoring report for third quarter 1994.
- Perform quarterly groundwater monitoring for fourth quarter 1994.

Please call if you have questions.

Sincerely,

EMCON Associates

David Larsen
Sampling Coordinator

Mark Smolley, R.G. 4650
Senior Project Geologist

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Attachment:
- Table 1 - Groundwater Monitoring Data, Third Quarter 1994
- Table 2 - Historical Groundwater Elevation Data
- Table 3 - Historical Groundwater Analytical Data (TPHG, BTEX, and TRPH)
- Table 4 - Historical Groundwater Analytical Data (VOCs and SVOCs)
- Table 5 - Historical Groundwater Analytical Data (Diesel and Metals)
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Third Quarter 1994
- Appendix A - Field Data Report, Integrated Wastestream Management, August 31, 1994
- Appendix B - Certified Analytical Report and Chain-of-Custody Documentation, Third Quarter 1994

Table 1
Groundwater Monitoring Data
Third Quarter 1994
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		ppb	ppb	ppb	ppb	ppb	ppb
MW-1	08-02-94	108.03	17.95	90.08	ND	SW	0.017	08-02-94	210	82	<1	<1	2.5	NA
MW-2	08-02-94	107.43	17.59	89.84	ND	SW	0.017	08-02-94	4900	800	290	120	620	NA
MW-3	08-02-94	107.77	17.81	89.96	ND	SW	0.017	08-02-94	17000	530	410	720	2600	6.6
MW-4	08-02-94	106.58	15.94	90.64	ND	SW	0.017	08-02-94	<50	3.8	<0.5	<0.5	<0.5	NA
MW-5	08-02-94	106.68	16.81	89.87	ND	SW	0.017	08-02-94	1900	680	<10	24	<10	NA
MW-6	08-02-94	105.16	13.99	91.17	ND	SW	0.017	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	08-02-94	107.08	14.61	92.47	ND	SW	0.017	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
TPHG = Total petroleum hydrocarbons as gasoline
TOG = Total oil and grease measured by EPA Method 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons measured by EPA Method 418.1
ppb = Parts per billion or micrograms per liter (µg/l)
ND = None detected
SW = Southwest
NA = Not analyzed

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Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-1	12-23-91	108.03	18.26	89.77	Sheen	NR	NR
MW-1	01-07-92	108.03	17.44	90.59	Sheen	NR	NR
MW-1	01-19-92	108.03	17.17	90.86	ND	NR	NR
MW-1	02-19-92	108.03	16.52	91.51	ND	NR	NR
MW-1	03-18-92	108.03	16.81	91.22	ND	NR	NR
MW-1	04-20-92	108.03	17.56	90.47	ND	NR	NR
MW-1	05-15-92	108.03	17.96	90.07	ND	NR	NR
MW-1	06-12-92	108.03	18.16	89.87	ND	NR	NR
MW-1	07-15-92	108.03	18.32	89.71	ND	NR	NR
MW-1	08-07-92	108.03	18.34	89.69	ND	NR	NR
MW-1	09-14-92	108.03	18.46	89.57	ND	NR	NR
MW-1	10-07-92	108.03	18.52	89.51	ND	NR	NR
MW-1	11-12-92	108.03	18.11	89.92	ND	NR	NR
MW-1	12-09-92	108.03	17.10	90.93	ND	NR	NR
MW-1	01-21-93	108.03	15.44	92.59	ND	NR	NR
MW-1	02-22-93	108.03	16.54	91.49	ND	NR	NR
MW-1	03-25-93	108.03	17.05	90.98	ND	NR	NR
MW-1	04-14-93	108.03	17.45	90.58	ND	NR	NR
MW-1	05-22-93	108.03	17.78	90.25	ND	NR	NR
MW-1	06-17-93	108.03	17.90	90.13	ND	NR	NR
MW-1	07-27-93	108.03	18.10	89.93	ND	NR	NR
MW-1	08-29-93	108.03	18.31	89.72	ND	NR	NR
MW-1	09-30-93	108.03	18.24	89.79	ND	NR	NR
MW-1	11-16-93	108.03	18.17	89.86	ND	NR	NR
MW-1	02-02-94	108.03	17.31	90.72	ND	NR	NR
MW-1	04-29-94	108.03	17.31	90.72	ND	NR	NR
MW-1	08-02-94	108.03	17.95	90.08	ND	SW	0.017

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-2	12-23-91	107.43	17.98	89.45	Sheen	NR	NR
MW-2	01-07-92	107.43	17.15	90.28	Sheen	NR	NR
MW-2	01-19-92	107.43	17.47	89.96	ND	NR	NR
MW-2	02-19-92	107.43	16.28	91.15	ND	NR	NR
MW-2	03-18-92	107.43	16.52	90.91	ND	NR	NR
MW-2	04-20-92	107.43	17.27	90.16	ND	NR	NR
MW-2	05-15-92	107.43	17.62	89.81	ND	NR	NR
MW-2	06-12-92	107.43	^17.63	^89.80	0.05	NR	NR
MW-2	07-15-92	107.43	17.65	89.78	ND	NR	NR
MW-2	08-07-92	107.43	17.80	89.63	ND	NR	NR
MW-2	09-14-92	107.43	^18.09	^89.34	0.55	NR	NR
MW-2	10-07-92	107.43	^18.55	^88.88	0.31	NR	NR
MW-2	11-12-92	107.43	17.95	89.48	Sheen	NR	NR
MW-2	12-09-92	107.43	^16.85	^90.58	0.02	NR	NR
MW-2	01-21-93	107.43	^15.08	^92.35	0.01	NR	NR
MW-2	02-22-93	107.43	^16.20	^91.23	0.01	NR	NR
MW-2	03-25-93	107.43	^16.72	^90.71	0.01	NR	NR
MW-2	04-14-93	107.43	^17.15	^90.28	ND	NR	NR
MW-2	05-22-93	107.43	^17.44	^89.99	ND	NR	NR
MW-2	06-17-93	107.43	17.57	89.86	ND	NR	NR
MW-2	07-27-93	107.43	^17.71	^89.72	ND	NR	NR
MW-2	08-29-93	107.43	^18.20	^89.23	ND	NR	NR
MW-2	09-30-93	107.43	^18.14	^89.29	ND	NR	NR
MW-2	11-16-93	107.43	^17.85	^89.58	ND	NR	NR
MW-2	02-02-94	107.43	16.96	90.47	ND	NR	NR
MW-2	04-29-94	107.43	16.95	90.48	ND	NR	NR
MW-2	08-02-94	107.43	17.59	89.84	ND	SW	0.017

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-3	12-23-91	107.77	18.14	89.63	Sheen	NR	NR
MW-3	01-07-92	107.77	17.26	90.51	Sheen	NR	NR
MW-3	01-19-92	107.77	17.63	90.14	ND	NR	NR
MW-3	02-19-92	107.77	16.34	91.43	ND	NR	NR
MW-3	03-18-92	107.77	16.62	91.15	ND	NR	NR
MW-3	04-20-92	107.77	17.38	90.39	ND	NR	NR
MW-3	05-15-92	107.77	17.80	89.97	ND	NR	NR
MW-3	06-12-92	107.77	18.01	89.76	ND	NR	NR
MW-3	07-15-92	107.77	18.17	89.60	ND	NR	NR
MW-3	08-07-92	107.77	18.23	89.54	ND	NR	NR
MW-3	09-14-92	107.77	18.36	89.41	ND	NR	NR
MW-3	10-07-92	107.77	18.90	88.87	Sheen	NR	NR
MW-3	11-12-92	107.77	18.00	89.77	Sheen	NR	NR
MW-3	12-09-92	107.77	16.85	90.92	Droplets	NR	NR
MW-3	01-21-93	107.77	15.24	92.53	ND	NR	NR
MW-3	02-22-93	107.77	16.36	91.41	ND	NR	NR
MW-3	03-25-93	107.77	16.89	90.88	ND	NR	NR
MW-3	04-14-93	107.77	17.29	90.48	ND	NR	NR
MW-3	05-22-93	107.77	17.64	90.13	ND	NR	NR
MW-3	06-17-93	107.77	17.75	90.02	ND	NR	NR
MW-3	07-27-93	107.77	17.98	89.79	ND	NR	NR
MW-3	08-29-93	107.77	18.14	89.63	ND	NR	NR
MW-3	09-30-93	107.77	18.14	89.63	ND	NR	NR
MW-3	11-16-93	107.77	18.30	89.47	ND	NR	NR
MW-3	02-02-94	107.77	17.16	90.61	ND	NR	NR
MW-3	04-29-94	107.77	17.14	90.63	ND	NR	NR
MW-3	08-02-94	107.77	17.81	89.96	ND	SW	0.017

