



EMCON

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

97 SEP 30 AM 9:18

Date September 30, 1997

Project 20805-123.004

To:

Mr. Barney Chan

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

3858

We are enclosing:

Copies	Description
<u>1</u>	<u>Second quarter 1997 groundwater monitoring results and</u> <u>remediation system performance evaluation report,</u> <u>ARCO service station 2035, Albany, California</u>

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

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: Kevin Graves, RWQCB - SFBR
Paul Supple, ARCO Products Company
File





Date: September 30, 1997

Re: ARCO Station #

2035 • 1001 San Pablo Avenue • Albany, CA
Second Quarter 1997 Groundwater Monitoring Results and
Remediation System Performance Evaluation 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:

A handwritten signature in black ink that reads "Paul Supple". The signature is written in a cursive, flowing style.

Paul Supple
Environmental Engineer



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August 29, 1997
Project 20805-123.004

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

Re: Second quarter 1997 groundwater monitoring program results and remediation system performance evaluation report, ARCO service station 2035, Albany, California

Dear Mr. Supple:

This letter presents the results of the second quarter 1997 groundwater monitoring program at ARCO Products Company (ARCO) service station 2035, 1001 San Pablo Avenue, Albany, California (Figure 1). Operation and performance data for the site's soil-vapor extraction (SVE) and groundwater extraction remediation systems are also presented. 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.

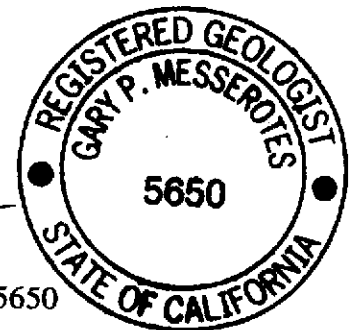
Please call if you have questions.

Sincerely,

EMCON

Gowri Kowtha
for Gowri Kowtha
Staff Engineer

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



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August 29, 1997

ARCO QUARTERLY REPORT

Station No.: 2035 Address: 1001 San Pablo Avenue, San Pablo, California
EMCON Project No.: 20805-123.004
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 /Barney Chan
Reporting Period: April 1, 1997 to July 1, 1997

WORK PERFORMED THIS QUARTER (Second- 1997):

1. Prepared and submitted quarterly report for first quarter 1997.
2. Conducted quarterly groundwater monitoring and sampling for second quarter 1997.

WORK PROPOSED FOR NEXT QUARTER (Third- 1997):

1. Prepare and submit quarterly report for second quarter 1997.
2. Perform quarterly groundwater monitoring and sampling for third quarter 1997.
3. Restart SVE system and continue operation if influent hydrocarbon concentrations warrant.

QUARTERLY MONITORING:

Current Phase of Project: Quarterly Groundwater Monitoring and Operation and Maintenance of Remediation Systems
The SVE system was shut down on August 12, 1996, because of low TVHg and benzene concentrations in extracted soil vapor.
The groundwater treatment system was shut down on August 8, 1996, because of low influent TPHg concentrations.

Frequency of Sampling: Quarterly (groundwater), Monthly (SVE)

Frequency of Monitoring: Quarterly (groundwater), Monthly (SVE)

Is Floating Product (FP) Present On-site: Yes No

Cumulative FP Recovered to Date : 27.9 gallons, Wells AS-1, AS-2, RW-1, VW-1, VW-2, and VW-7

FP Recovered This Quarter : None

Bulk Soil Removed to Date : 605 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: Air-Bubbling in RW-1

Average Depth to Groundwater: 10.65 feet

Groundwater Gradient (Average): 0.024 ft/ft toward west-southwest (consistent with past events)

SVE QUARTERLY OPERATION AND PERFORMANCE:

Equipment Inventory: Therm Tech Model VAC-10 Thermal/Catalytic Oxidizer
The SVE system was shut down on August 12, 1996, because of low TVHg and benzene concentrations in extracted soil vapor.
The groundwater treatment system was shut down on August 8, 1996, because of low influent TPHg concentrations.

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Operating Mode:	Catalytic Oxidation
BAAQMD Permit #:	10931
TPH Conc. End of Period (lab):	NA (Not Available)
Benzene Conc. End of Period (lab):	NA
SVE Flowrate End of Period:	NA
Total HC Recovered This Period:	0.0 pounds
Total HC Recovered to Date:	3007.5 pounds
Utility Usage	
Electric (KWH):	663 KWH
Gas (Therms):	1 Therm
Operating Hours This Period (SVE):	0.0 hours
Operating Hours to Date (SVE):	6873.2 hours
Percent Operational (SVE):	0.0%
Operating Hours This Period (GWE):	0.0 hours
Percent Operational (GWE):	0.0%
Unit Maintenance:	Routine monthly maintenance
Number of Auto Shut Downs:	0
Destruction Efficiency Permit Requirement:	90%
Percent TPH Conversion:	NA
Average Stack Temperature:	NA
Average SVE Source Flow:	0.0 scfm
Average SVE Process Flow:	0.0 scfm
Average Source Vacuum:	0.0 inches of water

DISCUSSION:

The SVE system has been shut down since August 12, 1996, because of relatively low gasoline concentrations in the influent vapor stream. The SVE system may be restarted during the third quarter, if hydrocarbons concentrations and groundwater levels warrant.

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Second Quarter 1997
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Table 3 - Historical Groundwater Elevation Data, Shell Station
- Table 4 - Approximate Cumulative Floating Product Recovered, Wells AS-1, AS-2, RW-1, VW-1, VW-2, and VW-7
- Table 5 - Soil-Vapor Extraction System Operation and Performance Data
- Table 6 - Soil-Vapor Extraction Well Data
- Table 7 - Influent and Effluent Groundwater Analyses Summary Report
- Table 8 - Estimated Total Dissolved TPHG and Benzene Removed, Summary Report
- Figure 1 - Site Location
- Figure 2 - Site Plan
- Figure 3 - Groundwater Data, Second Quarter 1997
- Figure 4 - Soil-Vapor Extraction and Treatment System, Historical System Influent TVHG and Benzene Concentrations
- Figure 5 - Soil-Vapor Extraction and Treatment System, Historical Hydrocarbon Removal Rates
- Figure 6 - Groundwater Treatment System, Historical System Influent TPHG and Benzene Concentrations

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- Figure 7 - Groundwater Treatment System, Historical Hydrocarbon Removal Rates
- Appendix A - Analytical Results and Chain of Custody Documentation, Second Quarter 1997
Groundwater Monitoring Event
- Appendix B - SVE System Monitoring Data Log Sheets

cc: Barney Chan, ACHCSA
Kevin Graves, RWQCB-SFBR

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Table 1
Groundwater Monitoring Data
Second Quarter 1997

ARCO Service Station 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

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	Oil and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	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	µg/L	µg/L	µg/L
MW-1	05-22-97	41.41	9.65	31.76	ND	WSW	0.024	05-22-97	110	5.5	<0.5	<0.5	0.7	10	--	--	--	--	--	--
MW-2	05-22-97	40.38	10.65	29.73	ND	WSW	0.024	05-22-97	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-3	05-22-97	41.44	10.40	31.04	ND	WSW	0.024	05-22-97	<100 [^]	<1 [^]	<1 [^]	<1 [^]	<1 [^]	95	--	--	--	--	--	--
MW-4	05-22-97	40.33	9.91	30.42	ND	WSW	0.024	05-22-97	Not sampled: well sampled annually, during the first quarter											
MW-5	05-22-97	41.84	10.28	31.56	ND	WSW	0.024	05-22-97	Not sampled: well sampled annually, during the first quarter											
MW-6	05-22-97	40.13	13.00	27.13	ND	WSW	0.024	05-22-97	Not sampled: well sampled annually, during the first quarter											
RW-1	05-22-97	40.33	10.10	30.23	ND	WSW	0.024	05-22-97	3000	630	84	45	340	<60 [^]	--	--	--	--	--	--

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

SM: standard method

TRPH: total recoverable petroleum hydrocarbons

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

ND: none detected

WSW: west-southwest

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

--: not analyzed or not applicable

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

ARCO Service Station 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

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	Oil and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	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	µg/L	µg/L	µg/L
MW-1	03-24-95	41.41	6.21	35.20	ND	NW	0.037	03-24-95	8800	3600	<50	62	99	--	--	--	--	--	--	--
MW-1	05-24-95	41.41	9.37	32.04	ND	WNW	0.013	05-24-95	4800	2000	<20	52	<20	--	--	--	--	--	--	--
MW-1	08-22-95	41.41	10.30	31.11	ND	SW	0.012	08-22-95	780	310	<2.5	12	<2.5	14	--	--	--	--	--	--
MW-1	11-09-95	41.41	12.25	29.16	ND	WSW	0.01	11-09-95	58	14	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-1	02-27-96	41.41	9.08	32.33	ND	SW	0.009	02-27-96	2700	930	12	18	32	51	--	--	--	--	--	--
MW-1	04-22-96	41.41	9.11	32.30	ND	WSW	0.014	04-22-96	2700	1000	<10	22	<10	<60	--	--	--	--	--	--
MW-1	08-15-96	41.41	10.37	31.04	ND	SW	0.011	08-15-96	300	52	<0.5	0.9	<0.5	22	--	--	--	--	--	--
MW-1	12-10-96	41.41	8.79	32.62	ND	WSW	0.023	12-10-96	270	63	0.7	<0.5	1	25	--	--	--	--	--	--
MW-1	03-27-97	41.41	9.80	31.61	ND	WSW	0.026	03-27-97	1500	610	<5 ^a	15	7	56	--	--	--	--	--	--
MW-1	05-22-97	41.41	9.65	31.76	ND	WSW	0.024	05-22-97	110	5.5	<0.5	<0.5	0.7	10	--	--	--	--	--	--
MW-2	03-24-95	40.38	6.96	33.42	ND	NW	0.037	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	05-24-95	40.38	10.02	30.36	ND	WNW	0.013	05-24-95	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-2	08-22-95	40.38	10.87	29.51	ND	SW	0.012	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-2	11-09-95	40.38	13.12	27.26	ND	WSW	0.01	11-09-95	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-2	02-27-96	40.38	10.25	30.13	ND	SW	0.009	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-2	04-22-96	40.38	9.98	30.40	ND	WSW	0.014	04-22-96	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-2	08-15-96	40.38	11.10	29.28	ND	SW	0.011	08-15-96	<50	<0.5	<0.5	<0.5	<0.5	4	--	--	--	--	--	--
MW-2	12-10-96	40.38	10.00	30.38	ND	WSW	0.023	12-10-96	Not sampled: well sampled semi-annually, during the first and third quarters											
MW-2	03-27-97	40.38	10.38	30.00	ND	WSW	0.026	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	12	--	--	--	--	--	--
MW-2	05-22-97	40.38	10.65	29.73	ND	WSW	0.024	05-22-97	Not sampled: well sampled semi-annually, during the first and third quarters											

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

ARCO Service Station 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	Oil and Grease SM 5520B&F µg/L	Oil and Grease SM 5520C µg/L	Oil and Grease SM 5520F µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-3	03-24-95	41.44	7.29	34.15	ND	NW	0.037	03-24-95	51	0.8	<0.5	2.4	<0.5	--	--	--	--	--	<500	--
MW-3	05-24-95	41.44	9.53	31.91	ND	WNW	0.013	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	<500	--
MW-3	08-22-95	41.44	11.19	30.25	ND	SW	0.012	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	79	--	--	--	--	<500	--
MW-3	11-09-95	41.44	12.77	28.67	ND	WSW	0.01	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	600	--
MW-3	02-27-96	41.44	9.41	32.03	ND	SW	0.009	02-27-96	120	3.6	<0.5	2.2	3.7	90	--	--	--	--	<0.5	--
MW-3	04-22-96	41.44	9.63	31.81	ND	WSW	0.014	04-22-96	<50	<0.5	<0.5	<0.5	<0.5	90	--	--	--	--	--	--
MW-3	08-15-96	41.44	11.12	30.32	ND	SW	0.011	08-15-96	<50	<0.5	<0.5	<0.5	<0.5	54	--	--	--	--	--	--
MW-3	12-10-96	41.44	10.34	31.10	ND	WSW	0.023	12-10-96	71	<0.5	<0.5	<0.5	<0.5	130	--	--	--	--	--	--
MW-3	03-27-97	41.44	10.28	31.16	ND	WSW	0.026	03-27-97	<100 [^]	<1 [^]	<1 [^]	<1 [^]	<1 [^]	170	--	--	--	--	--	--
MW-3	05-22-97	41.44	10.40	31.04	ND	WSW	0.024	05-22-97	<100 [^]	<1 [^]	<1 [^]	<1 [^]	<1 [^]	95	--	--	--	--	--	--
MW-4	03-24-95	40.33	5.92	34.41	ND	NW	0.037	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	05-24-95	40.33	9.23	31.10	ND	WNW	0.013	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	08-22-95	40.33	10.61	29.72	ND	SW	0.012	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	99	--	--	--	--	--	--
MW-4	11-09-95	40.33	11.97	28.36	ND	WSW	0.01	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	89	--	--	--	--	--
MW-4	02-27-96	40.33	8.84	31.49	ND	SW	0.009	02-27-96	<50	0.8	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-4	04-22-96	40.33	9.15	31.18	ND	WSW	0.014	04-22-96	Not sampled: well sampled annually, during the first quarter											
MW-4	08-15-96	40.33	10.35	29.98	ND	SW	0.011	08-15-96	Not sampled: well sampled annually, during the first quarter											
MW-4	12-10-96	40.33	8.70	31.63	ND	WSW	0.023	12-10-96	Not sampled: well sampled annually, during the first quarter											
MW-4	03-27-97	40.33	9.75	30.58	ND	WSW	0.026	03-27-97	<5000 [^]	<50 [^]	<50 [^]	<50 [^]	<50 [^]	4200	--	--	--	--	--	--
MW-4	05-22-97	40.33	9.91	30.42	ND	WSW	0.024	05-22-97	Not sampled: well sampled annually, during the first quarter											

