



ENVIRONMENTAL
PROTECTION

98 NOV -6 PM 3: 14

November 3, 1998
Project 20805-123.005

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

Re: Quarterly Groundwater Monitoring Report, Second Quarter 1998, for ARCO Service Station No. 2035, located at 1001 San Pablo Avenue, San Pablo, California

Dear Mr. Supple:

Pinnacle Environmental Solutions, a division of EMCON (Pinnacle), is submitting the attached report which presents the results of the second quarter 1998 groundwater monitoring program at ARCO Products Company (ARCO) Service Station No. 2035, located at 1001 San Pablo Avenue, San Pablo, California. The monitoring program complies with the Alameda County Health Care Services Agency regarding underground tank investigations.

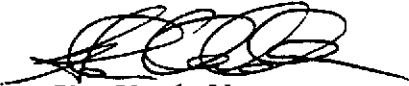
LIMITATIONS


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,

Pinnacle


Glen VanderVeen
Project Manager


Valli Voruganti, P.E.
Project Engineer

Attachment: Quarterly Groundwater Monitoring Report, Second Quarter 1998

cc: Barney Chan, ACHCSA



November 3, 1998

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 2035 Address: 1001 San Pablo Avenue, San Pablo, California
 Pinnacle Project No.: 20805-123.005
 ARCO Environmental Engineer/Phone No.: Paul Supple /(510) 299-8891
 Pinnacle Project Manager/Phone No.: Glen VanderVeen /(925) 977-9020
 Primary Agency/Regulatory ID No.: ACHCSA /Barney Chan

WORK PERFORMED THIS QUARTER (SECOND - 1998):

1. Prepared and submitted quarterly groundwater monitoring report for first quarter 1998.
2. Performed quarterly groundwater monitoring and sampling for second quarter 1998.
3. Continued bubbling air into well RW-1 to introduce dissolved oxygen into the groundwater, thereby enhancing biodegradation of petroleum hydrocarbon in groundwater in the vicinity of the well.

WORK PROPOSED FOR NEXT QUARTER (THIRD - 1998):

1. Prepare and submit quarterly groundwater monitoring report for second quarter 1998.
2. Perform quarterly groundwater monitoring and sampling for third quarter 1998.
3. Restart SVE system and continue operation if hydrocarbon concentrations in extracted vapor warrant and water levels drop.
4. Continue bubbling air into well RW-1.

QUARTERLY MONITORING:

Current Phase of Project: Quarterly Groundwater Monitoring and Operation and Maintenance of Remediation Systems
SVE and Enhanced Bioremediation

Frequency of Sampling: Annual (First Quarter): MW-5
Quarterly: MW-1 through MW-4, MW-6, RW-1

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: Bubbling air in RW-1

Average Depth to Groundwater: 10 feet

Groundwater Flow Direction and Gradient (Average): 0.02 ft/ft toward west

SVE QUARTERLY OPERATION AND PERFORMANCE:

Equipment Inventory:	Therm Tech Model VAC-10 Thermal/Catalytic Oxidizer
Operating Mode:	Catalytic Oxidation
BAAQMD Permit #:	10931
TPH Conc. End of Period (lab):	NA (Not Applicable)
Benzene Conc. End of Period (lab):	NA
SVE Flowrate End of Period:	NA
Total HC Recovered This Period:	0 pounds
Total HC Recovered to Date:	3016.5 pounds
Utility Usage	
Electric (KWH):	810 KWH
Gas (Therms):	0 Therm
Operating Hours This Period (SVE):	0 hours
Operating Hours to Date (SVE):	7211.1 hours
Percent Operational (SVE):	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:	NA
Average SVE Process Flow:	NA
Average Source Vacuum:	NA

DISCUSSION:

The SVE system has been shut down since August 12, 1996, because of relatively low gasoline concentrations in the influent vapor stream and high water. The SVE system was not in operation during the second quarter, and may be restarted in the third quarter of 1998 if hydrocarbons concentrations and groundwater levels warrant. Pinnacle is currently bubbling air at low flow rates of 2 cfm in well RW-1 to introduce dissolved oxygen into groundwater to promote biodegradation of hydrocarbons in the vicinity of RW-1.

ATTACHMENTS:

- Table 1 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Groundwater Analytical Summary Map
- Figure 2 - Groundwater Elevation Contour Map
- Appendix A - Sampling and Analysis Procedures
- Appendix B - Certified Analytical Reports and Chain-of-Custody Documentation
- Appendix C - Field Data Sheets
- Appendix D - SVE System Monitoring Data Log Sheets

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Flooding 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	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-1	09-04-97	41.41	10.22	31.19	ND	W	0.019	09-04-97	180	40	<0.5	1.2	0.5	26	--	--	--	--	--	--
MW-1	11-03-97	41.41	10.68	30.73	ND	SW	0.038	11-03-97	83	8	<0.5	<0.5	<0.5	13	--	--	--	--	--	--
MW-1	02-20-98	41.41	6.92	34.49	ND	W	0.031	02-20-98	1800	540	7	27	31	46	--	--	--	--	--	--
MW-1	05-18-98	41.41	9.28	32.13	ND	W	0.023	05-18-98	4500	1300	20	57	20	<60	--	--	--	--	--	--
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											
MW-2	09-04-97	40.38	10.87	29.51	ND	W	0.019	09-04-97	<50	<0.5	<0.5	<0.5	<0.5	19	--	--	--	--	--	--
MW-2	11-03-97	40.38	11.25	29.13	ND	SW	0.038	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	18	--	--	--	--	--	--
MW-2	02-20-98	40.38	7.69	32.69	ND	W	0.031	02-20-98	<50	0.5	<0.5	<0.5	<0.5	12	--	--	--	--	--	--
MW-2	05-18-98	40.38	9.88	30.50	ND	W	0.023	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	10	--	--	--	--	--	--

