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

Date December 13, 1996
Project 20805-134.003

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	Third quarter 1996 groundwater monitoring results for ARCO service station 6113, Livermore, California

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

John C. Young
Project Manager

cc: Sum Arigala, RWQCB - SFBR
Danielle Stefani, LFD
Paul Supple, ARCO Products Company
File

ARCO Products Company

Date:
December 12, 1996

Re: ARCO Station #

6113 • 785 East Stanley Boulevard • Livermore, CA
Third Quarter 1996 Groundwater Monitoring Results

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

Submitted by:

Paul Supple
Environmental Engineer

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

December 12, 1996
Project 20805-134.003

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

Re: Third quarter 1996 groundwater monitoring program results, ARCO service station 6113, Livermore, California

Dear Mr. Supple:

This letter presents the results of the third quarter 1996 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.

LIMITATIONS

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

Please call if you have questions.

Sincerely,

EMCON

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
EXP. 7/98
NO. 6407
STATE OF CALIFORNIA

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

December 12, 1996

ARCO QUARTERLY REPORT

Station No.: 6113	Address: 785 East Stanley Boulevard, Livermore, California
EMCON Project No.	20805-134.003
ARCO Environmental Engineer/Phone No.:	Paul Supple /(510) 299-8891
EMCON Project Manager/Phone No.:	John Young /(408) 453-7300
Primary Agency/Regulatory ID No.:	ACHCSA /Susan Hugo

WORK PERFORMED THIS QUARTER (Third- 1996):

1. Conducted quarterly groundwater monitoring and sampling for third quarter 1996.
2. Prepared and submitted quarterly report for second quarter 1996.

WORK PROPOSED FOR NEXT QUARTER (Fourth- 1996):

1. Perform quarterly groundwater monitoring and sampling for fourth quarter 1996.
2. Prepare and submit quarterly report for third quarter 1996.

QUARTERLY MONITORING:

Current Phase of Project:	Quarterly Groundwater Monitoring
Frequency of Sampling:	Quarterly (groundwater)
Frequency of Monitoring:	Quarterly (groundwater)
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Bulk Soil Removed to Date :	288 cubic yards of TPH impacted soil
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	None
Approximate Depth to Groundwater:	16.03 feet
Groundwater Gradient (Average):	0.019 ft/ft toward north (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Third Quarter 1996
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Third Quarter 1996
- Appendix A - Field Data Sheets, Third Quarter 1996 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain of Custody Documentation, Third Quarter 1996 Groundwater Monitoring Event

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

Table 1
Groundwater Monitoring Data
Third Quarter 1996

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

Date: 12-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**MTBE** EPA 8240	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	08-08-96	457.04	16.13	440.91	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-2	08-08-96	457.74	16.19	441.55	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-3	08-08-96	456.97	16.03	440.94	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-4	08-08-96	456.55	16.80	439.75	ND	N	0.019	08-08-96	98	<0.5	<0.5	<0.5	1.3	<3	- -	- -	- -
MW-5	08-08-96	455.84	16.38	439.46	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-6	08-08-96	454.93	16.65	438.28	ND	N	0.019	08-08-96	<50	0.5	<0.5	<0.5	0.5	<3	- -	-	-
MW-7	08-08-96	454.92	Not surveyed: unable to locate well					08-08-96	Not sampled: unable to locate well								
MW-8	08-08-96	456.97	13.85	443.12	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-9	08-08-96	456.18	14.12	442.06	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-10	08-08-96	456.85	17.20	439.65	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-11	08-08-96	455.07	17.77	437.30	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-12	08-08-96	455.04	17.30	437.74	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United Statest Environmental Protection Agency
MTBE: methyl-tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
ND: none detected
N: north
- -: not analyzed or not applicable

