PF
STID 3942

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

Date December 31, 1997
Project 20805-131.012

To:

Ms. Juliet Shin
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 1997 groundwater monitoring results report,
	ARCO service station 6002, Oakland, California
	6235 Seminary 94605
1	Jeffrey Enebly letter

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

Gary P. Messerotes
Project Manager

cc: Paul Supple, ARCO Products Company
File

ARCO Products Company

Date:
December 31, 1997

Re: ARCO Station #

6002 • 6235 Seminary Avenue • Oakland, CA
Third Quarter 1997 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 29, 1997
Project 20805-131.012

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

Re: Third quarter 1997 groundwater monitoring results, ARCO service station 6002, Oakland, California

Dear Mr. Supple:

This letter presents the results of the third quarter 1997 groundwater monitoring program at ARCO Products Company (ARCO) service station 6002, 6235 Seminary Avenue, Oakland, 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, results should not be construed as a guarantee of the absence of such conditions at the site, but rather as the product of the scope and limitations of work performed during the monitoring event.

Please call if you have questions.

Sincerely,

EMCON

Gary P. Messerotes, R.G. 5650
Project Manager

REGISTERED GEOLOGIST
GARY P. MESSEROTES
5650
STATE OF CALIFORNIA

December 29, 1997

ARCO QUARTERLY REPORT

Station No.: 6002	Address: 6235 Seminary Avenue, Oakland, California
EMCON Project No.:	20805-131.012
ARCO Environmental Engineer/Phone No.:	Paul Supple /(510) 299-8891
EMCON Project Manager/Phone No.:	Gary P. Messerotes /(408) 453-7300
Primary Agency/Regulatory ID No.:	ACHCSA /Juliet Shin

WORK PERFORMED THIS QUARTER (Third - 1997):

1. Prepared and submitted quarterly groundwater monitoring report for second quarter 1997.
2. Performed quarterly groundwater monitoring and sampling for third quarter 1997.

WORK PROPOSED FOR NEXT QUARTER (Fourth - 1997):

1. Prepare and submit quarterly groundwater monitoring report for third quarter 1997.
2. Perform quarterly groundwater monitoring and sampling for fourth quarter 1997.

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 :	approximately 370 cubic yards of TPH impacted soil
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	None
Average Depth to Groundwater:	9.47 feet
Groundwater Gradient (Average):	0.076 ft/ft toward west (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data,Third Quarter 1997
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Third Quarter 1997
- Appendix A - Analytical Results and Chain of Custody Documentation,Third Quarter 1997 Groundwater Monitoring Event

cc: Juliet Shin, ACHCSA

Table 1
Groundwater Monitoring Data
Third Quarter 1997

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-3	08-05-97	248.35	8.29	240.06	ND	W	0.076	08-05-97	Not sampled: well sampled annually, during the first quarter						
MW-4	08-05-97	242.91	11.90	231.01	ND	W	0.076	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	- -
MW-5	08-05-97	244.82	13.14	231.68	ND	W	0.076	08-05-97	340	2.2	<0.5	15	8.8	39	- -
MW-6	08-05-97	252.20	7.12	245.08	ND	W	0.076	08-05-97	Not sampled: well sampled annually, during the first quarter						
MW-7	08-05-97	235.95	12.33	223.62	ND	W	0.076	08-05-97	110	0.5	<0.5	<0.5	0.8	81	- -
MW-8	08-05-97	240.37	9.32	231.05	ND	W	0.076	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	- -
VW-1	08-05-97	NR	7.51	NR	ND	W	0.076	08-05-97	630	<1^	<1^	3	2	120	- -
VW-4	08-05-97	NR	9.47	NR	ND	W	0.076	08-05-97	<10000^	180	<100^	<100^	110	12000	- -

ft-MSL: elevation in feet, relative to mean sea level
MWN: groundwater flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
EPA: United States Environmental Protection Agency
MTBE: Methyl tert-butyl ether
NR: not reported; data not available or not measurable
ND: none detected
W: west
^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference
- -: not analyzed or not applicable