**Table 1
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1995 - Present***

**ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California**

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-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	9.33	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	--	--	--	--	--	<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-3	09-04-97	41.44	10.75	30.69	ND	W	0.019	09-04-97	<50	<0.5	<0.5	<0.5	<0.5	37	--	--	--	--	--	--
MW-3	11-03-97	41.44	11.44	30.00	ND	SW	0.038	11-03-97	<200	<2	<2	<2	<2	130	--	--	--	--	--	--
MW-3	02-20-98	41.44	7.48	33.96	ND	W	0.031	02-20-98	<200	<2	5	<2	8	140	--	--	--	--	<0.5	--
MW-3	05-18-98	41.44	9.87	31.57	ND	W	0.023	05-18-98	<100	<1	<1	<1	<1	150	--	--	--	--	<0.5	--
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											
MW-4	09-04-97	40.33	10.25	30.08	ND	W	0.019	09-04-97	Not sampled: well sampled annually, during the first quarter											
MW-4	11-03-97	40.33	10.79	29.54	ND	SW	0.038	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-4	02-20-98	40.33	6.78	33.55	ND	W	0.031	02-20-98	<2000	<20	<20	<20	<20	3300	--	--	--	--	--	--
MW-4	05-18-98	40.33	9.26	31.07	ND	W	0.023	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--

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1995 - Present***

**ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California**

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-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-5	09-04-97	41.84	10.73	31.11	ND	W	0.019	09-04-97	Not sampled: well sampled annually, during the first quarter											
MW-5	11-03-97	41.84	11.23	30.61	ND	SW	0.038	11-03-97	Not sampled: well sampled annually, during the first quarter											
MW-5	02-20-98	41.84	6.67	35.17	ND	W	0.031	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-5	05-18-98	41.84	9.61	32.23	ND	W	0.023	05-18-98	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											
MW-6	09-04-97	40.13	13.30	26.83	ND	W	0.019	09-04-97	Not sampled: well sampled annually, during the first quarter											
MW-6	11-03-97	40.13	13.42	26.71	ND	SW	0.038	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	19	--	--	--	--	--	--
MW-6	02-20-98	40.13	10.57	29.56	ND	W	0.031	02-20-98	<100	<1	<1	<1	<1	95	--	--	--	--	--	--
MW-6	05-18-98	40.13	12.64	27.49	ND	W	0.023	05-18-98	<100	<1	<1	<1	<1	180	--	--	--	--	--	--

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		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
RW-1	09-04-97	40.33	10.42	29.91	ND	W	0.019	09-04-97	7100	120	55	14	160	<60
RW-1	11-03-97	40.33	9.10	31.23	ND	SW	0.038	11-03-97	<200	14	19	3	19	140
RW-1	02-20-98	40.33	7.49	32.84	ND	W	0.031	02-20-98	3800	1000	85	64	220	950
RW-1	05-18-98	40.33	8.90	31.43	ND	W	0.023	05-18-98	<200	45	<2	2	4	220

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

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

mg/L: milligrams per liter

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

ND: none detected

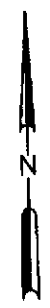
NR: not reported; data not available

W: west

--: 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



SHELL STATION

SIDEWALK

MARIN AVENUE

SAN PABLO AVENUE

MW-6
(<100/<1/180)

RW-1
(<200/45/220)

MW-2
(ND/ND/10)

MW-4
(ND/ND/ND)

VW-1

VW-3

MW-1
(4,500/1,300/<60)

VW-2

VW-7

VW-4

VW-5

VW-6

STATION BUILDING

VW-9

MW-3
(<100/<1/150)

MW-5
(NS)

Service island (Typ.)

NEW TANK PIT

APPROXIMATE PROPERTY LINE

Former gasoline storage tank pit

Remediation compound

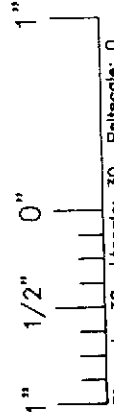
Former waste-oil tank

EXPLANATION

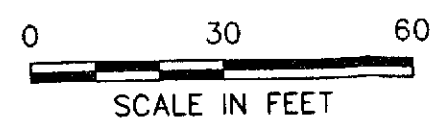
- ⊙ Groundwater monitoring well
- ⊗ Recovery well
- Vapor extraction well
- ⊕ Air sparge well

- (<100/<1/150) Concentration of total petroleum hydrocarbons as gasoline (TPHG), benzene, and MTBE in groundwater (ug/L); samples collected 5/18/98
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L), benzene (0.5 ug/L), or MTBE (3 ug/L)
- < Method reporting limit raised due to high analyte concentration requiring sample dilution or matrix interference
- NS Not sampled

IMAGE Files: <No Images>
 XREF Files: <No Xrefs>
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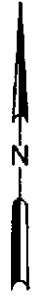


Pinnacle
 ENVIRONMENTAL SOLUTIONS
 A DIVISION OF EMCON



DATE	SEPT. 1998
DWN	KAB
APP	-3
REV	
PROJECT NO.	20805-123.005

FIGURE 1
 ARCO PRODUCTS COMPANY
 SERVICE STATION 2035, 1001 SAN PABLO AVE.
 ALBANY, CALIFORNIA
GROUNDWATER ANALYTICAL SUMMARY
SECOND QUARTER 1998



SHELL STATION

SIDEWALK

MARIN AVENUE

SAN PABLO AVENUE

SIDEWALK

Service island (Typ.)