esj/h:\6113\6113mdb.xls\Table 1:imi
20805-134.003

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**MTBE** EPA 8240	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	03-25-94	457.04	17.54	439.50	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	<600	- -
MW-1	06-02-94	457.04	21.30	435.74	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	<500	- -
MW-1	09-16-94	457.04	19.98	437.06	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	<500	- -
MW-1	11-29-94	457.04	19.12	437.92	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	-	- -	<500	- -
MW-1	03-23-95	457.04	14.12	442.92	ND	NW	0.035	03-23-95	Not sampled: not scheduled for chemical analysis								
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-1	08-31-95	457.04	17.12	439.92	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-1	11-28-95	457.04	16.34	440.70	ND	NNW	0.025	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3	- -	- -	- -
MW-1	02-22-96	457.04	13.23	443.81	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-1	05-23-96	457.04	14.02	443.02	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-1	08-08-96	457.04	16.13	440.91	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-2	03-25-94	457.74	17.26	440.48	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	- -	- -
MW-2	06-02-94	457.74	21.23	436.51	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	- -	- -
MW-2	09-16-94	457.74	19.64	438.10	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	- -	- -
MW-2	11-29-94	457.74	18.89	438.85	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	- -	- -	- -	- -
MW-2	03-23-95	457.74	14.15	443.59	ND	NW	0.035	03-23-95	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-2	08-31-95	457.74	17.24	440.50	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-2	11-28-95	457.74	16.40	441.34	ND	NNW	0.025	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3	-	- -	- -
MW-2	02-22-96	457.74	13.55	444.19	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-2	05-23-96	457.74	14.29	443.45	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-2	08-08-96	457.74	16.19	441.55	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-3	03-25-94	456.97	17.57	439.40	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-3	06-02-94	456.97	21.30	435.67	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-3	09-16-94	456.97	20.03	436.94	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-3	11-29-94	456.97	19.13	437.84	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-3	03-23-95	456.97	14.13	442.84	ND	NW	0.035	03-23-95	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-3	08-31-95	456.97	17.06	439.91	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-3	11-28-95	456.97	16.27	440.70	ND	NNW	0.025	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-3	02-22-96	456.97	13.14	443.83	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-3	05-23-96	456.97	13.95	443.02	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-3	08-08-96	456.97	16.03	440.94	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-4	03-25-94	456.55	18.59	437.96	ND	NR	NR	03-25-94	480	5.4	<0.5	1.6	1.7	--	--	--	--
MW-4	06-02-94	456.55	21.41	435.14	ND	NR	NR	06-02-94	270	4.2	<0.5	1	<1.7	--	--	--	--
MW-4	09-16-94	456.55	20.51	436.04	ND	N	0.014	09-16-94	250	1	<0.5	<0.6	<1	--	--	--	--
MW-4	11-29-94	456.55	19.77	436.78	ND	N	0.025	11-29-94	280	1.8	<0.5	<1.2	<0.8	--	--	--	--
MW-4	03-23-95	456.55	15.39	441.16	ND	NW	0.035	03-23-95	210	2.1	0.6	0.8	2.1	--	--	--	--
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	--	--	--	--
MW-4	08-31-95	456.55	17.86	438.69	ND	NNW	0.03	08-31-95	160	1.2	0.7	<0.5	<2	<3	--	--	--
MW-4	11-28-95	456.55	17.18	439.37	ND	NNW	0.025	11-29-95	150	0.7	<0.5	0.7	1.4	<3	--	--	--
MW-4	02-22-96	456.55	14.80	441.75	ND	NNW	0.031	02-22-96	100	<0.5	<0.5	<0.6	0.8	<3	--	--	--
MW-4	05-23-96	456.55	14.43	442.12	ND	NNW	0.025	05-23-96	86	<0.5	<0.5	<0.5	<0.7	<3	--	--	--
MW-4	08-08-96	456.55	16.80	439.75	ND	N	0.019	08-08-96	98	<0.5	<0.5	<0.5	1.3	<3	--	--	--