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

ARCO Service Station 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

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	Oil and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN														
MW-5	03-24-95	41.84	6.23	35.61	ND	NW	0.037	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	05-24-95	41.84	9.61	32.23	ND	WNW	0.013	05-24-95	Not sampled: well sampled annually, during the first quarter											
MW-5	08-22-95	41.84	11.12	30.72	ND	SW	0.012	08-22-95	Not sampled: well sampled annually, during the first quarter											
MW-5	11-09-95	41.84	12.52	29.32	ND	WSW	0.01	11-09-95	Not sampled: well sampled annually, during the first quarter											
MW-5	02-27-96	41.84	9.52	32.32	ND	SW	0.009	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-5	04-22-96	41.84	9.44	32.40	ND	WSW	0.014	04-22-96	Not sampled: well sampled annually, during the first quarter											
MW-5	08-15-96	41.84	10.83	31.01	ND	SW	0.011	08-15-96	Not sampled: well sampled annually, during the first quarter											
MW-5	12-10-96	41.84	9.20	32.64	ND	WSW	0.023	12-10-96	Not sampled: well sampled annually, during the first quarter											
MW-5	03-27-97	41.84	10.10	31.74	ND	WSW	0.026	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-5	05-22-97	41.84	10.28	31.56	ND	WSW	0.024	05-22-97	Not sampled: well sampled annually, during the first quarter											
MW-6	03-24-95	40.13	9.03	31.10	ND	NW	0.037	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	05-24-95	40.13	12.45	27.68	ND	WNW	0.013	05-24-95	Not sampled: well sampled annually, during the first quarter											
MW-6	08-22-95	40.13	13.32	26.81	ND	SW	0.012	08-22-95	Not sampled: well sampled annually, during the first quarter											
MW-6	11-09-95	40.13	14.13	26.00	ND	WSW	0.01	11-09-95	Not sampled: well sampled annually, during the first quarter											
MW-6	02-27-96	40.13	11.86	28.27	ND	SW	0.009	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-6	04-22-96	40.13	12.35	27.78	ND	WSW	0.014	04-22-96	Not sampled: well sampled annually, during the first quarter											
MW-6	08-15-96	40.13	13.18	26.95	ND	SW	0.011	08-15-96	Not sampled: well sampled annually, during the first quarter											
MW-6	12-10-96	40.13	11.94	28.19	ND	WSW	0.023	12-10-96	Not sampled: well sampled annually, during the first quarter											
MW-6	03-27-97	40.13	13.10	27.03	ND	WSW	0.026	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-6	05-22-97	40.13	13.00	27.13	ND	WSW	0.024	05-22-97	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 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

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	Oil and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	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	µg/L	µg/L	µg/L
RW-1	03-24-95	40.33	9.32	31.02**	0.01	NW	0.037	03-24-95	11000	560	660	150	1700	--	--	--	--	--	--	--
RW-1	05-24-95	40.33	9.75	30.60**	0.03	WNW	0.013	05-24-95	Not sampled: well contained floating product											
RW-1	08-22-95	40.33	10.86	29.48**	0.02	SW	0.012	08-22-95	Not sampled: well contained floating product											
RW-1	11-09-95	40.33	20.61	19.72	ND	WSW	0.01	11-09-95	1600	79	46	13	240	--	--	--	--	--	--	--
RW-1	02-27-96	40.33	16.56	23.77	ND	SW	0.009	02-27-96	210	44	7.5	2.5	24	29	--	--	--	--	--	--
RW-1	04-22-96	40.33	9.65	30.68	ND	WSW	0.014	04-22-96	36000	7400	3700	580	3400	<300	--	--	--	--	--	--
RW-1	08-15-96	40.33	10.60	29.73	ND	SW	0.011	08-15-96	1800	31	38	15	150	<30^	--	--	--	--	--	--
RW-1	12-10-96	40.33	8.72	31.61	ND	WSW	0.023	12-10-96	25000	1900	1000	330	3200	<100^	--	--	--	--	--	--
RW-1	03-27-97	40.33	10.33	30.00	ND	WSW	0.026	03-27-97	7200	1900	59	95	240	480	--	--	--	--	--	--
RW-1	05-22-97	40.33	10.10	30.23	ND	WSW	0.024	05-22-97	3000	630	84	45	340	<60^	--	--	--	--	--	--

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

ARCO Service Station 2035
 1001 San Pablo Avenue, Albany, California

Date: 08-27-97

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	Oil and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	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	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

SM: standard method

TRPH: total recoverable petroleum hydrocarbons

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

ND: none detected

NW: northwest

WNW: west-northwest

SW: southwest

WSW: west-southwest

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

- -: not analyzed or not applicable

*: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report*, ARCO Service Station 2035, Albany, California, (EMCON, March 25, 1996).

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

Table 3
Historical Groundwater Elevation Data

Shell Station, 999 San Pablo Avenue

Date: 08-07-97

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product feet
Shell Station					
S-1	12-10-96	42.73	7.56	35.17	ND
S-1	02-20-97	42.73	7.95	34.78	ND
S-1	05-22-97	42.73	8.11	34.62	ND
S-2	12-10-96	40.73	8.57	32.16	ND
S-2	02-20-97	40.73	8.15	32.58	ND
S-2	05-22-97	40.73	8.79	31.94	ND
S-3	12-10-96	41.46	7.96	33.50	ND
S-3	02-20-97	41.46	7.44	34.02	ND
S-3	05-22-97	41.46	7.13	34.33	ND
S-4	12-10-96	41.10	7.04	34.06	ND
S-4	02-20-97	41.10	7.07	34.03	ND
S-4	05-22-97	41.10	6.63	34.47	ND
S-5	12-10-96	39.99	9.10	30.89	ND
S-5	02-20-97	39.99	8.93	31.06	ND
S-5	05-22-97	39.99	10.07	29.93**	0.02
S-6	12-10-96	40.12	6.68	33.44	ND
S-6	02-20-97	40.12	5.70	34.42	ND
S-6	05-22-97	40.12	5.49	34.63	ND
S-7	12-10-96	40.10	9.04	31.06	ND
S-7	02-20-97	40.10	9.60	30.50	ND
S-7	05-22-97	40.10	10.63	29.47	ND

TOC: top of casing

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

ND: none detected

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

Table 4
Approximate Cumulative Floating Product Recovered

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 08-22-97

Well Designations	Date	Floating Product Recovered gallons
RW-1	1992	22.3
RW-1	1993	1.0
RW-1	1994	0.0
AS-1, AS-2, RW-1, VW-1, VW-2, and VW-7	1995	4.6
VW-7	1996	0.003
VW-7	1997	0.0
1992 to 1997 Total:		27.9

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035		Vapor Treatment Unit: Therm Tech Model			
Location: 1001 San Pablo Avenue Albany, California		VAC-10 thermal/catalytic oxidizer			
Consultant: EMCON		Start-Up Date: 12-07-93			
1921 Ringwood Avenue		Operation and Performance Data From: 12-07-93			
San Jose, California		To: 07-01-97			
System shut down on 8-12-96.					
Date Begin:	12-07-93	12-08-93	12-09-93	12-10-93	12-15-93
Date End:	12-08-93	12-09-93	12-10-93	12-15-93	12-16-93
Mode of Oxidation:	Therm-Ox (17)	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:	1	0	1	5	1
Days of Downtime:	0	1	0	0	0
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	2800	NA (18)	NA	NA	NA
mg/m3 (4) as gasoline	10000	NA	NA	NA	NA
ppmv as benzene (5)	170	NA	NA	NA	NA
mg/m3 as benzene	540	NA	NA	NA	NA
System Influent: ppmv as gasoline	390	NA	390	410	500
mg/m3 as gasoline	1400	NA	1400	1500	1800
ppmv as benzene	12	NA	19	31	24
mg/m3 as benzene	38	NA	60	100	79
System Effluent: ppmv as gasoline	21	NA	36	6	NA
mg/m3 as gasoline	76	NA	130	21	NA
ppmv as benzene	0.7	NA	1	<0.01	NA
mg/m3 as benzene	2.3	NA	3.1	<0.05	NA
Average Well Field Flow Rate (6), scfm (7):	10.0	0.0	10.0	5.0	45.0
Average System Influent Flow Rate (6), scfm:	100.0	0.0	100.0	87.0	100.0
Average Destruction Efficiency (8), percent (9):	94.6	NA	90.7	98.6	NA
Average Emission Rates (10), pounds per day (11)					
Gasoline:	0.68	0.00	1.17	0.16	NA
Benzene:	0.02	0.00	0.03	<0.00	NA
Operating Hours This Period:	<u>21.00</u>	<u>0.00</u>	<u>23.00</u>	<u>121.00</u>	<u>18.00</u>
Operating Hours To Date:	21.0	21.0	44.0	165.0	183.0
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.52	0.00	0.52	0.49	0.67
SVE Pounds Removed This Period, as gasoline (13):	11.00	0.00	12.05	59.10	12.13
GWE Pounds Removed This Period, as gasoline (14):	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	11.00	0.00	12.05	59.10	12.13
Total Pounds Removed To Date, as gasoline:	11.0	11.0	23.1	82.2	94.3
Total Gallons Removed This Period, as gasoline (16):	<u>1.77</u>	<u>0.00</u>	<u>1.94</u>	<u>9.53</u>	<u>1.96</u>
Total Gallons Removed To Date, as gasoline:	1.8	1.8	3.7	13.3	15.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035	Vapor Treatment Unit: Therm Tech Model				
Location: 1001 San Pablo Avenue Albany, California	VAC-10 thermal/catalytic oxidizer				
Consultant: EMCON	Start-Up Date: 12-07-93				
1921 Ringwood Avenue	Operation and Performance Data From: 12-07-93				
San Jose, California	To: 07-01-97				
	System shut down on 8-12-96.				
Date Begin:	12-16-93	12-21-93	12-25-93	12-29-93	12-31-93
Date End:	12-21-93	12-25-93	12-29-93	12-31-93	01-07-94
Mode of Oxidation:	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:	0	4	0	2	0
Days of Downtime:	5	0	4	0	7
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	NA	NA	NA	NA	NA
mg/m3 (4) as gasoline	NA	NA	NA	NA	NA
ppmv as benzene (5)	NA	NA	NA	NA	NA
mg/m3 as benzene	NA	NA	NA	NA	NA
System Influent: ppmv as gasoline	NA	NA	NA	NA	NA
mg/m3 as gasoline	NA	NA	NA	NA	NA
ppmv as benzene	NA	NA	NA	NA	NA
mg/m3 as benzene	NA	NA	NA	NA	NA
System Effluent: ppmv as gasoline	NA	NA	NA	NA	NA
mg/m3 as gasoline	NA	NA	NA	NA	NA
ppmv as benzene	NA	NA	NA	NA	NA
mg/m3 as benzene	NA	NA	NA	NA	NA
Average Well Field Flow Rate (6), scfm (7):	0.0	20.0	0.0	54.0	0.0
Average System Influent Flow Rate (6), scfm:	0.0	100.0	0.0	78.0	0.0
Average Destruction Efficiency (8), percent (9):	NA	NA	NA	NA	NA
Average Emission Rates (10), pounds per day (11)					
Gasoline:	0.00	0.00	0.00	0.00	0.00
Benzene:	0.00	0.00	0.00	0.00	0.00
Operating Hours This Period:	<u>0.00</u>	<u>104.00</u>	<u>0.00</u>	<u>43.00</u>	<u>0.00</u>
Operating Hours To Date:	183.0	287.0	287.0	330.0	330.0
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.00	0.00	0.00	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):	0.00	0.00	0.00	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	0.00	0.00	0.00	0.00	0.00
Total Pounds Removed To Date, as gasoline:	94.3	94.3	94.3	94.3	94.3
Total Gallons Removed This Period, as gasoline (16):	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Gallons Removed To Date, as gasoline:	15.2	15.2	15.2	15.2	15.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035		Vapor Treatment Unit: Therm Tech Model			
Location: 1001 San Pablo Avenue Albany, California		VAC-10 thermal/catalytic oxidizer			
Consultant: EMCON		Start-Up Date: 12-07-93			
1921 Ringwood Avenue		Operation and Performance Data From: 12-07-93			
San Jose, California		To: 07-01-97			
System shut down on 8-12-96.					
Date Begin:	01-07-94	01-12-94	01-24-94	03-31-94	12-31-94
Date End:	01-12-94	01-24-94	03-31-94	12-31-94	02-06-95
Mode of Oxidation:	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:	5	12	0	0	0
Days of Downtime:	0	0	66	275	37
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	NA	NA	NA	NA	NA
mg/m3 (4) as gasoline	NA	NA	NA	NA	NA
ppmv as benzene (5)	NA	NA	NA	NA	NA
mg/m3 as benzene	NA	NA	NA	NA	NA
System Influent: ppmv as gasoline	NA	690	NA	NA	NA
mg/m3 as gasoline	NA	2500	NA	NA	NA
ppmv as benzene	NA	11	NA	NA	NA
mg/m3 as benzene	NA	37	NA	NA	NA
System Effluent: ppmv as gasoline	NA	14	NA	NA	NA
mg/m3 as gasoline	NA	52	NA	NA	NA
ppmv as benzene	NA	0.29	NA	NA	NA
mg/m3 as benzene	NA	0.93	NA	NA	NA
Average Well Field Flow Rate (6), scfm (7):	37.0	41.0	0.0	0.0	0.0
Average System Influent Flow Rate (6), scfm:	60.0	64.0	0.0	0.0	0.0
Average Destruction Efficiency (8), percent (9):	97.9	97.9	NA	NA	NA
Average Emission Rates (10), pounds per day (11)					
Gasoline:	0.30	0.30	0.00	0.00	0.00
Benzene:	0.01	0.01	0.00	0.00	0.00
Operating Hours This Period:	<u>123.00</u>	<u>285.00</u>	<u>0.00</u>	<u>0.00</u>	<u>8.90</u>
Operating Hours To Date:	453.0	738.0	738.0	738.0	746.9
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.48	0.60	0.00	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):	59.40	170.67	0.00	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	59.40	170.67	0.00	0.00	0.00
Total Pounds Removed To Date, as gasoline:	153.7	324.3	324.3	324.3	324.3
Total Gallons Removed This Period, as gasoline (16):	<u>9.58</u>	<u>27.53</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Gallons Removed To Date, as gasoline:	24.8	52.3	52.3	52.3	52.3