STATION BUILDING

NEW TANK PIT

APPROXIMATE PROPERTY LINE

DRIVEWAY

Former gasoline storage tank pit

Remediation compound

Former waste-oil tank

EXPLANATION

- ⊙ Groundwater monitoring well
- (32.13) Groundwater elevation (Ft.-MSL); measured 5/18/98
- ? - - - Groundwater elevation contour (Ft.-MSL)
- ← Approximate direction of groundwater flow showing gradient

MW-6 (27.49)

RW-1 (31.43)

MW-2 (30.50)

MW-1 (32.13)

MW-3 (31.57)

MW-4 (31.07)

MW-5 (32.23)

0.02

? - - - 29 - - - ?

? - - - 30 - - - ?

? - - - 31 - - - ?

? - - - 32 - - - ?

? - - - 28 - - - ?

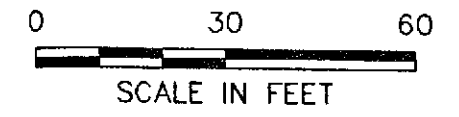
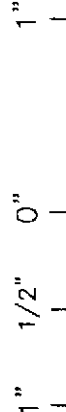


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 XREF Files: <No Xrefs>
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 SANJOSE/CADD: N:\DWG\PINACL\2035\2035GWC.DWG Thu, 29/Oct/98 11:40am kblock



Pinnacle
 ENVIRONMENTAL SOLUTIONS
 A DIVISION OF EMCON

DATE SEPT. 1998
 DWN KAB
 APP _____
 REV _____
 PROJECT NO.
 20805-123.005

FIGURE 2
 ARCO PRODUCTS COMPANY
 SERVICE STATION 2035, 1001 SAN PABLO AVE.
 ALBANY, CALIFORNIA
GROUNDWATER ELEVATION CONTOURS
SECOND QUARTER 1998

APPENDIX A
SAMPLING AND ANALYSIS PROCEDURES

APPENDIX A

SAMPLING AND ANALYSIS PROCEDURES

The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

Sample Collection

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

Equipment Cleaning

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with deionized water. During field sampling, equipment surfaces that were placed in the well or came into contact with groundwater during field sampling were steam cleaned with deionized water before the next well was purged or sampled.

Water Level, Floating Hydrocarbon, and Total Well Depth Measurements

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness, and total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline, and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated by being rinsed with deionized water or steam cleaned after each use. A bottom-filling, clear Teflon[®] bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated by being rinsed with deionized water after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

Well Purging

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol presented in Figure A-1. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

Groundwater purged from the monitoring wells was transported in a 500-gallon water trailer, 55-gallon drum, or a 325-gallon truck-mounted tank to EMCON's San Jose or Sacramento office location for temporary storage. EMCON arranged for transport and disposal of the purged groundwater through Integrated Waste Stream Management, Inc.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Figure A-2 shows an example of the water sample field data sheet on which field data are recorded. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

Well Sampling

A Teflon bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the Teflon bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed. Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

Sample Preservation and Handling

The following section specifies sample containers, preservation methods, and sample handling procedures.

Sample Containers and Preservation

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

Sample Handling

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs until received by the laboratory. At the time of sampling, each sample was logged on an ARCO chain-of-custody record that accompanied the sample to the laboratory.

Samples that required overnight storage prior to shipping to the laboratory were kept cool (4° C) in a refrigerator. The refrigerator was kept in a warehouse, which was locked when not occupied by an EMCON employee. A sample/refrigerator log was kept to record the date and time that samples were placed into and removed from the refrigerator.

Samples were transferred from EMCON to an ARCO-approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from EMCON to laboratories performing the selected analyses routinely occurred within 24 hours of sample collection.

Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Laboratory analysis request sheets for documenting analyses to be performed

Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure A-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

Labels

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

Sampling and Analysis Chain-of-Custody Record

The ARCO chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the ARCO chain-of-custody record was returned to EMCON with the analytical results.

Groundwater Sampling and Analysis Request Form

A groundwater sampling and analysis request form (see Figure A-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)



OWT

MONITORING WELL PURGING PROTOCOL

MEASURE AND RECORD DEPTH TO WATER AND WELL TOTAL DEPTH

CHECK FOR FLOATING PRODUCT

YES

MEASURE AND DOCUMENT FLOATING PRODUCT THICKNESS. DO NOT SAMPLE WELL FOR DISSOLVED CONSTITUENTS.

NO

CALCULATE PURGE VOLUME BY USING THE FOLLOWING EQUATION:
 $P = \pi r^2 \times 7.48 \times h$
where:
P = calculated purge volume (gallons)
 $\pi = 3.14$
r = radius of well casing in feet
h = height of water column in feet

WELL EVACUATED TO PRACTICAL LIMITS OF DRYNESS BEFORE REMOVING CALCULATED PURGE VOLUME

EVACUATE WATER FROM WELL EQUAL TO THE CALCULATED PURGE VOLUME WHILE MONITORING GROUNDWATER STABILIZATION INDICATOR PARAMETERS (pH, CONDUCTIVITY, TEMPERATURE) AT INTERVALS OF ONE CASING VOLUME.