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-5	03-25-94	455.84	17.95	437.89	ND	NR	NR	03-25-94	780	36	1.5	4.8	5.7	--	--	--	--
MW-5	06-02-94	455.84	21.32	434.52	ND	NR	NR	06-02-94	500	25	7.4	6	33	--	--	--	--
MW-5	09-16-94	455.84	20.41	435.43	ND	N	0.014	09-16-94	1500	370	28	110	120	--	--	--	--
MW-5	11-29-94	455.84	19.72	436.12	ND	N	0.025	11-29-94	1100	280	11	82	31	--	--	--	--
MW-5	03-23-95	455.84	13.97	441.87	ND	NW	0.035	03-23-95	68	4.2	3.4	2.3	12	--	--	--	--
MW-5	05-31-95	455.84	Not surveyed: well was inaccessible					05-31-95	Not sampled: well was inaccessible								
MW-5	08-31-95	455.84	Not surveyed: well was inaccessible					08-31-95	Not sampled: well was inaccessible								
MW-5	11-28-95	455.84	16.46	439.38	ND	NNW	0.025	11-29-95	960	41	24	38	210	<5	--	--	--
MW-5	02-22-96	455.84	13.34	442.50	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-5	05-23-96	455.84	14.36	441.48	ND	NNW	0.025	05-23-96	7100	440	180	270	1700	<50	--	--	--
MW-5	08-08-96	455.84	16.38	439.46	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-6	03-25-94	454.93	17.13	437.80	ND	NR	NR	03-25-94	530	<2.5	<2.5	<2.5	4.6	--	--	--	--
MW-6	06-02-94	454.93	20.45	434.48	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-6	09-16-94	454.93	19.62	435.31	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-6	11-29-94	454.93	18.89	436.04	ND	N	0.025	11-29-94	<50	1.3	<0.5	<0.5	<0.5	--	--	--	--
MW-6	03-23-95	454.93	13.38	441.55	ND	NW	0.035	03-23-95	<50	1.5	<0.5	<0.5	0.9	--	--	--	--
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	--	--	--	--
MW-6	08-31-95	454.93	16.71	438.22	ND	NNW	0.03	08-31-95	150	9	1.8	4	12	<3	--	--	--
MW-6	11-28-95	454.93	15.65	439.28	ND	NNW	0.025	11-29-95	<50	0.6	<0.5	<0.5	0.8	<3	--	--	--
MW-6	02-22-96	454.93	12.53	442.40	ND	NNW	0.031	02-22-96	<50	1.9	<0.5	0.8	2.1	<3	--	--	--
MW-6	05-23-96	454.93	13.24	441.69	ND	NNW	0.025	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-6	08-08-96	454.93	16.65	438.28	ND	N	0.019	08-08-96	<50	0.5	<0.5	<0.5	0.5	<3	--	--	--