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035		Vapor Treatment Unit: Therm Tech Model			
Location: 1001 San Pablo Avenue Albany, California		VAC-10 thermal/catalytic oxidizer			
Consultant: EMCON 1921 Ringwood Avenue San Jose, California		Start-Up Date: 12-07-93			
		Operation and Performance Data From: 12-07-93			
		To: 07-01-97			
		System shut down on 8-12-96.			
Date Begin:	02-06-95	03-01-95	04-01-95	06-01-95	07-01-95
Date End:	03-01-95	04-01-95	06-01-95	07-01-95	08-01-95
Mode of Oxidation:	Therm-Ox	Therm-Ox	Therm-Ox	Cat-Ox (19)	Cat-Ox
Days of Operation:	21	7	0	5	26
Days of Downtime:	2	24	61	25	5
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	1800	2500	NA	3300	130
mg/m3 (4) as gasoline	6650	8900	NA	12000	480
ppmv as benzene (5)	17	31	NA	50	4
mg/m3 as benzene	62	99	NA	170	14
System Influent: ppmv as gasoline	240	<15	NA	600	130
mg/m3 as gasoline	880	<60	NA	2200	480
ppmv as benzene	6	<0.1	NA	10	4
mg/m3 as benzene	21	<0.5	NA	34	14
System Effluent: ppmv as gasoline	<15	<15	NA	<15	<15
mg/m3 as gasoline	<60	<60	NA	<60	<60
ppmv as benzene	<0.1	<0.1	NA	0.5	<0.1
mg/m3 as benzene	<0.5	<0.5	NA	1.5	<0.5
Average Well Field Flow Rate (6), scfm (7):	4.7	4.1	1.2	20.9	25.2
Average System Influent Flow Rate (6), scfm:	35.6	32.7	25.3	33.8	33.6
Average Destruction Efficiency (8), percent (9):	93.2	NA	NA	97.3	87.5
Average Emission Rates (10), pounds per day (11)					
Gasoline:	0.19	0.18	NA	0.18	0.18
Benzene:	0.00	0.00	NA	0.00	0.00
Operating Hours This Period:	<u>501.95</u>	<u>162.83</u>	<u>3.02</u>	<u>112.33</u>	<u>614.38</u>
Operating Hours To Date:	1248.9	1411.7	1414.7	1527.0	2141.4
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.12	0.14	0.00	0.94	0.05
SVE Pounds Removed This Period, as gasoline (13):	58.72	22.24	0.00	105.44	27.81
GWE Pounds Removed This Period, as gasoline (14):	<u>4.28</u>	<u>0.31</u>	<u>0.00</u>	<u>1.42</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	63.00	22.55	0.00	106.86	27.81
Total Pounds Removed To Date, as gasoline:	387.3	409.9	409.9	516.8	544.6
Total Gallons Removed This Period, as gasoline (16):	<u>10.16</u>	<u>3.64</u>	<u>0.00</u>	<u>17.24</u>	<u>4.49</u>
Total Gallons Removed To Date, as gasoline:	62.5	66.1	66.1	83.4	87.8

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035 Location: 1001 San Pablo Avenue Albany, California		Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer			
Consultant: EMCON 1921 Ringwood Avenue San Jose, California		Start-Up Date: 12-07-93 Operation and Performance Data From: 12-07-93 To: 07-01-97 System shut down on 8-12-96.			
Date Begin:	08-01-95	09-01-95	10-01-95	11-01-95	12-01-95
Date End:	09-01-95	10-01-95	11-01-95	12-01-95	01-01-96
Mode of Oxidation:	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox
Days of Operation:	23	30	26	30	21
Days of Downtime:	8	0	5	1	10
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	1850	617	425	850	940
mg/m3 (4) as gasoline	7800	2233	1535	3100	3385
ppmv as benzene (5)	17.5	5.9	4.7	11	7.4
mg/m3 as benzene	56	19	15	36	23
System Influent: ppmv as gasoline	1950	457	320	570	310
mg/m3 as gasoline	8300	1667	1165	2100	1300
ppmv as benzene	20	4.6	3.9	7	4.1
mg/m3 as benzene	63	15	12	23	13
System Effluent: ppmv as gasoline	54	<15	<15	<15	17
mg/m3 as gasoline	155	<60	<60	<60	63
ppmv as benzene	1	0.2	0.2	0.4	0.3
mg/m3 as benzene	3.2	0.6	0.5	1.2	0.9
Average Well Field Flow Rate (6), scfm (7):	27.7	139.7	91.2	68.0	39.5
Average System Influent Flow Rate (6), scfm:	76.5	114.7	88.4	73.4	57.8
Average Destruction Efficiency (8), percent (9):	98.1	96.4	94.8	97.1	95.2
Average Emission Rates (10), pounds per day (11)					
Gasoline:	1.07	0.62	0.48	0.40	0.33
Benzene:	0.02	0.01	0.00	0.01	0.00
Operating Hours This Period:	<u>562.61</u>	<u>717.42</u>	<u>624.47</u>	<u>708.09</u>	<u>493.54</u>
Operating Hours To Date:	2704.0	3421.4	4045.9	4754.0	5247.5
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.81	1.17	0.52	0.79	0.50
SVE Pounds Removed This Period, as gasoline (13):	454.96	837.62	327.19	558.66	246.98
GWE Pounds Removed This Period, as gasoline (14):	<u>0.49</u>	<u>0.24</u>	<u>0.07</u>	<u>11.02</u>	<u>5.51</u>
Total Pounds Removed This Period, as gasoline (15):	455.45	837.86	327.26	569.68	252.49
Total Pounds Removed To Date, as gasoline:	1000.0	1837.9	2165.1	2734.8	2987.3
Total Gallons Removed This Period, as gasoline (16):	<u>73.46</u>	<u>135.15</u>	<u>52.79</u>	<u>91.89</u>	<u>40.73</u>
Total Gallons Removed To Date, as gasoline:	161.3	296.5	349.2	441.1	481.9

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility	Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer				
Number: 2035					
Location: 1001 San Pablo Avenue Albany, California					
Consultant: EMCON	Start-Up Date: 12-07-93				
1921 Ringwood Avenue	Operation and Performance Data From: 12-07-93				
San Jose, California	To: 07-01-97				
	System shut down on 8-12-96.				
Date Begin:	01-01-96	02-01-96 (20)	03-01-96	04-01-96	05-01-96
Date End:	02-01-96	03-01-96	04-01-96	05-01-96	06-01-96
Mode of Oxidation:	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox
Days of Operation:	31	29	24	0	5
Days of Downtime:	0	0	7	30	26
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	<15	<15	NA	NA	NA
mg/m3 (4) as gasoline	<60	<60	NA	NA	NA
ppmv as benzene (5)	<0.1	<0.1	NA	NA	NA
mg/m3 as benzene	<0.5	<0.5	NA	NA	NA
System Influent: ppmv as gasoline	<15	<15	NA	NA	NA
mg/m3 as gasoline	<60	<60	NA	NA	NA
ppmv as benzene	0.3	0.3	NA	NA	NA
mg/m3 as benzene	0.9	0.9	NA	NA	NA
System Effluent: ppmv as gasoline	<15	<15	NA	NA	NA
mg/m3 as gasoline	<60	<60	NA	NA	NA
ppmv as benzene	<0.1	<0.1	NA	NA	NA
mg/m3 as benzene	<0.5	<0.5	NA	NA	NA
Average Well Field Flow Rate (6), scfm (7):	24.8	28.6	0.0	0.0	32.5
Average System Influent Flow Rate (6), scfm:	51.2	53.1	0.0	0.0	41.3
Average Destruction Efficiency (8), percent (9):	NA	NA	NA	NA	NA
Average Emission Rates (10), pounds per day (11)					
Gasoline:	0.28	0.29	NA	NA	NA
Benzene:	0.00	0.00	NA	NA	NA
Operating Hours This Period:	<u>744.00</u>	<u>158.00</u>	<u>0.00</u>	<u>2.38</u>	<u>120.25</u>
Operating Hours To Date:	5991.5	6149.5	6149.5	6151.9	6272.2
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.01	0.01	0.00	0.00	0.01
SVE Pounds Removed This Period, as gasoline (13):	4.14	1.01	0.00	0.00	0.88
GWE Pounds Removed This Period, as gasoline (14):	<u>3.99</u>	<u>0.00</u>	<u>0.01</u>	<u>0.00</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	8.13	1.01	0.01	0.00	0.88
Total Pounds Removed To Date, as gasoline:	2995.5	2996.5	2996.5	2996.5	2997.4
Total Gallons Removed This Period, as gasoline (16):	<u>1.31</u>	<u>0.16</u>	<u>0.00</u>	<u>0.00</u>	<u>0.14</u>
Total Gallons Removed To Date, as gasoline:	483.2	483.3	483.3	483.3	483.5