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	11-12-92	106.58	16.08	90.50	ND	NR	NR
MW-4	12-09-92	106.58	15.00	91.58	ND	NR	NR
MW-4	01-21-93	106.58	13.35	93.23	ND	NR	NR
MW-4	02-22-93	106.58	14.48	92.10	ND	NR	NR
MW-4	03-25-93	106.58	15.06	91.52	ND	NR	NR
MW-4	04-14-93	106.58	15.50	91.08	ND	NR	NR
MW-4	05-22-93	106.58	15.79	90.79	ND	NR	NR
MW-4	06-17-93	106.58	14.90	91.68	ND	NR	NR
MW-4	07-27-93	106.58	16.11	90.47	ND	NR	NR
MW-4	08-29-93	106.58	16.21	90.37	ND	NR	NR
MW-4	09-30-93	106.58	16.23	90.35	ND	NR	NR
MW-4	11-16-93	106.58	16.30	90.28	ND	NR	NR
MW-4	02-02-94	106.58	15.36	91.22	ND	NR	NR
MW-4	04-29-94	106.58	15.36	91.22	ND	NR	NR
MW-4	08-02-94	106.58	15.94	90.64	ND	SW	0.017
MW-5	11-12-92	106.68	16.81	89.87	ND	NR	NR
MW-5	12-09-92	106.68	16.40	90.28	ND	NR	NR
MW-5	01-21-93	106.68	14.58	92.10	ND	NR	NR
MW-5	02-22-93	106.68	15.65	91.03	ND	NR	NR
MW-5	03-25-93	106.68	16.07	90.61	ND	NR	NR
MW-5	04-14-93	106.68	16.34	90.34	ND	NR	NR
MW-5	05-22-93	106.68	16.56	90.12	ND	NR	NR
MW-5	06-17-93	106.68	Not surveyed:				
MW-5	07-27-93	106.68	16.80	89.88	ND	NR	NR
MW-5	08-29-93	106.68	16.93	89.75	ND	NR	NR
MW-5	09-30-93	106.68	16.97	89.71	ND	NR	NR
MW-5	11-16-93	106.68	17.03	89.65	ND	NR	NR
MW-5	02-02-94	106.68	16.38	90.30	ND	NR	NR
MW-5	04-29-94	106.68	16.41	90.27	ND	NR	NR
MW-5	08-02-94	106.68	16.81	89.87	ND	SW	0.017

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-20-94
Project Number: 0805-135.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-6	11-12-92	105.16	14.05	91.11	ND	NR	NR
MW-6	12-09-92	105.16	13.37	91.79	ND	NR	NR
MW-6	01-21-93	105.16	11.76	93.40	ND	NR	NR
MW-6	02-22-93	105.16	12.62	92.54	ND	NR	NR
MW-6	03-25-93	105.16	13.04	92.12	ND	NR	NR
MW-6	04-14-93	105.16	13.47	91.69	ND	NR	NR
MW-6	05-22-93	105.16	13.80	91.36	ND	NR	NR
MW-6	06-17-93	105.16	13.88	91.28	ND	NR	NR
MW-6	07-27-93	105.16	14.13	91.03	ND	NR	NR
MW-6	08-29-93	105.16	14.19	90.97	ND	NR	NR
MW-6	09-30-93	105.16	14.34	90.82	ND	NR	NR
MW-6	11-16-93	105.16	14.41	90.75	ND	NR	NR
MW-6	02-02-94	105.16	13.60	91.56	ND	NR	NR
MW-6	04-29-94	105.16	13.66	91.50	ND	NR	NR
MW-6	08-02-94	105.16	13.99	91.17	ND	SW	0.017
MW-7	11-12-92	107.08	14.75	92.33	ND	NR	NR
MW-7	12-09-92	107.08	12.55	94.53	ND	NR	NR
MW-7	01-21-93	107.08	11.52	95.56	ND	NR	NR
MW-7	02-22-93	107.08	12.82	94.26	ND	NR	NR
MW-7	03-25-93	107.08	13.43	93.65	ND	NR	NR
MW-7	04-14-93	107.08	13.98	93.10	ND	NR	NR
MW-7	05-22-93	107.08	14.41	92.67	ND	NR	NR
MW-7	06-17-93	107.08	14.50	92.58	ND	NR	NR
MW-7	07-27-93	107.08	14.82	92.26	ND	NR	NR
MW-7	08-29-93	107.08	15.05	92.03	ND	NR	NR
MW-7	09-30-93	107.08	15.04	92.04	ND	NR	NR
MW-7	11-16-93	107.08	15.12	91.96	ND	NR	NR
MW-7	02-02-94	107.08	14.04	93.04	ND	NR	NR
MW-7	04-29-94	107.08	14.10	92.98	ND	NR	NR
MW-7	08-02-94	107.08	14.61	92.47	ND	SW	0.017
AS-2	09-30-93	NR	18.31	NR	ND	NR	NR

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
NR = Not reported; data not available
ND = None detected
SW = Southwest
^ = Groundwater elevation (GWE) and depth to water (DTW) adjusted to include 80 percent of the floating product thickness (FPT):
[GWE = (TOC - DTW) + (FPT x 0.8)]

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 11-08-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		ppb	ppb	ppb	ppb	ppb	ppb
MW-1	03-18-92	790	310	26	12	44	<0.5 (1.4)
MW-1	06-12-92	1000	290	15	10	30	<0.5
MW-1	09-14-92	1000	370	6.5	6.5	17	0.9
MW-1	10-07-92	590	200	19	6.7	19	<0.5
MW-1	01-22-93	1200	370	57	18	39	NA
MW-1	04-14-93	140	46	<2.5	<2.5	<2.5	NA
MW-1	09-30-93	220	64	0.9	2.2	4	NA
MW-1	11-16-93	180	53	0.7	1.7	4.1	NA
MW-1	02-02-94	250	93	<0.5	1.9	1	NA
MW-1	04-29-94	350	99	1.3	3.9	11	NA
MW-1	08-02-94	210	82	<1	<1	2.5	NA
MW-2	03-18-92	8400	1400	1000	220	870	1.2 (3.0)
MW-2	06-12-92	Not sampled: well contained floating product					
MW-2	09-14-92	Not sampled: well contained floating product					
MW-2	10-07-92	Not sampled: well contained floating product					
MW-2	01-22-93	Not sampled: well contained floating product					
MW-2	04-14-93	Not sampled: well contained floating product					
MW-2	09-30-93	Not sampled: well contained floating product					
MW-2	11-16-93	Not sampled: well contained floating product					
MW-2	02-02-94	16000	1300	2500	540	2700	NA
MW-2	04-29-94	11000	1400	1200	360	1400	NA
MW-2	08-02-94	4900	800	290	120	620	NA
MW-3	03-18-92	20000	3200	560	380	1000	7.8 (8.1)
MW-3	06-12-92	46000	3400	4200	1300	5400	16
MW-3	09-14-92	53000	4300	5700	1300	7300	5.5
MW-3	10-07-92	Not sampled: well contained floating product					
MW-3	01-22-93	35000	2100	1400	1200	4400	31
MW-3	04-14-93	13000	1800	390	990	3500	26
MW-3	09-30-93	79000	2400	3400	1900	8100	23
MW-3	11-16-93	72000	1400	2100	1900	8300	38
MW-3	02-02-94	26000	1400	1200	1200	4400	7.7 (7.8)
MW-3	04-29-94	22000	1400	620	910	3400	10
MW-3	08-02-94	17000	530	410	720	2600	6.6
MW-4	11-12-92	77	32	<0.5	<0.5	<0.5	NA
MW-4	01-22-93	170	66	0.8	<0.5	1.5	NA
MW-4	04-14-93	<50	4.6	<0.5	<0.5	<0.5	NA
MW-4	09-30-93	52	13	<0.5	<0.5	<0.5	NA
MW-4	11-16-93	230	34	<0.5	<0.5	<0.5	NA
MW-4	02-02-94	<50	3.9	<0.5	<0.5	<0.5	NA
MW-4	04-29-94	<50	4.2	<0.5	<0.5	<0.5	NA
MW-4	08-02-94	<50	3.8	<0.5	<0.5	<0.5	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 11-08-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb	TOG or TRPH ppb
MW-5	11-12-92	2900	1300	12	67	18	NA
MW-5	01-22-93	17000	5000	780	260	330	NA
MW-5	04-14-93	12000	4600	<50	180	130	NA
MW-5	09-30-93	4500	1100	<10	39	16	NA
MW-5	11-16-93	3300	700	<10	22	<10	NA
MW-5	02-02-94	10000	3000	65	240	78	NA
MW-5	04-29-94	7600	2400	27	130	44	NA
MW-5	08-02-94	1900	680	<10	24	<10	NA
MW-6	11-12-92	51	2.6	<0.5	<0.5	<0.5	NA
MW-6	01-22-93	<50	1.2	<0.5	<0.5	<0.5	NA
MW-6	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-6	09-30-93	74	2	<0.5	<0.5	<0.5	NA
MW-6	11-16-93	72	2.6	<0.5	<0.5	<0.5	NA
MW-6	02-02-94	61	2.2	<0.5	<0.5	<0.5	NA
MW-6	04-29-94	<50	0.6	<0.5	<0.5	<0.5	NA
MW-6	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-12-92	<50	1.8	<0.5	<0.5	<0.5	NA
MW-7	01-22-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	09-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-16-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	02-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	04-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
AS-2	09-30-93	<50	1.2	<0.5	<0.5	<0.5	NA

