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

Rec'd 10/5/95

Date September 29, 1995
Project 20805-134.002

To:

Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502-6577

We are enclosing:

Copies	Description
1	Second quarter 1995 groundwater monitoring report for ARCO service station 6113, Livermore, California

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

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.

David Larsen
Project Coordinator

cc: Sum Arigala, RWQCB - SFBR
Danielle Stefani, LFD
Michael Whelan, ARCO Products Company
David Larsen, EMCON
File

ARCO Products Company
Environmental Engineering
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Date: September 29, 1995

Re: ARCO Station # 6113 • 785 East Stanley Boulevard • Livermore, CA
Second Quarter 1995 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
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

August 24, 1995
Project 20805-134.002

Mr. Mike Whelan
ARCO Products Company
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Re: Second quarter 1995 groundwater monitoring program results, ARCO service station 6113, Livermore, California

Dear Mr. Whelan:

This letter presents the results of the second quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 6113, 785 East Stanley Boulevard, Livermore, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

Ten on-site groundwater monitoring wells (MW-1 through MW-10), two off-site groundwater monitoring wells (MW-11 and MW-12), and four on-site vapor extraction wells (VW-1 through VW-4) were installed as part of a comprehensive site assessment conducted at this site between September 1989 and June 1993. Please refer to *Results of Vapor Extraction Well Installation at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California* (RESNA, June 2, 1994), and *First Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6113, Livermore, California* (EMCON, May 1995) for more details.

MONITORING PROGRAM FIELD PROCEDURES

A program of quarterly groundwater monitoring was initiated during the second quarter of 1995 to provide information concerning water quality, flow direction, and gradient consistent with ACHCSA and Regional Water Quality Control Board (RWQCB) requirements for underground fuel tank investigations. Water levels are measured quarterly in wells MW-1 through MW-12. Wells MW-1, MW-2, MW-3, MW-8, MW-9 and MW-10 are sampled annually, during the fourth quarter of the year. Wells MW-11 and MW-12 are sampled semiannually, during the second and fourth quarters. Wells MW-4 through MW-7 are sampled quarterly.

The second quarter 1995 groundwater monitoring event was performed by EMCON on May 31, 1995. Field work this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-4 and MW-6 through MW-12, (2) purging and subsequently sampling groundwater monitoring wells MW-4, MW-6, MW-7, MW-11, and MW-12 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Well MW-5 was inaccessible (EMCON could not remove the well-box lid); therefore, the well was not monitored during the second quarter of 1995. Copies of all field data sheets from the second quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during second quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (USEPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California Environmental Protection Agency (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank* (LUFT) *Field Manual* (State Water Resources Control Board, October 1989). Samples were analyzed for BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, November 1986, third edition). These methods are recommended in *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990) for analysis of samples from petroleum-hydrocarbon-impacted sites.

MONITORING PROGRAM RESULTS

Results of the second quarter 1995 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 halogenated volatile organic compounds (VOCs), total petroleum hydrocarbons as diesel (TPHD), and metals analyses. Copies of the second quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation data collected on May 31, 1995, indicate that groundwater beneath the site flows north-northwest at an approximate hydraulic gradient of 0.028 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the second quarter of 1995.

Groundwater samples from wells MW-6, MW-7, MW-11, and MW-12 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples from well MW-4 contained 190 micrograms per liter (µg/L) TPHG, and 1.6 µg/L benzene. Well MW-5 was inaccessible and was not sampled during second quarter 1995.

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.

SITE STATUS UPDATE

This update reports site activities performed during the second quarter of 1995 and those anticipated for the third quarter of 1995.

Second Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring report for first quarter 1995.
- Performed quarterly groundwater monitoring for second quarter 1995.

Work Anticipated for Third Quarter 1995

- Prepare and submit quarterly groundwater monitoring report for second quarter 1995.
- Perform quarterly groundwater monitoring for third quarter 1995.

Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

Lynn A. Gallagher, R.G. 6090
Project Geologist

REGISTERED GEOLOGIST
LYNN A. GALLAGHER
RG6090
STATE OF CALIFORNIA

Attachments:
- Table 1 - Groundwater Monitoring Data, Second Quarter 1995
- Table 2 - Historical Groundwater Elevation Data
- Table 3 - Historical Groundwater Analytical Data (TPHG, BTEX, and TRPH)
- Table 4 - Historical Groundwater Analytical Data (VOCs, TPHD, and Metals)
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Second Quarter 1995
- Appendix A - Field Data Sheets, Second Quarter 1995 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain-of-Custody Documentation, Second Quarter 1995

cc: Susan Hugo, ACHCSA
Sum Arigala, RWQCB - SFBR
Danielle Stefani, LFD

Table 1
Groundwater Monitoring Data
Second Quarter 1995

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

Date: 08-15-95
Project Number: 0805-134.02

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		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	05-31-95	457.04	14.45	442.59	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-2	05-31-95	457.74	14.67	443.07	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-3	05-31-95	456.97	14.46	442.51	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-4	05-31-95	456.55	15.32	441.23	ND	NNW	0.028	05-31-95	190	1.6	<0.5	0.7	0.9	NA
MW-5	05-31-95	455.84	Not surveyed: well was inaccessible					05-31-95	Not sampled: well was inaccessible					
MW-6	05-31-95	454.93	13.96	440.97	ND	NNW	0.028	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	05-31-95	454.92	13.72	441.20	ND	NNW	0.028	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	05-31-95	456.97	12.37	444.60	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-9	05-31-95	456.18	12.66	443.52	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-10	05-31-95	456.85	15.63	441.22	ND	NNW	0.028	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-11	05-31-95	455.07	16.68	438.39	ND	NNW	0.028	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	05-31-95	455.04	15.66	439.38	ND	NNW	0.028	05-31-95	<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 USEPA Method 5520 C&F
TRPH: total recoverable petroleum hydrocarbons measured by USEPA Method 418.1
µg/L: micrograms per liter
ND: none detected
NNW: north-northwest
NA: not analyzed

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Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