NO

YES

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:
pH = ± 0.1 pH units
COND. = ± 10 %
TEMP. = ± 1.0 °F

WELL RECHARGES TO A LEVEL SUFFICIENT FOR SAMPLE COLLECTION WITHIN 24 HOURS OF EVACUATION TO DRYNESS.

YES

NO

YES

NO

WELL PURGING CRITERIA MET: PROCEED TO WELL SAMPLING.

CONTINUE PURGING: EVACUATE ADDITIONAL CASING VOLUME OF WATER. MONITORING INDICATOR PARAMETERS FOR STABILITY.

FIELD TEST FIRST RECHARGE WATER FOR INDICATOR PARAMETERS. THEN PROCEED TO WELL SAMPLING.

RECORD WELL AS DRY FOR PURPOSES OF SAMPLING.



EMCON

MONITORING WELL PURGING PROTOCOL

FIGURE A-1

WATER SAMPLE FIELD DATA SHEET

Rev. 5/96



OWT

PROJECT NO: _____

SAMPLE ID: _____

PURGED BY: _____

CLIENT NAME: _____

SAMPLED BY: _____

LOCATION: _____

TYPE: Groundwater _____ Surface Water _____ Leachate _____ Other _____

CASING DIAMETER (Inches): 2 _____ 3 _____ 4 _____ 4.5 _____ 6 _____ Other _____

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

DEPTH OF WELL (feet): _____ CALCULATED PURGE (gal.): _____

DEPTH OF WATER (feet): _____ ACTUAL PURGE VOL (gal.): _____

DATE PURGED: _____

END PURGE: _____

DATE SAMPLED: _____

SAMPLING TIME: _____

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	TURBIDITY (Visual/NTU)	TIME (2400 HR)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: _____ ODOR: _____
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): _____

PURGING EQUIPMENT

SAMPLING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard™ _____ Dedicated
 Other: _____

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard™ _____ Dedicated
 Other: _____

WELL INTEGRITY: _____ LOCK: _____

REMARKS: _____

pH, E.C., Temp. Meter Calibration Date: _____ Time: _____ Meter Serial No.: _____

E.C. 1000 _____ / _____ pH 7 _____ / _____ pH 10 _____ / _____ pH 4 _____ / _____

Temperature °F _____

SIGNATURE: _____ REVIEWED BY: _____ PAGE _____ OF _____



WATER SAMPLE FIELD DATA SHEET

FIGURE
A-2



OWT

**EMCON - SACRAMENTO
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM**

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

[Empty box for special instructions]

Project Authorization: _____
EMCON Project No.: _____
OWT Project No.: _____
Task Code: _____
Originals To: _____
cc: _____

Well Lock Number (s)

CHECK BOX TO AUTHORIZE DATA ENTRY

Site Contact: _____
Name Phone #

Well Number or Source	Casing Diameter (inches)	Casing Length (feet)	Depth to Water (feet)	ANAYSES REQUESTED

Laboratory and Lab QC Instructions:

[Empty box for laboratory and lab QC instructions]



EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE

A-3

APPENDIX B

**CERTIFIED ANALYTICAL REPORTS,
AND CHAIN-OF-CUSTODY DOCUMENTATION**



June 4, 1998

Service Request No.: S9801257

Glen Vanderveen
PINNACLE
144 A Mayhew Wy.
Walnut Creek, CA 94596

RE: 20805-123.004/TO#22312.00/RAT8/2035 ALBANY

Dear Mr. Vanderveen:

The following pages contain analytical results for sample(s) received by the laboratory on May 20, 1998. 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 15, 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,

A handwritten signature in black ink, appearing to read "Steven L. Green", is written over a white background.

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#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-4(11)
Lab Code: S9801257-001
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	1	NA	5/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	5/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-1(15)
Lab Code: S9801257-002
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	20	NA	5/22/98	4500	
Benzene	EPA 5030	8020	0.5	20	NA	5/22/98	1300	
Toluene	EPA 5030	8020	0.5	20	NA	5/22/98	20	
Ethylbenzene	EPA 5030	8020	0.5	20	NA	5/22/98	57	
Xylenes, Total	EPA 5030	8020	0.5	20	NA	5/22/98	20	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	20	NA	5/22/98	<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#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-2(15')
Lab Code: S9801257-003
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	1	NA	5/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	5/22/98	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-6(14')
Lab Code: S9801257-004
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	5/23/98	<100	C1
Benzene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Toluene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Ethylbenzene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Xylenes, Total	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	2	NA	5/23/98	180	

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#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-3(20)
Lab Code: S9801257-005
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	5/23/98	<100	C1
Benzene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Toluene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Ethylbenzene	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Xylenes, Total	EPA 5030	8020	0.5	2	NA	5/23/98	<1	C1
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	2	NA	5/23/98	150	

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#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: 5/18/98
Date Received: 5/20/98

