Pinnacle
ENVIRONMENTAL SOLUTIONS

a division of EMCON

still high MtBE in all wells.
continue semi ann. monitoring

September 16, 1998
Project 20805-132.006

0, 4

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

Re: Quarterly Groundwater Monitoring Report, First Quarter 1998, for ARCO Service Station No. 6041, located at 7249 Village Parkway, Dublin, California

Dear Mr. Supple:

Pinnacle Environmental Solutions, a division of EMCON (Pinnacle), is submitting the attached report which presents the results of the first quarter 1998 groundwater monitoring program at ARCO Products Company (ARCO) Service Station No. 6041, located at 7249 Village Parkway, Dublin, California. The monitoring program complies with the Alameda County Health Care Services Agency 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,

Pinnacle

Glen VanderVeen
Project Manager

Jay R. Johnson, R.G.
Senior Project Supervisor

Attachment: Quarterly Groundwater Monitoring Report, First Quarter 1998

cc: Eva Chu, ACHCSA

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September 16, 1998

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.:	6041	Address:	7249 Village Parkway, Dublin, California
		Pinnacle Project No.	20805-132.006
		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 /Eva Chu

WORK PERFORMED THIS QUARTER (First - 1998):

1. Prepared and submitted quarterly groundwater monitoring report for fourth quarter 1997.
2. Performed quarterly groundwater monitoring and sampling for first quarter 1998.

WORK PROPOSED FOR NEXT QUARTER (Second - 1998):

1. Prepare and submit quarterly groundwater monitoring report for first quarter 1998.
2. Prepare quarterly status report for second quarter 1998. (Site is sampled semi-annually)

MONITORING:

Current Phase of Project:	Monitoring
Frequency of Groundwater Sampling	Semi-annual (1st/3rd quarter): MW-1, MW-2, MW-3, VW-2
Frequency of Groundwater Monitoring	Semi-annual
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Bulk Soil Removed to Date :	15 cubic yards of TPH impacted soil
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	None
Average Depth to Groundwater:	5.90 feet
Groundwater Gradient (Average):	0.024 ft/ft toward east

ATTACHMENTS:

- Table 1 - Groundwater Monitoring Data, First Quarter 1998
- Table 2 - Historical Groundwater Elevation and Analytical Data (Petroleum Hydrocarbons and Their Constituents)
- Table 3 - Historical Groundwater Elevation Data (UNOCAL, BP and Shell Stations)
- 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

Table 1
Groundwater Monitoring Data
First Quarter 1998

ARCO Service Station 6041
7249 Village Parkway, Dublin, 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
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	02-12-98	336.56	7.05	329.51	ND	E	0.024	02-12-98	210	<0.5	<0.5	<0.5	<0.5	8900	
MW-2	02-12-98	334.80	5.90	328.90	ND	E	0.024	02-12-98	310	54	<0.5	6.2	1.1	3800	
MW-3	02-12-98	335.53	6.68	328.85	ND	E	0.024	02-12-98	110	11	<0.5	<0.5	1.9	10000	
MW-4	02-12-98	334.22	6.35	327.87	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-5	02-12-98	335.87	6.45	329.42	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-6	02-12-98	335.84	3.15	332.69	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
VW-2	02-12-98	NR	6.65	NR	ND	E	0.024	02-12-98	200	19	<0.5	0.6	<0.5	2200	

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
ND: none detected
NR: not reported; data not available or not measurable
E: East
^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference
- - -: not analyzed or not applicable

Pinnacle

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, 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
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	02-15-95	336.56	8.53	328.03	ND	NR	NR	02-15-95	820	15	<1	5.2	1.4	--	--
MW-1	05-24-95	336.56	9.00	327.56	ND	ESE	0.002	05-24-95	640	12	<1	7.3	<1	--	--
MW-1	08-25-95	336.56	10.30	326.26	ND	NW	0.006	08-25-95	780	2	<1	2	2	2500	--
MW-1	11-28-95	336.56	11.01	325.55	ND	N	0.006	11-28-95	570	2.2	<0.5	1.4	0.9	--	--
MW-1	02-26-96	336.56	7.35	329.21	ND	E	0.012	03-13-96	1100	28	<7	13	7	3400	--
MW-1	05-23-96	336.56	8.73	327.83	ND	FG	FG	05-23-96	560	8.5	<1	1.1	<1	3900	--
MW-1	08-23-96	336.56	10.25	326.31	ND	FG	FG	08-23-96	860	<1	<1	<4	2	5600	--
MW-1	03-21-97	336.56	9.35	327.21	ND	SSE	0.005	03-21-97	520	12	<0.5	2.7	1.5	6200	--
MW-1	08-20-97	336.56	10.75	325.81	ND	SSW	0.001	08-20-97	<5000^	<50^	<50^	<50^	<50^	7400	--
MW-1	11-21-97	336.56	11.10	325.46	ND	SSW	0.002	11-21-97	<5000^	<50^	<50^	<50^	<50^	8500	--
MW-1	02-12-98	336.56	7.05	329.51	ND	E	0.024	02-12-98	210	<0.5	<0.5	<0.5	<0.5	8900	
MW-2	02-15-95	334.80	6.75	328.05	ND	NR	NR	02-15-95	730	110	1.7	25	66	--	--
MW-2	05-24-95	334.80	6.88	327.92	ND	ESE	0.002	05-24-95	370	110	<1	17	1.9	--	--
MW-2	08-25-95	334.80	7.91	326.89	ND	NW	0.006	08-25-95	150	6	<1	<1	<1	2700	--
MW-2	11-28-95	334.80	9.06	325.74	ND	N	0.006	11-28-95	<50	<0.5	<0.5	<0.5	0.8	--	--
MW-2	02-26-96	334.80	6.65	328.15	ND	E	0.012	03-13-96	350	66	<0.5	11	1.7	<3	--
MW-2	05-23-96	334.80	6.90	327.90	ND	FG	FG	05-23-96	540	140	<2.5	13	<2.5	4600	--
MW-2	08-23-96	334.80	8.45	326.35	ND	FG	FG	08-23-96	180	0.8	2	0.7	2.6	4000	--
MW-2	03-21-97	334.80	7.28	327.52	ND	SSE	0.005	03-21-97	410	90	<1^	14	4	3800	--
MW-2	08-20-97	334.80	8.87	325.93	ND	SSW	0.001	08-20-97	<5000^	<50^	<50^	<50^	<50^	3100	--
MW-2	11-21-97	334.80	9.28	325.52	ND	SSW	0.002	11-21-97	<2000^	<20^	<20^	<20^	<20^	2600	--
MW-2	02-12-98	334.80	5.90	328.90	ND	E	0.024	02-12-98	310	54	<0.5	6.2	1.1	3800	