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**MTBE** EPA 8240	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-7	03-25-94	454.92	16.91	438.01	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	06-02-94	454.92	20.31	434.61	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	09-16-94	454.92	19.47	435.45	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	11-29-94	454.92	18.73	436.19	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	03-23-95	454.92	13.29	441.63	ND	NW	0.035	03-23-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
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	--	--	--	--
MW-7	08-31-95	454.92	16.53	438.39	ND	NNW	0.03	08-31-95	<50	<0.5	<0.5	<0.5	1.2	<3	--	--	--
MW-7	11-28-95	454.92	15.50	439.42	ND	NNW	0.025	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-7	02-22-96	454.92	12.30	442.62	ND	NNW	0.031	02-22-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-7	05-23-96	454.92	13.02	441.90	ND	NNW	0.025	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-7	08-08-96	454.92	Not surveyed: unable to locate well					08-08-96	Not sampled: unable to locate well								
MW-8	03-25-94	456.97	15.04	441.93	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-8	06-02-94	456.97	18.43	438.54	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-8	09-16-94	456.97	17.02	439.95	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-8	11-29-94	456.97	16.83	440.14	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-8	03-23-95	456.97	11.55	445.42	ND	NW	0.035	03-23-95	Not sampled: not scheduled for chemical analysis								
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-8	08-31-95	456.97	15.68	441.29	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-8	11-28-95	456.97	14.15	442.82	ND	NNW	0.025	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-8	02-22-96	456.97	10.97	446.00	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-8	05-23-96	456.97	11.90	445.07	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-8	08-08-96	456.97	13.85	443.12	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-9	03-25-94	456.18	15.78	440.40	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	06-02-94	456.18	19.03	437.15	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	09-16-94	456.18	17.84	438.34	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	11-29-94	456.18	17.32	438.86	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	03-23-95	456.18	13.18	443.00	ND	NW	0.035	03-23-95	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-9	08-31-95	456.18	14.40	441.78	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-9	11-28-95	456.18	14.26	441.92	ND	NNW	0.025	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	02-22-96	456.18	12.05	444.13	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-9	05-23-96	456.18	12.07	444.11	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-9	08-08-96	456.18	14.12	442.06	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-10	03-25-94	456.85	18.84	438.01	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	06-02-94	456.85	22.40	434.45	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	09-16-94	456.85	21.25	435.60	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	11-29-94	456.85	20.50	436.35	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	03-23-95	456.85	14.86	441.99	ND	NW	0.035	03-23-95	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-10	08-31-95	456.85	14.40	442.45	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-10	11-28-95	456.85	17.24	439.61	ND	NNW	0.025	11-29-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	02-22-96	456.85	14.30	442.55	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-10	05-23-96	456.85	14.93	441.92	ND	NNW	0.025	05-23-96	Not sampled: not scheduled for chemical analysis								
MW-10	08-08-96	456.85	17.20	439.65	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								

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

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

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**MTBE** EPA 8240	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-11	03-25-94	455.07	18.28	436.79	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	06-02-94	455.07	21.78	433.29	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	09-16-94	455.07	20.98	434.09	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	11-29-94	455.07	20.67	434.40	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	03-23-95	455.07	17.34	437.73	ND	NW	0.035	03-23-95	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	--	--	--	--
MW-11	08-31-95	455.07	20.20	434.87	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-11	11-28-95	455.07	17.80	437.27	ND	NNW	0.025	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-11	02-22-96	455.07	15.97	439.10	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-11	05-23-96	455.07	15.50	439.57	ND	NNW	0.025	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-11	08-08-96	455.07	17.77	437.30	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								
MW-12	03-25-94	455.04	18.74	436.30	ND	NR	NR	03-25-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	06-02-94	455.04	22.21	432.83	ND	NR	NR	06-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	09-16-94	455.04	21.62	433.42	ND	N	0.014	09-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	11-29-94	455.04	20.82	434.22	ND	N	0.025	11-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	03-23-95	455.04	15.54	439.50	ND	NW	0.035	03-23-95	Not sampled: not scheduled for chemical analysis								
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	--	--	--	--
MW-12	08-31-95	455.04	18.23	436.81	ND	NNW	0.03	08-31-95	Not sampled: not scheduled for chemical analysis								
MW-12	11-28-95	455.04	17.53	437.51	ND	NNW	0.025	11-28-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	02-22-96	455.04	14.45	440.59	ND	NNW	0.031	02-22-96	Not sampled: not scheduled for chemical analysis								
MW-12	05-23-96	455.04	14.88	440.16	ND	NNW	0.025	05-23-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	08-08-96	455.04	17.30	437.74	ND	N	0.019	08-08-96	Not sampled: not scheduled for chemical analysis								