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	09-20-89	457.04	21.03	436.01	ND	NR	NR
MW-1	10-12-89	457.04	19.64	437.40	ND	NR	NR
MW-1	06-21-90	457.04	21.72	435.32	ND	NR	NR
MW-1	09-20-90	457.04	19.79	437.25	ND	NR	NR
MW-1	12-18-90	457.04	19.28	437.76	ND	NR	NR
MW-1	02-21-91	457.04	22.45	434.59	ND	NR	NR
MW-1	03-20-91	457.04	19.87	437.17	ND	NR	NR
MW-1	04-10-91	457.04	19.42	437.62	ND	NR	NR
MW-1	05-20-91	457.04	25.95	431.09	ND	NR	NR
MW-1	06-20-91	457.04	32.55	424.49	ND	NR	NR
MW-1	07-25-91	457.04	38.22	418.82	ND	NR	NR
MW-1	08-13-91	457.04	40.74	416.30	ND	NR	NR
MW-1	09-12-91	457.04	43.16	413.88	ND	NR	NR
MW-1	10-22-91	457.04	DRY	DRY	ND	DRY	DRY
MW-1	11-13-91	457.04	DRY	DRY	ND	DRY	DRY
MW-1	12-21-91	457.04	DRY	DRY	ND	DRY	DRY
MW-1	01-18-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	02-21-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	03-19-92	457.04	36.16	420.88	ND	NR	NR
MW-1	04-24-92	457.04	38.14	418.90	ND	NR	NR
MW-1	05-20-92	457.04	40.74	416.30	ND	NR	NR
MW-1	06-29-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	07-28-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	08-26-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	09-11-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	10-29-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	11-11-92	457.04	DRY	DRY	ND	DRY	DRY
MW-1	12-14-92	457.04	Not surveyed: inaccessible due to construction activities				
MW-1	01-27-93	457.04	30.10	426.94	ND	NR	NR
MW-1	02-26-93	457.04	24.72	432.32	ND	NR	NR
MW-1	03-30-93	457.04	20.87	436.17	ND	NR	NR
MW-1	04-30-93	457.04	19.46	437.58	ND	NR	NR
MW-1	05-14-93	457.04	19.27	437.77	ND	NR	NR
MW-1	06-17-93	457.04	19.21	437.83	ND	NR	NR
MW-1	07-27-93	457.04	19.95	437.09	ND	NR	NR
MW-1	08-30-93	457.04	20.72	436.32	ND	NR	NR
MW-1	11-04-93	457.04	20.61	436.43	ND	NR	NR
MW-1	03-25-94	457.04	17.54	439.50	ND	NR	NR
MW-1	06-02-94	457.04	21.30	435.74	ND	NR	NR
MW-1	09-16-94	457.04	19.98	437.06	ND	N	0.014
MW-1	11-29-94	457.04	19.12	437.92	ND	N	0.025
MW-1	03-23-95	457.04	14.12	442.92	ND	NW	0.035
MW-1	05-31-95	457.04	14.45	442.59	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

Well Desig-nation	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	09-20-89	457.74	20.67	437.07	ND	NR	NR
MW-2	10-12-89	457.74	18.98	438.76	ND	NR	NR
MW-2	06-21-90	457.74	21.88	435.86	ND	NR	NR
MW-2	09-20-90	457.74	19.90	437.84	ND	NR	NR
MW-2	12-18-90	457.74	19.32	438.42	ND	NR	NR
MW-2	02-21-91	457.74	23.02	434.72	ND	NR	NR
MW-2	03-20-91	457.74	20.01	437.73	ND	NR	NR
MW-2	04-10-91	457.74	19.81	437.93	ND	NR	NR
MW-2	05-20-91	457.74	26.62	431.12	ND	NR	NR
MW-2	06-20-91	457.74	33.15	424.59	ND	NR	NR
MW-2	07-25-91	457.74	37.10	420.64	ND	NR	NR
MW-2	08-13-91	457.74	37.20	420.54	ND	NR	NR
MW-2	09-12-91	457.74	DRY	DRY	ND	DRY	DRY
MW-2	10-22-91	457.74	DRY	DRY	ND	DRY	DRY
MW-2	11-13-91	457.74	DRY	DRY	ND	DRY	DRY
MW-2	12-21-91	457.74	DRY	DRY	ND	DRY	DRY
MW-2	01-18-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	02-21-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	03-19-92	457.74	35.82	421.92	ND	NR	NR
MW-2	04-24-92	457.74	36.64	421.10	ND	NR	NR
MW-2	05-20-92	457.74	37.23	420.51	ND	NR	NR
MW-2	06-29-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	07-28-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	08-26-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	09-11-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	10-29-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	11-11-92	457.74	DRY	DRY	ND	DRY	DRY
MW-2	12-14-92	457.74	Not surveyed: inaccessible due to construction activities				
MW-2	01-27-93	457.74	32.87	424.87	ND	NR	NR
MW-2	02-26-93	457.74	Not surveyed: inaccessible due to construction activities				
MW-2	03-30-93	457.74	20.47	437.27	ND	NR	NR
MW-2	04-30-93	457.74	19.02	438.72	ND	NR	NR
MW-2	05-14-93	457.74	18.65	439.09	ND	NR	NR
MW-2	06-17-93	457.74	18.21	439.53	ND	NR	NR
MW-2	07-27-93	457.74	17.95	439.79	ND	NR	NR
MW-2	08-30-93	457.74	18.43	439.31	ND	NR	NR
MW-2	11-04-93	457.74	19.73	438.01	ND	NR	NR
MW-2	03-25-94	457.74	17.26	440.48	ND	NR	NR
MW-2	06-02-94	457.74	21.23	436.51	ND	NR	NR
MW-2	09-16-94	457.74	19.64	438.10	ND	N	0.014
MW-2	11-29-94	457.74	18.89	438.85	ND	N	0.025
MW-2	03-23-95	457.74	14.15	443.59	ND	NW	0.035
MW-2	05-31-95	457.74	14.67	443.07	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

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	09-20-89	456.97	20.98	435.99	ND	NR	NR
MW-3	10-12-89	456.97	19.66	437.31	ND	NR	NR
MW-3	06-21-90	456.97	21.72	435.25	ND	NR	NR
MW-3	09-20-90	456.97	19.72	437.25	ND	NR	NR
MW-3	12-18-90	456.97	19.21	437.76	ND	NR	NR
MW-3	02-21-91	456.97	22.36	434.61	ND	NR	NR
MW-3	03-20-91	456.97	19.79	437.18	ND	NR	NR
MW-3	04-10-91	456.97	19.35	437.62	ND	NR	NR
MW-3	05-20-91	456.97	25.86	431.11	ND	NR	NR
MW-3	06-20-91	456.97	32.45	424.52	ND	NR	NR
MW-3	07-25-91	456.97	38.06	418.91	ND	NR	NR
MW-3	08-13-91	456.97	38.40	418.57	ND	NR	NR
MW-3	09-12-91	456.97	DRY	DRY	ND	DRY	DRY
MW-3	10-22-91	456.97	DRY	DRY	ND	DRY	DRY
MW-3	11-13-91	456.97	DRY	DRY	ND	DRY	DRY
MW-3	12-21-91	456.97	DRY	DRY	ND	DRY	DRY
MW-3	01-18-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	02-21-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	03-19-92	456.97	36.03	420.94	ND	NR	NR
MW-3	04-24-92	456.97	37.92	419.05	ND	NR	NR
MW-3	05-20-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	06-29-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	07-28-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	08-26-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	09-11-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	10-29-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	11-11-92	456.97	DRY	DRY	ND	DRY	DRY
MW-3	12-14-92	456.97	Not surveyed: inaccessible due to construction activities				
MW-3	01-27-93	456.97	30.36	426.61	ND	NR	NR
MW-3	02-26-93	456.97	24.96	432.01	ND	NR	NR
MW-3	03-30-93	456.97	21.45	435.52	ND	NR	NR
MW-3	04-30-93	456.97	19.43	437.54	ND	NR	NR
MW-3	05-14-93	456.97	19.37	437.60	ND	NR	NR
MW-3	06-17-93	456.97	19.38	437.59	ND	NR	NR
MW-3	07-27-93	456.97	20.10	436.87	ND	NR	NR
MW-3	08-30-93	456.97	20.98	435.99	ND	NR	NR
MW-3	11-04-93	456.97	20.91	436.06	ND	NR	NR
MW-3	03-25-94	456.97	17.57	439.40	ND	NR	NR
MW-3	06-02-94	456.97	21.30	435.67	ND	NR	NR
MW-3	09-16-94	456.97	20.03	436.94	ND	N	0.014
MW-3	11-29-94	456.97	19.13	437.84	ND	N	0.025
MW-3	03-23-95	456.97	14.13	442.84	ND	NW	0.035
MW-3	05-31-95	456.97	14.46	442.51	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