esj/j:\qtr_rpts\6002\6002mdb.xls\Table 1:imi
20805-131.012

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	03-15-95	247.06	7.37	239.69	ND	WSW	0.08	03-15-95	13000	1200	44	770	1100	--	--
MW-1	05-30-95	247.06	8.48	238.58	ND	WSW	0.08	05-30-95	19000	1600	30	890	1400	--	--
MW-1	09-01-95	247.06	9.47	237.59	ND	WSW	0.09	09-01-95	14000	1300	28	480	780	24000	--
MW-1	11-13-95	247.06	8.78	** 238.29	0.01	WSW	0.08	11-13-95	11000	570	17	260	410	--	25000
MW-1	02-23-96	247.06	Well was decommisioned on 2-12-96					03-01-96	Well was decommisioned on 2-12-96						
MW-2	03-15-95	249.30	8.25	241.05	ND	WSW	0.08	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-2	05-30-95	249.30	9.93	239.37	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-2	09-01-95	249.30	10.69	238.61	ND	WSW	0.09	09-01-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-2	11-13-95	249.30	10.32	238.98	ND	WSW	0.08	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-2	02-23-96	249.30	Well was decommisioned on 2-12-96					03-01-96	Well was decommisioned on 2-12-96						
MW-3	03-15-95	248.35	6.76	241.59	ND	WSW	0.08	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-3	05-30-95	248.35	7.81	240.54	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-3	09-01-95	248.35	8.65	239.70	ND	WSW	0.09	09-01-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-3	11-13-95	248.35	8.25	240.10	ND	WSW	0.08	11-13-95	120	45	0.7	<0.5	6.2	--	--
MW-3	02-23-96	248.35	6.64	241.71	ND	WSW	0.08	03-01-96	<50	<0.5	<0.5	0.6	1.9	<3	--
MW-3	05-10-96	248.35	7.95	240.40	ND	WSW	0.08	05-10-96	Not sampled: well sampled annually, during the first quarter						
MW-3	08-09-96	248.35	8.06	240.29	ND	SW	0.08	08-09-96	Not sampled: well sampled annually, during the first quarter						
MW-3	11-08-96	248.35	Not surveyed: inaccessible			SW	0.055	11-11-96	Not sampled: inaccessible						
MW-3	03-21-97	248.35	8.21	240.14	ND	WSW	0.051	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-3	05-27-97	248.35	8.25	240.10	ND	WSW	0.069	05-27-97	Not sampled: well sampled annually, during the first quarter						
MW-3	08-05-97	248.35	8.29	240.06	ND	W	0.076	08-05-97	Not sampled: well sampled annually, during the first quarter						