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, 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
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-3	02-15-95	335.53	8.55	326.98	ND	NR	NR	02-15-95	100	14	<0.5	6.3	<0.5	- -	- -
MW-3	05-24-95	335.53	8.17	327.36	ND	ESE	0.002	05-24-95	110	8	<0.5	2.7	<0.5	- -	- -
MW-3	08-25-95	335.53	9.27	326.26	ND	NW	0.006	08-25-95	210	3.6	<0.5	2.9	0.6	20000	- -
MW-3	11-28-95	335.53	9.91	325.62	ND	N	0.006	11-28-95	81	1.5	<0.5	1.4	<0.5	- -	15000
MW-3	02-26-96	335.53	8.42	327.11	ND	E	0.012	03-13-96	16000	1600	1200	300	2000	9500	- -
MW-3	05-23-96	335.53	7.70	327.83	ND	FG	FG	05-23-96	6500	690	<10	120	14	8600	- -
MW-3	08-23-96	335.53	9.25	326.28	ND	FG	FG	08-23-96	1700	85	2.1	61	5.3	11000	- -
MW-3	03-21-97	335.53	8.72	326.81	ND	SSE	0.005	03-21-97	100	2	<1^	1	<1^	6600	- -
MW-3	08-20-97	335.53	9.73	325.80	ND	SSW	0.001	08-20-97	<5000^	<50^	<50^	<50^	<50^	7700	- -
MW-3	11-21-97	335.53	10.10	325.43	ND	SSW	0.002	11-21-97	<5000^	<50^	<50^	<50^	<50^	9700	- -
MW-3	02-12-98	335.53	6.68	328.85	ND	E	0.024	02-12-98	110	11	<0.5	<0.5	1.9	10000	
MW-4	02-15-95	334.22	7.85	326.37	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	- -	- -
MW-4	05-24-95	334.22	6.68	327.54	ND	ESE	0.002	05-24-95	Not sampled: well sampled semi-annually, during the first and third quarters						
MW-4	08-25-95	334.22	6.93	327.29	ND	NW	0.006	08-25-95	<50	<0.5	<0.5	<0.5	<0.5	<3	- -
MW-4	11-28-95	334.22	8.21	326.01	ND	N	0.006	11-28-95	Not sampled: well sampled semi-annually, during the first and third quarters						
MW-4	02-26-96	334.22	6.65	327.57	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -
MW-4	05-23-96	334.22	6.47	327.75	ND	FG	FG	05-23-96	Not sampled; well sampled semi-annually, during the first and third quarters						
MW-4	08-23-96	334.22	7.66	326.56	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-4	03-21-97	334.22	6.84	327.38	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-4	08-20-97	334.22	8.32	325.90	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-4	11-21-97	334.22	8.65	325.57	ND	SSW	0.002	11-21-97	Not sampled; well not part of sampling program						
MW-4	02-12-98	334.22	6.35	327.87	ND	E	0.024	02-12-98	Not sampled; well not part of sampling program						

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1995 - Present*

ARCO Service Station 6041
7249 Village Parkway, Dublin, 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
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-5	02-15-95	335.87	7.80	328.07	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-5	05-24-95	335.87	8.10	327.77	ND	ESE	0.002	05-24-95	Not sampled: well sampled annually, during the first quarter						
MW-5	08-25-95	335.87	9.43	326.44	ND	NW	0.006	08-25-95	Not sampled: well sampled annually, during the first quarter						
MW-5	11-28-95	335.87	10.12	325.75	ND	N	0.006	11-28-95	Not sampled: well sampled annually, during the first quarter						
MW-5	02-26-96	335.87	6.73	329.14	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-5	05-23-96	335.87	7.87	328.00	ND	FG	FG	05-23-96	Not sampled: well sampled annually, during the first quarter						
MW-5	08-23-96	335.87	9.46	326.41	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-5	03-21-97	335.87	8.23	327.64	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-5	08-20-97	335.87	9.92	325.95	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-5	11-21-97	335.87	10.18	325.69	ND	SSW	0.002	11-21-97	Not sampled: well not part of sampling program						
MW-5	02-12-98	335.87	6.45	329.42	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-6	02-15-95	335.84	7.81	328.03	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-6	05-24-95	335.84	8.35	327.49	ND	ESE	0.002	05-24-95	Not sampled: well sampled annually, during the first quarter						
MW-6	08-25-95	335.84	9.71	326.13	ND	NW	0.006	08-25-95	Not sampled: well sampled annually, during the first quarter						
MW-6	11-28-95	335.84	10.28	325.56	ND	N	0.006	11-28-95	Not sampled: well sampled annually, during the first quarter						
MW-6	02-26-96	335.84	6.60	329.24	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-6	05-23-96	335.84	8.05	327.79	ND	FG	FG	05-23-96	Not sampled: well sampled annually, during the first quarter						
MW-6	08-23-96	335.84	9.58	326.26	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-6	03-21-97	335.84	8.39	327.45	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-6	08-20-97	335.84	9.98	325.86	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-6	11-21-97	335.84	10.31	325.53	ND	SSW	0.002	11-21-97	Not sampled: well not part of sampling program						
MW-6	02-12-98	335.84	3.15	332.69	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

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
VW-2	03-21-97	NR	8.22	NR	ND	SSE	0.005	03-21-97	150	8.9	<0.5	<0.5	0.6	270	--
VW-2	08-20-97	NR	9.16	NR	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
VW-2	11-21-97	NR	8.27	NR	ND	SSW	0.002	11-21-97	<200^	3	<2^	<2^	<2^	180	--
VW-2	02-12-98	NR	6.65	NR	ND	E	0.024	02-12-98	200	19	<0.5	0.6	<0.5	2200	

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
ND: none detected
NR: not reported; data not available or not measurable
E: East
^: 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, ARCO Service Station 6041, Dublin, California,* (EMCON, February 26, 1996).

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
BP Station 1116					
MW-1	02-11-94	335.17	8.72	326.45	
MW-1	10-04-94	335.17	9.66	325.51	
MW-1	11-18-94	335.17	Not surveyed		
MW-1	02-15-95	335.17	6.56	328.61	
MW-1	05-24-95	335.17	6.80	328.37	
MW-1	08-25-95	335.17	8.61	326.56	
MW-1	11-28-95	335.17	9.54	325.63	
MW-1	02-26-96	335.17	Not surveyed		
MW-1	05-23-96	335.17	7.13	328.04	
MW-1	08-23-96	335.17	6.71	328.46	
MW-1	12-02-96	335.17	8.58	326.59	
MW-1	03-21-97	335.17	Not surveyed		
MW-1	08-22-97	335.17	8.80	326.37	
MW-1	11-21-97	335.17	Not surveyed		
MW-1	02-12-98	335.17	4.40	330.77	
MW-2	02-11-94	334.58	8.10	326.48	
MW-2	10-04-94	334.58	9.27	325.31	
MW-2	11-18-94	334.58	Not surveyed		
MW-2	02-15-95	334.58	5.97	328.61	
MW-2	05-24-95	334.58	6.50	328.08	
MW-2	08-25-95	334.58	8.30	326.28	
MW-2	11-28-95	334.58	9.05	325.53	
MW-2	02-26-96	334.58	Not surveyed		
MW-2	05-23-96	334.58	6.95	327.63	
MW-2	08-23-96	334.58	6.53	328.05	
MW-2	12-02-96	334.58	8.40	326.18	
MW-2	03-21-97	334.58	Not surveyed		
MW-2	08-22-97	334.58	8.55	326.03	
MW-2	11-21-97	334.58	Not surveyed		
MW-2	02-12-98	334.58	4.10	330.48	