TPHG = Total petroleum hydrocarbons as gasoline
TOG = Total oil and grease measured by EPA Method 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons measured by EPA Method 418.1
ppb = parts per billion or micrograms per liter (µg/l)
NA = Not analyzed

Table 4
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-29-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semi-Volatile Organic Compounds by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-1	03-18-92	13	1.2	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	06-12-92	18	1.4	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	09-14-92	15	1.5	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	10-07-92	23	1.5	0.6	ND	ND	ND	NA	NA	NA	NA
MW-1	01-22-93	11	0.9	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	04-14-93	21	1.8	0.6	ND	ND	ND	ND	ND	ND	ND
MW-1	09-30-93	19	1.1	0.7	ND	ND	ND	NA	NA	NA	NA
MW-1	11-16-93	22	0.9	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	02-02-94	11	1.1	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	04-29-94	13	1.3	0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-1	08-02-94	15	1.4	0.7	0.7	<0.5	<0.5	NA	NA	NA	NA
MW-2	03-18-92	19	2.22	ND	0.5	ND	ND	NA	NA	NA	NA
MW-2	06-12-92	Not sampled: well contained floating product									
MW-2	09-14-92	Not sampled: well contained floating product									
MW-2	10-07-92	Not sampled: well contained floating product									
MW-2	01-22-93	Not sampled: well contained floating product									
MW-2	04-14-93	Not sampled: well contained floating product									
MW-2	09-30-93	Not sampled: well contained floating product									
MW-2	11-16-93	Not sampled: well contained floating product									
MW-2	02-02-94	13	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-2	04-29-94	9.4	1.9	<0.5	2.2	<0.5	<0.5	NA	NA	NA	NA
MW-2	08-02-94	15	2	<0.5	2.9	<0.5	<0.5	NA	NA	NA	NA

Table 4
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-29-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semi-Volatile Organic Compounds by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-3	03-18-92	2.7	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	06-12-92	1.9	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	09-14-92	2	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	10-07-92	Not sampled: well contained floating product									
MW-3	01-22-93	1.9	ND	ND	ND	ND	ND	440	350	280	13
MW-3	04-14-93	1.7	ND	ND	ND	ND	ND	130	100	250	14
MW-3	09-30-93	1.2	ND	ND	ND	ND	ND	480	320	ND	ND
MW-3	11-16-93	1.5	ND	ND	ND	ND	ND	590	640	ND	ND
MW-3	02-02-94	ND*	ND*	ND*	ND*	ND*	ND*	160	91	9	ND
MW-3	04-29-94	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	110	50	<10	<10
MW-3	08-02-94	1	<0.5	<0.5	<0.5	<0.5	<0.5	120	53	10	<10
MW-4	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	01-22-93	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4	04-14-93	1.1	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	09-30-93	1.6	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	11-16-93	1.9	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	02-02-94	1.4	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	04-29-94	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-4	08-02-94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA

Table 4
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-29-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semi-Volatile Organic Compounds by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-5	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-5	01-22-93	11	4.7	ND	1.8	ND	ND	ND	ND	ND	ND
MW-5	04-14-93	7.9	2	ND	1.5	0.9	ND	NA	NA	NA	NA
MW-5	09-30-93	17	2.8	ND	2.9	0.8	ND	NA	NA	NA	NA
MW-5	11-16-93	19	5.1	ND	4	ND	ND	NA	NA	NA	NA
MW-5	02-02-94	2.7	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-5	04-29-94	10	2.7	<0.5	2.4	<0.5	<0.5	NA	NA	NA	NA
MW-5	08-02-94	13	5.4	<0.5	5.7	<0.5	<0.5	NA	NA	NA	NA
MW-6	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-6	01-22-93	120	6.2	6.6	1.8	ND	ND	NA	NA	NA	NA
MW-6	04-14-93	120	5.8	ND	1.1	ND	6.3	NA	NA	NA	NA
MW-6	09-30-93	220	5.2	ND	2.7	ND	ND	NA	NA	NA	NA
MW-6	11-16-93	160	8.5	15	3.2	ND	ND	NA	NA	NA	NA
MW-6	02-02-94	100	ND	6.7	ND	ND	ND	NA	NA	NA	NA
MW-6	04-29-94	95	6.6	7.2	<2.5	<2.5	<2.5	NA	NA	NA	NA
MW-6	08-02-94	87	6.1	4.6	<2.5	<2.5	<2.5	NA	NA	NA	NA

Table 4
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-29-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semi-Volatile Organic Compounds by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-7	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	01-22-93	6.8	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	04-14-93	4.3	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	09-30-93	2.5	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	11-16-93	4	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	02-02-94	3.4	ND	0.8	ND	ND	ND	NA	NA	NA	NA
MW-7	04-29-94	3.4	<0.5	1.1	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-7	08-02-94	3.3	<0.5	0.8	<0.5	<0.5	<0.5	NA	NA	NA	NA
AS-2	09-30-93	29	1.5	1	ND	ND	ND	NA	NA	NA	NA

PCE = Tetrachloroethene
TCE = Trichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
1,1-DCA = 1,1-Dichloroethane
ppb = Parts per billion or micrograms per liter (µg/l)
ND = Not detected
* = Sample was analyzed for volatile organic compounds using EPA Method 624 (only BTEX was detected)

Table 5
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 11-08-94
Project Number: 0805-135.01

Well Designation	Water Sample Field Date	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Zinc by EPA 6010	Nickel by EPA 6010
		ppb	ppb	ppb	ppb	ppb	ppb
MW-1	03-18-92	<50	<3	5	3	31	<20
MW-1	06-12-92	<50	NA	NA	NA	NA	NA
MW-1	09-14-92	<80	NA	NA	NA	NA	NA
MW-1	10-07-92	<50	NA	NA	NA	NA	NA
MW-1	01-22-93	NA	NA	NA	NA	NA	NA
MW-1	04-14-93	NA	<3	<5	3	25	<20
MW-1	09-30-93	NA	NA	NA	NA	NA	NA
MW-1	11-16-93	NA	NA	NA	NA	NA	NA
MW-1	02-02-94	NA	NA	NA	NA	NA	NA
MW-1	04-29-94	NA	NA	NA	NA	NA	NA
MW-1	08-02-94	NA	NA	NA	NA	NA	NA
MW-2	03-18-92	230*	<3	21	9	54	38
MW-2	06-12-92	Not sampled: well contained floating product					
MW-2	09-14-92	Not sampled: well contained floating product					
MW-2	10-07-92	Not sampled: well contained floating product					
MW-2	01-22-93	Not sampled: well contained floating product					
MW-2	04-14-93	Not sampled: well contained floating product					
MW-2	09-30-93	Not sampled: well contained floating product					
MW-2	11-16-93	Not sampled: well contained floating product					
MW-2	02-02-94	NA	NA	NA	NA	NA	NA
MW-2	04-29-94	NA	NA	NA	NA	NA	NA
MW-2	08-02-94	NA	NA	NA	NA	NA	NA
MW-3	03-18-92	2800*	<3	67	27	156	113
MW-3	06-12-92	1600*	NA	NA	NA	NA	NA
MW-3	09-14-92	40000*	NA	NA	NA	NA	NA
MW-3	10-07-92	Not sampled: well contained floating product					
MW-3	01-22-93	13000*	<3	10	8	28	23
MW-3	04-14-93	<50	<3	<5	3	25	<20
MW-3	09-30-93	17000*	<5	50	26	100	70
MW-3	11-16-93	NA	NA	NA	NA	NA	NA
MW-3	02-02-94	NA	NA	NA	NA	NA	NA
MW-3	04-29-94	NA	NA	NA	NA	NA	NA
MW-3	08-02-94	NA	NA	NA	NA	NA	NA

Table 5
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

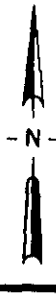
Date: 11-08-94
Project Number: 0805-135.01