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-4	03-15-95	242.91	9.37	233.54	ND	WSW	0.08	03-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-4	05-30-95	242.91	11.47	231.44	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-4	09-01-95	242.91	12.28	230.63	ND	WSW	0.09	09-01-95	78	<0.5	0.7	<0.5	<0.5	<3	--
MW-4	11-13-95	242.91	11.75	231.16	ND	WSW	0.08	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-4	02-23-96	242.91	8.51	234.40	ND	WSW	0.08	03-01-96	59	1.2	7.4	1.6	9.3	3	--
MW-4	05-10-96	242.91	11.35	231.56	ND	WSW	0.08	05-10-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	08-09-96	242.91	9.70	233.21	ND	SW	0.08	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	11-08-96	242.91	11.79	231.12	ND	SW	0.055	11-08-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	03-21-97	242.91	10.94	231.97	ND	WSW	0.051	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	81	--
MW-4	05-27-97	242.91	11.51	231.40	ND	WSW	0.069	05-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	08-05-97	242.91	11.90	231.01	ND	W	0.076	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-5	03-15-95	244.82	11.99	232.83	ND	WSW	0.08	03-15-95	21000	870	22	1600	1900	--	--
MW-5	05-30-95	244.82	12.97	231.85	ND	WSW	0.08	05-30-95	17000	2100	250	1000	520	--	--
MW-5	09-01-95	244.82	14.03	230.79	ND	WSW	0.09	09-01-95	19000	1500	25	1600	880	8300	--
MW-5	11-13-95	244.82	13.65	231.17	ND	WSW	0.08	11-13-95	21000	1300	22	1400	630	--	--
MW-5	02-23-96	244.82	11.93	232.89	ND	WSW	0.08	03-01-96	27000	1300	<50	1600	1500	730	--
MW-5	05-10-96	244.82	13.05	231.77	ND	WSW	0.08	05-10-96	17000	460	21	760	480	1000	--
MW-5	08-09-96	244.82	13.22	231.60	ND	SW	0.08	08-09-96	16000	420	14	870	390	1500	--
MW-5	11-08-96	244.82	Not surveyed: inaccessible			SW	0.055	11-11-96	Not sampled: inaccessible						
MW-5	03-21-97	244.82	13.24	231.58	ND	WSW	0.051	03-21-97	18000	110	<50^	730	1500	1800	--
MW-5	05-27-97	244.82	13.10	231.72	ND	WSW	0.069	05-27-97	21000	86	<20^	810	610	1700	--
MW-5	08-05-97	244.82	13.14	231.68	ND	W	0.076	08-05-97	340	2.2	<0.5	15	8.8	39	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-6	06-29-95	NR	6.63	NR	ND	NR	NR	06-30-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-6	09-01-95	NR	Not surveyed:					09-01-95	Not sampled:						
MW-6	11-13-95	NR	7.70	NR	ND	WSW	0.08	11-13-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-6	02-23-96	NR	9.82	NR	ND	WSW	0.08	03-01-96	<50	<0.5	0.8	<0.5	0.6	<3	--
MW-6	05-10-96	NR	15.25	NR	ND	WSW	0.08	05-10-96	Not sampled: well sampled annually, during the first quarter						
MW-6	08-09-96	252.20	11.11	241.09	ND	SW	0.08	08-09-96	Not sampled: well sampled annually, during the first quarter						
MW-6	11-08-96	252.20	9.31	242.89	ND	SW	0.055	11-11-96	Not sampled: well sampled annually, during the first quarter						
MW-6	03-21-97	252.20	9.40	242.80	ND	WSW	0.051	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-6	05-27-97	252.20	7.08	245.12	ND	WSW	0.069	05-27-97	Not sampled: well sampled annually, during the first quarter						
MW-6	08-05-97	252.20	7.12	245.08	ND	W	0.076	08-05-97	Not sampled: well sampled annually, during the first quarter						
MW-7	08-09-96	235.95	Not surveyed: well was dry			SW	0.08	08-09-96	Not sampled: well was dry						
MW-7	11-08-96	235.95	Not surveyed: well was dry			SW	0.055	11-11-96	Not sampled: well was dry						
MW-7	01-27-97	235.95	NR	NR	ND	NR	NR	01-27-97	2900	29	<5^	<5^	580	220	--
MW-7	03-21-97	235.95	7.13	228.82	ND	WSW	0.051	03-21-97	590	3.5	<0.5	<0.5	1.3	90	--
MW-7	05-27-97	235.95	9.02	226.93	ND	WSW	0.069	05-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-7	08-05-97	235.95	12.33	223.62	ND	W	0.076	08-05-97	110	0.5	<0.5	<0.5	0.8	81	--
MW-8	08-09-96	240.37	9.41	230.96	ND	SW	0.08	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-8	11-08-96	240.37	9.19	231.18	ND	SW	0.055	11-11-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-8	03-21-97	240.37	8.55	231.82	ND	WSW	0.051	03-21-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-8	05-27-97	240.37	11.06	229.31	ND	WSW	0.069	05-27-97	91	0.6	<0.5	<0.5	0.6	66	--
MW-8	08-05-97	240.37	9.32	231.05	ND	W	0.076	08-05-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--
AS-1	06-29-95	NR	9.20	NR	ND	NR	NR	06-30-95	<50	1.6	<0.5	0.9	0.9	--	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
VW-1	02-23-96	NR	5.29	NR	ND	WSW	0.08	03-01-96	21000	490	57	520	1500	240	--
VW-1	05-10-96	NR	6.80	NR	ND	WSW	0.08	05-10-96	3700	61	<5	100	50	200	--
VW-1	08-09-96	NR	7.03	NR	ND	SW	0.08	08-09-96	970	2.7	<2.5	2.7	3.7	180	--
VW-1	11-08-96	NR	Not surveyed: inaccessible			SW	0.055	11-11-96	Not sampled: inaccessible						
VW-1	03-21-97	NR	7.51	NR	ND	WSW	0.051	03-21-97	640	<4^	<1^	1	3	194	--
VW-1	05-27-97	NR	7.51	NR	ND	WSW	0.069	05-27-97	Not sampled: well sampled semi-annually, during the first and third quarters						
VW-1	08-05-97	NR	7.51	NR	ND	W	0.076	08-05-97	630	<1^	<1^	3	2	120	--
VW-2	02-23-96	NR	6.92	NR	ND	WSW	0.08	03-01-96	Not sampled: not part of sampling program						
VW-2	05-10-96	NR	Not surveyed: not scheduled for monitoring					05-10-96	Not sampled: not part of sampling program						
VW-4	05-10-96	NR	8.58	NR	ND	WSW	0.08	05-10-96	13000	2500	41	420	660	43000	--
VW-4	08-09-96	NR	11.70	NR	ND	SW	0.08	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	6200	--
VW-4	11-08-96	NR	9.38	NR	ND	SW	0.055	11-08-96	7800	510	7	180	370	21000	--
VW-4	03-21-97	NR	9.11	NR	ND	WSW	0.051	03-21-97	10000	290	10	270	230	8900	--
VW-4	05-27-97	NR	9.34	NR	ND	WSW	0.069	05-27-97	Not sampled: well sampled semi-annually, during the first and third quarters						
VW-4	08-05-97	NR	9.47	NR	ND	W	0.076	08-05-97	<10000^	180	<100^	<100^	110	12000	--