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-3	02-11-94	335.13	8.60	326.53	
MW-3	10-04-94	335.13	9.81	325.32	
MW-3	11-18-94	335.13	Not surveyed		
MW-3	02-15-95	335.13	6.61	328.52	
MW-3	05-24-95	335.13	6.83	328.30	
MW-3	08-25-95	335.13	8.84	326.29	
MW-3	11-28-95	335.13	8.57	326.56	
MW-3	02-26-96	335.13	Not surveyed		
MW-3	05-23-96	335.13	7.26	327.87	
MW-3	08-23-96	335.13	6.84	328.29	
MW-3	12-02-96	335.13	8.61	326.52	
MW-3	03-21-97	335.13	Not surveyed		
MW-3	08-22-97	335.13	8.97	326.16	
MW-3	11-21-97	335.13	Not surveyed		
MW-3	02-12-98	335.13	4.22	330.91	
AW-4	02-11-94	333.41	6.84	326.57	
AW-4	10-04-94	333.41	8.04	325.37	
AW-4	11-18-94	333.41	6.80	326.61	
AW-4	02-15-95	333.41	4.91	328.50	
AW-4	05-24-95	333.41	5.32	328.09	
AW-4	08-25-95	333.41	7.22	326.19	
AW-4	11-28-95	333.41	7.81	325.60	
AW-4	02-26-96	333.41	Not surveyed		
AW-4	05-23-96	333.41	5.17	328.24	
AW-4	08-23-96	333.41	4.73	328.68	
AW-4	12-02-96	333.41	6.43	326.98	
AW-4	03-21-97	333.41	Not surveyed		
AW-4	08-22-97	333.41	Not surveyed		
AW-4	11-21-97	333.41	Not surveyed		
AW-4	02-12-98	333.41	3.99	329.42	

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
AW-5	02-11-94	334.81	8.20	326.61	
AW-5	10-04-94	334.81	8.70	326.11	
AW-5	11-18-94	334.81	8.20	326.61	
AW-5	02-15-95	334.81	6.65	328.16	
AW-5	05-24-95	334.81	7.27	327.54	
AW-5	08-25-95	334.81	8.52	326.29	
AW-5	11-28-95	334.81	9.32	325.49	
AW-5	02-26-96	334.81	7.13	327.68	
AW-5	05-23-96	334.81	8.58	326.23	
AW-5	08-23-96	334.81	8.18	326.63	
AW-5	12-02-96	334.81	7.90	326.91	
AW-5	03-21-97	334.81	Not surveyed		
AW-5	08-22-97	334.81	10.27	324.54	
AW-5	11-21-97	334.81	Not surveyed		
AW-5	02-12-98	334.81	7.57	327.24	
AW-6	02-11-94	334.90	8.04	326.86	
AW-6	10-04-94	334.90	9.33	325.57	
AW-6	11-18-94	334.90	7.17	327.73	
AW-6	02-15-95	334.90	6.19	328.71	
AW-6	05-24-95	334.90	6.87	328.03	
AW-6	08-25-95	334.90	8.29	326.61	
AW-6	11-28-95	334.90	9.20	325.70	
AW-6	02-26-96	334.90	5.78	329.12	
AW-6	05-23-96	334.90	6.94	327.96	
AW-6	08-23-96	334.90	6.50	328.40	
AW-6	12-02-96	334.90	8.46	326.44	
AW-6	03-21-97	334.90	Not surveyed		
AW-6	08-22-97	334.90	8.58	326.32	
AW-6	11-21-97	334.90	Not surveyed		
AW-6	02-12-98	334.90	5.07	329.83	

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
Former Shell Station					
MW-1	02-11-94	334.83	8.62	326.21	
MW-1	08-25-94	334.83	9.24	325.59	
MW-1	11-23-94	334.83	8.74	326.09	
MW-1	02-15-95	334.83	6.84	327.99	
MW-1	05-24-95	334.83	7.91	326.92	
MW-1	08-25-95	334.83	8.11	326.72	
MW-1	11-28-95	334.83	Not surveyed: not scheduled for monitoring		
MW-1	02-26-96	334.83	5.60	329.23	
MW-1	05-23-96	334.83	Not surveyed: not scheduled for monitoring		
MW-1	08-23-96	334.83	8.23	326.60	
MW-1	11-22-96	334.83	Not surveyed: not scheduled for monitoring		
MW-1	03-21-97	334.83	Not surveyed: not scheduled for monitoring		
MW-1	11-21-97	334.83	Not surveyed: not scheduled for monitoring		
MW-1	02-12-98	334.83	Not surveyed: not scheduled for monitoring		
MW-2	02-11-94	336.96	11.04	325.92	
MW-2	08-25-94	336.96	11.29	325.67	
MW-2	11-23-94	336.96	10.92	326.04	
MW-2	02-15-95	336.96	8.90	328.06	
MW-2	05-24-95	336.96	10.02	326.94	
MW-2	08-25-95	336.96	10.24	326.72	
MW-2	11-28-95	336.96	Not surveyed: not scheduled for monitoring		
MW-2	02-26-96	336.96	7.54	329.42	
MW-2	05-23-96	336.96	Not surveyed: not scheduled for monitoring		
MW-2	08-23-96	336.96	10.29	326.67	
MW-2	11-22-96	336.96	Not surveyed: not scheduled for monitoring		
MW-2	03-21-97	336.96	Not surveyed: not scheduled for monitoring		
MW-2	11-21-97	336.96	Not surveyed: not scheduled for monitoring		
MW-2	02-12-98	336.96	Not surveyed: not scheduled for monitoring		

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-3	02-11-94	336.93	10.68	326.25	
MW-3	08-25-94	336.93	11.30	325.63	
MW-3	11-23-94	336.93	10.48	326.45	
MW-3	02-15-95	336.93	8.35	328.58	
MW-3	05-24-95	336.93	9.67	327.26	
MW-3	08-25-95	336.93	9.36	327.57	
MW-3	11-28-95	336.93	Not surveyed: not scheduled for monitoring		
MW-3	02-26-96	336.93	7.04	329.89	
MW-3	05-23-96	336.93	Not surveyed: not scheduled for monitoring		
MW-3	08-23-96	336.93	10.00	326.93	
MW-3	11-22-96	336.93	Not surveyed: not scheduled for monitoring		
MW-3	03-21-97	336.93	Not surveyed: not scheduled for monitoring		
MW-3	11-21-97	336.93	Not surveyed: not scheduled for monitoring		
MW-3	02-12-98	336.96	Not surveyed: not scheduled for monitoring		
MW-4	02-11-94	337.14	10.71	326.43	
MW-4	08-25-94	337.14	10.84	326.30	
MW-4	11-23-94	337.14	10.78	326.36	
MW-4	02-15-95	337.14	9.49	327.65	
MW-4	05-24-95	337.14	10.73	326.41	
MW-4	08-25-95	337.14	10.22	326.92	
MW-4	11-28-95	337.14	Not surveyed: not scheduled for monitoring		
MW-4	02-26-96	337.14	7.52	329.62	
MW-4	05-23-96	337.14	Not surveyed: not scheduled for monitoring		
MW-4	08-23-96	337.14	9.84	327.30	
MW-4	11-22-96	337.14	Not surveyed: not scheduled for monitoring		
MW-4	03-21-97	337.14	Not surveyed: not scheduled for monitoring		
MW-4	11-21-97	337.14	Not surveyed: not scheduled for monitoring		
MW-4	02-12-98	336.96	Not surveyed: not scheduled for monitoring		