Well Desig-nation	Water Sample Field Date	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Zinc by EPA 6010	Nickel by EPA 6010
		ppb	ppb	ppb	ppb	ppb	ppb
MW-4	11-12-92	NA	NA	NA	NA	NA	NA
MW-4	01-22-93	NA	NA	NA	NA	NA	NA
MW-4	04-14-93	NA	NA	NA	NA	NA	NA
MW-4	09-30-93	NA	NA	NA	NA	NA	NA
MW-4	11-16-93	NA	NA	NA	NA	NA	NA
MW-4	02-02-94	NA	NA	NA	NA	NA	NA
MW-4	04-29-94	NA	NA	NA	NA	NA	NA
MW-4	08-02-94	NA	NA	NA	NA	NA	NA
MW-5	11-12-92	NA	NA	NA	NA	NA	NA
MW-5	01-22-93	NA	NA	NA	NA	NA	NA
MW-5	04-14-93	NA	NA	NA	NA	NA	NA
MW-5	09-30-93	NA	NA	NA	NA	NA	NA
MW-5	11-16-93	NA	NA	NA	NA	NA	NA
MW-5	02-02-94	NA	NA	NA	NA	NA	NA
MW-5	04-29-94	NA	NA	NA	NA	NA	NA
MW-5	08-02-94	NA	NA	NA	NA	NA	NA
MW-6	11-12-92	NA	NA	NA	NA	NA	NA
MW-6	01-22-93	NA	NA	NA	NA	NA	NA
MW-6	04-14-93	NA	NA	NA	NA	NA	NA
MW-6	09-30-93	NA	NA	NA	NA	NA	NA
MW-6	11-16-93	NA	NA	NA	NA	NA	NA
MW-6	02-02-94	NA	NA	NA	NA	NA	NA
MW-6	04-29-94	NA	NA	NA	NA	NA	NA
MW-6	08-02-94	NA	NA	NA	NA	NA	NA
MW-7	11-12-92	NA	NA	NA	NA	NA	NA
MW-7	01-22-93	NA	NA	NA	NA	NA	NA
MW-7	04-14-93	NA	NA	NA	NA	NA	NA
MW-7	09-30-93	NA	NA	NA	NA	NA	NA
MW-7	11-16-93	NA	NA	NA	NA	NA	NA
MW-7	02-02-94	NA	NA	NA	NA	NA	NA
MW-7	04-29-94	NA	NA	NA	NA	NA	NA
MW-7	08-02-94	NA	NA	NA	NA	NA	NA
AS-2	09-30-93	NA	NA	NA	NA	NA	NA

TPHD = Total petroleum hydrocarbons as diesel by EPA Method 3510/California DHS LUFT Method
ppb = parts per billion or micrograms per liter (µg/l)
NA = Not analyzed
* = Chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline

152753

Base map from USGS 7.5' Quad. Maps:
Oakland East and Oakland West, California.
Photorevised 1980.



Scale : 0 2000 4000 Feet

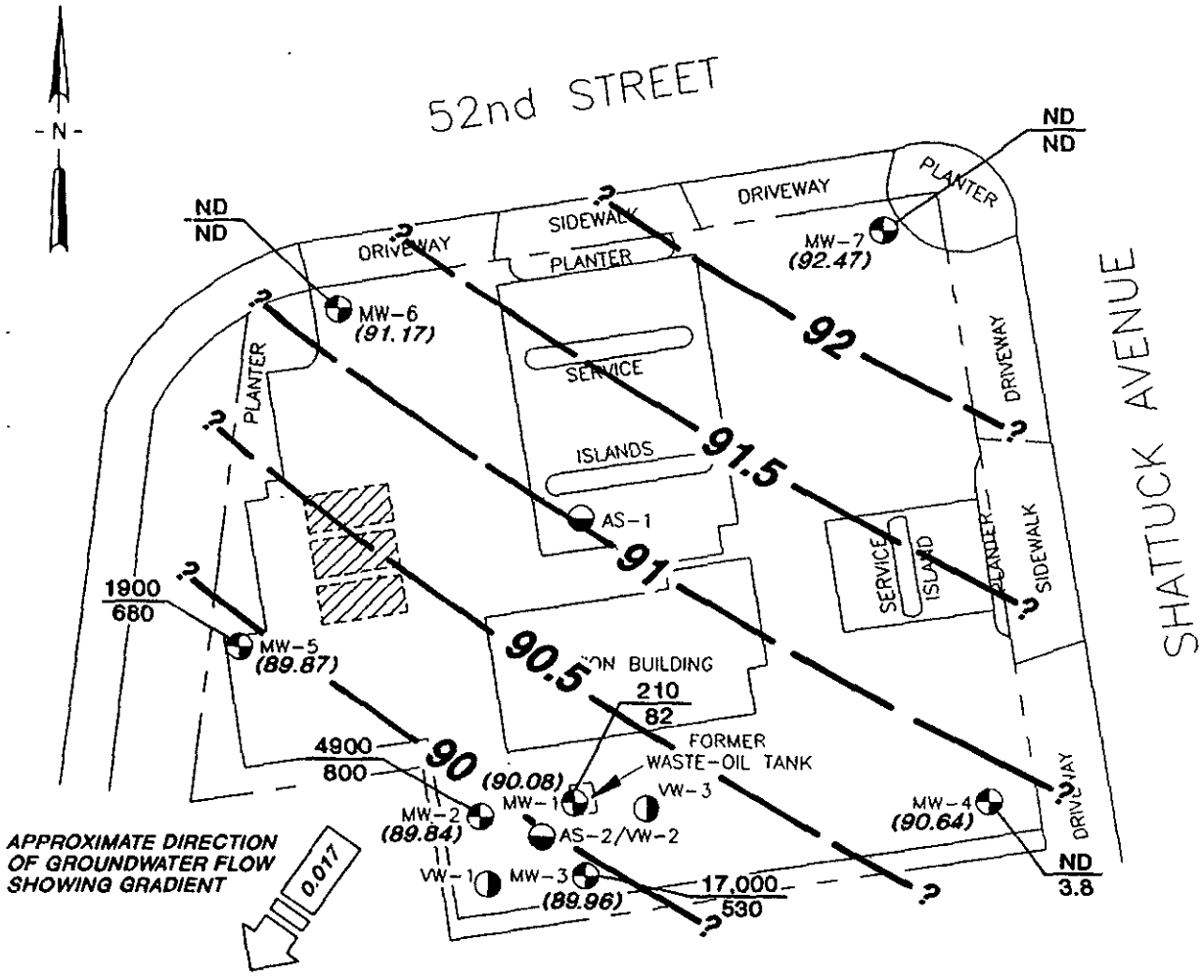
EMCON Associates

ARCO PRODUCTS COMPANY
SERVICE STATION 6148, 5131 SHATTUCK AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

SITE LOCATION

FIGURE
1

PROJECT NO.
805-135.01



EXPLANATION

- Groundwater monitoring well
- Vapor extraction well
- Air sparge/vapor extraction well
- Existing underground gasoline storage tank
- *(90.64)* Groundwater elevation (Ft.-MSL); measured 8/02/94
- 210 / 82 — TPHG concentration in groundwater (ppb) / Benzene concentration in groundwater (ppb)
  ND = Not detected
- ?——— Groundwater elevation contour (Ft. -MSL)

SCALE: 0 — 40 FEET (Approximate)

Base map modified from RESNA, 1994.

12/94

EMCON Associates

ARCO PRODUCTS COMPANY
SERVICE STATION 6148, 5131 SHATTUCK AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
THIRD QUARTER 1994

FIGURE 2

PROJECT NO. 805-135.01

APPENDIX A

FIELD DATA REPORT, INTEGRATED WASTESTREAM MANAGEMENT, AUGUST 31, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

August 31, 1994

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

Dear Mr. Young:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. A-6148 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on August 2, 1994.

Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

REGISTERED GEOLOGIST
WALTER H. HOWE
No. 730
Exp. 4/96
STATE OF CALIFORNIA

950 AMES AVENUE MILPITAS, CA. 95035 (408) 942-8955

INTEGRATED
WASTESTREAM
MANAGEMENT

A6148Q3.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-6148, Oakland, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
DATE SAMPLED	8/2/94	8/2/94	8/2/94	8/2/94	8/2/94	8/2/94	8/2/94
DEPTH TO WATER	17.95	17.59	17.81	15.94	16.81	13.99	14.61
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA
TPHg	210	4,900	17,000	ND	1,900	ND	ND
BTEX							
BENZENE	82	800	530	3.8	680	ND	ND
TOLUENE	<1	290	410	ND	<10	ND	ND
ETHLYBENZENE	<1	120	720	ND	24	ND	ND
XYLENES	2.5	620	2,600	ND	<10	ND	ND
EPA 418.1							
PETROLEUM HYDROCARBONS	NA	NA	6.6	NA	NA	NA	NA
EPA 5030							
CIS-1, 2	0.7	2.9	ND	ND	5.7	<2.5	ND
CHLOROFORM	0.7	ND	ND	ND	ND	4.6	0.8
TCE	1.4	2.0	ND	ND	5.4	6.1	ND
PCE	15	15	1.0	ND	13	87	3.3

FOOTNOTES:

Concentrations reported in ug/L (ppb)
TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)
BTEX Distinction (USEPA Method 8020)
PCE = Tetrachloroethene (USEPA Method 8010)
* = Well inaccessible

** = Not sampled per consultant request
DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)
TCE = Trichloroethene (USEAP Method 8010)
ND = Not Detected
NA = Not applicable
FP = Floating product

950 AMES AVENUE MILPITAS, CA 95035 (408) 942-8955

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 1100

Site Departure Time: 1535

Weather Conditions: Sunny Clear

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 5131 Southdeck Av. Oak. **Date:** 8-2-94

Client / Station#: Arco 6148 **Field Technician:** Vince/Cisco **Day of Week:** Tuesday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	* LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y=YES, N=NO) FP=FLOATING PRODUCT	COMMENTS	MATERIALS
4	mw-1	OK	Yes	OK	OK	OK	26.12	17.95	17.95	N/A	N/A	NO	4"	15/16
6	mw-2	OK	Yes	OK	OK	OK	26.13	17.59	17.59	N/A	N/A	NO	4"	15/16
7	mw-3	OK	Yes	OK	OK	OK	26.14	17.81+	17.81+	N/A	N/A	NO	4"	15/16
3	mw-4	OK	Yes	OK	OK	OK	26.70	15.94	15.94	N/A	N/A	NO	4"	15/16
5	mw-5	OK	Yes	OK	OK	OK	25.38	16.81	16.81	N/A	N/A	NO	4"	15/16
2	mw-6	OK	Yes	OK	OK	OK	27.30	13.99	13.99	N/A	N/A	NO	4"	15/16
1	mw-7	OK	Yes	OK	OK	OK	27.60	14.61	14.61	N/A	N/A	NO	4"	15/16

PAGE 2 OF 3 DATE: 8-2-94 CLIENT/STATION #: Arco 6148 ADDRESS: 5131 Shattuck Av. OAK

WELL ID: MW-4 TD 26.70 - DTW 15.94 x 0.66 Gal./Linear Ft. x 3 Casing Volume = 21.30 Calculated Purge

DATE PURGED: 8-2-94 START (2400 HR): 1410 END (2400 HR) 1415
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1418 DTW: 16.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1411	5	7.72	0.40	74.3	CLEAR
1413	10	7.39	0.30	73.6	CLEAR
1414	15	7.19	0.31	73.1	CLEAR
1415	21	7.17	0.30	72.8	CLEAR

Total purge: 21
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-7 TD 27.60 - DTW 14.61 x 0.66 Gal./Linear Ft. x 3 Casing Volume = 25.72 Calculated Purge

DATE PURGED: 8-2-94 START (2400 HR): 1420 END (2400 HR) 1425
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1433 DTW: 19.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1421	5	6.78	0.26	75.2	CLEAR
1422	10	6.72	0.27	74.6	CLEAR
1423	15	6.70	0.26	74.1	CLEAR
1425	25	6.69	0.25	73.2	CLOUDY

Total purge: 25
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-6 TD 27.30 - DTW 13.99 x 0.66 Gal./Linear Ft. x 3 Casing Volume = 26.35 Calculated Purge

DATE PURGED: 8-2-94 START (2400 HR): 1445 END (2400 HR) 1451
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1457 DTW: 14.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1446	5	6.64	0.26	73.9	CLEAR
1447	10	6.61	0.26	73.4	CLEAR
1448	15	6.62	0.26	73.6	CLEAR
1451	26	6.63	0.26	72.0	CLEAR

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-5 TD 25.38 - DTW 16.81 x 0.66 Gal./Linear Ft. x 3 Casing Volume = 16.96 Calculated Purge

DATE PURGED: 8-2-94 START (2400 HR): 1505 END (2400 HR) 1509
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1515 DTW: 19.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1506	5	6.67	0.29	74.2	CLEAR
1507	10	6.66	0.28	73.7	CLEAR
1509	17	6.65	0.26	73.2	CLEAR

Total purge: 17
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Abungan SIGNATURE: Francisco Abungan

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

PAGE 3 OF 3 DATE: 8-2-94 CLIENT/STATION #: Arco 6148 ADDRESS: 5131 St. Lattuck ave. Berkeley

WELL ID: MW-1 TD 26.12 - DTW 17.95 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 16.17 (Calculated Purge)

DATE PURGED: 8-2-94 START (2400 HR): 1358 END (2400 HR) 1404
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1410 DTW: 22.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1400	2	7.35	0.49	72.0	clear
1401	6	7.44	0.28	71.8	clear
1402	11	7.30	0.26	71.0	clear
1404	16	7.28	0.24	70.7	clear

Total purge: 16
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-2 TD 26.13 - DTW 17.59 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 16.90 (Calculated Purge)

DATE PURGED: 8-2-94 START (2400 HR): 1417 END (2400 HR) 1422
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1428 DTW: 23.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1418	2	7.15	0.26	71.5	clear
1419	5	7.02	0.24	71.3	clear
1420	11	6.98	0.23	70.9	clear
1422	12	6.97	0.23	70.8	clear

Total purge: 12
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 11 and again at 12 gallons

WELL ID: MW-3 TD 26.14 - DTW 17.81+ x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 16.49 (Calculated Purge)

DATE PURGED: 8-2-94 START (2400 HR): 1438 END (2400 HR) 1444
DATE SAMPLED: 8-2-94 TIME (2400 HR): 1450 DTW: 21.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1440	1	6.93	0.25	72.2	black
1441	6	6.89	0.24	71.6	clear
1442	11	6.86	0.24	71.2	clear
1444	16	6.87	0.23	70.9	clear

Total purge: 16
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: ____ TD ____ - DTW ____ x Gal./Linear Ft. ____ x Casing Volume ____ - Calculated Purge ____

DATE PURGED: ____ START (2400 HR): ____ END (2400 HR) ____
DATE SAMPLED: ____ TIME (2400 HR): ____ DTW: ____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge: ____
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

APPENDIX B

CERTIFIED ANALYTICAL REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION, THIRD QUARTER 1994

Columbia Analytical Services, Inc.

August 16, 1994 Service Request No. S940870

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 6148**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on August 5, 1994. For your reference, these analyses have been assigned our service request number S940870.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

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Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
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 MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	S940870
Project:	ARCO Facility No. 6148	**Date Collected:**	8/2/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	8/11/94
		Date Analyzed:	8/12/94

Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-3 (21.9)	S940870-004	0.5	6.6
Method Blank	S940811-WB	0.5	ND

Approved By: Kenneth Murphy Date: August 16, 1994

IAMRL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	S940870
Project:	ARCO Facility No. 6148	**Date Collected:**	8/2/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	NA
		Date Analyzed:	8/9,10/94

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Analyte:	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes, Total
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-1 (22.9)	S940870-002	210	82	<1 *	<1 *	2.5
MW-2 (23.1)	S940870-003	4,900	800	290	120	620
MW-3 (21.9)	S940870-004	17,000	530	410	720	2,600
MW-4 (16.1)	S940870-005	ND	3.8	ND	ND	ND
MW-5 (19.1)	S940870-006	1,900	680	<10 *	24	<10 *
MW-6 (14.1)	S940870-007	ND	ND	ND	ND	ND
MW-7 (14.9)	S940870-008	ND	ND	ND	ND	ND
Method Blank	S940809-WB	ND	ND	ND	ND	ND
Method Blank	S940810-WB	ND	ND	ND	ND	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: Kevin A Murphy Date: August 16, 1994

5ABTXGAS/061694

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA

Halogenated Volatile Organic Compounds
EPA Methods 5030/601
Units: ug/L (ppb)