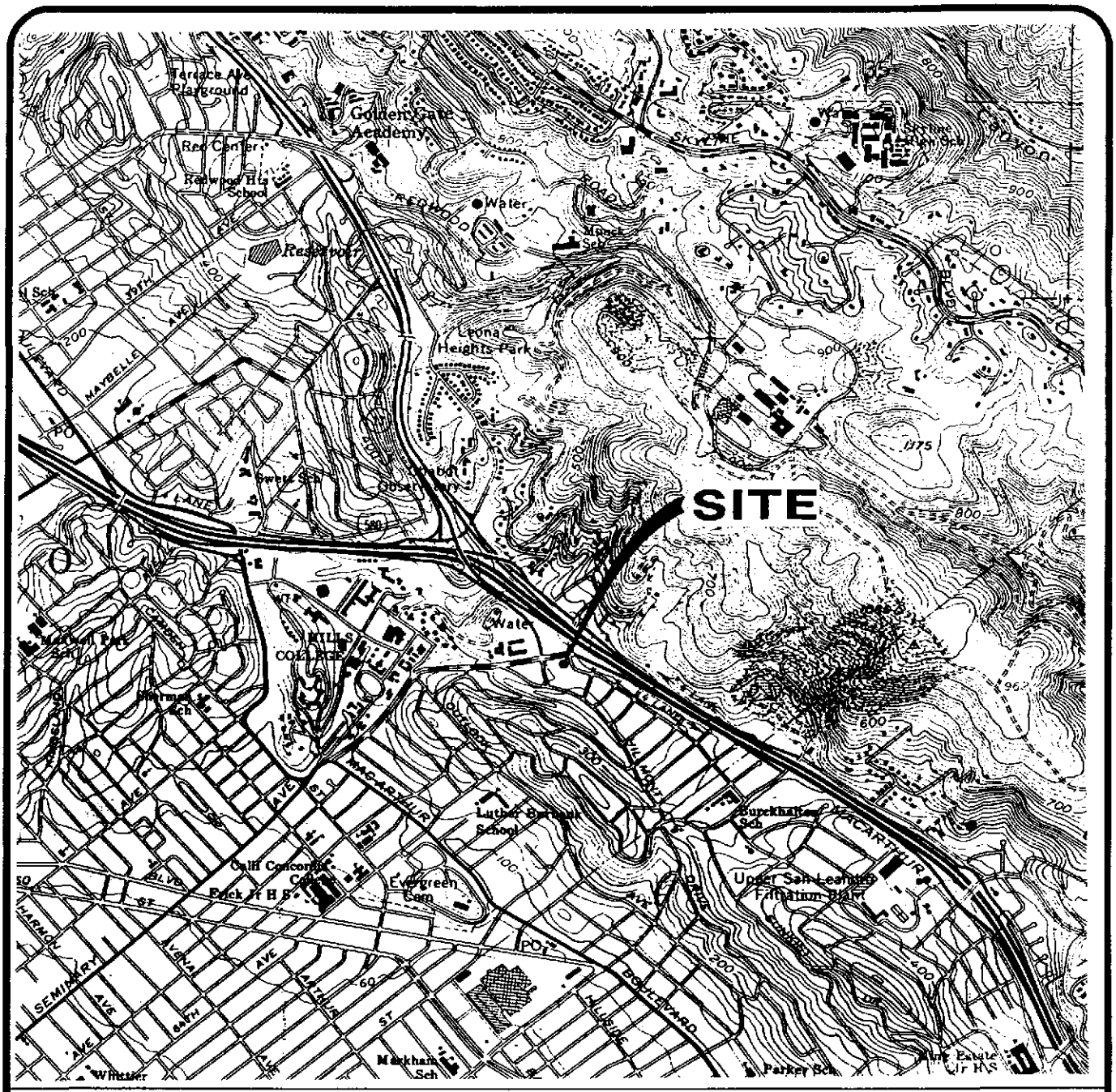
Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 11-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		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
µg/L: micrograms per liter
EPA: United States Environmental Protection Agency
MTBE: Methyl-tert-butyl ether
ND: none detected
NR: not reported; data not available or not measurable
W: west
WSW: west-southwest
SW: southwest
- -: not analyzed or not applicable
*: For previous historical groundwater elevation data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6002, Oakland, California,* (EMCON, February 23, 1996).
^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference
** [corrected elevation (Z')] = Z + (h * 0.73) where: Z: measured elevation, h: floating product thickness, 0.73: density ratio of oil to water