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	02-21-91	456.55	22.01	434.54	ND	NR	NR
MW-4	03-20-91	456.55	20.31	436.24	ND	NR	NR
MW-4	04-10-91	456.55	19.55	437.00	ND	NR	NR
MW-4	05-20-91	456.55	25.24	431.31	ND	NR	NR
MW-4	06-20-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	07-25-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	08-13-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	09-12-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	10-22-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	11-13-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	12-21-91	456.55	DRY	DRY	ND	DRY	DRY
MW-4	01-18-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	02-21-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	03-19-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	04-24-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	05-20-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	06-29-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	07-28-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	08-26-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	09-11-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	10-29-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	11-11-92	456.55	DRY	DRY	ND	DRY	DRY
MW-4	12-14-92	456.55	Not surveyed: inaccessible due to construction activities				
MW-4	01-27-93	456.55	DRY	DRY	ND	DRY	DRY
MW-4	02-26-93	456.55	23.60	432.95	ND	NR	NR
MW-4	03-30-93	456.55	20.87	435.68	ND	NR	NR
MW-4	04-30-93	456.55	19.73	436.82	ND	NR	NR
MW-4	05-14-93	456.55	19.75	436.80	ND	NR	NR
MW-4	06-17-93	456.55	19.69	436.86	ND	NR	NR
MW-4	07-27-93	456.55	20.40	436.15	ND	NR	NR
MW-4	08-30-93	456.55	21.10	435.45	ND	NR	NR
MW-4	11-04-93	456.55	21.60	434.95	ND	NR	NR
MW-4	03-25-94	456.55	18.59	437.96	ND	NR	NR
MW-4	06-02-94	456.55	21.41	435.14	ND	NR	NR
MW-4	09-16-94	456.55	20.51	436.04	ND	N	0.014
MW-4	11-29-94	456.55	19.77	436.78	ND	N	0.025
MW-4	03-23-95	456.55	15.39	441.16	ND	NW	0.035
MW-4	05-31-95	456.55	15.32	441.23	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

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-5	06-29-92	455.84	50.53	405.31	ND	NR	NR
MW-5	07-28-92	455.84	54.92	400.92	ND	NR	NR
MW-5	08-26-92	455.84	59.58	396.26	ND	NR	NR
MW-5	09-11-92	455.84	60.88	394.96	ND	NR	NR
MW-5	10-29-92	455.84	DRY	DRY	ND	DRY	DRY
MW-5	11-11-92	455.84	DRY	DRY	ND	DRY	DRY
MW-5	12-14-92	455.84	Not surveyed: inaccessible due to construction activities				
MW-5	01-27-93	455.84	29.08	426.76	ND	NR	NR
MW-5	02-26-93	455.84	23.56	432.28	ND	NR	NR
MW-5	03-30-93	455.84	20.32	435.52	ND	NR	NR
MW-5	04-30-93	455.84	19.57	436.27	ND	NR	NR
MW-5	05-14-93	455.84	19.29	436.55	ND	NR	NR
MW-5	06-17-93	455.84	18.66	437.18	ND	NR	NR
MW-5	07-27-93	455.84	20.16	435.68	ND	NR	NR
MW-5	08-30-93	455.84	Not surveyed:				
MW-5	11-04-93	455.84	21.05	434.79	ND	NR	NR
MW-5	03-25-94	455.84	17.95	437.89	ND	NR	NR
MW-5	06-02-94	455.84	21.32	434.52	ND	NR	NR
MW-5	09-16-94	455.84	20.41	435.43	ND	N	0.014
MW-5	11-29-94	455.84	19.72	436.12	ND	N	0.025
MW-5	03-23-95	455.84	13.97	441.87	ND	NW	0.035
MW-5	05-31-95	455.84	Not surveyed: well was inaccessible				

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

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	06-29-92	454.93	49.72	405.21	ND	NR	NR
MW-6	07-28-92	454.93	54.63	400.30	ND	NR	NR
MW-6	08-26-92	454.93	59.45	395.48	ND	NR	NR
MW-6	09-11-92	454.93	^60.73	^394.20	0.04	NR	NR
MW-6	10-29-92	454.93	62.14	392.79	ND	NR	NR
MW-6	11-11-92	454.93	^62.42	^392.51	0.03	NR	NR
MW-6	12-14-92	454.93	Not surveyed: inaccessible due to construction activities				
MW-6	01-27-93	454.93	Not surveyed: inaccessible due to construction activities				
MW-6	02-26-93	454.93	22.73	432.20	ND	NR	NR
MW-6	03-30-93	454.93	19.53	435.40	ND	NR	NR
MW-6	04-30-93	454.93	18.76	436.17	ND	NR	NR
MW-6	05-14-93	454.93	^19.19	^435.74	0.01	NR	NR
MW-6	06-17-93	454.93	18.54	436.39	ND	NR	NR
MW-6	07-27-93	454.93	19.47	435.46	ND	NR	NR
MW-6	08-30-93	454.93	^20.33	^434.60	0.01	NR	NR
MW-6	11-04-93	454.93	^20.33	^434.60	0.01	NR	NR
MW-6	03-25-94	454.93	17.13	437.80	ND	NR	NR
MW-6	06-02-94	454.93	20.45	434.48	ND	NR	NR
MW-6	09-16-94	454.93	19.62	435.31	ND	N	0.014
MW-6	11-29-94	454.93	18.89	436.04	ND	N	0.025
MW-6	03-23-95	454.93	13.38	441.55	ND	NW	0.035
MW-6	05-31-95	454.93	13.96	440.97	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-7	06-29-92	454.92	49.57	405.35	ND	NR	NR
MW-7	07-28-92	454.92	54.60	400.32	ND	NR	NR
MW-7	08-26-92	454.92	59.60	395.32	ND	NR	NR
MW-7	09-11-92	454.92	60.74	394.18	ND	NR	NR
MW-7	10-29-92	454.92	62.23	392.69	ND	NR	NR
MW-7	11-11-92	454.92	62.69	392.23	ND	NR	NR
MW-7	12-14-92	454.92	Not surveyed: inaccessible due to construction activities				
MW-7	01-27-93	454.92	27.97	426.95	ND	NR	NR
MW-7	02-26-93	454.92	22.57	432.35	ND	NR	NR
MW-7	03-30-93	454.92	19.29	435.63	ND	NR	NR
MW-7	04-30-93	454.92	18.79	436.13	ND	NR	NR
MW-7	05-14-93	454.92	18.35	436.57	ND	NR	NR
MW-7	06-17-93	454.92	18.36	436.56	ND	NR	NR
MW-7	07-27-93	454.92	19.49	435.43	ND	NR	NR
MW-7	08-30-93	454.92	20.26	434.66	ND	NR	NR
MW-7	11-04-93	454.92	20.33	434.59	ND	NR	NR
MW-7	03-25-94	454.92	16.91	438.01	ND	NR	NR
MW-7	06-02-94	454.92	20.31	434.61	ND	NR	NR
MW-7	09-16-94	454.92	19.47	435.45	ND	N	0.014
MW-7	11-29-94	454.92	18.73	436.19	ND	N	0.025
MW-7	03-23-95	454.92	13.29	441.63	ND	NW	0.035
MW-7	05-31-95	454.92	13.72	441.20	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-8	06-29-92	456.97	50.40	406.57	ND	NR	NR
MW-8	07-28-92	456.97	55.79	401.18	ND	NR	NR
MW-8	08-26-92	456.97	60.79	396.18	ND	NR	NR
MW-8	09-11-92	456.97	61.97	395.00	ND	NR	NR
MW-8	10-29-92	456.97	63.51	393.46	ND	NR	NR
MW-8	11-11-92	456.97	64.21	392.76	ND	NR	NR
MW-8	12-14-92	456.97	Not surveyed: inaccessible due to construction activities				
MW-8	01-27-93	456.97	25.57	431.40	ND	NR	NR
MW-8	02-26-93	456.97	19.86	437.11	ND	NR	NR
MW-8	03-30-93	456.97	16.69	440.28	ND	NR	NR
MW-8	04-30-93	456.97	15.83	441.14	ND	NR	NR
MW-8	05-14-93	456.97	15.79	441.18	ND	NR	NR
MW-8	06-17-93	456.97	15.79	441.18	ND	NR	NR
MW-8	07-27-93	456.97	16.80	440.17	ND	NR	NR
MW-8	08-30-93	456.97	17.37	439.60	ND	NR	NR
MW-8	11-04-93	456.97	17.60	439.37	ND	NR	NR
MW-8	03-25-94	456.97	15.04	441.93	ND	NR	NR
MW-8	06-02-94	456.97	18.43	438.54	ND	NR	NR
MW-8	09-16-94	456.97	17.02	439.95	ND	N	0.014
MW-8	11-29-94	456.97	16.83	440.14	ND	N	0.025
MW-8	03-23-95	456.97	11.55	445.42	ND	NW	0.035
MW-8	05-31-95	456.97	12.37	444.60	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