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-5	02-11-94	334.96	8.97	325.99	
MW-5	08-25-94	334.96	9.19	325.77	
MW-5	11-23-94	334.96	8.78	326.18	
MW-5	02-15-95	334.96	6.88	328.08	
MW-5	05-24-95	334.96	8.04	326.92	
MW-5	08-25-95	334.96	8.34	326.62	
MW-5	11-28-95	334.96	Not surveyed: not scheduled for monitoring		
MW-5	02-26-96	334.96	Not surveyed: not scheduled for monitoring		
MW-5	05-23-96	334.96	Not surveyed: not scheduled for monitoring		
MW-5	08-23-96	334.96	Not surveyed: not scheduled for monitoring		
MW-5	11-22-96	334.96	Not surveyed: not scheduled for monitoring		
MW-5	03-21-97	334.96	Not surveyed: not scheduled for monitoring		
MW-5	11-21-97	334.96	Not surveyed: not scheduled for monitoring		
MW-5	02-12-98	336.96	Not surveyed: not scheduled for monitoring		
MW-6	02-11-94	335.42	9.02	326.40	
MW-6	08-25-94	335.42	9.79	325.63	
MW-6	11-23-94	335.42	9.20	326.22	
MW-6	02-15-95	335.42	7.36	328.06	
MW-6	05-24-95	335.42	8.80	326.62	
MW-6	08-25-95	335.42	8.50	326.92	
MW-6	11-28-95	335.42	Not surveyed: not scheduled for monitoring		
MW-6	02-26-96	335.42	5.94	329.48	
MW-6	05-23-96	335.42	Not surveyed: not scheduled for monitoring		
MW-6	08-23-96	335.42	8.88	326.54	
MW-6	11-22-96	335.42	Not surveyed: not scheduled for monitoring		
MW-6	03-21-97	335.42	Not surveyed: not scheduled for monitoring		
MW-6	11-21-97	335.42	Not surveyed: not scheduled for monitoring		
MW-6	02-12-98	336.96	Not surveyed: not scheduled for monitoring		

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-7	02-11-94	333.23	6.12	327.11	
MW-7	08-25-94	333.23	6.76	326.47	
MW-7	11-23-94	333.23	6.75	326.48	
MW-7	02-15-95	333.23	5.40	327.83	
MW-7	05-24-95	333.23	6.82	326.41	
MW-7	08-25-95	333.23	6.46	326.77	
MW-7	11-28-95	333.23			Not surveyed: not scheduled for monitoring
MW-7	02-26-96	333.23			Not surveyed: not scheduled for monitoring
MW-7	05-23-96	333.23			Not surveyed: not scheduled for monitoring
MW-7	08-23-96	333.23			Not surveyed: not scheduled for monitoring
MW-7	11-22-96	333.23			Not surveyed: not scheduled for monitoring
MW-7	03-21-97	333.23			Not surveyed: not scheduled for monitoring
MW-7	11-21-97	333.23			Not surveyed: not scheduled for monitoring
MW-7	02-12-98	336.96			Not surveyed: not scheduled for monitoring
MW-8	02-11-94	335.80	8.80	327.00	
MW-8	08-25-94	335.80	9.52	326.28	
MW-8	11-23-94	335.80	9.08	326.72	
MW-8	02-15-95	335.80	6.67	329.13	
MW-8	05-24-95	335.80	7.56	328.24	
MW-8	08-25-95	335.80	8.60	327.20	
MW-8	11-28-95	335.80			Not surveyed: not scheduled for monitoring
MW-8	02-26-96	335.80			Not surveyed: not scheduled for monitoring
MW-8	05-23-96	335.80			Not surveyed: not scheduled for monitoring
MW-8	08-23-96	335.80			Not surveyed: not scheduled for monitoring
MW-8	11-22-96	335.80			Not surveyed: not scheduled for monitoring
MW-8	03-21-97	335.80			Not surveyed: not scheduled for monitoring
MW-8	11-21-97	335.80			Not surveyed: not scheduled for monitoring
MW-8	02-12-98	336.96			Not surveyed: not scheduled for monitoring

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-9	02-11-94	334.57	8.88	325.69	
MW-9	08-25-94	334.57	8.79	325.78	
MW-9	11-23-94	334.57	8.65	325.92	
MW-9	02-15-95	334.57	7.36	327.21	
MW-9	05-24-95	334.57	7.75	326.82	
MW-9	08-25-95	334.57	7.90	326.67	
MW-9	11-28-95	334.57			Not surveyed: not scheduled for monitoring
MW-9	02-26-96	334.57			Not surveyed: not scheduled for monitoring
MW-9	05-23-96	334.57			Not surveyed: not scheduled for monitoring
MW-9	08-23-96	334.57			Not surveyed: not scheduled for monitoring
MW-9	11-22-96	334.57			Not surveyed: not scheduled for monitoring
MW-9	03-21-97	334.57			Not surveyed: not scheduled for monitoring
MW-9	11-21-97	334.57			Not surveyed: not scheduled for monitoring
MW-9	02-12-98	336.96			Not surveyed: not scheduled for monitoring
MW-11	02-11-94	334.20	8.21	325.99	
MW-11	08-25-94	334.20	8.68	325.52	
MW-11	11-23-94	334.20	8.27	325.93	
MW-11	02-15-95	334.20	6.46	327.74	
MW-11	05-24-95	334.20	7.69	326.51	
MW-11	08-25-95	334.20	7.70	326.50	
MW-11	11-28-95	334.20			Not surveyed: not scheduled for monitoring
MW-11	02-26-96	334.20			Not surveyed: not scheduled for monitoring
MW-11	05-23-96	334.20			Not surveyed: not scheduled for monitoring
MW-11	08-23-96	334.20			Not surveyed: not scheduled for monitoring
MW-11	11-22-96	334.20			Not surveyed: not scheduled for monitoring
MW-11	03-21-97	334.20			Not surveyed: not scheduled for monitoring
MW-11	02-12-98	336.96			Not surveyed: not scheduled for monitoring
MW-12	02-11-94	332.53	7.18	325.35	
MW-12	08-25-94	332.53	7.24	325.29	
MW-12	11-23-94	332.53	7.16	325.37	
MW-12	02-15-95	332.53	5.16	327.37	
MW-12	05-24-95	332.53	6.95	325.58	
MW-12	08-25-95	332.53	5.63	326.90	
MW-12	11-28-95	332.53			Not surveyed: not scheduled for monitoring
MW-12	02-26-96	332.53			Not surveyed: not scheduled for monitoring
MW-12	05-23-96	332.53			Not surveyed: not scheduled for monitoring
MW-12	08-23-96	332.53			Not surveyed: not scheduled for monitoring
MW-12	11-22-96	332.53			Not surveyed: not scheduled for monitoring
MW-12	03-21-97	332.53			Not surveyed: not scheduled for monitoring
MW-12	11-21-97	332.53			Not surveyed: not scheduled for monitoring
MW-12	02-12-98	336.96			Not surveyed: not scheduled for monitoring