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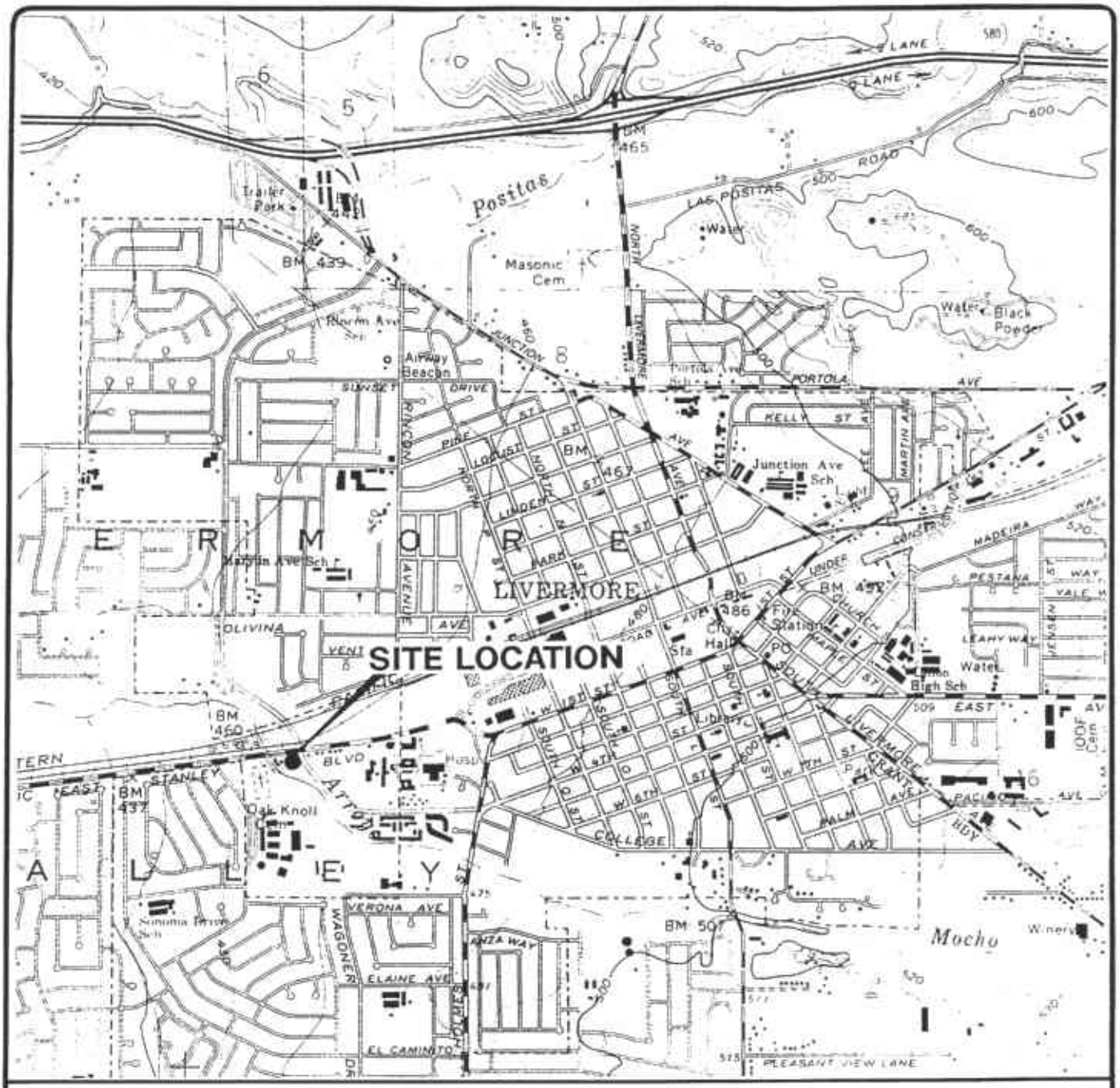
ARCO Service Station 6113
785 East Stanley Boulevard, Livermore, California

Date: 11-21-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**MTBE** EPA 8240	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United States Environmental Protection Agency
MTBE: Methyl-tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
ND: none detected
NR: not reported; data not available
DRY: dry well; groundwater was not detected
N: north
NW: northwest
NNW: north-northwest
- -: not analyzed or not applicable
*: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6113, Livermore, California,* (EMCON, February 26, 1996).