	Sample Name:	MW-1 (22.9)	MW-2 (23.1)	MW-3 (21.9)
	Lab Code:	S940870-002	S940870-003	S940870-004
	Date Analyzed:	8/12/94	8/11/94	8/12/94
Analyte	**MRL**			
Dichlorodifluoromethane (CFC 12)	1	ND	ND	ND
Chloromethane	1	ND	ND	ND
Vinyl Chloride	0.5	ND	ND	ND
Bromomethane	0.5	ND	ND	ND
Chloroethane	0.5	ND	ND	ND
Trichlorofluoromethane (CFC 11)	0.5	ND	ND	ND
1,1-Dichloroethene	0.5	ND	ND	ND
Trichlorotrifluoroethane (CFC 113)	0.5	ND	ND	ND
Methylene Chloride	0.5	ND	ND	ND
trans-1,2-Dichloroethene	0.5	ND	ND	ND
cis-1,2-Dichloroethene	0.5	0.7	2.9	ND
1,1-Dichloroethane	0.5	ND	ND	ND
Chloroform	0.5	0.7	ND	ND
1,1,1-Trichloroethane (TCA)	0.5	ND	ND	ND
Carbon Tetrachloride	0.5	ND	ND	ND
1,2-Dichloroethane	0.5	ND	ND	ND
Trichloroethene (TCE)	0.5	1.4	2.0	ND
1,2-Dichloropropane	0.5	ND	ND	ND
Bromodichloromethane	0.5	ND	ND	ND
2-Chloroethyl Vinyl Ether	5	ND	ND	ND
trans-1,3-Dichloropropene	0.5	ND	ND	ND
cis-1,3-Dichloropropene	0.5	ND	ND	ND
1,1,2-Trichloroethane	0.5	ND	ND	ND
Tetrachloroethene (PCE)	0.5	15	15	1.0
Dibromochloromethane	0.5	ND	ND	ND
Chlorobenzene	0.5	ND	ND	ND
Bromoform	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

Approved By: _____ Date: August 16, 1994

3S44/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA

Halogenated Volatile Organic Compounds
EPA Methods 5030/601
Units: ug/L (ppb)

		Sample Name:	MW-4 (16.1)	MW-5 (19.1)	MW-6 (14.1) *
		Lab Code:	S940870-005	S940870-006	S940870-007
		Date Analyzed:	8/12/94	8/11/94	8/11/94
Analyte	**MRL**				
Dichlorodifluoromethane (CFC 12)	1		ND	ND	<5
Chloromethane	1		ND	ND	<5
Vinyl Chloride	0.5		ND	ND	<2.5
Bromomethane	0.5		ND	ND	<2.5
Chloroethane	0.5		ND	ND	<2.5
Trichlorofluoromethane (CFC 11)	0.5		ND	ND	<2.5
1,1-Dichloroethene	0.5		ND	ND	<2.5
Trichlorotrifluoroethane (CFC 113)	0.5		ND	ND	<2.5
Methylene Chloride	0.5		ND	ND	<2.5
trans-1,2-Dichloroethene	0.5		ND	ND	<2.5
cis-1,2-Dichloroethene	0.5		ND	5.7	<2.5
1,1-Dichloroethane	0.5		ND	ND	<2.5
Chloroform	0.5		ND	ND	4.6
1,1,1-Trichloroethane (TCA)	0.5		ND	ND	<2.5
Carbon Tetrachloride	0.5		ND	ND	<2.5
1,2-Dichloroethane	0.5		ND	ND	<2.5
Trichloroethene (TCE)	0.5		ND	5.4	6.1
1,2-Dichloropropane	0.5		ND	ND	<2.5
Bromodichloromethane	0.5		ND	ND	<2.5
2-Chloroethyl Vinyl Ether	5		ND	ND	<25
trans-1,3-Dichloropropene	0.5		ND	ND	<2.5
cis-1,3-Dichloropropene	0.5		ND	ND	<2.5
1,1,2-Trichloroethane	0.5		ND	ND	<2.5
Tetrachloroethene (PCE)	0.5		ND	13	87
Dibromochloromethane	0.5		ND	ND	<2.5
Chlorobenzene	0.5		ND	ND	<2.5
Bromoform	0.5		ND	ND	<2.5
1,1,2,2-Tetrachloroethane	0.5		ND	ND	<2.5
1,3-Dichlorobenzene	1		ND	ND	<5
1,4-Dichlorobenzene	1		ND	ND	<5
1,2-Dichlorobenzene	1		ND	ND	<5

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved By: Tom A Murphy Date: August 16, 1994

3S44/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA

Halogenated Volatile Organic Compounds
EPA Methods 5030/601
Units: ug/L (ppb)

		Sample Name:	MW-7 (14.9)	Method Blank
		Lab Code:	S940870-008	S940811-WB
		Date Analyzed:	8/12/94	8/11/94
Analyte	**MRL**			
Dichlorodifluoromethane (CFC 12)	1		ND	ND
Chloromethane	1		ND	ND
Vinyl Chloride	0.5		ND	ND
Bromomethane	0.5		ND	ND
Chloroethane	0.5		ND	ND
Trichlorofluoromethane (CFC 11)	0.5		ND	ND
1,1-Dichloroethene	0.5		ND	ND
Trichlorotrifluoroethane (CFC 113)	0.5		ND	ND
Methylene Chloride	0.5		ND	ND
trans-1,2-Dichloroethene	0.5		ND	ND
cis-1,2-Dichloroethene	0.5		ND	ND
1,1-Dichloroethane	0.5		ND	ND
Chloroform	0.5		0.8	ND
1,1,1-Trichloroethane (TCA)	0.5		ND	ND
Carbon Tetrachloride	0.5		ND	ND
1,2-Dichloroethane	0.5		ND	ND
Trichloroethene (TCE)	0.5		ND	ND
1,2-Dichloropropane	0.5		ND	ND
Bromodichloromethane	0.5		ND	ND
2-Chloroethyl Vinyl Ether	5		ND	ND
trans-1,3-Dichloropropene	0.5		ND	ND
cis-1,3-Dichloropropene	0.5		ND	ND
1,1,2-Trichloroethane	0.5		ND	ND
Tetrachloroethene (PCE)	0.5		3.3	ND
Dibromochloromethane	0.5		ND	ND
Chlorobenzene	0.5		ND	ND
Bromoform	0.5		ND	ND
1,1,2,2-Tetrachloroethane	0.5		ND	ND
1,3-Dichlorobenzene	1		ND	ND
1,4-Dichlorobenzene	1		ND	ND
1,2-Dichlorobenzene	1		ND	ND

Approved By: Kevin A Murphy Date: August 16, 1994

3S44/060194

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APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6148

Service Request: S940870
Date Analyzed: 8/12/94

Initial Calibration Verification (ICV) Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: ppm

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Hydorcarbon Mixture	40	43.1	108	90-110

Approved By: Karen A Murphy Date: August 16, 1994

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S940870
Project:	ARCO Facility No. 6148	**Date Collected:**	8/2/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	8/11/94
		Date Analyzed:	8/12/94

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: Batch QC
Lab Code: S940871-006

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Hydrocarbon Mixture	8.0	8.0	0.7	6.69	7.28	75	82	57-127	8

Approved By: Kevin A Murphy Date: August 16, 1994

DMS1S/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA
Date Analyzed: 8/9,10/94

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (22.9)	S940870-002	99
MW-2 (23.1)	S940870-003	96
MW-3 (21.9)	S940870-004	99
MW-4 (16.1)	S940870-005	101
MW-5 (19.1)	S940870-006	98
MW-6 (14.1)	S940870-007	93
MW-7 (14.9)	S940870-008	100
MS	S940869-002MS	101
DMS	S940869-002DMS	102
Method Blank	S940809-WB	95
Method Blank	S940810-WB	96

CAS Acceptance Limits: 69-116

Approved By: Donna Murphy Date: August 16 1994

SUR1/062994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6148

Service Request: S940870
Date Analyzed: 8/9/94

Initial Calibration Verification (ICV) Summary
BTEX 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	27.8	111	85-115
Toluene	25	26.2	105	85-115
Ethylbenzene	25	26.4	106	85-115
Xylenes, Total	75	76.6	102	85-115
Gasoline	250	247	99	90-110

Approved By: Kim A Murphy Date: August 16, 1994

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S940870
Project:	ARCO Facility No. 6148	**Date Collected:**	8/2/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	NA
		Date Analyzed:	8/9/94

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S940869-002

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	250	250	ND	224	233	90	93	67-121	4

Approved By: Leon A Murphy Date: August 16, 1994

DMS1S/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA
Date Analyzed: 8/11,12/94

Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/601

Sample Name	Lab Code	Percent Recovery 4-Bromofluorobenzene
MW-1 (22.9)	S940870-002	99
MW-2 (23.1)	S940870-003	107
MW-3 (21.9)	S940870-004	103
MW-4 (16.1)	S940870-005	105
MW-5 (19.1)	S940870-006	107
MW-6 (14.1)	S940870-007	107
MW-7 (14.9)	S940870-008	99
MS	S940844-001MS	105
DMS	S940844-001DMS	103
Method Blank	S940811-WB	104

CAS Acceptance Limits: 76-138

Approved By: Kevin A Murphy Date: August 16, 1994

SUR1/062994

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Client: IWM
Project: ARCO Facility No. 6148