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-13	02-11-94	335.64	9.12	326.52	
MW-13	08-25-94	335.64	9.32	326.32	
MW-13	11-23-94	335.64	9.37	326.27	
MW-13	02-15-95	335.64	8.42	327.22	
MW-13	05-24-95	335.64	9.90	325.74	
MW-13	08-25-95	335.64	8.32	327.32	
MW-13	11-28-95	335.64			Not surveyed: not scheduled for monitoring
MW-13	02-26-96	335.64	5.76	329.88	
MW-13	05-23-96	335.64			Not surveyed: not scheduled for monitoring
MW-13	08-23-96	335.64	8.66	326.98	
MW-13	11-22-96	335.64			Not surveyed: not scheduled for monitoring
MW-13	03-21-97	335.64			Not surveyed: not scheduled for monitoring
MW-13	11-21-97	335.64			Not surveyed: not scheduled for monitoring
MW-13	02-12-98	335.64			Not surveyed: not scheduled for monitoring
RW-1	08-25-94	336.19	10.56	325.63	
RW-1	11-23-94	336.19	10.07	326.12	
RW-1	02-15-95	336.19	8.20	327.99	
RW-1	05-24-95	336.19	9.66	326.53	
RW-1	08-25-95	336.19	9.37	326.82	
RW-1	11-28-95	336.19			Not surveyed: not scheduled for monitoring
RW-1	02-26-96	336.19			Not surveyed: not scheduled for monitoring
RW-1	05-23-96	336.19			Not surveyed: not scheduled for monitoring
RW-1	08-23-96	336.19			Not surveyed: not scheduled for monitoring
RW-1	11-22-96	336.19			Not surveyed: not scheduled for monitoring
RW-1	03-21-97	336.19			Not surveyed: not scheduled for monitoring
RW-1	11-21-97	336.19			Not surveyed: not scheduled for monitoring
RW-1	02-12-98	336.96			Not surveyed: not scheduled for monitoring

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
UNOCAL Station					
MW-1	02-11-94	336.07	9.72	326.35	
MW-1	05-17-94	336.07	9.26	326.81	
MW-1	08-25-94	336.07	10.58	325.49	
MW-1	11-18-94	336.07	9.69	326.38	
MW-1	02-17-95	336.07	7.80	328.27	
MW-1	05-24-95	336.07	8.98	327.09	
MW-1	08-25-95	336.07	9.68	326.39	
MW-1	11-28-95	336.07	10.45	325.62	
MW-1	02-26-96	336.07	6.45	329.62	
MW-1	05-23-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	08-23-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	11-22-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	02-12-97	336.07	Not surveyed: not scheduled for monitoring		
MW-1	11-21-97	336.07	Not surveyed: Site closed, well destroyed		
MW-2	02-11-94	336.78	9.85	326.93	
MW-2	05-17-94	336.78	9.31	327.47	
MW-2	08-25-94	336.78	10.75	326.03	
MW-2	11-18-94	336.78	9.95	326.83	
MW-2	02-17-95	336.78	7.58	329.20	
MW-2	05-24-95	336.78	8.33	328.45	
MW-2	08-25-95	336.78	9.76	327.02	
MW-2	11-28-95	336.78	10.65	326.13	
MW-2	02-26-96	336.78	6.39	330.39	
MW-2	05-23-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	08-23-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	11-22-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	02-12-97	336.78	Not surveyed: not scheduled for monitoring		
MW-2	11-21-97	336.78	Not surveyed: Site closed, well destroyed		