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035		Vapor Treatment Unit: Therm Tech Model			
Location: 1001 San Pablo Avenue Albany, California		VAC-10 thermal/catalytic oxidizer			
Consultant: EMCON		Start-Up Date: 12-07-93			
1921 Ringwood Avenue		Operation and Performance Data From: 12-07-93			
San Jose, California		To: 07-01-97			
System shut down on 8-12-96.					
Date Begin:	06-01-96	07-01-96	08-01-96	09-01-96	10-01-96
Date End:	07-01-96	08-01-96	09-01-96	10-01-96	01-01-97
Mode of Oxidation:	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox
Days of Operation:	0	16	10	0	0
Days of Downtime:	30	15	21	30	92
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline (3)	NA	160	16	NA	NA
mg/m3 (4) as gasoline	NA	660	67	NA	NA
ppmv as benzene (5)	NA	0.8	<0.2	NA	NA
mg/m3 as benzene	NA	2.5	<0.5	NA	NA
System Influent: ppmv as gasoline	NA	160	16	NA	NA
mg/m3 as gasoline	NA	660	67	NA	NA
ppmv as benzene	NA	0.8	<0.2	NA	NA
mg/m3 as benzene	NA	2.5	<0.5	NA	NA
System Effluent: ppmv as gasoline	NA	<5	<5	NA	NA
mg/m3 as gasoline	NA	<20	<20	NA	NA
ppmv as benzene	NA	<0.2	<0.2	NA	NA
mg/m3 as benzene	NA	<0.5	<0.5	NA	NA
Average Well Field Flow Rate (6), scfm (7):	0.0	52.4	52.6	0.0	0.0
Average System Influent Flow Rate (6), scfm:	0.0	95.1	95.4	0.0	0.0
Average Destruction Efficiency (8), percent (9):	NA	97.0	70.1 (22)	NA	NA
Average Emission Rates (10), pounds per day (11)					
Gasoline:	NA	0.17	0.17	NA	NA
Benzene:	NA	0.00	0.00	NA	NA
Operating Hours This Period:	<u>0.00</u>	<u>372.17</u>	<u>228.86</u>	<u>0.00</u>	<u>0.00</u>
Operating Hours To Date:	6272.2	6644.3	6873.2	6873.2	6873.2
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.00	0.01	0.01	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):	0.00	4.38	2.70	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):	<u>0.00</u>	<u>3.07</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Pounds Removed This Period, as gasoline (15):	0.00	7.45	2.70	0.00	0.00
Total Pounds Removed To Date, as gasoline:	2997.4	3004.8	3007.5	3007.5	3007.5
Total Gallons Removed This Period, as gasoline (16):	<u>0.00</u>	<u>1.20</u>	<u>0.44</u>	<u>0.00</u>	<u>0.00</u>
Total Gallons Removed To Date, as gasoline:	483.5	484.7	485.1	485.1	485.1

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035	Vapor Treatment Unit: Therm Tech Model	
Location: 1001 San Pablo Avenue Albany, California	VAC-10 thermal/catalytic oxidizer	
Consultant: EMCON	Start-Up Date: 12-07-93	
1921 Ringwood Avenue	Operation and Performance Data From: 12-07-93	
San Jose, California	To: 07-01-97	
	System shut down on 8-12-96.	
Date Begin:	01-01-97	04-01-97
Date End:	04-01-97	07-01-97
Mode of Oxidation:	Cat-Ox	Cat-Ox
Days of Operation:	0	0
Days of Downtime:	90	91
Average Vapor Concentrations (1)		
Well Field Influent: ppmv (2) as gasoline (3)	NA	NA
mg/m3 (4) as gasoline	NA	NA
ppmv as benzene (5)	NA	NA
mg/m3 as benzene	NA	NA
System Influent: ppmv as gasoline	NA	NA
mg/m3 as gasoline	NA	NA
ppmv as benzene	NA	NA
mg/m3 as benzene	NA	NA
System Effluent: ppmv as gasoline	NA	NA
mg/m3 as gasoline	NA	NA
ppmv as benzene	NA	NA
mg/m3 as benzene	NA	NA
Average Well Field Flow Rate (6), scfm (7):	0.0	0.0
Average System Influent Flow Rate (6), scfm:	0.0	0.0
Average Destruction Efficiency (8), percent (9):	NA	NA
Average Emission Rates (10), pounds per day (11)		
Gasoline:	NA	NA
Benzene:	NA	NA
Operating Hours This Period:	0.00	0.00
Operating Hours To Date:	6873.2	6873.2
SVE Pounds/ Hour Removal Rate, as gasoline (12):	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):	0.00	0.00
Total Pounds Removed This Period, as gasoline (15):	0.00	0.00
Total Pounds Removed To Date, as gasoline:	3007.5	3007.5
Total Gallons Removed This Period, as gasoline (16):	0.00	0.00
Total Gallons Removed To Date, as gasoline:	485.1	485.1

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035 Location: 1001 San Pablo Avenue Albany, California Consultant: EMCON 1921 Ringwood Avenue San Jose, California	Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer Start-Up Date: 12-07-93 Operation and Performance Data From: 12-07-93 To: 07-01-97 System shut down on 8-12-96.
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CURRENT REPORTING PERIOD:	04-01-97	to	07-01-97
DAYS / HOURS IN PERIOD:	91		2184.0
DAYS / HOURS OF OPERATION:	0		0.0
DAYS / HOURS OF DOWN TIME:	91		2184.0
PERCENT OPERATIONAL:			0.0 %
PERIOD POUNDS REMOVED:	0.0		
PERIOD GALLONS REMOVED:	0.0		
AVERAGE WELL FIELD FLOW RATE (scfm):			0.0
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):			0.0

1. Average vapor monitoring concentrations were calculated for all periods after February 6, 1995. Average concentrations are based on discrete sample results reported during the month; refer to Appendix B for discrete sample results.
2. ppmv: parts per million by volume
3. Between December 7, 1993, and February 6, 1995:
 Concentration (as gasoline in ppmv) = [concentration (as gasoline in mg/m³) x 24.05 (lb/m³/lb-mole of air)/mg] / 87 lb/lb-mole
4. mg/m³: milligrams per cubic meter
5. Between December 7, 1993, and February 6, 1995:
 Concentration (as benzene in ppmv) = [concentration (as benzene in mg/m³) x 24.05 (lb/m³/lb-mole of air)/mg] / 78 lb/lb-mole
6. Average flow rates (time weighted average) are based on instantaneous flow rates recorded during the month; refer to Appendix B for instantaneous flow data.
7. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Fahrenheit
8. Average destruction efficiencies are calculated using monthly average concentrations; refer to Appendix B for instantaneous destruction efficiency data.
9. destruction efficiency, percent = [(system influent concentration (as gasoline in mg/m³) - system effluent concentration (as gasoline in mg/m³)] / system influent concentration (as gasoline in mg/m³) x 100 percent
10. Average emission rates are calculated using monthly average concentrations and flow rates; refer to Appendix B for instantaneous emission rate data.
11. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m³) x system influent flow rate (scfm) x 0.02832 m³/ft³ x 1440 minutes/day x 1 pound/454,000 mg
12. pounds/ hour removal rate (as gasoline) = well field influent concentration (as gasoline in mg/m³) x well field influent flow rate (scfm) x 0.02832 m³/ft³ x 60 minutes/hour x 1 pound/454,000 mg
13. Soil-vapor extraction (SVE) pounds removed this period (as gasoline) = pounds/ hour removal rate (SVE) x hours of operation (SVE)
14. Groundwater extraction (GWE); refer to Table 8 for GWE system performance data
15. Represents the total mass recovered by the SVE and GWE systems, and the total mass abated by the thermal/catalytic oxidizer
16. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
17. Therm-Ox: thermal oxidation
18. NA: not analyzed, not applicable, or not available
19. Cat-Ox: catalytic oxidation; the SVE system's abatement unit was converted to the Cat-Ox mode of operation on June 20, 1995
20. On February 7, 1996 the SVE wells were taken off-line; however, the therm tech unit remained on for the groundwater extraction system.
21. The utility costs for February and March were \$694.00 and \$649.00, respectively. The SVE system was shut down on February 7, 1996, therefore cost per pound was not calculated for these periods. The utility costs incurred during February and March are associated with the off gas abatement for the aeration tank.
22. Although the destruction efficiency appeared to be less than 90 percent, laboratory analytical results collected during this period indicate the effluent TVHG and benzene concentrations in off-gas discharged to the atmosphere were below laboratory detection limits, indicating compliance with BAAQMD discharge requirements.

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 08-07-97

Date	Well Identification											
	VW-1			VW-2			VW-3			VW-4		
	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response
	ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O	
For SVE well monitoring data prior to July 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
07-10-95	open	NA	NA	open	NA	NA	closed	NA	NA	closed	NA	NA
08-08-95	open	NA	47.0	open	NA	46.0	open	NA	47.0	open	NA	47.0
09-12-95	open	3390 PID	26.7	open	2332 PID	26.5	open	263 PID	25.0	open	1736 PID	26.3
09-28-95	open	1498 PID	30.0	open	1075 PID	29.0	open	235 PID	26.0	open	911 PID	30.0
09-28-95	open	1800 LAB	NA	open	1500 LAB	NA	open	180 LAB	NA	open	990 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	closed	NA	NA	open	NA	NA
09-29-95	open	NA	NA	open	NA	NA	closed	NA	NA	open	NA	NA
10-26-95	open	NA	25.5	open	NA	25.5	closed	NA	0.0	open	NA	25.3
12-05-95	open	NA	54.0	open	NA	54.0	closed	NA	NA	closed	NA	NA
02-07-96	open	698 PID	NA	open	390 PID	NA	open	501 PID	NA	open	610 PID	NA
03-25-96	System was manually shut down.											
05-17-96	open	1945 PID	30.0	closed	101 PID	18.0	closed	50.1 PID	18.0	open	197 PID	25.0
05-22-96	System was manually shut down.											
07-16-96	open	7600 PID	NA	open	3100 PID	NA	open	1450 PID	NA	open	3310 PID	NA
08-08-96	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
02-04-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
02-18-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
03-07-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
05-23-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
<p>TVHG: concentration of total volatile hydrocarbons as gasoline ppmv: parts per million by volume in-H2O: inches of water open: open to the system open(b): open to the system and bubbling air passive: open to the atmosphere closed: closed to the system and atmosphere closed (b): closed to the system and atmosphere, but bubbling air NA: not analyzed or not measured PID: TVHG concentration was measured with a portable photo-ionization detector LAB: TVHG concentration was analyzed in the laboratory</p>												

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 08-07-97

Date	Well Identification											
	VW-5			VW-6			VW-7			VW-8		
	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response
	ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O	
For SVE well monitoring data prior to July 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
07-10-95	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
08-08-95	open	NA	46.0	open	NA	36.0	open	NA	47.0	open	NA	43.0
09-12-95	open	243 PID	26.2	open	587 PID	27.7	open	1297 PID	25.5	open	830 PID	26.2
09-28-95	open	301 PID	30.0	open	230 PID	32.0	open	941 PID	30.0	open	956 PID	29.0
09-28-95	open	280 LAB	NA	open	250 LAB	NA	open	1400 LAB	NA	open	2000 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-29-95	open	NA	NA	closed	NA	NA	open	NA	NA	open	NA	NA
10-26-95	open	NA	25.3	closed	NA	0.0	open	NA	19.0	open	NA	21.9
12-05-95	closed	NA	NA	closed	NA	NA	open	NA	54.0	closed	NA	NA
02-07-96	open	47.2 PID	NA	open	840 PID	NA	open	102 PID	NA	open	780 PID	NA
03-25-96	System was manually shut down.											
05-17-96	closed	80.6 PID	20.0	open	195 PID	22.0	open	419 PID	28.0	closed	116 PID	18.0
05-22-96	System was manually shut down.											
07-16-96	open	300 PID	NA	open	NA	NA	open	590 PID	NA	open	1400 PID	NA
08-08-96	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
02-04-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
02-18-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
03-07-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
05-23-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
TVHG: concentration of total volatile hydrocarbons as gasoline ppmv: parts per million by volume in-H2O: inches of water open: open to the system open(b): open to the system and bubbling air passive: open to the atmosphere closed: closed to the system and atmosphere closed (b): closed to the system and atmosphere, but bubbling air NA: not analyzed or not measured PID: TVHG concentration was measured with a portable photo-ionization detector LAB: TVHG concentration was analyzed in the laboratory												

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 08-07-97

Date	Well Identification											
	VW-9			RW-1			AS-1V			AS-2V		
	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response	Valve Position	TVHG	Vacuum Response
	ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O		ppmv	in-H2O	
For SVE well monitoring data prior to July 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
07-10-95	closed	NA	NA	open(b)	NA	NA	open	NA	NA	open	NA	NA
08-08-95	open	NA	44.5	open	NA	49.0	open	NA	44.5	open	NA	44.5
09-12-95	open	566 PID	25.3	open	1072 PID	26.3	open	2522 PID	26.6	open	2522 PID	26.6
09-28-95	open	393 PID	25.0	open	921 PID	31.0	open	1213 PID	26.5	open	1183 PID	26.0
09-28-95	open	500 LAB	NA	open	1100 LAB	NA	open	1400 LAB	NA	open	1500 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	closed	NA	NA
09-29-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
10-26-95	open	NA	22.4	open	NA	23.9	open	NA	25.7	open	NA	25.7
12-05-95	closed	NA	NA	closed	NA	NA	open	NA	54.0	closed	NA	NA
02-07-96	open	1110 PID	NA	open	57 PID	NA	open	465 PID	NA	open	465 PID	NA
03-25-96	System was manually shut down.											
05-17-96	open	384 PID	28.0	closed	118 PID	25.0	open	146 PID	30.0	open	208 PID	30.0
05-22-96	System was manually shut down.											
07-16-96	open	425 PID	NA	open	1140 PID	NA	open	4600 PID	NA	open	4600 PID	NA
08-08-96	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
02-04-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
02-18-97	closed	NA	NA	closed (b)	NA	NA	closed	NA	NA	closed	NA	NA
03-07-97	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
05-23-97	closed	NA	NA	closed (b)	NA	NA	closed	NA	NA	closed	NA	NA
TVHG: concentration of total volatile hydrocarbons as gasoline ppmv: parts per million by volume in-H2O: inches of water open: open to the system open(b): open to the system and bubbling air passive: open to the atmosphere closed: closed to the system and atmosphere closed (b): closed to the system and atmosphere, but bubbling air NA: not analyzed or not measured PID: TVHG concentration was measured with a portable photo-ionization detector LAB: TVHG concentration was analyzed in the laboratory												