Well Desig-nation	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-9	06-29-92	456.18	50.29	405.89	ND	NR	NR
MW-9	07-28-92	456.18	55.53	400.65	ND	NR	NR
MW-9	08-26-92	456.18	60.62	395.56	ND	NR	NR
MW-9	09-11-92	456.18	61.67	394.51	ND	NR	NR
MW-9	10-29-92	456.18	63.17	393.01	ND	NR	NR
MW-9	11-11-92	456.18	63.68	392.50	ND	NR	NR
MW-9	12-14-92	456.18	Not surveyed: inaccessible due to construction activities				
MW-9	01-27-93	456.18	26.48	429.70	ND	NR	NR
MW-9	02-26-93	456.18	Not surveyed: inaccessible due to construction activities				
MW-9	03-30-93	456.18	17.77	438.41	ND	NR	NR
MW-9	04-30-93	456.18	17.01	439.17	ND	NR	NR
MW-9	05-14-93	456.18	16.55	439.63	ND	NR	NR
MW-9	06-17-93	456.18	16.68	439.50	ND	NR	NR
MW-9	07-27-93	456.18	17.77	438.41	ND	NR	NR
MW-9	08-30-93	456.18	18.74	437.44	ND	NR	NR
MW-9	11-04-93	456.18	18.72	437.46	ND	NR	NR
MW-9	03-25-94	456.18	15.78	440.40	ND	NR	NR
MW-9	06-02-94	456.18	19.03	437.15	ND	NR	NR
MW-9	09-16-94	456.18	17.84	438.34	ND	N	0.014
MW-9	11-29-94	456.18	17.32	438.86	ND	N	0.025
MW-9	03-23-95	456.18	13.18	443.00	ND	NW	0.035
MW-9	05-31-95	456.18	12.66	443.52	ND	NNW	0.028
MW-10	03-30-93	456.85	21.33	435.52	ND	NR	NR
MW-10	04-30-93	456.85	20.51	436.34	ND	NR	NR
MW-10	05-14-93	456.85	20.26	436.59	ND	NR	NR
MW-10	06-17-93	456.85	20.30	436.55	ND	NR	NR
MW-10	07-27-93	456.85	20.29	436.56	ND	NR	NR
MW-10	08-30-93	456.85	22.19	434.66	ND	NR	NR
MW-10	11-04-93	456.85	22.11	434.74	ND	NR	NR
MW-10	03-25-94	456.85	18.84	438.01	ND	NR	NR
MW-10	06-02-94	456.85	22.40	434.45	ND	NR	NR
MW-10	09-16-94	456.85	21.25	435.60	ND	N	0.014
MW-10	11-29-94	456.85	20.50	436.35	ND	N	0.025
MW-10	03-23-95	456.85	14.86	441.99	ND	NW	0.035
MW-10	05-31-95	456.85	15.63	441.22	ND	NNW	0.028

Table 2
Historical Groundwater Elevation Data

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

Date: 08-09-95
Project Number: 0805-134.02

Well Desig-nation	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-11	03-30-93	455.07	20.78	434.29	ND	NR	NR
MW-11	04-30-93	455.07	20.71	434.36	ND	NR	NR
MW-11	05-14-93	455.07	20.01	435.06	ND	NR	NR
MW-11	06-17-93	455.07	20.18	434.89	ND	NR	NR
MW-11	07-27-93	455.07	21.31	433.76	ND	NR	NR
MW-11	08-30-93	455.07	21.09	433.98	ND	NR	NR
MW-11	11-04-93	455.07	21.40	433.67	ND	NR	NR
MW-11	03-25-94	455.07	18.28	436.79	ND	NR	NR
MW-11	06-02-94	455.07	21.78	433.29	ND	NR	NR
MW-11	09-16-94	455.07	20.98	434.09	ND	N	0.014
MW-11	11-29-94	455.07	20.67	434.40	ND	N	0.025
MW-11	03-23-95	455.07	17.34	437.73	ND	NW	0.035
MW-11	05-31-95	455.07	16.68	438.39	ND	NNW	0.028
MW-12	03-30-93	455.04	21.33	433.71	ND	NR	NR
MW-12	04-30-93	455.04	20.23	434.81	ND	NR	NR
MW-12	05-14-93	455.04	19.97	435.07	ND	NR	NR
MW-12	06-17-93	455.04	20.00	435.04	ND	NR	NR
MW-12	07-27-93	455.04	20.94	434.10	ND	NR	NR
MW-12	08-30-93	455.04	21.79	433.25	ND	NR	NR
MW-12	11-04-93	455.04	21.95	433.09	ND	NR	NR
MW-12	03-25-94	455.04	18.74	436.30	ND	NR	NR
MW-12	06-02-94	455.04	22.21	432.83	ND	NR	NR
MW-12	09-16-94	455.04	21.62	433.42	ND	N	0.014
MW-12	11-29-94	455.04	20.82	434.22	ND	N	0.025
MW-12	03-23-95	455.04	15.54	439.50	ND	NW	0.035
MW-12	05-31-95	455.04	15.66	439.38	ND	NNW	0.028