BTEX, MTBE and TPH as Gasoline

Sample Name: RW-1(15')
Lab Code: S9801257-006
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	4	NA	5/23/98	<200	C
Benzene	EPA 5030	8020	0.5	4	NA	5/23/98	45	
Toluene	EPA 5030	8020	0.5	4	NA	5/23/98	<2	C1
Ethylbenzene	EPA 5030	8020	0.5	4	NA	5/23/98	2	
Xylenes, Total	EPA 5030	8020	0.5	4	NA	5/23/98	4	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	4	NA	5/23/98	220	

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#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980522-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	5/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	5/22/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	5/22/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: WA# 22312.00/Albany/2035
Sample Matrix: Water

Service Request: L9801634
Date Collected: 5/18/98
Date Received: 5/26/98

Total Recoverable Petroleum Hydrocarbons (TRPH)

Prep Method: METHOD
Analysis Method: 418.1
Test Notes:

Units: mg/L (ppm)
Basis: NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
MW-3(20)	L9801634-001	0.5	1	5/26/98	5/26/98	ND	
Method Blank	L980526-MB	0.5	1	5/26/98	5/26/98	ND	

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
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-4(11)	S9801257-001		87	111
MW-1(15)	S9801257-002		102	101
MW-2(15)	S9801257-003		98	107
MW-6(14)	S9801257-004		101	106
MW-3(20)	S9801257-005		103	110
RW-1(15)	S9801257-006		103	91
MW-4(11)	S9801257-001MS		92	104
MW-4(11)	S9801257-001DMS		97	103
Method Blank	S980522-WB1		103	96

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S9801257
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 5/23/98

Matrix Spike/Duplicate Matrix Spike Summary
 TPH as Gasoline

Sample Name: MW-4(11') **Units:** ug/L (ppb)
Lab Code: S9801257-001MS, S9801257-001DMS **Basis:** NA
Test Notes:

Percent Recovery

Analyte	Prep Method	Analysis Method	Spike Level			Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference	Result Notes
			MRL	MS	DMS		MS	DMS	MS	DMS			
Gasoline	EPA 5030	CA/LUFT	50	250	250	ND	280	280	112	112	75-135	<1	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RAT&2035 ALBANY

Service Request: 89801257
Date Analyzed: 5/22/98

**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		Result Notes
					Percent Recovery	Percent Recovery	
					Acceptance Limits		
TPH as Gasoline	EPA 5030	CA/LUFT	250	270	90-110	108	
Benzene	EPA 5030	8020	25	24	85-115	96	
Toluene	EPA 5030	8020	25	24	85-115	96	
Ethylbenzene	EPA 5030	8020	25	24	85-115	96	
Xylenes, Total	EPA 5030	8020	75	71	85-115	95	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	25	25	85-115	100	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.004/TO#22312.00/RATE/2035 ALBANY

Service Request: 89801257
Date Analyzed: 5/22/98

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	CAS Percent Recovery		Result Notes
					Acceptance Limits	Percent Recovery	
TPH as Gasoline	EPA 5030	CA/LUFT	250	270	90-110	108	
Benzene	EPA 5030	8020	25	24	85-115	96	
Toluene	EPA 5030	8020	25	24	85-115	96	
Ethylbenzene	EPA 5030	8020	25	24	85-115	96	
Xylenes, Total	EPA 5030	8020	75	71	85-115	95	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	25	25	85-115	100	

ICV032196

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: WA# 22312.00/Albany/2035
LCS Matrix: Water

Service Request: L9801634
Date Collected: NA
Date Received: NA
Date Extracted: 5/26/98
Date Analyzed: 5/26/98

**Laboratory Control Sample/Duplicate Laboratory Control Sample Summary
 Total Recoverable Petroleum Hydrocarbons (TRPH)**

Sample Name: Duplicate Lab Control Sample
Lab Code: L980526-LCS, L980526-DLCS
Test Notes: OG1

Units: mg/L (ppm)
Basis: NA

Analyte	Prep Method	Analysis Method	Percent Recovery								Result Notes
			True Value		Result		CAS		Relative Percent Difference		
			LCS	DLCS	LCS	DLCS	LCS	DLCS		Acceptance Limits	
TRPH	METHOD	418.1	1.98	1.98	1.93	2.00	97	101	75-125	4	

OG1

Sample quantity was insufficient to perform matrix spike and matrix spike duplicate. Three separate, replicate one liter samples are required to analyze sample and spikes.

ARCO Products Company

Division of Atlantic/Richfield Company

Task Order No. **2237.00**

Chain of Custody

ARCO Facility no. 2035	City (Facility) Alhambra	Project manager (Consultant) Glen Vanderveen	
ARCO engineer Paul Scapple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 437-9576
Consultant name EMCCN	Address (Consultant) 144A Mayhew Way, Walnut Creek, CA		

Laboratory Name
CPS

Contract Number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 8020	BTEX/TPH EPA 1602/20015	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 1631/ISM 508E	EPA 601/6010	EPA 624/6240	EPA 625/6270	TCLP Metals <input type="checkbox"/> VOAD <input type="checkbox"/> VOAD	CAN Metals EPA 6010/7000 TLCU <input type="checkbox"/> STLCU	Lead Org/MSD Lead EPA 7420/7421D	
			Soil	Water	Other	Ice	Acid														
MW-4(1)	1	2		X		X	HCL	5/18/98	13:40		X										
MW-1(15)2	2	2		X		X	HCL		11:05		X										
MW-2(15)3	2	2		X		X	HCL		11:42		X										
MW-6(14)4	2	2		X		X	HCL		14:05		X										
MW-3(20)5	4	4		X		X	HCL		12:10		X			X							
RW-1(15)6	2	2		X		X	HCL		13:20		X										
								5/18/98													
								per sample with HCL													