Table 7
Influent and Effluent Groundwater Analyses

Facility Number: 2035		Groundwater Treatment Unit: Aeration Tank with Two 200 Pound Liquid-Phase Carbon Polish Units				
Location: 1001 San Pablo Avenue Albany, California		Groundwater treatment system was shut down on 8-8-96.				
Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl- benzene µg/L	Total Xylenes µg/L
I-1	02-08-95	NA	NA	NA	NA	NA
I-1	02-08-95	49000	4300	4900	1000	5200
I-1	02-14-95	33000	4300	5800	970	5600
I-1	02-21-95	21000	940	1500	360	4000
I-1	02-28-95	15000	430	290	54	2000
I-1	06-20-95	20000	1500	1200	220	2300
I-1	08-08-95	11000	970	1100	210	1800
I-1	09-12-95	2700	200	150	29	290
I-1	10-11-95	1000	97	38	7	69
I-1	11-08-95	2500	38	27	8	240
I-1	11-30-95	29000	190	530	300	3100
I-1	01-30-96	70	4.5	1.8	<0.5	8.3
I-1	07-16-96	4300	530	210	110	550
I-2	02-08-95	NA	NA	NA	NA	NA
I-2	02-08-95	1500	59	70	14	86
I-2	02-14-95	1500	59	70	14	86
I-2	02-21-95	340	7.2	8.8	1.9	37
I-2	02-28-95	390	3.9	2.5	0.9	16
I-2	06-20-95	2200	30	27	11	77
I-2	08-08-95	330	17	18	3.5	36
I-2	09-12-95	78	4.1	3	<0.5	8.9
I-2	10-11-95	<50	0.9	<0.5	<0.5	1
I-2	11-08-95	1800	2.5	2.7	3.8	35
I-2	11-30-95	220	5	7.4	1.7	22
I-2	01-30-96	<50	<0.5	<0.5	<0.5	<0.5
I-2	07-16-96	230	23	7.6	4.5	21

Table 7
Influent and Effluent Groundwater Analyses

Facility Number: 2035		Groundwater Treatment Unit: Aeration Tank with Two 200 Pound Liquid-Phase Carbon Polish Units				
Location: 1001 San Pablo Avenue Albany, California		Groundwater treatment system was shut down on 8-8-96.				
Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl- benzene µg/L	Total Xylenes µg/L
I-3	02-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-14-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-21-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-28-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	06-20-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	08-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	09-12-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	10-11-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	11-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	11-30-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	01-30-96	<50	<0.5	<0.5	<0.5	<0.5
I-3	07-16-96	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-08-95	<50	0.7	<0.5	<0.5	<0.5
E-1	02-14-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-21-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-28-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	06-20-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	08-08-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	09-12-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	10-11-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	11-08-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	11-30-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	01-30-96	<50	<0.5	<0.5	<0.5	<0.5
E-1	07-16-96	<50	<0.5	<0.5	<0.5	<0.5

TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
NA: not analyzed

Table 8
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Groundwater Treatment Unit: Aeration Tank with Two 200 Pound
Liquid-Phase Carbon Polish Units

Sample Designation	Sample Date	Groundwater Extraction			TPHG Removal Data					Benzene Removal Data				
		Total Volume Extracted	Period Volume Extracted	Period Flow Rate	Period Influent Concentration	Period Removal Rate	Period Pounds Removed	Total Pounds Removed	Total Gallons Removed	Period Influent Concentration	Period Removal Rate	Period Pounds Removed	Total Pounds Removed	Total Gallons Removed
		gallons	gallons	gpd	µg/L	lbs/day	pounds	pounds	gallons	µg/L	lbs/day	pounds	pounds	gallons
I-1	02-08-95	628	0	0	NA	0.000	0.000	0.000	0.000	NA	0.0000	0.0000	0.0000	0.0000
I-1	02-08-95	880	252	2,520	49,000	1.031	0.103	0.103	0.017	4,300	0.0904	0.0090	0.0090	0.0012
I-1	02-14-95	1,329	449	76	33,000	0.021	0.124	0.227	0.037	4,300	0.0027	0.0161	0.0251	0.0035
I-1	02-21-95	15,499	14,170	2,051	21,000	0.360	2.484	2.710	0.437	940	0.0161	0.1112	0.1363	0.0188
I-1	02-28-95	28,788	13,289	1,894	15,000	0.237	1.664	4.374	0.706	430	0.0068	0.0477	0.1840	0.0254
I-1	03-08-95	31,358	2,570	316	15,000	0.040	0.322	4.696	0.757	430	0.0011	0.0092	0.1932	0.0266
I-1	06-20-95	31,695	337	3	20,000	0.001	0.056	4.752	0.767	1,500	0.0000	0.0042	0.1975	0.0272
I-1	06-30-95	40,933	9,238	924	20,000	0.154	1.542	6.294	1.015	1,500	0.0116	0.1157	0.3131	0.0432
I-1	08-08-95	46,416	5,483	141	11,000	0.013	0.503	6.798	1.097	970	0.0011	0.0444	0.3575	0.0493
I-1	09-12-95	57,434	11,018	315	2,700	0.007	0.248	7.046	1.137	200	0.0005	0.0184	0.3759	0.0518
I-1	10-11-95	66,534	9,100	314	1,000	0.003	0.076	7.122	1.149	97	0.0003	0.0074	0.3833	0.0529
I-1	11-08-95	106,654	40,120	1,433	2,500	0.030	0.837	7.959	1.284	38	0.0005	0.0127	0.3960	0.0546
I-1	11-30-95	151,566	44,912	2,041	29,000	0.494	10.871	18.831	3.037	190	0.0032	0.0712	0.4672	0.0644
I-1 (6)	12-22-95	174,511	22,945	1,043	29,000	0.252	5.554	24.385	3.933	190	0.0017	0.0364	0.5036	0.0695
I-1 (6)	01-01-96	191,063	16,552	1,655	29,000	0.401	4.007	28.391	4.580	190	0.0026	0.0262	0.5299	0.0731
I-1	01-30-96	251,187	60,124	2,073	70	0.001	0.035	28.426	4.585	4.5	0.0001	0.0023	0.5321	0.0734
I-1 (6)	04-01-96	296,826	45,639	736	70	0.000	0.027	28.453	4.589	4.5	0.0000	0.0017	0.5339	0.0736
I-1	07-16-96	331,575	34,749	328	4,300	0.012	1.247	29.700	4.791	530	0.0015	0.1537	0.6876	0.0948
I-1 (6)	08-08-96	382,464	50,889	2,213	4,300	0.079	1.826	31.527	5.085	530	0.0098	0.2251	0.9127	0.1259
Groundwater treatment system was shut down on 8-8-96.														

Table 8
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Groundwater Treatment Unit: Aeration Tank with Two 200 Pound
Liquid-Phase Carbon Polish Units

Sample Designation	Sample Date	Groundwater Extraction			TPHG Removal Data					Benzene Removal Data				
		Total Volume Extracted gallons	Period Volume Extracted gallons	Period Flow Rate gpd	Period Influent Concentration µg/L	Period Removal Rate lbs/day	Period Pounds Removed ¹ pounds	Total Pounds Removed pounds	Total Gallons Removed ² gallons	Period Influent Concentration µg/L	Period Removal Rate lbs/day	Period Pounds Removed ³ pounds	Total Pounds Removed pounds	Total Gallons Removed ⁴ gallons
I-2	02-08-95	628	0	0	NA	0.000	0.000	0.000	0.000	NA	0.0000	0.0000	0.0000	0.0000
I-2	02-08-95	880	252	2,520	1,500	0.032	0.003	0.003	0.001	59	0.0012	0.0001	0.0001	0.0000
I-2	02-14-95	1,329	449	85	1,500	0.001	0.006	0.009	0.001	59	0.0000	0.0002	0.0003	0.0000
I-2	02-21-95	15,499	14,170	2,024	340	0.006	0.040	0.049	0.008	7	0.0001	0.0009	0.0012	0.0002
I-2	02-28-95	28,788	13,289	1,898	390	0.006	0.043	0.092	0.015	4	0.0001	0.0004	0.0016	0.0002
I-2	03-08-95	31,358	2,570	321	390	0.001	0.008	0.101	0.016	4	0.0000	0.0001	0.0017	0.0002
I-2	06-20-95	31,695	337	3	2,200	0.000	0.006	0.107	0.017	30	0.0000	0.0001	0.0018	0.0002
I-2	06-30-95	40,933	9,238	924	2,200	0.017	0.170	0.276	0.045	30	0.0002	0.0023	0.0041	0.0006
I-2	08-08-95	46,416	5,483	141	330	0.000	0.015	0.292	0.047	17	0.0000	0.0008	0.0049	0.0007
I-2	09-12-95	57,434	11,018	315	78	0.000	0.007	0.299	0.048	4	0.0000	0.0004	0.0053	0.0007
I-2	10-11-95	66,534	9,100	314	<50	0.000	0.004	0.303	0.049	1	0.0000	0.0001	0.0053	0.0007
I-2	11-08-95	106,654	40,120	1,433	1,800	0.022	0.603	0.905	0.146	3	0.0000	0.0008	0.0062	0.0009
I-2	11-30-95	151,566	44,912	2,041	220	0.004	0.082	0.988	0.159	5	0.0001	0.0019	0.0080	0.0011
I-2 (6)	12-22-95	174,511	22,945	1,043	220	0.002	0.042	1.030	0.166	5	0.0000	0.0010	0.0090	0.0012
I-2 (6)	01-01-96	191,063	16,552	1,655	220	0.003	0.030	1.060	0.171	5	0.0001	0.0007	0.0097	0.0013
I-2	01-30-96	251,187	60,124	2,073	<50	0.001	0.025	1.085	0.175	<0.5	0.0000	0.0003	0.0099	0.0014
I-2 (6)	04-01-96	296,826	45,639	736	<50	0.000	0.019	1.104	0.178	<0.5	0.0000	0.0002	0.0101	0.0014
I-2	07-16-96	331,575	34,749	328	230	0.000	0.015	1.119	0.180	23	0.0000	0.0001	0.0103	0.0014
I-2 (6)	08-08-96	382,464	50,889	2,213	230	0.001	0.021	1.140	0.184	23	0.0000	0.0002	0.0105	0.0014