152753

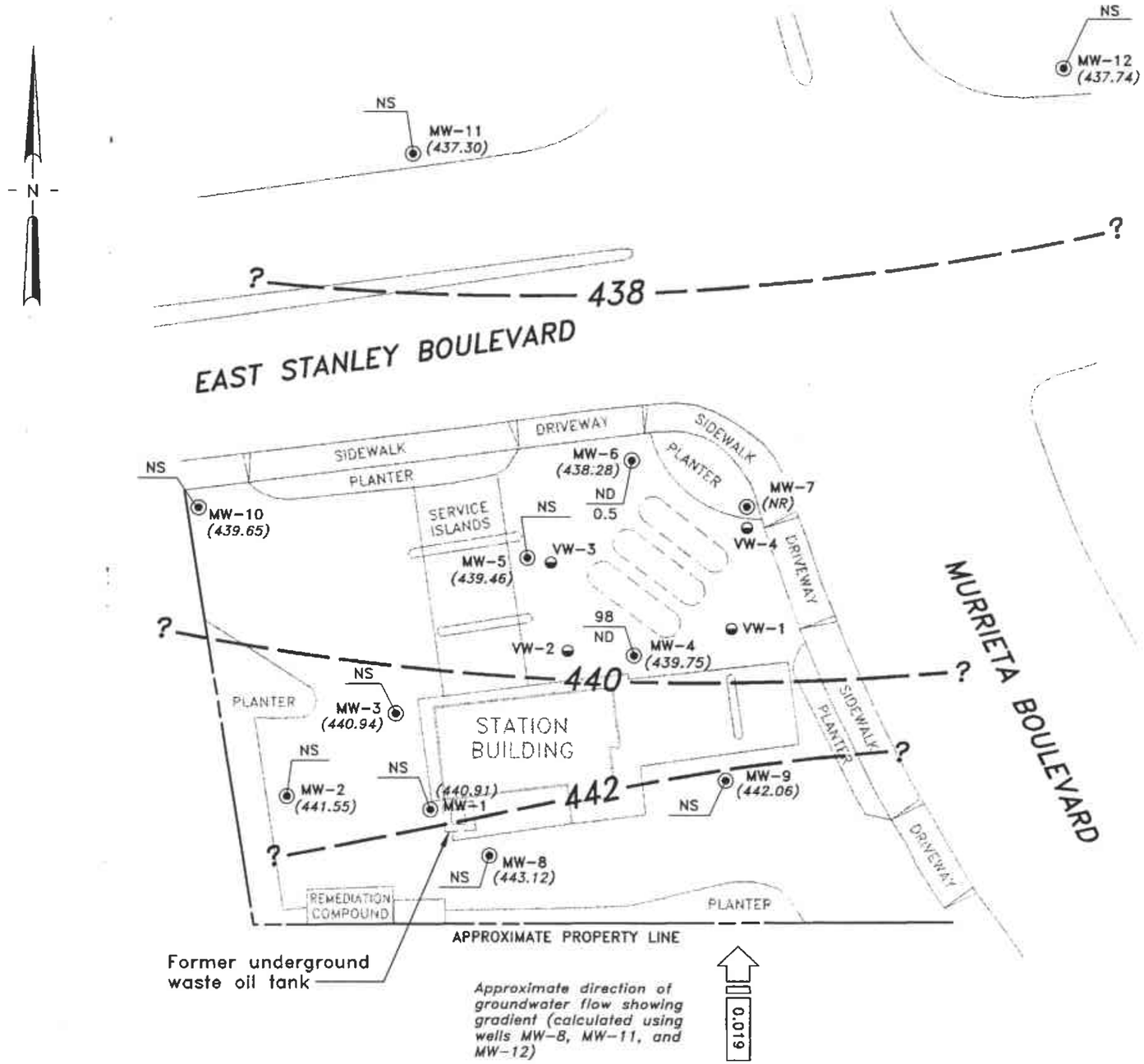


EMCON

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

SITE LOCATION

FIGURE
1
PROJECT NO.
805-134.03



EXPLANATION

- ◉ Groundwater monitoring well
- ◒ Vapor extraction well
- Existing underground gasoline storage tank
- (439.75) Groundwater elevation (Ft.–MSL) measured 8/8/96
- ? Groundwater elevation contour (Ft.–MSL)
- 98 / ND — TPHG concentration in groundwater (ug/L); sampled 8/8/96 / Benzene concentration in groundwater (ug/L); sampled 8/8/96
- 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)
- NR — Not recorded; unable to locate well