Method of shipment
Sampler will deliver

Special Detection Limit/reporting
Lowest Possible

Special QA/QC
As Normal

Remarks
RATG

#20805-123.00
Lab Number
59801257

Turnaround Time:

Priority Rush
1 Business Day

Rush
2 Business Days

Expedited
5 Business Days

Standard
10 Business Days

Due 6/3/98

Condition of sample:				Temperature received:			
Relinquished by sampler	Date	Time	Received by	Date	Time	Received by	
	5-19-98	08:00		5/20/98	9:38 AM		
Relinquished by	Date	Time	Received by	Date	Time	Received by	
Relinquished by	Date	Time	Received by laboratory	Date	Time	Received by	

APPENDIX C
FIELD DATA SHEETS

EMCON - Groundwater Sampling and Analysis Request Form

PROJECT NAME : ARCO STATION 2035
 1001 San Pablo Avenue, Albany

Sampling Project #: 21775-217.003
Reporting Project #: 20805-123.004

DATE REQUESTED : 18-May-98

Project Manager: Glen Vanderveen

Groundwater Monitoring Instructions	Treatment System Instructions
<p>Quarterly Monitoring - Second Month of the Quarter Perform a water level survey prior to sampling (see ARCO SOP) Well survey points are top of well casings. Purge three (3) casing volumes. You will have to bring a trailer for purge water transport. Well MW-3 may contain floating product. Sample all wells regardless of product per John Young's request. Please use the reporting project number (#20805-123.004) on the chain-of-custody forms, sample containers, and analytical results. Sample ID's on the C-O-C and the sample bottles must include the depth at which the sample was collected [i.e. MW-1 (30)].</p>	<p>Treatment system must be off for one week prior to sampling. On going going SVE, sparging and air bubbling are being performed. Bubbler may be on during sampling please be careful not to damage any of the hoses. RW-1 may contain FP please sample this well from the sample port. Lisle Rath Pager# (888) 606-0933</p>

Site Contact: Saaid

Site Phone: (510) 525-1326

Well Locks: ARCO Key

Well ID or Source	Casing Diameter (inches)	Casing Length (feet)	Top Of Screen (feet)	Analyses Requested
MW-5	4.0	25.1	8.5	<p>< Do not sample this well</p> <p align="center">Water Levels Dissolved Oxygen TPH-Gasoline BTEX MTBE by EPA 8020 (Fill 2- 40ml HCL VOAs)</p>
MW-4	4.0	25.8	8.5	
MW-1	4.0	30.1	15.0 -	
MW-2	4.0	29.1	20.0 -	
MW-6	2.0	24.8	8.0	
MW-3	4.0	33.5	12.5 -	
RW-1	6.0	25.4	11.0 -	
Above wells in indicated order				
MW-3				<p>Add:</p> <p align="center">TRPH (EPA 418.1) (Fill 2- 1liter HCL Glass)</p>
Above wells in indicated order				
<p>Laboratory Instructions: Please use the EMCON reporting project number (#2805-123.004) on the CAR. Lowest detection limits possible. Normal QA/QC.</p>				

ND = None Detected IP = Intermittent Product

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



OWT

PROJECT NO 21775-217.003
 PURGED BY C. Chapp
 SAMPLED BY ↓

SAMPLE ID MW-1 (15')
 CLIENT NAME ARCO # 2035
 LOCATION Albany

TYPE Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches) 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): _____ VOLUME IN CASING (gal.): 13.34
 DEPTH OF WELL (feet): 9.28 CALCULATED PURGE (gal.): 40.002
 DEPTH OF WATER (feet): 29.7 ACTUAL PURGE VOL (gal.): _____

DATE PURGED: 5-18-98 END PURGE: 10:56
 DATE SAMPLED: ↓ SAMPLING TIME: 11:05

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>10:46</u>	<u>13.0</u>	<u>665</u>	<u>744.3</u>	<u>68.2</u>	<u>yellow</u>	<u>hazy</u>
<u>10:51</u>	<u>26.5</u>	<u>668</u>	<u>771.0</u>	<u>67.8</u>	<u>ll</u>	<u>light</u>
<u>10:56</u>	<u>40.0</u>	<u>672</u>	<u>798.3</u>	<u>67.2</u>	<u>ll</u>	<u>ll</u>
_____	_____	_____	_____	_____	_____	_____

OTHER: DO = 2.42 ODOR: NONE
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

2" Bladder Pump _____ Bailer (Teflon)
 Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard™ _____ Dedicated
 Other: _____

SAMPLING EQUIPMENT

_____ 2" Bladder Pump Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard™ _____ Dedicated
 Other: _____

WELL INTEGRITY: Good LOCK: No lock

REMARKS: _____

pH, E.C., Temp. Meter Calibration Date: 5-18-98 Time: 10:30 Meter Serial No.: 272
 E.C. 1000 10071000 pH 7.05 1200 pH 10 920 1000 pH 4 3931400

Temperature °F _____
 SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 1 OF 6

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



PROJECT NO 21775-217.003
 PURGED BY C. Chaco
 SAMPLED BY ↓

SAMPLE ID MW-2 (15')
 CLIENT NAME ARCO # 2035
 LOCATION Albany

TYPE Groundwater Surface Water Leachate Other
 CASING DIAMETER (inches) 2 3 4 5 6 Other