Service Request: S940870
Date Analyzed: 8/5/94

Initial Calibration Verification (ICV) Summary
Halogenated Organic Compounds
EPA Methods 5030/601
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Chloromethane	100	75.8	76	D-193
Vinyl Chloride	100	114	114	28-163
Bromomethane	100	112	112	D-144
Chloroethane	100	108	108	46-137
Trichlorofluoromethane (CFC 11)	100	111	111	21-156
1,1-Dichloroethene	100	93.6	94	28-167
Methylene Chloride	100	105	105	25-162
trans-1,2-Dichloroethene	100	94.3	94	38-155
1,1-Dichloroethane	100	103	103	47-132
Chloroform	100	107	107	49-133
1,1,1-Trichloroethane (TCA)	100	101	101	41-138
Carbon Tetrachloride	100	105	105	43-143
1,2-Dichloroethane	100	98.3	98	51-147
Trichloroethene (TCE)	100	101	101	35-146
1,2-Dichloropropane	100	99.8	100	44-156
Bromodichloromethane	100	101	101	42-172
trans-1,3-Dichloropropene	100	113	113	22-178
cis-1,3-Dichloropropene	100	97.5	98	22-178
1,1,2-Trichloroethane	100	95.8	96	39-136
Tetrachloroethene (PCE)	100	104	104	26-162
Dibromochloromethane	100	100	100	24-191
Chlorobenzene	100	100	100	38-150
Bromoform	100	95.4	95	13-159
1,1,2,2-Tetrachloroethane	100	88.5	88	8-184
1,3-Dichlorobenzene	100	111	111	7-187
1,4-Dichlorobenzene	100	108	108	42-143
1,2-Dichlorobenzene	100	109	109	D-208

Approved By: Donna Murphy Date: August 6 1994

ICV41/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6148
Sample Matrix: Water

Service Request: S940870
Date Collected: 8/2/94
Date Received: 8/5/94
Date Extracted: NA
Date Analyzed: 8/11/94

Matrix Spike/Duplicate Matrix Spike Summary
Halogenated Volatile Organics
EPA Methods 5030/601
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S940844-001

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS		
1,1-Dichloroethene	10	10	ND	9.14	9.63	91	96	69-142	5
Trichloroethene	10	10	ND	10.5	10.2	105	102	42-148	3
Tetrachloroethene	10	10	ND	10.3	10.2	103	102	80-136	1

Approved By: Donna A Murphy Date: August 16, 1994

DMS1S/060194

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APPENDIX B

CHAIN OF CUSTODY

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no.	A6148
City (Facility)	OAKland
Project manager (Consultant)	TOM De Son / J. Young
ARCO engineer	M.W
Telephone no. (ARCO)	4155712434
Telephone no. (Consultant)	408/9428955
Fax no. (Consultant)	408/9421499
Consultant name	IWM / RosnA
Address (Consultant)	950 Ames av. Milp. CA 95035
Laboratory name	CAS
Contract number	07077
Method of shipment	CAS Courier

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid (HCL)	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH 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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
FB-1	1	2		✓		✓	✓	8-2-94	1118		✓	✓			✓							
MW-1	2	2+2		✓		✓	✓	"	1410		✓	✓			✓							
MW-2	3	2+2		✓		✓	✓	"	1428		✓	✓			✓							
MW-3	4	8		✓		✓	✓	"	1450		✓	✓		✓	✓		✓					
MW-4	5	2+2		✓		✓	✓	"	1418		✓	✓			✓							
MW 5	6	2+2		✓		✓	✓	"	1515		✓	✓			✓							
MW-6	7	2+2		✓		✓	✓	"	1457		✓	✓			✓							
MW-7	8	2+2		✓		✓	✓	"	1433		✓	✓			✓							

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB-1

Lab number: S940870

Condition of sample: Okay

Temperature received: Cool

Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: [signature]	8-5-94	1430	Received by		
Relinquished by			Received by		
Relinquished by			Received by laboratory: [signature]	8-5-94	1430

Turnaround time

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

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

Kelso; 8270

RECEIVED AUG 2 4 1994

Columbia Analytical Services inc.

August 19, 1994

Service Request No.: K944771S

Tom Delon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO A6148 Oakland/Project #IMW-94-5CC/SJ94-0870**

Dear Tom:

Enclosed are the results of the sample(s) submitted to our laboratory on August 9, 1994. For your reference, these analyses have been assigned our service request number K944771S.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 239.

Respectfully submitted,

Columbia Analytical Services, Inc.

Howard Boorse
Project Chemist

HB/td

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
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 MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Received:**	08/09/94
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Extracted:**	08/10/94[a]
Sample Matrix:	Water	**Date Analyzed:**	08/16/94
		Service Request No.:	K944771S

Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270
µg/L (ppb)

Sample Name: MW-3
Lab Code: K944771-001

Base Neutral Analyte	MRL	Result	Base Neutral Analyte	MRL	Result
N-Nitrosodimethylamine	25	ND	2,6-Dinitrotoluene	10	ND
Aniline	25	ND	Diethyl Phthalate	10	ND
Bis(2-chloroethyl) Ether	10	ND	4-Chlorophenyl Phenyl Ether	10	ND
1,2-Dichlorobenzene	10	ND	Fluorene	10	ND
1,3-Dichlorobenzene	10	ND	4-Nitroaniline	25	ND
1,4-Dichlorobenzene	10	ND	N-Nitrosodiphenylamine	10	ND
Bis(2-chloroisopropyl) Ether	10	ND	4-Bromophenyl Phenyl Ether	10	ND
N-Nitrosodi-n-propylamine	10	ND	Hexachlorobenzene	10	ND
Hexachloroethane	10	ND	Phenanthrene	10	ND
Nitrobenzene	10	ND	Anthracene	10	ND
Isophorone	10	ND	Di-n-butyl Phthalate	10	ND
Bis(2-chloroethoxy)methane	10	ND	Fluoranthene	10	ND
1,2,4-Trichlorobenzene	10	ND	Pyrene	10	ND
Naphthalene	10	120	Butylbenzyl Phthalate	10	ND
4-Chloroaniline	10	ND	3,3'-Dichlorobenzidine	25	ND
Hexachlorobutadiene	10	ND	Benz(a)anthracene	10	ND
2-Methylnaphthalene	10	53	Bis(2-ethylhexyl) Phthalate	10	10
Hexachlorocyclopentadiene	10	ND	Chrysene	10	ND
2-Chloronaphthalene	10	ND	Di-n-octyl Phthalate	10	ND
2-Nitroaniline	25	ND	Benzo(b)fluoranthene	10	ND
Dimethyl Phthalate	10	ND	Benzo(k)fluoranthene	10	ND
Acenaphthylene	10	ND	Benzo(a)pyrene	10	ND
3-Nitroaniline	25	ND	Indeno(1,2,3-c,d)pyrene	10	ND
Acenaphthene	10	ND	Dibenz(a,h)anthracene	10	ND
Dibenzofuran	10	ND	Benzo(g,h,i)perylene	10	ND
2,4-Dinitrotoluene	10	ND			

Acid Analyte	MRL	Result	Acid Analyte	MRL	Result
Phenol	10	ND	2,4-Dichlorophenol	10	ND
2-Chlorophenol	10	ND	4-Chloro-3-methylphenol	10	ND
Benzyl Alcohol	10	ND	2,4,6-Trichlorophenol	10	ND
2-Methylphenol	10	ND	2,4,5-Trichlorophenol	10	ND
3- and 4-Methylphenol♦	10	ND	2,4-Dinitrophenol	25	ND
2-Nitrophenol	10	ND	4-Nitrophenol	25	ND
2,4-Dimethylphenol	10	ND	2-Methyl-4,6-dinitrophenol	25	ND
Benzoic Acid	25	ND	Pentachlorophenol	25	ND

♦ Quantified as 4-methylphenol.
a Sample was extracted 1 day past the end of the recommended maximum holding time.