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
THIRD QUARTER 1996

FIGURE NO.
2
PROJECT NO.
805-134.003

G:\805-134\GDQ REV 0 11/18/96 15:51:58 DD DJ

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 21775-248.002 STATION ADDRESS : 785 East Stanley Blvd. Livermore DATE : 9-6-

ARCO STATION # : 6113 FIELD TECHNICIAN : M. Gallegos DAY : Thursday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket Present	Lock Number	Type Of 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	good	good	yes	ARCO	LWC	16.13	16.23	NR	NA.	44.7	
2	MW-2						16.19	16.19			38.5	
3	MW-3						16.03	16.03			59.0	
4	MW-6						16.65	16.65			66.6	
5	MW-7											
6	MW-8						13.85	13.85				
7	MW-9						14.12	14.12			68.5	
8	MW-10						17.20	17.20			49.6	
9	MW-11						17.77	17.77			44.3	
10	MW-12						17.30	17.30			33.1	water in box
11	MW-4	↓	↓	↓	↓	↓	16.80	16.80			26.6	
12	MW-5	good	good	good	none	slip.	16.38	16.38			62.4	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-268-CC2 SAMPLE ID: MW-4 (26')

PURGED BY: MIKE/FEGO CLIENT NAME: ARCO 6113

SAMPLED BY: V LOCATION: Livermore, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	6.40 ~~13.50~~
DEPTH TO WATER (feet):	16.80	CALCULATED PURGE (gal.):	19.20
DEPTH OF WELL (feet):	26.6	ACTUAL PURGE VOL. (gal.):	19.5

DATE PURGED: 8-8-96 Start (2400 Hr) 1246 End (2400 Hr) 1252

DATE SAMPLED: V Start (2400 Hr) ~~1300~~ 1300 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1248	6.5	6.87	604	70.9	Cloudy	Light
1250	13.0	6.79	584	69.9	"	"
1252	19.5	6.81	586	70.0	"	"

D. O. (ppm): NR ODOR: moderate

COLOR: NR (COBALT 0 - 500)

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

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

WELL INTEGRITY: Good LOCK #: Arco-key

REMARKS: All Samples taken

Meter Calibration: Date: 8-8-96 Time: ___ Meter Serial #: 3204 Temperature °F: ___

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

Location of previous calibration: MW-6

Signature: [signature] Reviewed By: [signature] Page 1 of 3

Rev. 3, 2/94

EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

PROJECT NO: 21775-248.002 SAMPLE ID: MW-6 (66')

PURGED BY: M Callison CLIENT NAME: ARCO 6113

SAMPLED BY: ↓ 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): NR VOLUME IN CASING (gal.): 32.63

DEPTH TO WATER (feet): 16.65 CALCULATED PURGE (gal.): 97.90

DEPTH OF WELL (feet): 66.6 ACTUAL PURGE VOL. (gal.): 98.0

DATE PURGED: 8-8-96 Start (2400 Hr) 1154 End (2400 Hr) 1221

DATE SAMPLED: ↓ Start (2400 Hr) 1225 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1203	32.5	6.95	712	69.6	Clear	light
1212	65.0	6.94	716	69.9	"	Clear
1221	98.0	6.96	719	69.5	"	"

D. O. (ppm): NR ODOR: ~~Strong~~ moderate NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ____ Centrifugal Pump
- ✓ Submersible Pump
- ____ Well Wizard™
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)
- ____ Dedicated

Other: ____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ____ Well Wizard™
- X Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated

Other: ____

WELL INTEGRITY: Good LOCK #: ARCO-Key

REMARKS: all samples taken

Meter Calibration: Date: 8/8/96 Time: 1150 Meter Serial #: 9204 Temperature °F: 75.5

(EC 1000 1011/1000) (DI ____) (pH 7 694/700) (pH 10 1004/1000) (pH 4 394/ ____)

Location of previous calibration: ____

Signature: M Callison Reviewed By: [illegible] Page 2 of 3

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 2775-24.002 SAMPLE ID: MW-7

PURGED BY: M. Gallegos CLIENT NAME: Arco #113

SAMPLED BY: ↓ LOCATION: Livermore, CA.

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

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

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

DEPTH TO WATER (feet): ↓ CALCULATED PURGE (gal.): ↓

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

DATE PURGED: 8-8-94 Start (2400 Hr) NR. End (2400 Hr) NR.

DATE SAMPLED: NR Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
unable	to locate		well box to new landscaping.			

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

Field QC samples collected at this well: ___ Parameters field filtered at this well: ___

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: N/A. LOCK #: ___

REMARKS: ___

Meter Calibration: Date: 8/8/94 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-6

Signature: [signature] Reviewed By: [signature] Page 3 of 3

Columbia Analytical Services, Inc.

August 20, 1996 Service Request No.: S9601292

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

RE: 6113 LIVERMORE/20805-134.003/TO#19350.00

Dear Mr. Young:

Attached are the results of the samples submitted to our lab on August 8, 1996. For you reference, our service request number for this work is S9601292.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

If you have questions or further needs, please call me at (408) 428-1283.

Sincerely,

Steven L. Green
Project Chemist

Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9601292
Project:	6113 LIVERMORE/20805-134.003/TO#19350.00	**Date Collected:**	8/8/96
Sample Matrix:	Water	**Date Received:**	8/8/96
		Date Extracted:	NA

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

		Sample Name:	**MW-6 (66)**	**MW-4 (26)**	**Method Blank**
		Lab Code:	S9601292-001	S9601292-002	S960813-WB1
		Date Analyzed:	8/13/96	8/13/96	8/13/96
Analyte	**MRL**				
TPH as Gasoline	50		ND	98	ND
Benzene	0.5		0.5	ND	ND
Toluene	0.5		ND	ND	ND
Ethylbenzene	0.5		ND	ND	ND
Total Xylenes	0.5		0.5	1.3	ND
Methyl *tert*-Butyl Ether	3		ND	ND	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9601292
Project:	6113 LIVERMORE/20805-134.003/TO#19350.00	**Date Collected:**	8/8/96
Sample Matrix:	Water	**Date Received:**	8/8/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

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

Sample Name	**Lab Code**	**PID Detector Percent Recovery** 4-Bromofluorobenzene	**FID Detector Percent Recovery** α,α,α-Trifluorotoluene
MW-6 (66)	S9601292-001	101	99
MW-4 (26)	S9601292-002	104	101
Batch QC (MS)	S9601276-010MS	100	101
Batch QC (DMS)	S9601276-010DMS	99	97
Method Blank	S960813-WB1	99	98
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9601292
Project:	6113 LIVERMORE/20805-134.003/TO#19350.00	**Date Collected:**	8/8/96
Sample Matrix:	Water	**Date Received:**	8/8/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9601276-010

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	0.7	25.9	24.7	101	96	75-135	5
Toluene	25	25	ND	25.6	24.3	102	97	73-136	5
Ethylbenzene	25	25	ND	25.3	24.2	101	97	69-142	4

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9601292
Project:	6113 LIVERMORE/20805-134.003/TO#19350.00	**Date Analyzed:**	8/13/96

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.6	102	85-115
Toluene	25	26.1	104	85-115
Ethylbenzene	25	25.6	102	85-115
Xylenes, Total	75	77.2	103	85-115
Gasoline	250	251	100	90-110
Methyl *tert*-Butyl Ether	50	48	96	85-115