CASING ELEVATION (feet/MSL) VOLUME IN CASING (gal.) 12.35
 DEPTH OF WELL (feet) 28.8 CALCULATED PURGE (gal.) 37.06
 DEPTH OF WATER (feet) 9.89 ACTUAL PURGE VOL. (gal.) 37.5

DATE PURGED 5-18-98 END PURGE 11:36
 DATE SAMPLED ✓ SAMPLING TIME 11:42

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>11:28</u>	<u>12.5</u>	<u>7.15</u>	<u>737.7</u>	<u>70.5</u>	<u>yellow</u>	<u>light</u>
<u>11:32</u>	<u>25.5</u>	<u>7.10</u>	<u>734.6</u>	<u>68.6</u>	<u>"</u>	<u>"</u>
<u>11:36</u>	<u>37.5</u>	<u>7.11</u>	<u>736.8</u>	<u>68.4</u>	<u>"</u>	<u>"</u>

OTHER: D.O = 1.70 ODOR: NONE
 (COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1):

PURGING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Centrifugal Pump Bailer (PVC)
 Submersible Pump Bailer (Stainless Steel)
 Well Wizard™ Dedicated
 Other:

SAMPLING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Bomb Sampler Bailer (Stainless Steel)
 Dipper Submersible Pump
 Well Wizard™ Dedicated
 Other:

WELL INTEGRITY Good LOCK: ARCO

REMARKS:

pH, E.C., Temp. Meter Calibration Date Time Meter Serial No.
 E.C. 1000 1 pH 7 pH 10 1 pH 4 1
 Temperature °F
 SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 2 OF 6

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



OWT

PROJECT NO 21775-217.003
PURGED BY C. Chaco
SAMPLED BY ↓

SAMPLE ID MW-3 (20)
CLIENT NAME ARCO # 2035
LOCATION Albany

TYPE Groundwater Surface Water _____ Leachate _____ Other _____
CASING DIAMETER (inches) 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL) _____ VOLUME IN CASING (gal.) 15.11
DEPTH OF WELL (feet) 33.0 CALCULATED PURGE (gal.) 45.33
DEPTH OF WATER (feet) 9.87 ACTUAL PURGE VOL. (gal.) 46.0

DATE PURGED: 5-18-98 END PURGE 12:14
DATE SAMPLED: ↓ SAMPLING TIME: 12:20

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>12:04</u>	<u>15.0</u>	<u>6.74</u>	<u>656.8</u>	<u>67.0</u>	<u>cloudy</u>	<u>mod</u>
<u>12:09</u>	<u>30.5</u>	<u>6.77</u>	<u>630.7</u>	<u>68.1</u>	<u>"</u>	<u>mod</u>
<u>12:14</u>	<u>46.0</u>	<u>6.80</u>	<u>635.2</u>	<u>67.5</u>	<u>"</u>	<u>light</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: D.O = 1.45 ; ODOR: straw
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Centrifugal Pump Bailer (PVC)
 Submersible Pump Bailer (Stainless Steel)
 Well Wizard™ Dedicated
Other: _____

SAMPLING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Bomb Sampler Bailer (Stainless Steel)
 Dipper Submersible Pump
 Well Wizard™ Dedicated
Other: _____

WELL INTEGRITY: Good LOCK: MCJ

REMARKS: _____

pH, E.C., Temp. Meter Calibration: Date _____ Time: _____ Meter Serial No.: _____
E.C. 1000 _____ pH 7 _____ pH 10 _____ pH 4 _____
Temperature °F _____
SIGNATURE: [Signature] REVIEWED BY: MA PAGE 3 OF 6

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



OWT

PROJECT NO 21775-217.003
 PURGED BY C. Chaco
 SAMPLED BY ↓

SAMPLE ID MW-4 (11')
 CLIENT NAME ARCO # 2035
 LOCATION Albany

TYPE Groundwater Surface Water Leachate Other
 CASING DIAMETER (inches) 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL) _____ VOLUME IN CASING (gal.) : _____
 DEPTH OF WELL (feet) : 25.1 CALCULATED PURGE (gal.) : NA
 DEPTH OF WATER (feet) : 9.26 ACTUAL PURGE VOL. (gal.) : NA

DATE PURGED : 5-18-98 END PURGE : _____
 DATE SAMPLED : ↓ SAMPLING TIME : 13:40

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>13:40</u>	<u>Grab</u>	<u>6.55</u>	<u>288.0</u>	<u>68.7</u>	<u>CR</u>	<u>0</u>

OTHER: DO: 4.20 ODOR: None
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : NR

PURGING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard™ _____ Dedicated
 Other: _____

SAMPLING EQUIPMENT

_____ 2" Bladder Pump Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard™ _____ Dedicated
 Other: _____

WELL INTEGRITY: Good LOCK: ARCO

REMARKS: _____

pH, E.C., Temp. Meter Calibration Date _____ Time _____ Meter Serial No.: _____
 E.C. 1000 / _____ pH 7 / _____ pH 10 / _____ pH 4 / _____
 Temperature °F _____
 SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 4 OF 6

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



OWT

PROJECT NO 21775-217.003
 PURGED BY C. Chapco
 SAMPLED BY [Signature]

SAMPLE ID MW-6 (11)
 CLIENT NAME ARCO # 2035
 LOCATION Albany

TYPE Groundwater Surface Water Leachate Other
 CASING DIAMETER (inches) 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL) VOLUME IN CASING (gal.)
 DEPTH OF WELL (feet) 243 CALCULATED PURGE (gal.)
 DEPTH OF WATER (feet) 12.64 ACTUAL PURGE VOL (gal.)