Approved by _____ Date 8/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Date Received:**	NA
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Extracted:**	08/10/94
Sample Matrix:	Water	**Date Analyzed:**	08/16/94
		Service Request No.:	K944771S

Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270
µg/L (ppb)

Sample Name: *Method Blank*
Lab Code: K940810-WB1

Base Neutral Analyte	MRL	Result	Base Neutral Analyte	MRL	Result
N-Nitrosodimethylamine	25	ND	2,6-Dinitrotoluene	10	ND
Aniline	25	ND	Diethyl Phthalate	10	ND
Bis(2-chloroethyl) Ether	10	ND	4-Chlorophenyl Phenyl Ether	10	ND
1,2-Dichlorobenzene	10	ND	Fluorene	10	ND
1,3-Dichlorobenzene	10	ND	4-Nitroaniline	25	ND
1,4-Dichlorobenzene	10	ND	N-Nitrosodiphenylamine	10	ND
Bis(2-chloroisopropyl) Ether	10	ND	4-Bromophenyl Phenyl Ether	10	ND
N-Nitrosodi-n-propylamine	10	ND	Hexachlorobenzene	10	ND
Hexachloroethane	10	ND	Phenanthrene	10	ND
Nitrobenzene	10	ND	Anthracene	10	ND
Isophorone	10	ND	Di-n-butyl Phthalate	10	ND
Bis(2-chloroethoxy)methane	10	ND	Fluoranthene	10	ND
1,2,4-Trichlorobenzene	10	ND	Pyrene	10	ND
Naphthalene	10	ND	Butylbenzyl Phthalate	10	ND
4-Chloroaniline	10	ND	3,3'-Dichlorobenzidine	25	ND
Hexachlorobutadiene	10	ND	Benz(a)anthracene	10	ND
2-Methylnaphthalene	10	ND	Bis(2-ethylhexyl) Phthalate	10	ND
Hexachlorocyclopentadiene	10	ND	Chrysene	10	ND
2-Chloronaphthalene	10	ND	Di-n-octyl Phthalate	10	ND
2-Nitroaniline	25	ND	Benzo(b)fluoranthene	10	ND
Dimethyl Phthalate	10	ND	Benzo(k)fluoranthene	10	ND
Acenaphthylene	10	ND	Benzo(a)pyrene	10	ND
3-Nitroaniline	25	ND	Indeno(1,2,3-c,d)pyrene	10	ND
Acenaphthene	10	ND	Dibenz(a,h)anthracene	10	ND
Dibenzofuran	10	ND	Benzo(g,h,i)perylene	10	ND
2,4-Dinitrotoluene	10	ND			

Acid Analyte	MRL	Result	Acid Analyte	MRL	Result
Phenol	10	ND	2,4-Dichlorophenol	10	ND
2-Chlorophenol	10	ND	4-Chloro-3-methylphenol	10	ND
Benzyl Alcohol	10	ND	2,4,6-Trichlorophenol	10	ND
2-Methylphenol	10	ND	2,4,5-Trichlorophenol	10	ND
3- and 4-Methylphenol♦	10	ND	2,4-Dinitrophenol	25	ND
2-Nitrophenol	10	ND	4-Nitrophenol	25	ND
2,4-Dimethylphenol	10	ND	2-Methyl-4,6-dinitrophenol	25	ND
Benzoic Acid	25	ND	Pentachlorophenol	25	ND

♦ Quantified as 4-methylphenol.

Approved by _____ Date 8/22/94

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Received:**	08/09/94
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Extracted:**	08/10/94
Sample Matrix:	Water	**Date Analyzed:**	08/16/94
		Service Request No.:	K944771S

Surrogate Recovery Summary
Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270

Sample Name	Lab Code	Percent Recovery					
		2FP	PHL	TBP	NBZ	FBP	TPH
Method Blank	K940810-WB1	76	84	78	69	73	92
Laboratory Control Sample	K940810-WL1	73	85	89	71	74	95
MW-3	K944771-001	[a]<5	15	[a]<5	72	80	93
EPA Acceptance Criteria		21-100	10-94	10-123	35-114	43-116	33-141

2FP 2-Fluorophenol
PHL Phenol-D_6
TBP 2,4,6-Tribromophenol
NBZ Nitrobenzene-D_5
FBP 2-Fluorobiphenyl
TPH Terphenyl-D_{14}

a Outside of acceptance limits because of matrix interferences. The chromatogram showed nontarget components that interfered with the analysis. Insufficient sample quantity remained for additional analysis.

Approved by _____ Date 8/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Received:**	NA
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Extracted:**	08/10/94
Sample Matrix:	Water	**Date Analyzed:**	08/16/94
		Service Request No.:	K944771S

Surrogate Recovery Summary
Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270

Sample Name	Lab Code	Percent Recovery					
		2FP	PHL	TBP	NBZ	FBP	TPH
Batch QC	K944745-001	79	87	87	77	73	88
Batch QC	K944745-001MS	73	84	90	72	75	86
Batch QC	K944745-001DMS	78	42	91	76	76	87
EPA Acceptance Criteria		21-100	10-94	10-123	35-114	43-116	33-141

2FP 2-Fluorophenol
PHL Phenol-D_6
TBP 2,4,6-Tribromophenol
NBZ Nitrobenzene-D_5
FBP 2-Fluorobiphenyl
TPH Terphenyl-D_{14}

Approved by _____ Date 8/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Received:**	NA
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Extracted:**	08/10/94
Sample Matrix:	Water	**Date Analyzed:**	08/16/94
		Service Request No.:	K944771S

Matrix Spike/Duplicate Matrix Spike Summary
Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270
µg/L (ppb)

Sample Name: Batch QC
Lab Code: K944745-001

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria	Relative Percent Difference
Phenol	400	400	ND	220	210	55	52	12-89	5
2-Chlorophenol	400	400	ND	230	220	58	55	27-123	4
1,4-Dichlorobenzene	200	200	ND	130	150	65	75	36-97	14
N-Nitrosodi-n-propylamine	200	200	ND	130	88	65	44	41-116	39
1,2,4-Trichlorobenzene	200	200	ND	130	140	65	70	39-98	7
4-Chloro-3-methylphenol	400	400	ND	260	290	65	72	23-97	11
Acenaphthene	200	200	ND	160	170	80	85	46-118	6
4-Nitrophenol	400	400	ND	260	300	65	75	10-80	14
2,4-Dinitrotoluene	200	200	ND	140	150	70	75	24-96	7
Pentachlorophenol	400	400	ND	270	310	68	78	9-103	14
Pyrene	200	200	ND	170	170	85	85	26-127	<1

Approved by Howard Bowe Date 8/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Date Extracted:**	08/10/94
Project:	ARCO A6148 Oakland/Project #IMW-94-5CC	**Date Analyzed:**	08/16/94
LCS Matrix:	Water	**Service Request No.:**	K944771S

Laboratory Control Sample Summary
Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3520/8270
µg/L (ppb)

Analyte	True Value	Result	Percent Recovery	EPA Percent Recovery Acceptance Criteria
Phenol	100	65	65	5-112
2-Chlorophenol	100	66	66	23-134
1,4-Dichlorobenzene	100	74	74	20-124
N-Nitrosodi-n-propylamine	100	73	73	D-230
1,2,4-Trichlorobenzene	100	73	73	44-142
4-Chloro-3-methylphenol	100	67	67	22-147
Acenaphthene	100	86	86	47-145
4-Nitrophenol	100	57	57	D-132
2,4-Dinitrotoluene	100	73	73	39-139
Pentachlorophenol	100	30	30	14-176
Pyrene	100	102	102	52-115

D Detected; result must be greater than zero.

Approved by Howard Fowler Date 8/22/94

APPENDIX B

CHAIN OF CUSTODY INFORMATION

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A6148	City (Facility) OAKland	Project manager (Consultant) TomDeSon / J. Young	Laboratory name CAS
ARCO engineer M.W	Telephone no. (ARCO) 4155712434	Telephone no. (Consultant) 408/9428955	Fax no. (Consultant) 408/9421499	Contract number 6767
Consultant name IWM / ResnA	Address (Consultant) 950 Amos ave. Milp. CA 95035			Method of shipment CAS COURIER

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 EPA 8020/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi ☐ VOA ☐ Metals ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐		
FB-1	1	2		✓		✓	✓	8-2 94	1118		✓	✓			✓							
22.9 MW-1	2	2+2		✓		✓	✓		1410		✓	✓			✓							
23.1 MW-2	3	2+2		✓		✓	✓		1428		✓	✓			✓							
21.9 MW-3	4	8		✓		✓	✓		1450		✓	✓		✓	✓		✓		Rec'd ½ Amber broken			*
16.1 MW-4	5	2+2		✓		✓	✓		1418		✓	✓			✓							
19.1 MW-5	6	2+2		✓		✓	✓		1515		✓	✓			✓							
14.1 MW-6	7	2+2		✓		✓	✓		1457		✓	✓			✓							
14.9 MW-7	8	2+2		✓		✓	✓	6 6	1433		✓	✓			✓							

Special detection Limit/reporting

Special QA/QC

Remarks Rec'd on FB-1

Lab number 5940870

Turnaround time

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

Condition of sample: Okay		Temperature received: cool	
Relinquished by sampler: [signature]	Date: 8-5-94	Time: 1430	Received by:
Relinquished by: [signature] CAS-SF	Date: 8-8-94	Time: 1600	Received by: [signature] Lori K. Hawn CAS-K 8/9/94 1000
Relinquished by:	Date:	Time:	Received by laboratory: [signature] Date: 8-5-94 Time: 1430

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
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