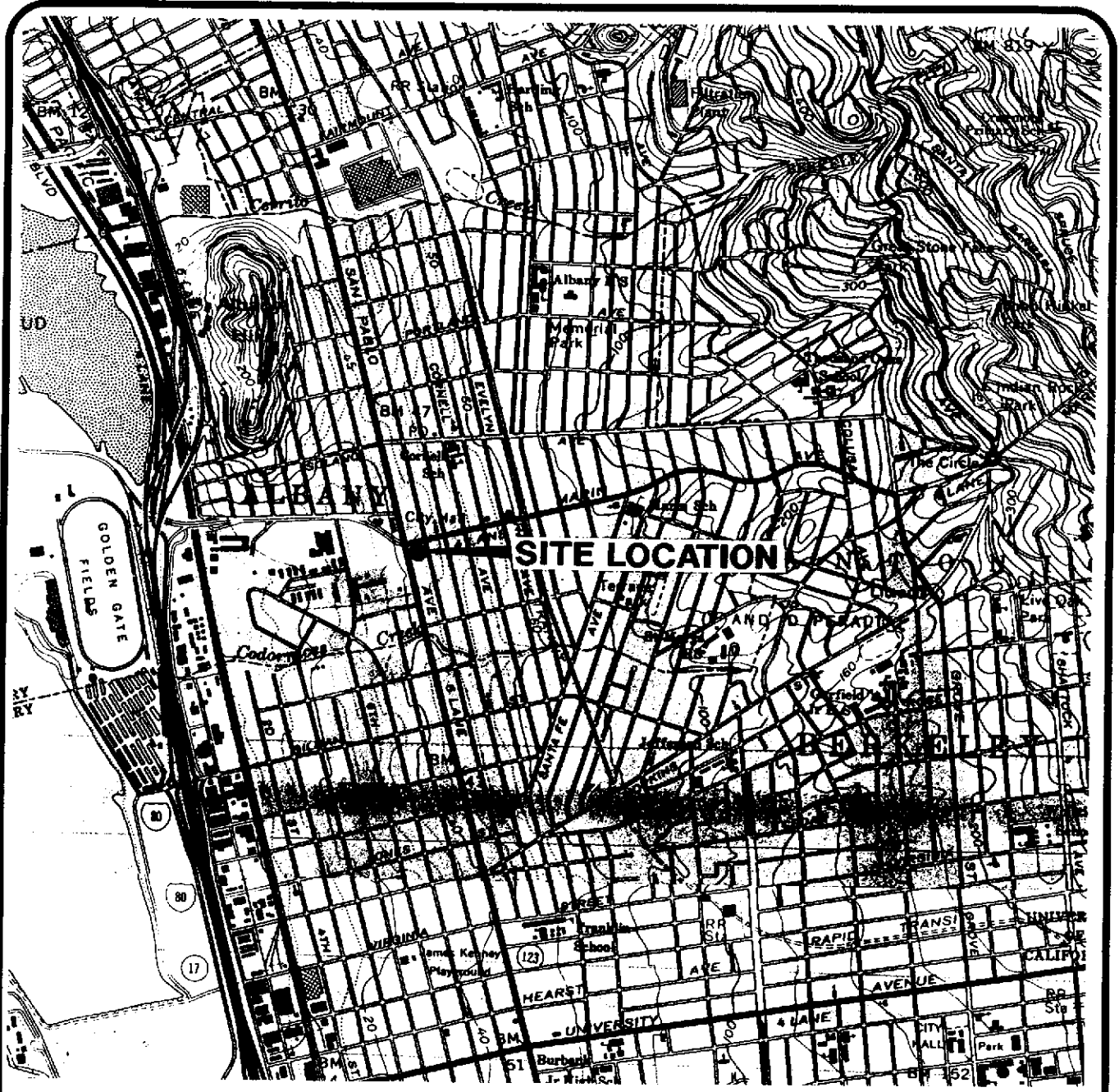
Groundwater treatment system was shut down on 8-8-96.

Table 8
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Groundwater Treatment Unit: Aeration Tank with Two 200 Pound
Liquid-Phase Carbon Polish Units

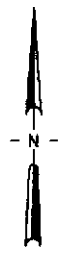
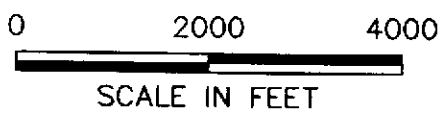
Sample Desig- nation	Sample Date	Groundwater Extraction			TPHG Removal Data					Benzene Removal Data				
		Total Volume Extracted gallons	Period Volume Extracted gallons	Period Flow Rate gpd	Period Influent Concentration µg/L	Period Removal Rate lbs/day	Period Pounds Removed ¹ pounds	Total Pounds Removed ² pounds	Total Gallons Removed ² gallons	Period Influent Concentration µg/L	Period Removal Rate lbs/day	Period Pounds Removed ³ pounds	Total Pounds Removed ⁴ pounds	Total Gallons Removed ⁴ gallons
CURRENT REPORTING PERIOD:		04-01-97			to	07-01-97								
DAYS / HOURS IN PERIOD:		91			2,184.0									
DAYS / HOURS OF OPERATION:		0			0.0									
DAYS / HOURS OF DOWN TIME:		91			2,184.0									
PERCENT OPERATIONAL:					0%									
PERIOD GROUNDWATER EXTRACTED (gallons):					0									
PERIOD HYDROCARBON REMOVAL (TOTAL):					0 pounds		0.000 gallons		0.0000 pounds		0.0000 gallons			
HYDROCARBONS REMOVED BY AERATION TANK:					0 pounds		0.000 gallons		0.0000 pounds		0.0000 gallons			
HYDROCARBONS REMOVED BY CARBON:					0 pounds		0.000 gallons		0.0000 pounds		0.0000 gallons			
PERCENT PRIMARY CARBON LOADING: ⁵					0%									
PERIOD AVERAGE FLOW RATE (gpd):					0.0 (includes down time)									
PERIOD AVERAGE FLOW RATE (gpd):					0.0 (excludes down time)									
PERIOD AVERAGE FLOW RATE (gpm):					0.0 (excludes down time)									
<p>TPHG: total petroleum hydrocarbons as gasoline gpd: gallons per day µg/L: micrograms per liter lbs/day: pounds per day NA: not analyzed gpm: gallons per minute</p> <p>*: The totalizer reading of the groundwater system was estimated from two consecutive monitoring events. **: The TPHG and benzene concentrations were assumed to be equal to the previous sampling event.</p> <ol style="list-style-type: none"> 1. Period TPHG removed (pounds) = period influent TPHG concentration (µg/L) x period volume of groundwater extracted (gallons) x 3.7854 (liters/gallon) x 0.00000002205 (pounds/µg) 2. Total TPHG removed (gallons) = total TPHG removed (pounds) x 0.1613 (gallons/pound) 3. Period benzene removed (pounds) = period influent benzene concentration (µg/L) x period volume of groundwater extracted (gallons) x 3.7854 (liters/gallon) x 0.00000002205 (pounds/µg) 4. Total benzene removed (gallons) = total benzene removed (pounds) x 0.1379 (gallons/pound) 5. Percent carbon loading = (total TPHG removed by carbon / 10 pounds of TPH-G) x 100 The percent carbon loading calculation assumes a 5% by weight carbon adsorption efficiency. The treatment system uses two 200 pound carbon canisters. Carbon Loading (10 lbs TPHG) = 1 canister x 200 lbs carbon/canister x 1 lb TPHG/20 lb carbon <p>6. Assumption that the BTEX and TPHG concentrations in the groundwater treatment system samples are the same as the previous sampling event on 11-30-95. System sampling schedule was reduced from monthly to quarterly by EBMUD during the third quarter 1995, therefore samples were not collected in December 1995.</p>														



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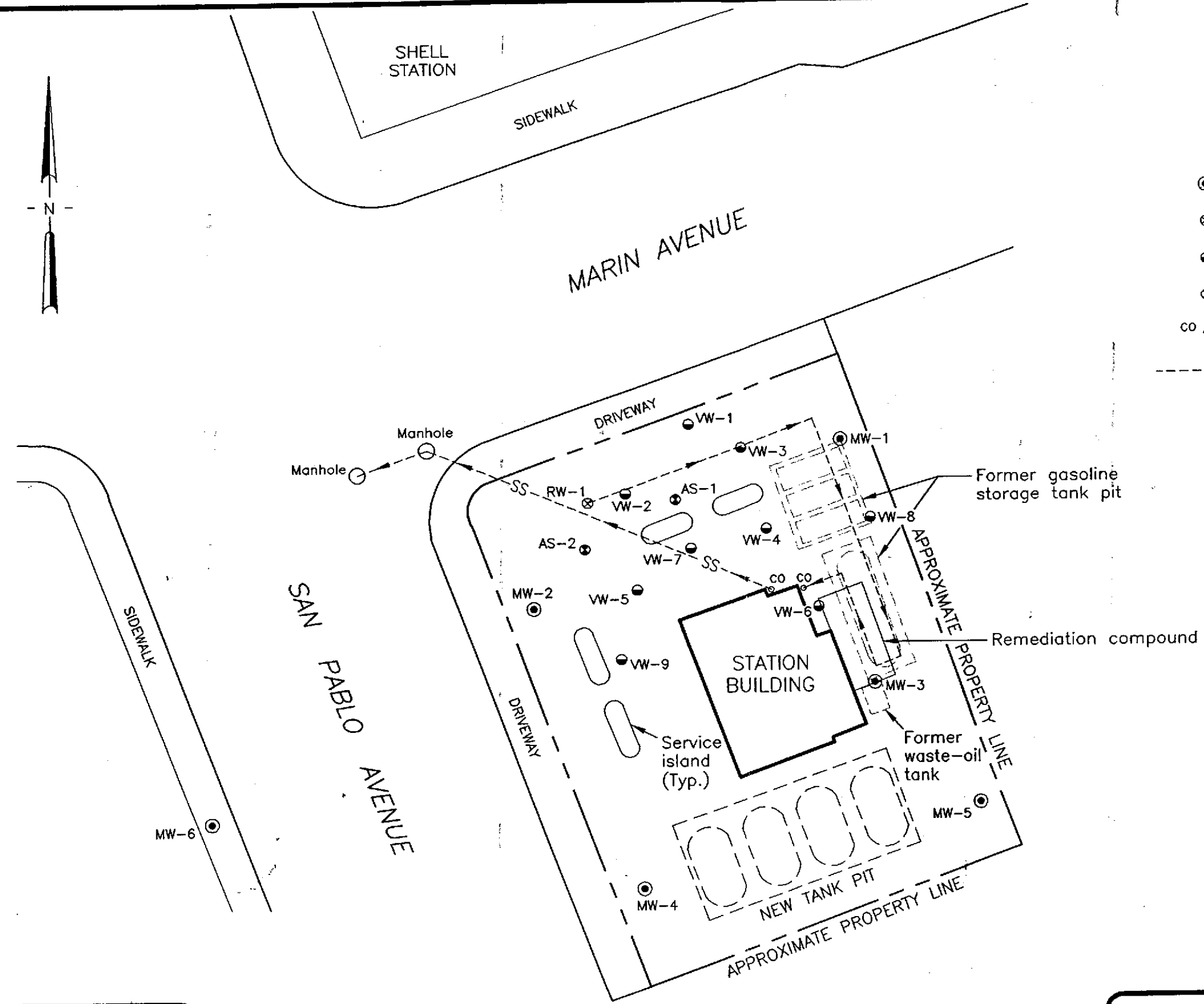
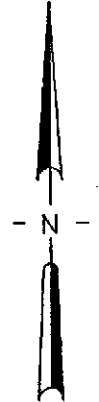
Base map from USGS 7.5' Quad. Maps:
 Oakland West and Richmond, California.
 Photorevised 1980.



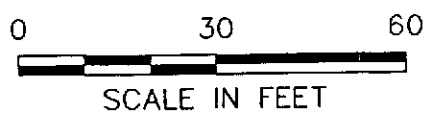
DATE APR. 1997
 DWN KAJ
 APP _____
 REV _____
 PROJECT NO.
 805-123.004

FIGURE 1
 ARCO PRODUCTS COMPANY
 SERVICE STATION 2035, 1001 SAN PABLO AVE.
 ALBANY, CALIFORNIA
**QUARTERLY GROUNDWATER MONITORING
 SITE LOCATION**

EA-SANJOSE-CAD/DRAWINGS: G:\805-123\S\SITE.dwg Xrefs: <NONE>
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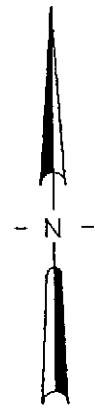
- EXPLANATION
- ⊙ Groundwater monitoring well
 - ⊗ Recovery well
 - Vapor extraction well
 - ⊕ Air sparge well
 - CO Existing sewer cleanout
 - Subgrade groundwater remediation piping route