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
ND: none detected
NR: not reported; data not available
DRY: dry well; groundwater was not detected
N: north
NW: northwest
NNW: north-northwest
^: 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
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	09-20-89	80	3	1	0.7	1	<5000
MW-1	06-21-90	<20	<0.5	0.66	<0.5	<0.5	13000
MW-1	09-20-90	<50	<0.5	1	<0.5	1.8	<5000
MW-1	12-18-90	<50	<0.5	1.8	<0.5	1.7	NA
MW-1	02-21-91	<50	1.2	2.3	<0.5	2.2	NA
MW-1	05-20-91	<30	<0.3	<0.3	<0.3	<0.3	NA
MW-1	08-13-91	Not sampled: dry well					
MW-1	11-13-91	Not sampled: dry well					
MW-1	03-19-92	400	<3.5	<1.2	<0.8	<1.0	NA
MW-1	06-29-92	Not sampled: dry well					
MW-1	09-11-92	Not sampled: dry well					
MW-1	11-12-92	Not sampled: dry well					
MW-1	03-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-1	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	120000
MW-1	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	900
MW-1	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	2900
MW-1	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	<600
MW-1	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	<500
MW-1	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	<500
MW-1	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	<500
MW-1	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-1	05-31-95	Not sampled: not scheduled for chemical analysis					

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-2	09-20-89	<50	<0.5	<0.5	<0.5	1	<5000
MW-2	06-21-90	<20	<0.5	<0.5	<0.5	<0.5	<5000
MW-2	09-20-90	<50	<0.5	0.7	<0.5	1.4	<5000
MW-2	12-18-90	<50	0.6	1.5	<0.5	1.9	<5000
MW-2	02-21-91	<50	<0.5	<0.5	<0.5	<0.5	<5000
MW-2	05-20-91	<30	<0.3	<0.3	<0.3	<0.3	<75000
MW-2	08-13-91	Not sampled: dry well					
MW-2	11-13-91	Not sampled: dry well					
MW-2	03-19-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	06-29-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	09-11-92	Not sampled: dry well					
MW-2	11-12-92	Not sampled: dry well					
MW-2	03-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-2	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-2	05-31-95	Not sampled: not scheduled for chemical analysis					

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L	TOG or TRPH µg/L
MW-3	09-20-89	170	8.9	0.6	1.1	<1	<5000
MW-3	06-21-90	<20	<0.5	1	<0.5	<0.5	10000
MW-3	09-20-90	<50	<0.5	1	<0.5	1.9	<5000
MW-3	12-18-90	<50	<0.5	1.7	<0.5	2	<5000
MW-3	02-21-91	<50	<0.5	<0.5	<0.5	<0.5	<5000
MW-3	05-20-91	97	1.3	1.1	6.2	8.4	<75000
MW-3	08-13-91	Not sampled: dry well					
MW-3	11-13-91	Not sampled: dry well					
MW-3	03-19-92	220	<1.1	<1.9	<0.6	<0.8	<5000
MW-3	06-29-92	Not sampled: dry well					
MW-3	09-11-92	Not sampled: dry well					
MW-3	11-12-92	Not sampled: dry well					
MW-3	03-30-93	200*	<4.0	<0.5	<0.5	<0.5	NA
MW-3	05-14-93	72*	<3.0	<0.5	<0.5	<0.5	NA
MW-3	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-3	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-4	02-21-91	3500	410	7.6	30	47	<5000
MW-4	05-20-91	1400	150	6	4.4	3.1	<75000
MW-4	08-13-91	Not sampled: dry well					
MW-4	11-13-91	Not sampled: dry well					
MW-4	03-19-92	Not sampled: dry well					
MW-4	06-29-92	Not sampled: dry well					
MW-4	09-11-92	Not sampled: dry well					
MW-4	11-12-92	Not sampled: dry well					
MW-4	03-31-93	680	110	5.2	3	7.4	NA
MW-4	05-14-93	1200	200	6.2	15	9.2	NA
MW-4	08-30-93	620	22	0.9	3.6	2.1	NA
MW-4	11-04-93	320	11	<0.5	1.3	0.9	NA
MW-4	03-25-94	480	5.4	<0.5	1.6	1.7	NA
MW-4	06-02-94	270	4.2	<0.5	1	<1.7	NA
MW-4	09-16-94	250	1	<0.5	<0.6	<1	NA
MW-4	11-29-94	280	1.8	<0.5	<1.2	<0.8	NA
MW-4	03-23-95	210	2.1	0.6	0.8	2.1	NA
MW-4	05-31-95	190	1.6	<0.5	0.7	0.9	NA

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-5	06-29-92	8900	1700	640	310	1100	NA
MW-5	09-11-92	13000	2200	1500	130	930	NA
MW-5	11-12-92	Not sampled: dry well					
MW-5	03-31-93	9700	1700	430	220	880	NA
MW-5	05-14-93	9800	1300	820	270	1100	NA
MW-5	08-30-93	Not sampled: well inaccessible					
MW-5	11-04-93	41000	3500	3100	890	5400	NA
MW-5	03-25-94	780	36	1.5	4.8	5.7	NA
MW-5	06-02-94	500	25	7.4	6	33	NA
MW-5	09-16-94	1500	370	28	110	120	NA
MW-5	11-29-94	1100	280	11	82	31	NA
MW-5	03-23-95	68	4.2	3.4	2.3	12	NA
MW-5	05-31-95	Not sampled: well was inaccessible					
MW-6	06-29-92	8600	1800	460	52	450	NA
MW-6	09-11-92	Not sampled: well contained floating product					
MW-6	11-12-92	Not sampled: well contained floating product					
MW-6	03-31-93	Not sampled: well contained floating product					
MW-6	05-14-93	Not sampled: well contained floating product					
MW-6	08-30-93	Not sampled: well contained floating product					
MW-6	11-04-93	Not sampled: well contained floating product					
MW-6	03-25-94	530	<2.5	<2.5	<2.5	4.6	NA
MW-6	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-6	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-6	11-29-94	<50	1.3	<0.5	<0.5	<0.5	NA
MW-6	03-23-95	<50	1.5	<0.5	<0.5	0.9	NA
MW-6	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	06-29-92	270	38	3.7	1.1	4.4	NA
MW-7	09-11-92	420	20	0.7	<0.5	<0.5	NA
MW-7	11-12-92	470	31	1	<0.5	0.8	NA
MW-7	03-31-93	190	20	1	<0.5	<0.5	NA
MW-7	05-14-93	170	17	0.6	<0.5	0.5	NA
MW-7	08-30-93	<50	1.8	<0.5	<0.5	0.5	NA
MW-7	11-04-93	<50	6.6	<0.5	<0.5	0.8	NA
MW-7	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	03-23-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-8	06-29-92	<50	<0.5	<0.5	<0.5	<0.5	<500
MW-8	09-11-92	<50	<0.5	<0.5	<0.5	<0.5	<500
MW-8	11-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	03-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-8	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-8	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-9	06-29-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	09-11-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	11-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	03-31-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-9	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-9	05-31-95	Not sampled: not scheduled for chemical analysis					
MW-10	03-31-93	230*	<0.5	<0.5	<1	0.6	NA
MW-10	05-14-93	440*	<10	<0.6	<0.9	<0.5	NA
MW-10	08-30-93	280*	<4	<0.5	<1.3	0.6	NA
MW-10	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-10	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-10	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-10	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-10	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-10	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-10	05-31-95	Not sampled: not scheduled for chemical analysis					