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

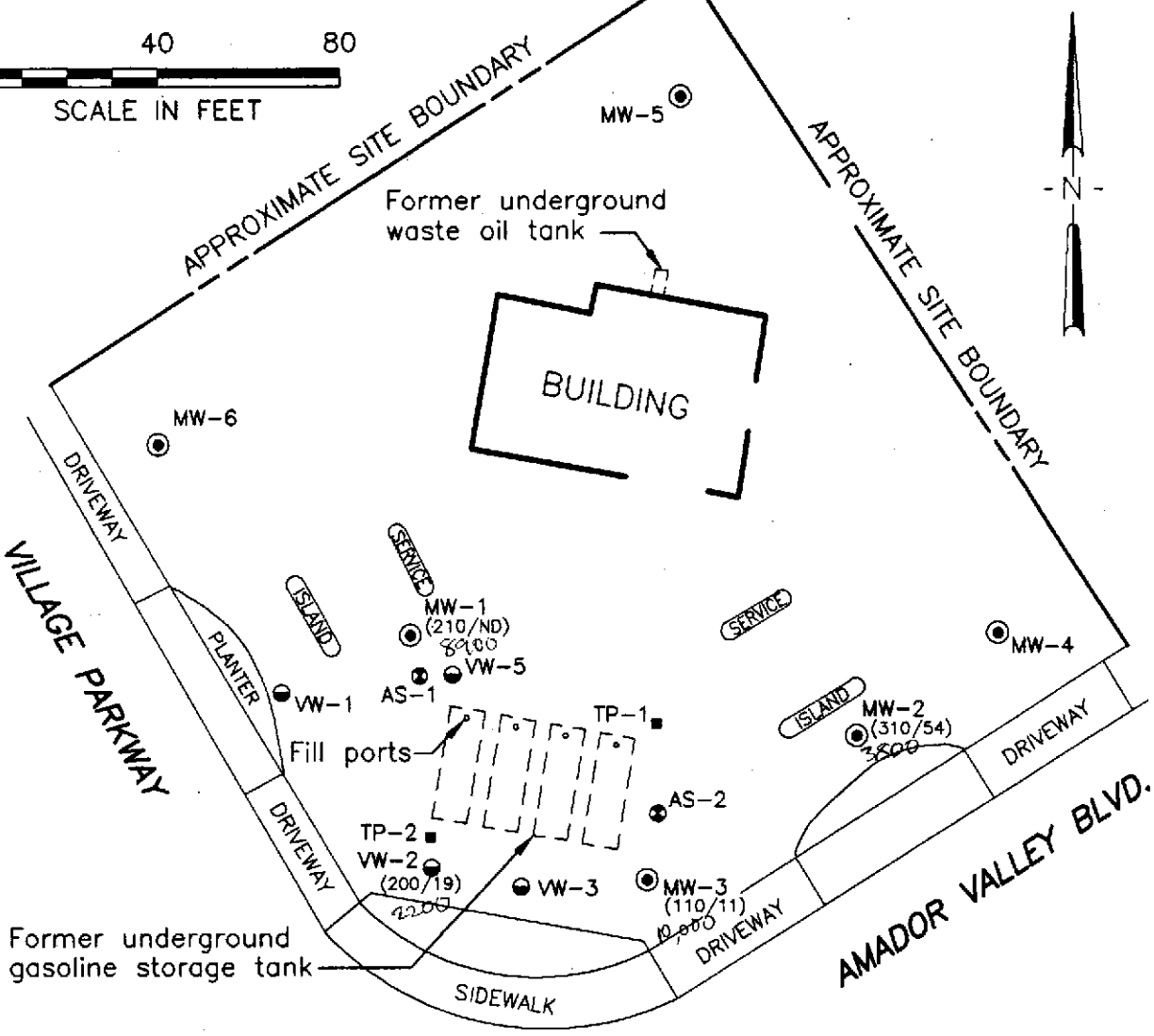
Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-3	02-11-94	336.98	10.01	326.97	
MW-3	05-17-94	336.98	9.49	327.49	
MW-3	08-25-94	336.98	10.93	326.05	
MW-3	11-18-94	336.98	10.15	326.83	
MW-3	02-17-95	336.98	7.62	329.36	
MW-3	05-24-95	336.98	8.26	328.72	
MW-3	08-25-95	336.98	10.03	326.95	
MW-3	11-28-95	336.98	10.85	326.13	
MW-3	02-26-96	336.98	6.39	330.59	
MW-3	05-23-96	336.98			Not surveyed: not scheduled for monitoring
MW-3	08-23-96	336.98			Not surveyed: not scheduled for monitoring
MW-3	11-22-96	336.98			Not surveyed: not scheduled for monitoring
MW-3	02-12-97	336.98			Not surveyed: not scheduled for monitoring
MW-3	11-21-97	336.98			Not surveyed: Site closed, well destroyed
MW-4	02-11-94	336.43	10.10	326.33	
MW-4	05-17-94	336.43	9.63	326.80	
MW-4	08-25-94	336.43	10.94	325.49	
MW-4	11-18-94	336.43	10.10	326.33	
MW-4	02-17-95	336.43	8.12	328.31	
MW-4	05-24-95	336.43	8.68	327.75	
MW-4	08-25-95	336.43	10.08	326.35	
MW-4	11-28-95	336.43	10.81	325.62	
MW-4	02-26-96	336.43	6.75	329.68	
MW-4	05-23-96	336.43			Not surveyed: not scheduled for monitoring
MW-4	08-23-96	336.43			Not surveyed: not scheduled for monitoring
MW-4	11-22-96	336.43			Not surveyed: not scheduled for monitoring
MW-4	02-12-97	336.43			Not surveyed: not scheduled for monitoring
MW-4	11-21-97	336.43			Not surveyed: Site closed, well destroyed

Table 3
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-5	02-11-94	335.96	10.08	325.88	
MW-5	05-17-94	335.96	9.24	326.72	
MW-5	08-25-94	335.96	10.43	325.53	
MW-5	11-18-94	335.96	10.09	325.87	
MW-5	02-17-95	335.96	7.76	328.20	
MW-5	05-24-95	335.96	7.98	327.98	
MW-5	08-25-95	335.96	9.57	326.39	
MW-5	11-28-95	335.96	10.33	325.63	
MW-5	02-26-96	335.96	7.15	328.81	
MW-5	05-23-96	335.96	8.65	327.31	
MW-5	08-23-96	335.96	10.02	325.94	
MW-5	11-22-96	335.96	10.16	325.80	
MW-5	02-12-97	335.96	7.18	328.78	
MW-5	11-21-97	335.96	Not surveyed: Site closed, well destroyed		

TOC: top of casing
ft-MSL: elevation in feet, relative to mean sea level



EXPLANATION

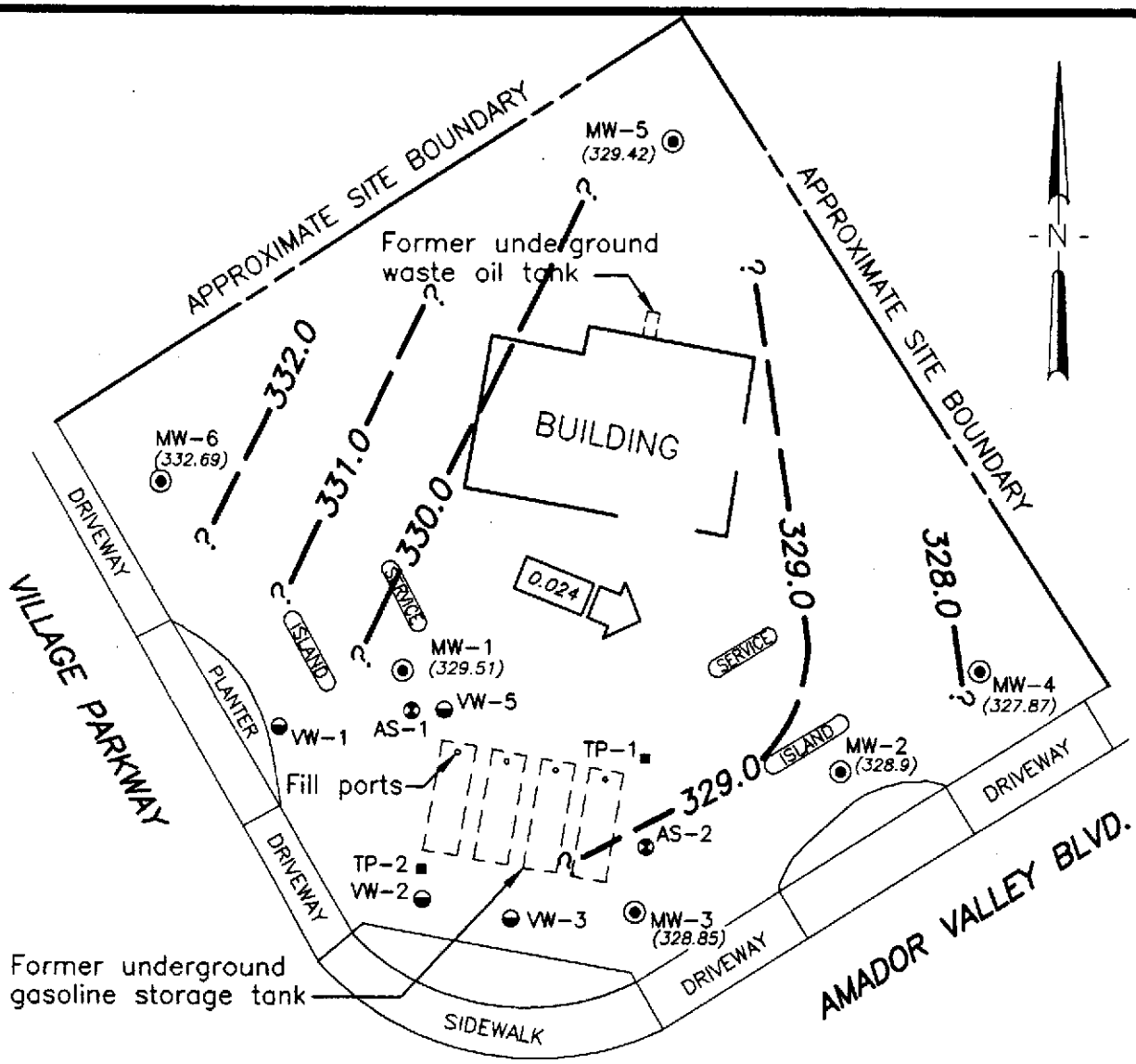
- ◉ Groundwater monitoring well
- ■ Tank pit observation well
- ◒ Vapor extraction well
- ◓ Air sparge well
- (310/54) Concentration of total petroleum hydrocarbons, as gasoline (TPHG) and benzene in groundwater (ug/L); samples were collected on 2/12/98
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)
- < Method reporting limit raised due to high analyte concentration requiring sample dilution or matrix interference