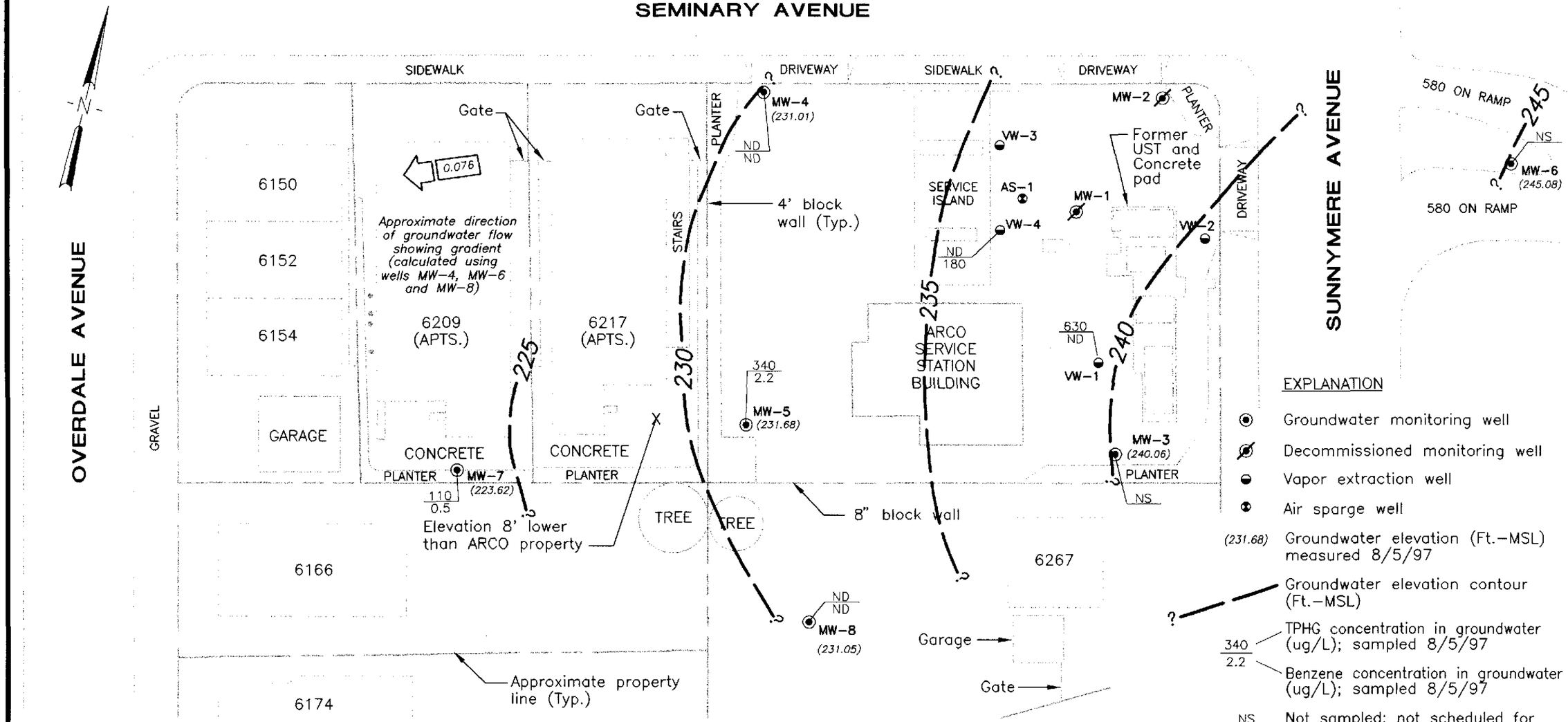


EMCON

DATE NOV. 1997
DWN KAJ
APP
REV
PROJECT NO.
805-131.012

FIGURE 1
ARCO PRODUCTS COMPANY
SERVICE STATION 6002, 6235 SEMINARY AVE.
OAKLAND, CALIFORNIA
QUARTERLY GROUNDWATER MONITORING
SITE LOCATION

EA-SANJOSE-CAD/DRAWINGS: I:\0Z002\SITELOC.dwg Xrefs: <NONE>
Scale: 1 = 1.00 DimScale: 1 = 1.00 Date: 3/12/97 Time: 5:19 PM Operator: KAJ



Base map modified from GSI, 1994.

EMCON

0 30 60
SCALE IN FEET

DATE NOV. 1997
DWN KLT
APP
REV
PROJECT NO.
805-131.012

FIGURE 2
ARCO PRODUCTS COMPANY
SERVICE STATION 6002, 6235 SEMINARY AVE.
OAKLAND, CALIFORNIA
QUARTERLY GROUNDWATER MONITORING
GROUNDWATER DATA - 3RD QUARTER 1997

EA-SANJOSE-CAD/DRAWINGS: G:\805-131\SJGWELEV.dwg Xrefs: <NONE>
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Columbia Analytical Services, Inc.