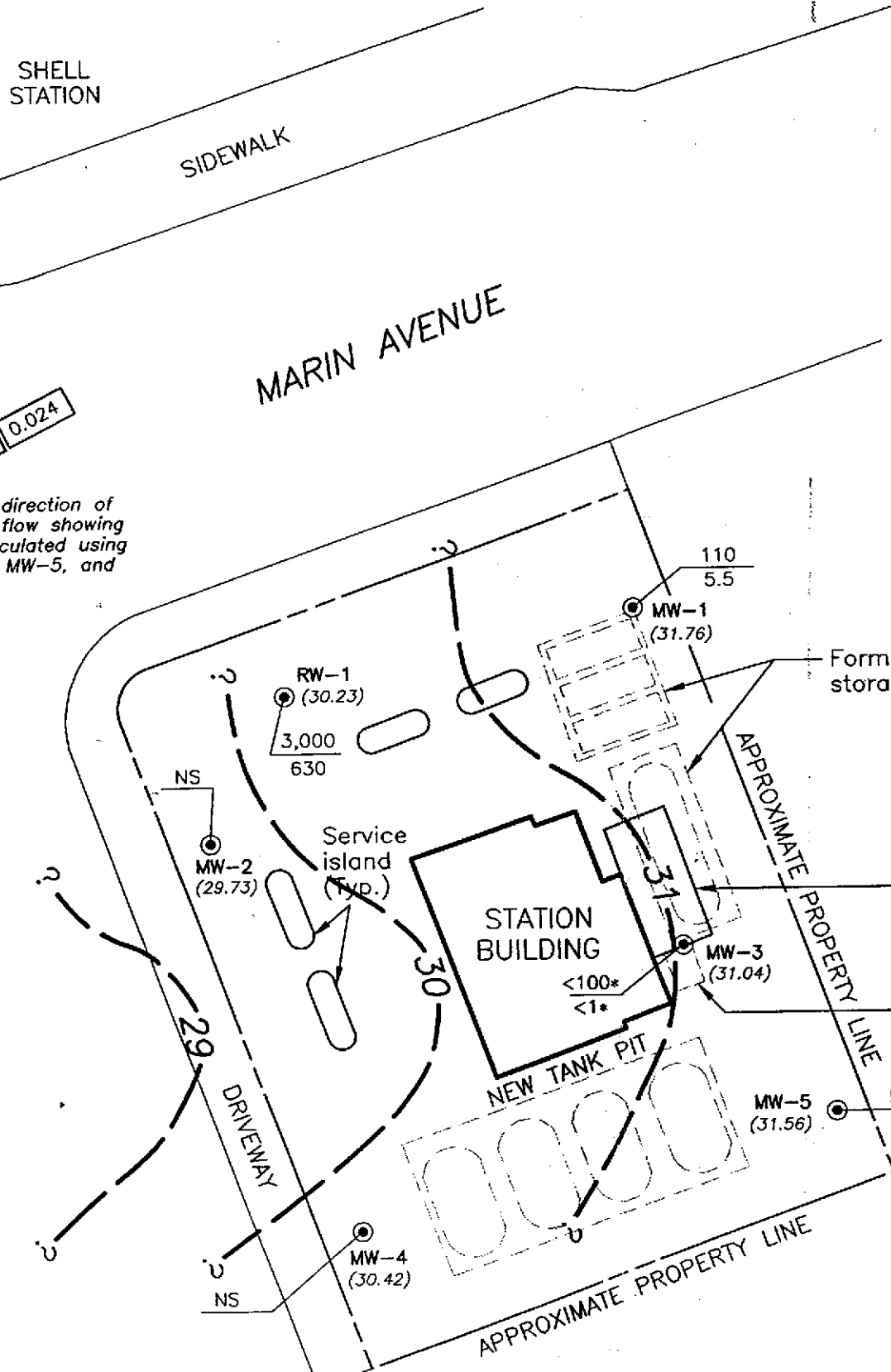
DATE APR. 1997
 DWN KAJ
 APP _____
 REV _____
 PROJECT NO.
 805-123.004

FIGURE 2
 ARCO PRODUCTS COMPANY
 SERVICE STATION 2035, 1001 SAN PABLO AVE.
 ALBANY, CALIFORNIA
**QUARTERLY GROUNDWATER MONITORING
 SITE PLAN**

EA-SANJOSE-CAD/DRAWINGS: G:\805-123\SIGWELEV.dwg Xref: <NONE>
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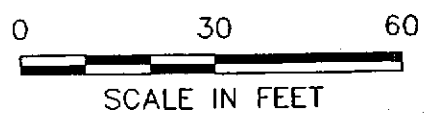


SAN PABLO AVENUE
 SIDEWALK



EXPLANATION

- ⊙ Groundwater monitoring well
- Vapor extraction well
- ⊛ Air sparge well
- (31.76) Groundwater elevation (Ft.-MSL); measured 5/22/97
- Groundwater elevation contour (Ft.-MSL)
- 110 / 5.5 TPHG concentration in groundwater (ug/L); sampled 5/22/97
- 110 / 5.5 Benzene concentration in groundwater (ug/L); sampled 5/22/97
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)
- NS Not sampled; not scheduled for chemical analysis
- * Raised method reporting limit

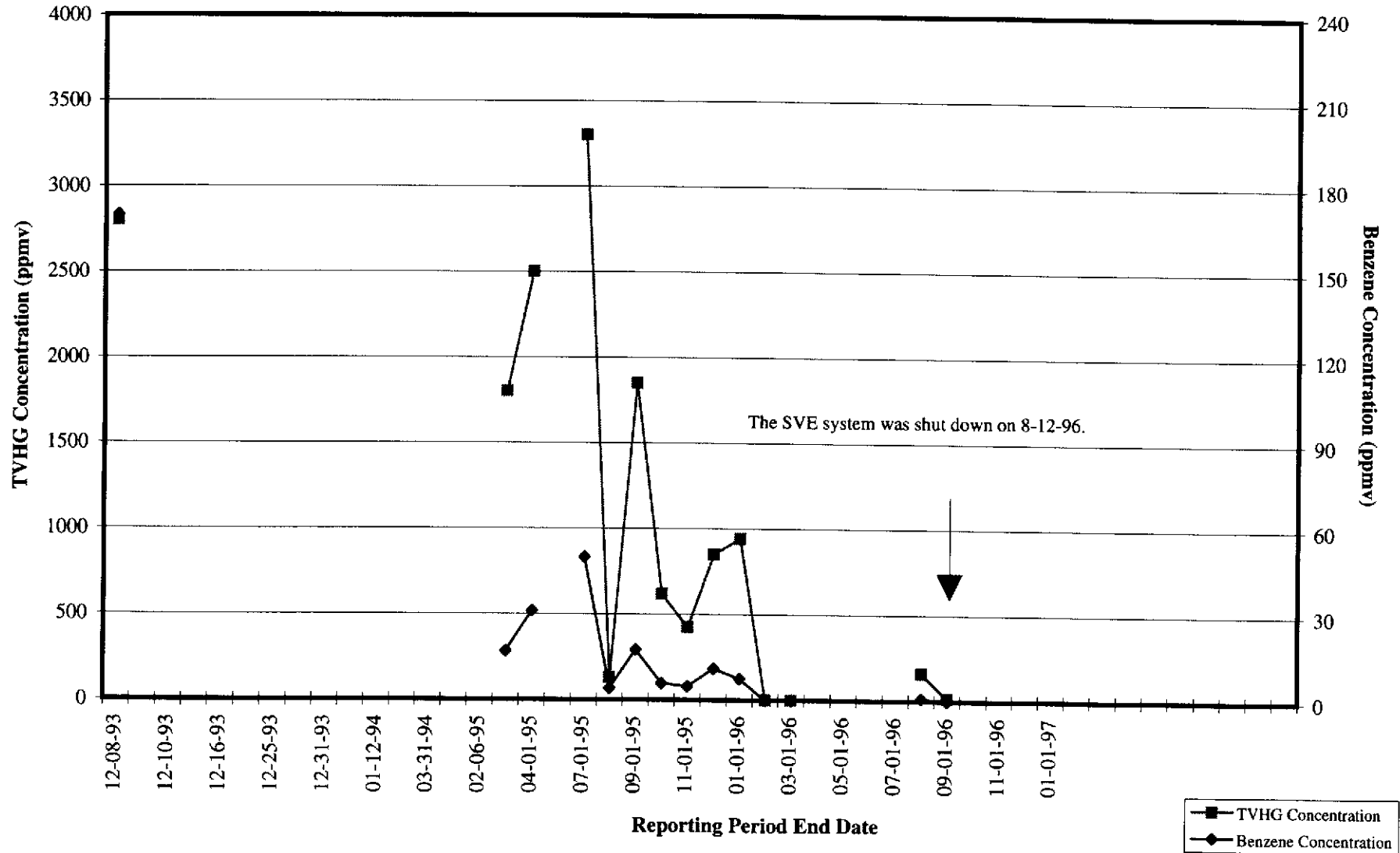


DATE AUG. 1997
 DWN KAJ
 APP _____
 REV _____
 PROJECT NO. 805-123.004

FIGURE 3
 ARCO PRODUCTS COMPANY
 SERVICE STA. 2035, 1001 SAN PABLO AVE.
 ALBANY, CALIFORNIA
**QUARTERLY GROUNDWATER MONITORING
 GROUNDWATER DATA - 2ND QUARTER 1997**

Figure 4

ARCO Service Station 2035
Soil-Vapor Extraction and Treatment System
Historical Well Field Influent TVHG and Benzene Concentrations



TVHG: total volatile hydrocarbons as gasoline
ppmv: parts per million by volume

Figure 5

ARCO Service Station 2035
Soil-Vapor Extraction and Treatment System
Historical Hydrocarbon Removal Rates

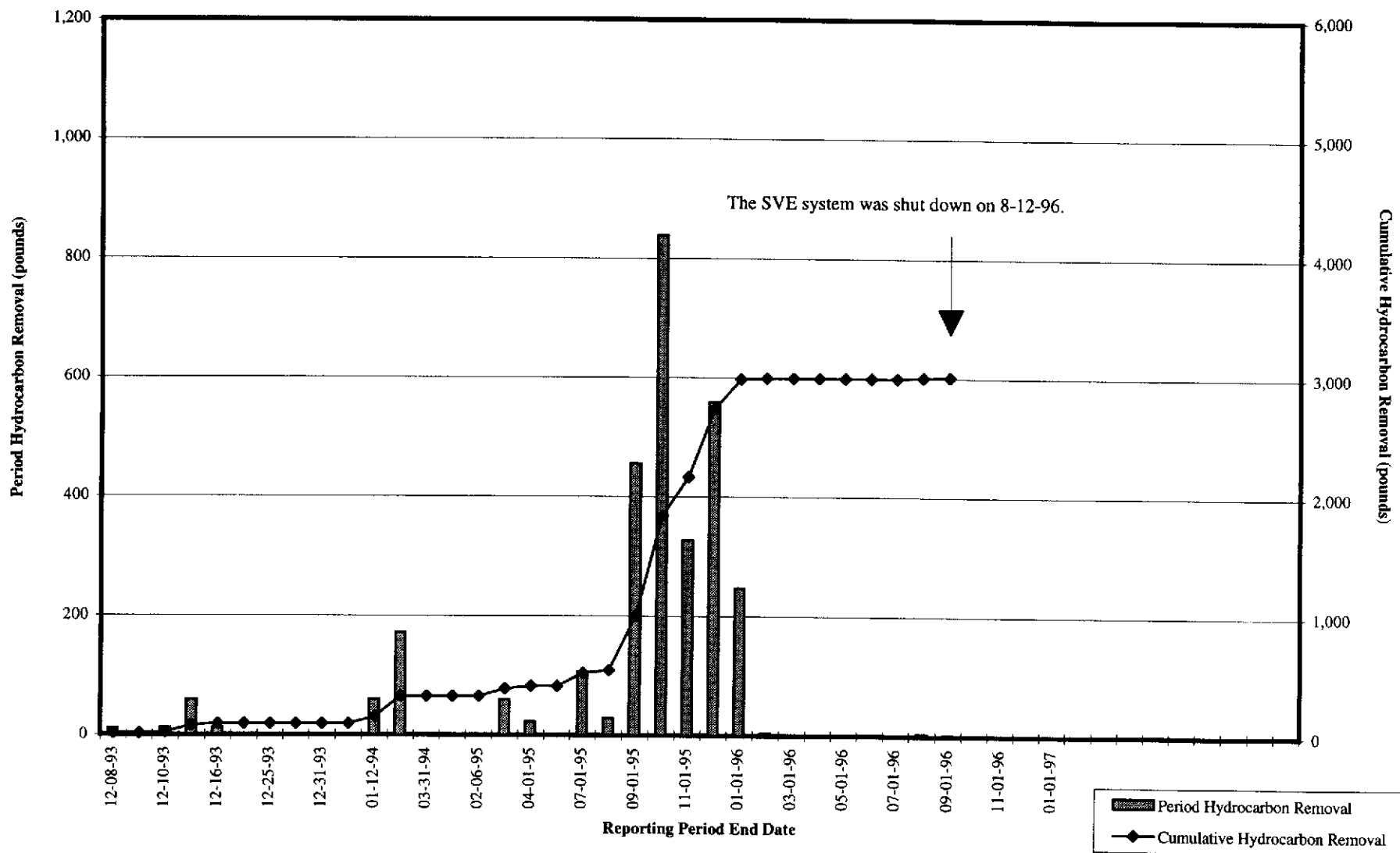
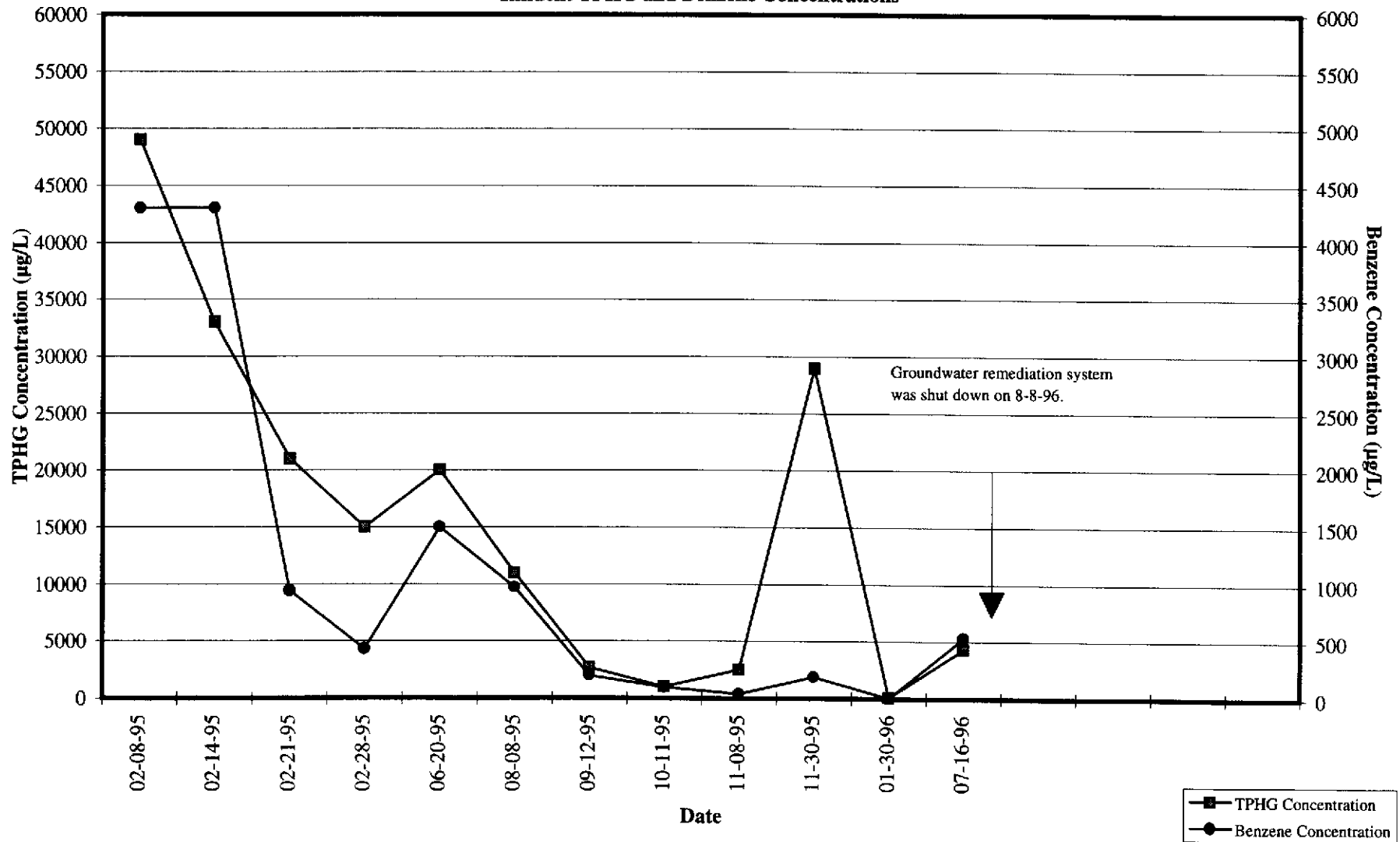