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TOG or TRPH
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-11	03-31-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-11	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	03-31-93	150	20	<0.5	<0.5	<0.5	NA
MW-12	05-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	08-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	11-04-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-12	03-23-95	Not sampled: not scheduled for chemical analysis					
MW-12	05-31-95	<50	<0.5	<0.5	<0.5	<0.5	NA

TPHG: total petroleum hydrocarbons as gasoline
TOG: total oil and grease measured by USEPA Method 5520 C&F
TRPH: total recoverable petroleum hydrocarbons measured by USEPA Method 418.1
µg/L: micrograms per liter
NA: not analyzed
*: chromatogram does not match the typical gasoline fingerprint

Table 4
Historical Groundwater Analytical Data
(VOCs, TPHD, and Metals)

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

Date: 07-10-95
Project Number: 0805-134.02

Well Desig-nation	Water Sample Field Date	Total VOCs	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Zinc by EPA 6010	Nickel by EPA 6010
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	09-20-89	NA	<50	NA	NA	NA	NA	NA
MW-1	06-21-90	NA	<100	NA	NA	NA	NA	NA
MW-1	09-20-90	NA	<50	NA	NA	NA	NA	NA
MW-1	12-18-90	NA	<5000	NA	NA	NA	NA	NA
MW-1	02-21-91	NA	<5000	NA	NA	NA	NA	NA
MW-1	05-20-91	NA	<75000	NA	NA	NA	NA	NA
MW-1	08-13-91	Not analyzed: sampling for additional parameters was discontinued						
MW-2	09-20-89	NA	<50	NA	NA	NA	NA	NA
MW-2	06-21-90	NA	<100	NA	NA	NA	NA	NA
MW-2	09-20-90	NA	<50	NA	NA	NA	NA	NA
MW-2	12-18-90	Not analyzed: sampling for additional parameters was discontinued						
MW-3	09-20-89	NA	<50	NA	NA	NA	NA	NA
MW-3	06-21-90	NA	<100	NA	NA	NA	NA	NA
MW-3	09-20-90	NA	<50	NA	NA	NA	NA	NA
MW-3	12-18-90	NA	NA	NA	NA	NA	NA	NA
MW-3	02-21-91	NA	NA	NA	NA	NA	NA	NA
MW-3	05-20-91	NA	NA	NA	NA	NA	NA	NA
MW-3	08-13-91	Not sampled: dry well						
MW-3	11-13-91	Not sampled: dry well						
MW-3	03-19-92	NA	<50	NA	NA	NA	NA	NA
MW-3	06-29-92	Not analyzed: sampling for additional parameters was discontinued						
MW-8	06-29-92	ND	<50	<3	1780	143	1310	5100
MW-8	09-11-92	NA	<50	13	3580	308	2620	10300
MW-8	11-12-92	NA	NA	28	3440	221	2550	9840
MW-8	03-30-93	Not analyzed: sampling for additional parameters was discontinued						
MW-9	06-29-92	NA	NA	NA	NA	NA	NA	NA
MW-9	09-11-92	NA	NA	NA	NA	NA	NA	NA
MW-9	11-12-92	NA	NA	10	1080	101	859	3070
MW-9	03-31-93	Not analyzed: sampling for additional parameters was discontinued						

VOCs: halogenated volatile organic compounds by USEPA Method 5030/601
TPHD: total petroleum hydrocarbons as diesel by USEPA Method 3510/California DHS LUFT Method
µg/L: micrograms per liter
NA: not analyzed
ND: not detected (31 compounds tested for VOCs were nondetectable)