August 15, 1997 Service Request No.: S9701495

Gary Messerotes
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 20805-131.012/TO#21133.00/6002 OAKLAND

Dear Mr. Messerotes:

The following pages contain analytical results for sample(s) received by the laboratory on August 5, 1997. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

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

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

Sincerely,

Steven L. Green
Project Chemist

Bernadette T. Cox

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:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	VW-1 (9)	Units:	ug/L (ppb)
Lab Code:	S9701495-001	Basis:	NA
Test Notes:	C1		

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	2	NA	8/12/97	630	
Benzene	EPA 5030	8020	0.5	2	NA	8/12/97	<1	
Toluene	EPA 5030	8020	0.5	2	NA	8/12/97	<1	
Ethylbenzene	EPA 5030	8020	0.5	2	NA	8/12/97	3	
Xylenes, Total	EPA 5030	8020	0.5	2	NA	8/12/97	2	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	2	NA	8/12/97	120	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	VW-4 (11)	Units:	ug/L (ppb)
Lab Code:	S9701495-002	Basis:	NA
Test Notes:	C1		

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	200	NA	8/12/97	<10000	
Benzene	EPA 5030	8020	0.5	200	NA	8/12/97	180	
Toluene	EPA 5030	8020	0.5	200	NA	8/12/97	<100	
Ethylbenzene	EPA 5030	8020	0.5	200	NA	8/12/97	<100	
Xylenes, Total	EPA 5030	8020	0.5	200	NA	8/12/97	110	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	200	NA	8/12/97	12000	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-4 (15)	Units:	ug/L (ppb)
Lab Code:	S9701495-003	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/7/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/7/97	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-7 (13)	Units:	ug/L (ppb)
Lab Code:	S9701495-004	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/7/97	110	
Benzene	EPA 5030	8020	0.5	1	NA	8/7/97	0.5	
Toluene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/7/97	0.8	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/7/97	81	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-8 (11)	Units:	ug/L (ppb)
Lab Code:	S9701495-005	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/7/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/7/97	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-5 (14)	Units:	ug/L (ppb)
Lab Code:	S9701495-006	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/7/97	340	
Benzene	EPA 5030	8020	0.5	1	NA	8/7/97	2.2	
Toluene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/7/97	15	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/7/97	8.8	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/7/97	39	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S970806-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/6/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/6/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/6/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/6/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/6/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/6/97	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S970812-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/12/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/12/97	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method:	EPA 5030	Units:	PERCENT
Analysis Method:	8020 CA/LUFT	Basis:	NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
VW-1 (9)	S9701495-001		86	116
VW-4 (11)	S9701495-002		103	85
MW-4 (15)	S9701495-003		100	95
MW-7 (13)	S9701495-004		100	92
MW-8 (11)	S9701495-005		103	89
MW-5 (14)	S9701495-006		101	98
VW-1 (9)	S9701495-001MS		93	111
VW-1 (9)	S9701495-001DMS		93	106
Method Blank	S970806-WB1		100	89
Method Blank	S970812-WB1		100	89
CAS Acceptance Limits:			69-116	69-116

SUR2/020397p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	8/12/97

Matrix Spike/Duplicate Matrix Spike Summary
BTE

Sample Name:	VW-1(9)	Units:	ug/L (ppb)
Lab Code:	S9701495-001MS, S9701495-001DMS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Benzene	EPA 5030	8020	0.5	50	50	ND	47	46	94	92	75-135	2
Toluene	EPA 5030	8020	0.5	50	50	ND	48	46	96	92	73-136	4
Ethylbenzene	EPA 5030	8020	0.5	50	50	3	48	47	90	88	69-142	2

DMS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-131.012/TO#21133.00/6002 OAKLAND

Service Request: S9701495
Date Analyzed: 8/12/97

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline

Sample Name: ICV
Lab Code: ICV1
Test Notes:

Units: ug/L (ppb)
Basis: NA

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	CAS Percent Recovery Acceptance Limits	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	260	90-110	104	
Benzene	EPA 5030	8020	25	27	85-115	108	
Toluene	EPA 5030	8020	25	28	85-115	112	
Ethylbenzene	EPA 5030	8020	25	28	85-115	112	
Xylenes, Total	EPA 5030	8020	75	85	85-115	113	
Methyl *tert*-Butyl Ether	EPA 5030	8020	25	28	85-115	112	

ICV032196

ARCO Products Company
Division of AtlanticRichfieldCompany

VOA F

Task Order No. 21133.00 S9701495

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	Project manager (Consultant) Gary Messerotes	Laboratory name CAS
ARCO engineer Paul Supple	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 ☐		
VW-1(9)	(1)	2		X		HCL	X	8/5/97	1215		X											
VW-4(4)	(2)	2		X		HCL	X	8/5/97	1240		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs

#20805-121.012

Lab number: S9701495

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	8/5/97	1350	Received by Kristina Soulen	8/5/97	1350
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

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

R8

ARCO Products Company Division of AtlanticRichfieldCompany

Task Order No. 21133.00 S9701495

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	Project manager (Consultant) Gary Messerotes	Laboratory name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300 / Fax no. (Consultant) (408) 453-0452	Contract number
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131		