10000 ppb MtBE

Pinnacle
ENVIRONMENTAL SOLUTIONS
A DIVISION OF EMCON

DATE JULY 1998
DWN KLT
APP
REV
PROJECT NO.
805-132.005

FIGURE 1
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PKWY
DUBLIN, CALIFORNIA
GROUNDWATER ANALYTICAL SUMMARY
FIRST QUARTER 1998



EXPLANATION

- Groundwater monitoring well
- Tank pit observation well
- Vapor extraction well
- Air sparge well
- (329.51) Groundwater elevation (Ft.–MSL); measured 2/12/98
- Approx. direction of groundwater flow showing gradient
- Groundwater elevation contour (Ft.–MSL)

0 40 80

SCALE IN FEET

Pinnacle

ENVIRONMENTAL SOLUTIONS
A DIVISION OF EMCON

DATE JULY 1998
DWN KLT
APP
REV
PROJECT NO.
805-132.005

FIGURE 2
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PKWY
DUBLIN, CALIFORNIA
GROUNDWATER ELEVATION CONTOURS
FIRST QUARTER 1998

<No Images>
<No Xrefs>
SANJOSE/CADD: N:\PINACL\6041GWC.DWG Wed, 22/Jul/98 01:12pm ktroyer

1" 1/2" 0" 1"

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)

MONITORING WELL PURGING PROTOCOL

OWT

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:

$P = \pi r^2 \times 7.48 \times 3$

where:

P = calculated purge volume (gallons)

$\pi = 3.14$

r = radius of well casing in feet

h = height of water column in feet

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.

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

NO

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:

pH = ± 0.1 pH units

COND. = ± 10 %

TEMP. = ± 1.0 °F

YES

WELL PURGING CRITERIA MET; PROCEED TO WELL SAMPLING.

NO

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

YES

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

YES

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

NO

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

____ 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: _____ 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 _____

EMCON

WATER SAMPLE FIELD DATA SHEET

FIGURE A-2

OWT

EMCON - SACRAMENTO
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

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 Istructions:

EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE
A-3

APPENDIX B

CERTIFIED ANALYTICAL REPORTS, AND CHAIN-OF-CUSTODY DOCUMENTATION

Columbia Analytical Services, Inc.

February 27, 1998 Service Request No.: S9800308

Gary Messerotes
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 20805-132.003/TO#21133.00/6041 DUBLIN

Dear Mr. Messerotes:

The following pages contain analytical results for sample(s) received by the laboratory on February 13, 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 13, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

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

Sincerely,

Steven L. Green
Project Chemist

Bernadette T. Cox for
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)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	2/12/98
Sample Matrix:	Water	**Date Received:**	2/13/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	VW-2(9)	Units:	ug/L (ppb)
Lab Code:	S9800308-001	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/22/98	200	
Benzene	EPA 5030	8020	0.5	1	NA	2/22/98	19	
Toluene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/22/98	0.6	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	40	NA	2/18/98	2200	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	2/12/98
Sample Matrix:	Water	**Date Received:**	2/13/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-2(14)	Units:	ug/L (ppb)
Lab Code:	S9800308-002	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/22/98	310	
Benzene	EPA 5030	8020	0.5	1	NA	2/22/98	54	
Toluene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/22/98	6.2	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/22/98	1.1	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	100	NA	2/17/98	3800	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	2/12/98
Sample Matrix:	Water	**Date Received:**	2/13/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-1(17)	Units:	ug/L (ppb)
Lab Code:	S9800308-003	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/22/98	210	
Benzene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	200	NA	2/17/98	8900	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	2/12/98
Sample Matrix:	Water	**Date Received:**	2/13/98

BTEX, MTBE and TPH as Gasoline

Sample Name:	MW-3(4)	Units:	ug/L (ppb)
Lab Code:	S9800308-004	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/22/98	110	
Benzene	EPA 5030	8020	0.5	1	NA	2/22/98	11	
Toluene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/22/98	1.9	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	200	NA	2/17/98	10000	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S980217-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/17/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	2/17/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	2/17/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/17/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/17/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	2/17/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S980218-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/18/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	2/18/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	2/18/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/18/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/18/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	2/18/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

BTEX, MTBE and TPH as Gasoline

Sample Name:	Method Blank	Units:	ug/L (ppb)
Lab Code:	S980222-WB1	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	2/22/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	2/22/98	ND	
Methyl *tert*-Butyl Ether	EPA 5030	8020	3	1	NA	2/22/98	ND	

1S22/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

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

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
VW-2(9)	S9800308-001		101	108
MW-2(14)	S9800308-002		103	105
MW-1(17)	S9800308-003		98	98
MW-3(4)	S9800308-004		105	110
BATCH QC	S9800335-001MS		96	96
BATCH QC	S9800335-001DMS		95	96
Method Blank	S980217-WB1		98	93
Method Blank	S980218-WB1		98	86
Method Blank	S980222-WB1		88	99
CAS Acceptance Limits:			69-116	69-116

SUR2/020397p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9800308
Project:	20805-132.003/TO#21133.00/6041 DUBLIN	**Date Collected:**	NA
Sample Matrix	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	2/18-19/98

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline

Sample Name:	BATCH QC	**Units:**	ug/L (ppb)
Lab Code:	S9800335-001MS, S9800335-001DMS	**Basis:**	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Gasoline	EPA 5030	CA/LUFT	50	250	250	ND	290	310	116	124	75-135	7	

DMS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-132.003/TO#21133.00/6041 DUBLIN

Service Request: S9800308
Date Analyzed: 2/17/98

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 Percent Recovery Acceptance Limits	Percent Recovery	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	250	250	90-110	100	
Benzene	EPA 5030	8020	25	26	85-115	104	
Toluene	EPA 5030	8020	25	26	85-115	104	
Ethylbenzene	EPA 5030	8020	25	26	85-115	104	
Xylenes, Total	EPA 5030	8020	75	81	85-115	108	
Methyl *tert*-Butyl Ether	EPA 5030	8020	25	23	85-115	92	