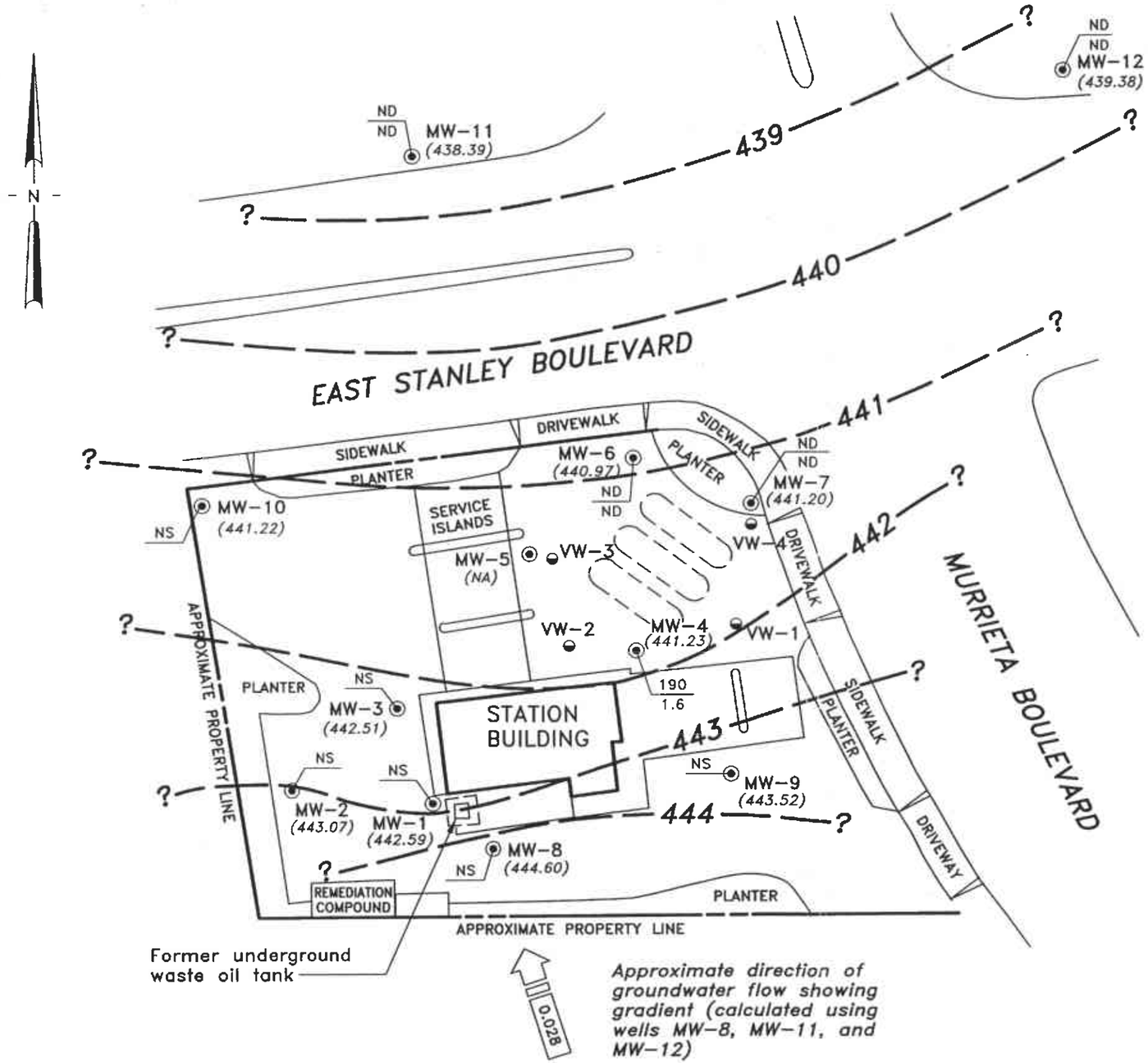
152753

EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 6113, 785 E. STANLEY BLVD.
QUARTERLY GROUNDWATER MONITORING
LIVERMORE, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-134.02



EXPLANATION

- Groundwater monitoring well
- Vapor extraction well
- Existing underground gasoline storage tank
- (442.59) Groundwater elevation (Ft.–MSL) measured 5/31/95
- Groundwater elevation contour (Ft.–MSL)
- 190 / 1.6 TPHG concentration in groundwater (ug/L); sampled 5/31/95
- Benzene concentration in groundwater (ug/L); sampled 5/31/95
- NS Not sampled; not scheduled for chemical analysis
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)
- NA Not available; well was inaccessible

Base map modified from RESNA, 1994.

EMCON

SCALE: 0 40 80 FEET
(Approximate)

ARCO PRODUCTS COMPANY
SERVICE STATION 6113, 785 E. STANLEY BLVD.
QUARTERLY GROUNDWATER MONITORING
LIVERMORE, CALIFORNIA

GROUNDWATER DATA
SECOND QUARTER 1995

FIGURE NO.
2
PROJECT NO.
805-134.02

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-248.01 STATION ADDRESS : 785 East Stanley Blvd. DATE : 5/31/95

ARCO STATION # : 6113 FIELD TECHNICIAN : M. ROSS DAY : WEDNESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	OK	Yes	Yes	Yes	Yes	14.45	14.45	NA	NA	44.9	
2	MW-2	OK	Yes	Yes	Yes	Yes	14.67	14.67	NA	NA	38.6	UNDER PRESSURE
3	MW-3	OK	Yes	Yes	Yes	Yes	14.46	14.46	NA	NA	39.0	UNDER PRESSURE
4	MW-6	OK	Yes	Yes	Yes	Yes	13.96	13.96	NA	NA	66.1	
5	MW-7	OK	Yes	Yes	Yes	Yes	13.72	13.72	NA	NA	67.5	
6	MW-8	OK	Yes	Yes	Yes	Yes	12.37	12.37	NA	NA	66.6	
7	MW-9	OK	Yes	Yes	Yes	Yes	12.66	12.66	NA	NA	67.9	
8	MW-10	OK	Yes	Yes	Yes	Yes	15.63	15.63	NA	NA	49.6	
9	MW-11	OK	Yes	Yes	Yes	Yes	16.68	16.68	NA	NA	49.5	
10	MW-12	OK	Yes	Yes	Yes	Yes	15.66	15.66	NA	NA	32.7	WATER IN BOX
11	MW-4	OK	Yes	Yes	Yes	Yes	15.32	15.32	NA	NA	26.7	
12	MW-5			UNABLE TO CHECK WATER LEVELS								
				UNABLE TO UNSCREW BOLT HOLDING PLATE OVER WELL BOX								

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-248.01 SAMPLE ID: MW-4

PURGED BY: M. Ross CLIENT NAME: Arco 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ✓ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 7.43

DEPTH TO WATER (feet): 15.32 CALCULATED PURGE (gal.): 22.30

DEPTH OF WELL (feet): 26.7 ACTUAL PURGE VOL. (gal.): 22.5

DATE PURGED: 5/31/95 Start (2400 Hr) 1458 End (2400 Hr) 1508

DATE SAMPLED: 5/31/95 Start (2400 Hr) 1512 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1502	7.5	6.91	675	72.2	clr	TRACE
1505	15.0	6.94	653	74.3	"	clr
1508	22.5	6.90	654	73.8	"	"

D. O. (ppm): NA ODOR: NONE

COLOR: NA (COBALT 0 - 500) TURBIDITY: NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ QDL Sampler	___ Bailer (Stainless Steel)
✓ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco

REMARKS: ___

Meter Calibration: Date: 5/31/95 Time: 1145 Meter Serial #: 9210 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-6

Signature: Mike Ross Reviewed By: SH Page 1 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-248.01 SAMPLE ID: MW-5

PURGED BY: M. Ross CLIENT NAME: ARCO 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	NA
DEPTH TO WATER (feet):	NA	CALCULATED PURGE (gal.):	NA
DEPTH OF WELL (feet):	NA	ACTUAL PURGE VOL. (gal.):	NA

DATE PURGED: NA Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
	UNABLE	TO	purge + Sample,		UNABLE	TO
	Remove	STUCK	BOLT ~~Casing~~	IN	WELL	UP.

D. O. (ppm): NA ODOR: NA NA (COBALT 0 - 500) NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	____ Bailer (Teflon®)
____ Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: NA		Other: NA	

WELL INTEGRITY: NA LOCK #: NA

REMARKS: UNABLE TO purge + Sample DUE TO STUCK BOLT IN Metal cover THAT Covers WELL

Meter Calibration: Date: NA Time: NA Meter Serial #: NA Temperature °F: NA

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: NA

Signature: Mike Ross Reviewed By: SK Page 2 of 6

1.96

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-248-01 SAMPLE ID: MW-6

PURGED BY: M. Ross CLIENT NAME: ARCO 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ✓ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 34.06

DEPTH TO WATER (feet): 13.96 CALCULATED PURGE (gal.): 102.19

DEPTH OF WELL (feet): 66.1 ACTUAL PURGE VOL. (gal.): 102.5

DATE PURGED: 5/31/95 Start (2400 Hr) 1157 End (2400 Hr) 1227

DATE SAMPLED: 5/31/95 Start (2400 Hr) 1235 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1210	34.5	6.39	699	78.4	Gy	Three
1218	68.5	6.96	757	74.7	"	"
1227	102.5	7.03	742	73.9	"	"

D. O. (ppm): NA ODOR: None

COLOR (COBALT 0 - 500): NA

TURBIDITY (NTU 0 - 200 or 0 - 1000): NA

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
✓ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 5/31/95 Time: 1145 Meter Serial #: 9210 Temperature °F 80.3

(EC 1000 994 / 1000) (DI 10.9) (pH 7 6.96 / 7.0) (pH 10 984 / 1000) (pH 4 398 / —)