Figure 6

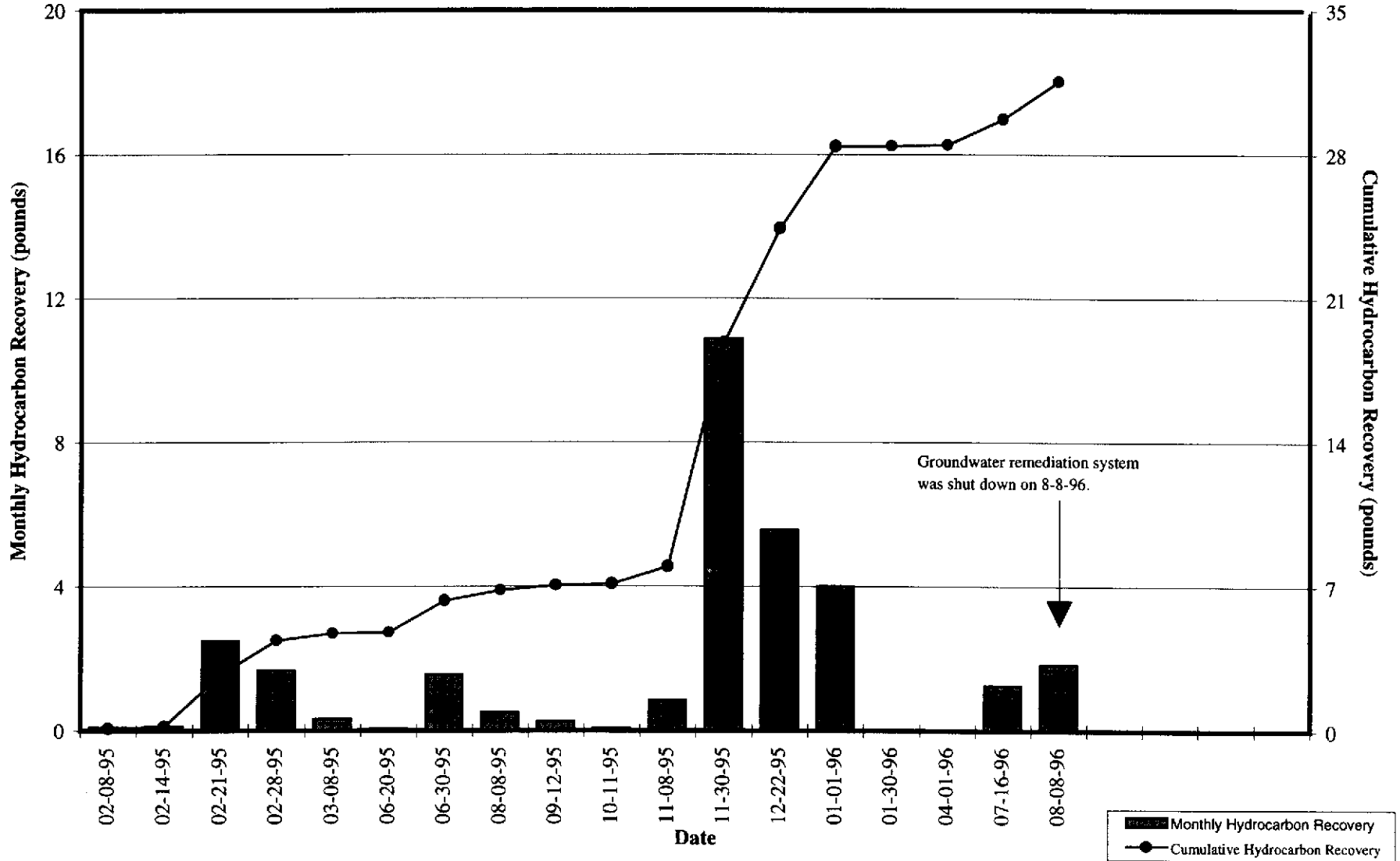
ARCO Service Station 2035
Historical Groundwater Treatment System
Influent TPHG and Benzene Concentrations



TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter

Figure 7

ARCO Service Station 2035
Historical Groundwater Treatment System Hydrocarbon Recovery Rates



APPENDIX A

**ANALYTICAL RESULTS AND CHAIN OF CUSTODY
DOCUMENTATION, SECOND QUARTER 1997
GROUNDWATER MONITORING EVENT**



June 6, 1997

Service Request No.: S9700961

Ms. Ivy Inouye
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 20805-123.004/TO#8121.00/2035 ALBANY

Dear Ms. Inouye:

The following pages contain analytical results for sample(s) received by the laboratory on May 23, 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 11, 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,

Two handwritten signatures are present. The first signature, on the left, is written in cursive and reads "Bernadette J. Cox for". The second signature, on the right, is also in cursive and appears to be "Greg Anderson".

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
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: 5/22/97
Date Received: 5/23/97

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-3 (13)
Lab Code: S9700961-001
Test Notes:

Units: ug/L (ppb)
Basis: NA

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	6/2/97	<100	C1
Benzene	EPA 5030	8020	0.5	2	NA	6/2/97	<1	C1
Toluene	EPA 5030	8020	0.5	2	NA	6/2/97	<1	C1
Ethylbenzene	EPA 5030	8020	0.5	2	NA	6/2/97	<1	C1
Xylenes, Total	EPA 5030	8020	0.5	2	NA	6/2/97	<1	C1
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	2	NA	6/2/97	95	

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: 5/22/97
Date Received: 5/23/97

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-1 (13)
Lab Code: S9700961-002
Test Notes:

Units: ug/L (ppb)
Basis: NA

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	6/3/97	110	
Benzene	EPA 5030	8020	0.5	1	NA	6/3/97	5.5	
Toluene	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/3/97	0.7	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/3/97	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: 5/22/97
Date Received: 5/23/97

BTEX, MTBE and TPH as Gasoline

Sample Name: RW-1 (15)
Lab Code: S9700961-003
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	20	NA	6/3/97	3000	
Benzene	EPA 5030	8020	0.5	20	NA	6/3/97	630	
Toluene	EPA 5030	8020	0.5	20	NA	6/3/97	84	
Ethylbenzene	EPA 5030	8020	0.5	20	NA	6/3/97	45	
Xylenes, Total	EPA 5030	8020	0.5	20	NA	6/3/97	340	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	20	NA	6/3/97	<60	C1

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S970602-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

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	6/2/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/2/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/2/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/2/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/2/97	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/2/97	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S970603-WB1
Test Notes:

Units: ug/L (ppb)
Basis: NA

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	6/3/97	ND	
Benzene	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Toluene	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	6/3/97	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	6/3/97	ND	

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-3 (13)	S9700961-001		102	96
MW-1 (13)	S9700961-002		101	104
RW-1 (15)	S9700961-003		101	96
BATCH QC	S9701010-003MS		103	101
BATCH QC	S9701010-003DMS		103	98
Method Blank	S970602-WB1		101	96
Method Blank	S970603-WB1		98	89

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY
Sample Matrix: Water

Service Request: S9700961
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 6/3/97

Matrix Spike/Duplicate Matrix Spike Summary
 BTE

Sample Name: BATCH QC Units: ug/L (ppb)
Lab Code: S9701010-003MS, S9701010-003DMS Basis: NA
Test Notes:

Percent Recovery

Analyte	Prep Method	Analysis Method	MRL	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
				MS	DMS		MS	DMS	MS	DMS		
Benzene	EPA 5030	8020	0.5	25	25	ND	26	27	104	108	75-135	4
Toluene	EPA 5030	8020	0.5	25	25	ND	26	26	104	104	73-136	<1
Ethylbenzene	EPA 5030	8020	0.5	25	25	ND	26	27	104	108	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#8121.00/2035 ALBANY

Service Request: S9700961
Date Analyzed: 6/2/97

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

Sample Name: ICV Units: ug/L (ppb)
 Lab Code: ICV1 Basis: NA
 Test Notes:

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	240	96	
Benzene	EPA 5030	8020	25	26	104	
Toluene	EPA 5030	8020	25	25	100	
Ethylbenzene	EPA 5030	8020	25	26	104	
Xylenes, Total	EPA 5030	8020	75	80	107	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	25	26	104	

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No.

Chain of Custody

ARCO Facility no. **ARCO 2035** City (Facility) **Albany** Project manager (Consultant) **PAUL Supple**
 ARCO engineer **PAUL Supple** Telephone no. (ARCO) Telephone no. (Consultant) **(406) 453-7300** Fax no. (Consultant) **(406) 453 0452**
 Consultant name **EMCON** Address (Consultant) **1921 Ringwood**

Laboratory name **CHS**
 Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 821/820	ETEX/TEX EPA 146/147/148/149/150/151	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM/SGE	EPA 801/8010	EPA 824/8240	EPA 826/8270	TCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Sent Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CANN Metals EPA 801/8010 TTL <input type="checkbox"/> STL <input type="checkbox"/>	Lead Org./DHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid															
mw-3																						
mw-3 (13) ①		2		<input checked="" type="checkbox"/>			HCL	5-22	12:15		<input checked="" type="checkbox"/>											
mw-1 (13) ②		2		<input checked="" type="checkbox"/>			↓	5-22	13:00		<input checked="" type="checkbox"/>											
RW-1 (15) ③		2		<input checked="" type="checkbox"/>			↓	5-22	13:50		<input checked="" type="checkbox"/>											

Method of shipment
Sampler will deliver

Special detection Limit/reporting
Lowest Possible

Special QA/QC
As Normal

Remarks
**2-40 ml HCL
 VOA's
 MTBE by 8020
 20805-123,004
 Lab number
 59700961**

Condition of sample: Relinquished by sampler **[Signature]** Date **5-21-97** Time **13205** Temperature received: Received by **[Signature]**
 Relinquished by Date Time Received by
 Relinquished by Date Time Received by Laboratory **[Signature]** Date **5/23** Time **110PM**

Turns. ound time
 Priority Rush 1 Business Day
 Rush 2 Business Days
 Expedited 5 Business Days
 Standard 6/9 10 Business Days

R8

APPENDIX B

SVE SYSTEM MONITORING DATA LOG SHEETS