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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-4(15)	3	2		X		X	HCL	8/5/97	1050		X											
MW-7(13)	4	2		X		X	HCL	↓	1130		X											
MW-8(11)	5	2		X		X	HCL	↓	1150		X											
MW-5(14)	6	2		X		X	HCL	↓	1300		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs

#20805-131.012

Lab number: S9701495

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

Condition of sample:

Temperature received:

Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: [signature]	8/5/97	1350	Received by: Kristina Soulen	8/5/97	1350
Relinquished by			Received by		
Relinquished by			Received by laboratory		

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

APC-3292 (2-91)

page 2 of 2

DQ

November 21, 1997
Project 20805-131.012

Mr. Jeffrey Enebly
6267 Sunnymere Avenue
Oakland, California 94605

Re: Third quarter 1997 laboratory analytical results, groundwater samples, 6267 Sunnymere Avenue, Oakland, California

Dear Mr. Enebly:

Enclosed please find a copy of the Third quarter 1997 groundwater monitoring results for ARCO service station 6002, Oakland, California. Included are the laboratory analytical results for the groundwater sample collected from well MW-8 during the third quarter of 1997. This well is located at 6267 Sunnymere Avenue, Oakland, California. The groundwater sample was collected on August 5, 1997, during quarterly sampling of the ARCO Products Company service station 6002, 6235 Seminary Avenue, Oakland.

Please call if you have questions.

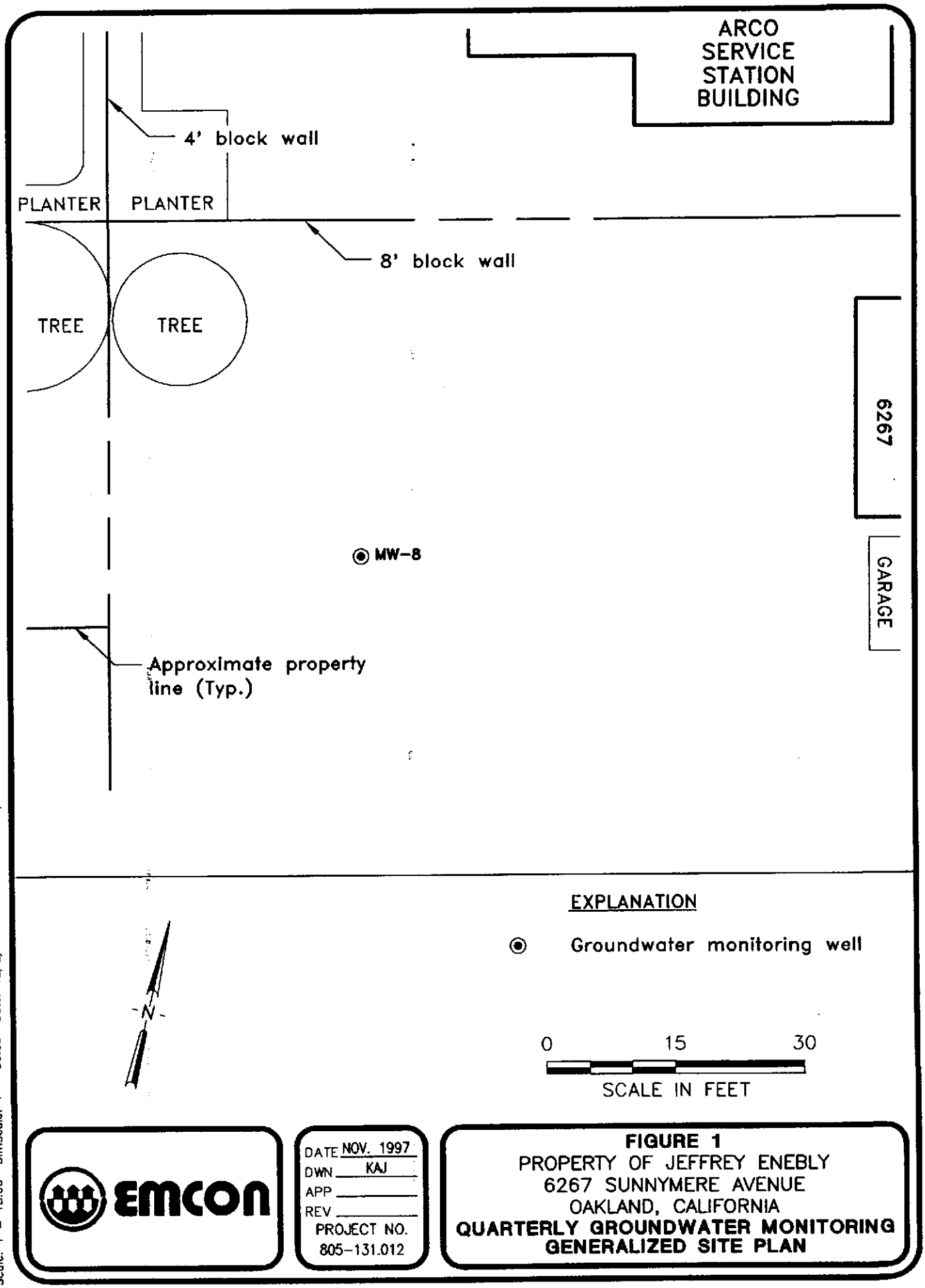
Sincerely,

EMCON

Gary P. Messerotes
Project Manager

Attachments: Figure 1 -Generalized Site Plan
Attachment A - Copy of Analytical Results and Chain-of-Custody Documentation, Well MW-8, Third Quarter 1997