Location of previous calibration: —

Signature: Mike Ross Reviewed By: S/— Page 3 of 6

L.96

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-248.01 SAMPLE ID: MW-7

PURGED BY: M. Ross CLIENT NAME: ARCO 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ✓ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 35.13

DEPTH TO WATER (feet): 13.72 CALCULATED PURGE (gal.): 105.40

DEPTH OF WELL (feet): 67.5 ACTUAL PURGE VOL. (gal.): 105.50

DATE PURGED: 5/31/95 Start (2400 Hr) 1246 End (2400 Hr) 1323

DATE SAMPLED: 5/31/95 Start (2400 Hr) 1330 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1256	35.5	7.09	773	75.5	LBr	TRACE
1312	70.5	7.04	737	74.7	"	"
1323	105.50	7.00	735	73.9	"	"

D. O. (ppm): NA ODOR: NONE

COLOR (COBALT 0 - 500): NA

TURBIDITY (NTU 0 - 200 or 0 - 1000): NA

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
✓ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 5/31/95 Time: 1145 Meter Serial #: 9210 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-6

Signature: Mike Ross Reviewed By: SA Page 4 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-248.01 SAMPLE ID: MW-11

PURGED BY: M. Ross CLIENT NAME: ARCO 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ✓ 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	4.54
DEPTH TO WATER (feet):	16.68	CALCULATED PURGE (gal.):	13.63
DEPTH OF WELL (feet):	44.5	ACTUAL PURGE VOL. (gal.):	9.5

DATE PURGED: 5/31/95 Start (2400 Hr) 1420 End (2400 Hr) 1431

DATE SAMPLED: 5/31/95 Start (2400 Hr) 1440 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1424	5.0	6.98	739	74.1	BLK	Heavy
1431	+ 9.5	7.21	734	74.0	11	11
1431	—	DRY	@ 9.5	GALLONS		
1440	Recharge	7.01	751	75.0	Brn	Heavy

D. O. (ppm): NA ODOR: None

COLOR (COBALT 0 - 500): NA

TURBIDITY (NTU 0 - 200 or 0 - 1000): NA

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	✓ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: Dry at 9.5 gallons

Meter Calibration: Date: 5/31/95 Time: 1145 Meter Serial #: 9210 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-6

Signature: Matthew Ross Reviewed By: ___ Page 5 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 7775-248.01 SAMPLE ID: MW-1A

PURGED BY: M. Ross CLIENT NAME: ARCO 6113

SAMPLED BY: M. Ross LOCATION: Livermore, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ✓ 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 2.78

DEPTH TO WATER (feet): 15.66 CALCULATED PURGE (gal.): 8.34

DEPTH OF WELL (feet): 32.7 ACTUAL PURGE VOL. (gal.): 8.5

DATE PURGED: 5/31/95 Start (2400 Hr) 1351 End (2400 Hr) 1401

DATE SAMPLED: 5/31/95 Start (2400 Hr) 1410 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1354	3.0	7.08	738	73.9	Light Brn	Trace
1358	6.0	6.87	720	72.7	"	Heavy
1401	8.5	6.87	713	72.2	"	Heavy

D. O. (ppm): NA ODOR: None

COLOR (visual): NA (COBALT 0 - 500)

TURBIDITY (visual): NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ Bailer (Teflon®)
___ Centrifugal Pump	✓ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Arco

REMARKS: ___

Meter Calibration: Date: 5/31/95 Time: 1145 Meter Serial #: 9210 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-6

Signature: [signature] Reviewed By: SK Page 6 of 6

Columbia Analytical Services inc.

June 14, 1995 Service Request No. S950683

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 6113 / EMCON Project No. 0805-134.02**

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on May 31, 1995. For your reference, these analyses have been assigned our service request number S950683.

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.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

001

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
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
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is 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
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:	EMCON	**Service Request:**	S950683
Project:	ARCO Facility No. 6113/EMCON Project No.0805-134.02	**Date Collected:**	5/31/95
Sample Matrix:	Water	**Date Received:**	5/31/95
		Date Extracted:	NA
		Date Analyzed:	6/9/95

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-6 (66)	S950683-001	ND	ND	ND	ND	ND
MW-7 (67)	S950683-002	ND	ND	ND	ND	ND
MW-11 (44)	S950683-003	ND	ND	ND	ND	ND
MW-12 (32)	S950683-004	ND	ND	ND	ND	ND
MW-4 (26)	S950683-005	190	1.6	ND	0.7	0.9
Method Blank	S950609-WB1	ND	ND	ND	ND	ND

Approved By: _____ Date: 6/14/95

5ABTXGAS/061694

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950683
Project:	ARCO Facility No. 6113/EMCON Project No.0805-134.02	**Date Collected:**	5/31/95
Sample Matrix:	Water	**Date Received:**	5/31/95
		Date Extracted:	NA
		Date Analyzed:	6/9/95

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

Sample Name: MW-7 (67)
Lab Code: S950683-002

	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	211	211	84	84	67-121	<1

Approved By: _____ Date: 6/14/95

DMS1S/060194

004

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 6113/EMCON Project No.0805-134.02
Sample Matrix: Water

Service Request: S950683
Date Collected: 5/31/95
Date Received: 5/31/95
Date Extracted: NA
Date Analyzed: 6/9/95

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-6 (66)	S950683-001	94
MW-7 (67)	S950683-002	95
MW-11 (44)	S950683-003	95
MW-12 (32)	S950683-004	94
MW-4 (26)	S950683-005	101
MW-7 (67) (MS)	S950683-002MS	101
MW-7 (67) (DMS)	S950683-002DMS	105
Method Blank	S950609-WB1	87

CAS Acceptance Limits: 69-116

Approved By: _____ Date: 6/14/95

SUR1/062994

005

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 6113/EMCON Project No.0805-134.02

Service Request: S950683
Date Analyzed: 6/9/95

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	25.8	103	85-115
Toluene	25	24.8	99	85-115
Ethylbenzene	25	25.6	102	85-115
Xylenes, Total	75	74.1	99	85-115
Gasoline	250	247	99	90-110

Approved By: _____ Date: 6/14/95

ICV25AL/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00

Chain of Custody

ARCO Facility no. 6113	City (Facility) Livermore	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave San Jose, CA 95131		Contract number

	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 M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
1	MW-6	(66)	2		X		X	HCL	5/31/95	1235		X											
2	MW-7	(67)	2		X		X	HCL		1330		X											
3	MW-11	(44)	2		X		X	HCL		1440		X											
4	MW-12	(32)	2		X		X	HCL		1410		X											
5	MW-4	(20)	2		X		X	HCL		1512		X											
	MW-5	( )	2		X		X	HCL	UNABLE	TO	PURGE	&	SAMPLE,										→
									WELL	LID	WAS	STUCK				SHUT.							

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2 40ml HCL VOAs

#0905-134.02

Lab number: 9506832

Turnaround time

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

Method of shipment: Sampler will deliver

Condition of sample: ok		Temperature received: Cool	
Relinquished by sampler: Mike Ponz	Date: 5/31/95	Time: 1648	Received by:
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by laboratory: Joanne Brown
			Date: 5/31/95 Time: 1640

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

APPC-3292 (2-91)

Due 6/14