DATE PURGED: 5-18-98 END PURGE:
 DATE SAMPLED: SAMPLING TIME: 14:05

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>14:05</u>	<u>Grab</u>	<u>6.88</u>	<u>925.4</u>	<u>69.4</u>	<u>CR</u>	<u>0</u>

OTHER: DO, 1.29 ODOR: None
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Centrifugal Pump Bailer (PVC)
 Submersible Pump Bailer (Stainless Steel)
 Well Wizard™ Dedicated
 Other:

SAMPLING EQUIPMENT

2" Bladder Pump Bailer (Teflon)
 Bomb Sampler Bailer (Stainless Steel)
 Dipper Submersible Pump
 Well Wizard™ Dedicated
 Other:

WELL INTEGRITY: Good LOCK: ARCO

REMARKS:

pH, E.C., Temp. Meter Calibration Date: Time: Meter Serial No.:
 E.C. 1000 pH 7 pH 10 pH 4
 Temperature °F
 SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 5 OF 6

WATER SAMPLE FIELD DATA SHEET

Rev 1/97



OWT

PROJECT NO 21775-217.003
 PURGED BY C. Chaco
 SAMPLED BY ↓

SAMPLE ID AW-1 (15)
 CLIENT NAME ARCO # 2035
 LOCATION Albany

TYPE Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches) 2 _____ 3 _____ 4 _____ 4.5 _____ 6 Other _____

CASING ELEVATION (feet/MSL) _____ VOLUME IN CASING (gal.) 24.40
 DEPTH OF WELL (feet) 8 25.5 CALCULATED PURGE (gal.) 73.20
 DEPTH OF WATER (feet) 8.90 ACTUAL PURGE VOL. (gal.) 74.0

DATE PURGED: 5-18-98 END PURGE: 13:14
 DATE SAMPLED: ↓ SAMPLING TIME: 13:20

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>12:53</u>	<u>24</u>	<u>8.03</u>	<u>776.0</u>	<u>70.2</u>	<u>cloudy</u>	<u>light</u>
<u>13:03</u>	<u>49</u>	<u>7.72</u>	<u>849.0</u>	<u>69.2</u>	<u>117</u>	<u>11</u>
<u>13:14</u>	<u>74</u>	<u>7.66</u>	<u>901.0</u>	<u>69.1</u>	<u>11</u>	<u>11</u>

OTHER: D.O. = 1.34 ODOR: NONE
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT

2" Bladder Pump Bailor (Teflon)
 Centrifugal Pump Bailor (PVC)
 Submersible Pump Bailor (Stainless Steel)
 Well Wizard™ Dedicated
 Other: _____

SAMPLING EQUIPMENT

2" Bladder Pump Bailor (Teflon)
 Bomb Sampler Bailor (Stainless Steel)
 Dipper Submersible Pump
 Well Wizard™ Dedicated
 Other: _____

WELL INTEGRITY: Good LOCK: N/A

REMARKS: _____

pH, E.C., Temp Meter Calibration Date _____ Time _____ Meter Serial No.: _____
 E.C. 1000 _____ pH 7 _____ pH 10 _____ pH 4 _____
 Temperature °F _____
 SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 6 OF 6

ARCO Products Company

Division of Atlantic/Richfield Company

Task Order No. **2737-00**

Chain of Custody

ARCO Facility no. 2035	City (Facility) Alhambra	Project manager (Consultant) Alan Vanderveen	Laboratory No. CP
ARCO engineer Paul Scipple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7500	Contract Number
Consultant name EMCON	Address (Consultant) 1400A Highway Way, Walnut Creek, CA		
		Fax no. (Consultant) (408) 437-9576	

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX (USEPA 1631)	PHE (USEPA 1631)	TPH (USEPA 1631)	Oil and Grease (USEPA 1631)	IPH (USEPA 1631)	EPA 8210 (USEPA 8060)	EPA 8210 (USEPA 8060)	EPA 8210 (USEPA 8060)	TCLP Metals (USEPA 8010/7000)	TCLP (USEPA 8010/7000)	Lead (USEPA 7240/7241)	Lead (USEPA 7240/7241)	
			Soil	Water	Other	Ice	Acid															
MM-4(1)	2		X			X		HCL	13:40													
MM-1(1)	2		X			X		HCL	11:05													
MM-2(15)	2		X			X		HCL	11:42													
MM-6(11)	2		X			X		HCL	14:05													
MM-3(20)	4		X			X		HCL	12:10					X								
MM-1(15)	2		X			X		HCL	13:20													

Method of Analysis: **Standard**

Special Details: **None**

Limit/Reporting: **None**

Special QA/QC: **As Normal**

Remarks: **RAT'S**

Lab Number: **H7000-13-01**

Turnaround Time: **5 Business Days**

Priority: **Standard**

Expedited: **None**

Standard: **10 Business Days**

Condition of sample:	Temperature:
Relinquished by sampler [Signature]	Date 5-19-98 Time 08:00
Relinquished by [Signature]	Date 5-19-98 Time 9:38 AM
Relinquished by	Date