cc: Juliet Shin, ACHCSA
Paul Supple, ARCO Products Company
File



EMCON

DATE NOV. 1997
DWN KAJ
APP
REV
PROJECT NO.
805-131.012

FIGURE 1
PROPERTY OF JEFFREY ENEBLY
6267 SUNNYMERE AVENUE
OAKLAND, CALIFORNIA
QUARTERLY GROUNDWATER MONITORING
GENERALIZED SITE PLAN

EA-SANJOSE-CAD/DRAWINGS: G:\805-131\SJGENSP.dwg Xrefs: <NONE>
Scale: 1 = 15.00 DimScale: 1 = 30.00 Date: 12/2/97 Time: 8:52 AM Operator: KAJ

ATTACHMENT A

COPY OF ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, WELL MW-8, THIRD QUARTER 1997

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
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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:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	8/5/97
Sample Matrix:	Water	**Date Received:**	8/5/97

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-8 (11)	Units:	ug/L (ppb)
Lab Code:	S9701495-005	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/7/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/7/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/7/97	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9701495
Project:	20805-131.012/TO#21133.00/6002 OAKLAND	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S970812-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	8/12/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/12/97	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	8/12/97	ND	

1S22/020597p

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 21133.00 S9701495

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	Project manager (Consultant) Gary Messerotes	Laboratory name CAS
ARCO engineer Paul Supple	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

Method of shipment: Sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 8020/EPA 8020	BTEX/TPH as gas/diesel EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-4	(15)	(3)	2		X		X	HCL	8/5/97	1050		X										
MW-7	(13)	(4)	2		X		X	HCL		1130		X										
MW-2	(11)	(5)	2		X		X	HCL		1150		X										
MW-5	(14)	(6)	2		X		X	HCL	↓	1300		X										

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCl VOAs

#20805-131.C

Lab number: S9701495

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler: Mike Ross	Date 8/5/97 Time 1350	Received by: Kristena Soulen	8/5/97 1350
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

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RS

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 6002	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO) —	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave		Contract number —

Method of shipment: Sampler will Deliver

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 M8020/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-5(23)		2		X			X	5/27/97	1310		X											
MW-7(13)		2		X			X	5/27/97	1435		X											
MW-8(12)		2		X			X	5/27/97	1450		X											
MW-4(23)		2		X			X	5/27/97	1415		X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2- 40 ml (HCl) VOAs

20805-131,012

Lab number

Turnaround time

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

Condition of sample:

Temperature received: Cold

	Date	Time			
Relinquished by sampler: Mike Ruan	5/28/97	1120	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date 5/28/97	Time 1125A

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 21123.00

Chain of Custody

ARCO Facility no.	6002
City (Facility)	Oakland
Project manager (Consultant)	Gary Messerotes
Laboratory name	CAS
ARCO engineer	Paul Supple
Telephone no. (ARCO)	
Telephone no. (Consultant)	(408) 453-7300
Fax no. (Consultant)	(408) 453-0452
Contract number	
Consultant name	EMCON
Address (Consultant)	1921 Ringwood Ave. San Jose CA 95131

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 w/ctx MTBE EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-4	(5)	2		X		X	HCL	8/5/97	1050		X											
MW-7	(3)	2		X		X	HCL	↓	1130		X											
MW-8	(1)	2		X		X	HCL	↓	1150		X											
MW-5	(4)	2		X		X	HCL	↓	1300		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs

#70805-131.02

Lab number:

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

Condition of sample:

Temperature received:

Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: Mike Ross	8/5/97	1350	Kristina Scanlon	8/5/97	1350
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 21133.00

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	Project manager (Consultant) Gary Messerotes	Laboratory name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408)453-7300 / Fax no. (Consultant) (408)453-0452	Contract number
Consultant name EMCON		Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131	

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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
VW-1(9)		2		X		HCL	X	8/5/97	1215		X											
VW-4(11)		2		X		HCL	X	8/5/97	1240		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs

#20805-121.017

Lab number:

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

Condition of sample:			Temperature received:		
Relinquished by sampler [signature]	Date 8/5/97	Time 1350	Received by [signature] 8/5/97 1350		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time

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