ICV/032196

TPH Gas-VOA, E, PC

ARCO Products Company

Division of Atlantic/Richfield Company

Task Order No. 21133.00

Chain of Custody

ARCO Facility no. 6041	City (Facility) Dublin	Project manager (Consultant) Gary Messerotes	Laboratory Name CAS
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 437-9526
Consultant name EMCON	Address (Consultant) 1971 Ringwood Ave, San Jose, CA 95131		Contract Number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM 503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐
VW-2(40)	1	2		X		X	HCL	2-12-98	1150		X									
MW-2(40)	2	2		X		X	HCL		1045		X									
MW-1(40)	3	2		X		X	HCL		1105		X									
MW-3(40)	4	2		X		X	HCL	↓	1128		X									

Special Detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: #20805-132.003 2-40ml HCL VOAs Please run all samples undiluted first before diluting for a 2nd run if necessary

Lab Number: 59800308

Method of shipment: Sampler will deliver

Turnaround Time:

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

Condition of sample:		Temperature received:	
Relinquished by sampler: Mark Kelly	Date/Time: 2/13/98	Received by:	2/13/98 1500
Relinquished by	Date/Time	Received by	
Relinquished by	Date/Time	Received by laboratory	Date / Time

Distribution: White Copy – Laboratory: Canary Copy – ARCO Environmental Engineering: Pink Copy – Consultant

RII 1/98

APPENDIX C

FIELD DATA SHEETS

EMCON - Groundwater Sampling and Analysis Request Form

PROJECT NAME : **ARCO STATION 6041**
7249 Village Parkway, Dublin

Sampling Project #: **21775-244.003**
Reporting Project #: **20805-132.003**

DATE REQUESTED : **12-Feb-98**

Project Manager: **Gary Messerotes**

Groundwater Monitoring Instructions	Treatment System Instructions
Quarterly Monitoring- 2nd Month Of The Quarter Bring a trailer for purge water transport, and a 15/16" socket for well access. Perform a water level survey prior to sampling (See ARCO SOP). The survey points are the tops of the well casings. Purge three (3) casing volumes. MW-3 may dry and is very slow to recharge, dry this well first and dedicate ateflon bailer so as not to cross contaminate. Please use the reporting project number **(#20805-132.003)** on the chain-of-custody form, sample containers, and analytical results. Sample ID's on the chain-of-custody, and the sample bottles must include the depth at which the sample was collected. [i.e. MW-1(30)]	There is no treatment system at this site. There should be two other consultanting firms accross the street. If they would like to copy the water level information, please provide them with the data. **Lisle Rath Pager# (888) 888-0933**

Site Contact: _____ Site Phone: _____ Well Locks: **ARCO Key**

Well ID or Source	Casing Diameter (inches)	Casing Length (feet)	Top Of Screen (feet)	Analyses Requested
MW-4	4.0	14.5		
MW-5	4.0	17.5		
MW-6	4.0	15.8		
Above wells in any order				
VW-2				**Water Levels**
MW-2	4.0	14.1	10.0	
MW-1	4.0	17.5	12.0	
MW-3	4.0	14.7	11.0	
Above wells in indicated order				
VW-2 MW-2 — MW-1 — MW-3 — **Above wells in indicated order**	(See Above)			**Dissolved Oxygen** **TPH-Gasoline** **BTEX** **MTBE by EPA 8020** (Fill 2- 40ml HCL VOAs)

Laboratory Instructions:
Provide lowest detection limits possible.
Please use the EMCON reporting project number **(#20805-132.003)** on the CAR.

ND = None Detected IP = Intermitent Product

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 21775-244.003 STATION ADDRESS : 7249 Village Parkway, Dublin DATE : 2/12/98

ARCO STATION # : 6041 FIELD TECHNICIAN : Manuel Gallegos DAY : Thursday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket Present	Lock Number	Type Of Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-4	[illegible]	15/16	YES	ARCO	LWC	6.35	6.35	ND	NA	14.5	well BOX needs to be raised. Box Sunk in.
2	MW-5	OK	15/16	YES	ARCO	LWC	6.45	6.45			17.5	
3	MW-6	B.D	15/16	YES	ARCO	LWC	3.15	3.15			15.8	well box needs to be replaced ASAP! rain water entering well.
4	VW-2	OK	15/16	YES	Arco	LWC	6.65	6.65			9.2	
10.0 5	MW-2	OK	15/16	YES	ARCO	LWC	5.90	5.70			14.0	DO=3.76
12.0 6	MW-1	OK	15/16	YES	ARCO	LWC	7.05	7.05			17.4	
11.0 7	MW-3	OK	15/16	YES	ARCO	LWC	6.68	6.68			14.7	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-244.007 SAMPLE ID: MW-1 (17')

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: ↓ LOCATION: Dublin, CA

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

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

CASING ELEVATION (feet/MSL):	N/A	VOLUME IN CASING (gal.):	6.74
DEPTH TO WATER (feet):	7.05	CALCULATED PURGE (gal.):	20.28
DEPTH OF WELL (feet):	17.4	ACTUAL PURGE VOL. (gal.):	7.0

DATE PURGED: 2-12-98 Start (2400 Hr) 1058 End (2400 Hr) 1100

DATE SAMPLED: ↓ Start (2400 Hr) 1105 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1100	7.0	6.82	1930	66.8	Clear	Light
___	well	Dry @	7.0	gallons	___	___
1105	recharge	6.41	2082	68.5	↓	↓
___	___	___	___	___	___	___
___	___	___	___	___	___	___

D. O. (ppm): 1.71 ODOR: Moderate

N/A (COBALT 0 - 500) N/A (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: N/A

Parameters field filtered at this well: N/A

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®)
___ DDL Sampler ___ Bailer (Stainless Steel)
___ Dipper ___ Submersible Pump
___ Well Wizard™ ___ Dedicated
Other: ___

WELL INTEGRITY: OK LOCK #: ARCO-key

REMARKS: All Samples taken

Meter Calibration: Date: 2/12/98 Time: ___ Meter Serial #: 87m Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: [signature] Reviewed By: SH Page 1 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-244.003 SAMPLE ID: MW-2 (14')

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: ↓ LOCATION: Dublin, CA

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

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

CASING ELEVATION (feet/MSL):	N/A	VOLUME IN CASING (gal.):	5.29
DEPTH TO WATER (feet):	5.90	CALCULATED PURGE (gal.):	15.87
DEPTH OF WELL (feet):	14.0	ACTUAL PURGE VOL. (gal.):	16.0

DATE PURGED: 2-12-98 Start (2400 Hr) 1032 End (2400 Hr) 1040

DATE SAMPLED: ↓ Start (2400 Hr) 1045 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1034	5.5	5.49	2054	64.0	Brn	Heavy
1037	11.0	6.05	2599	65.6		
1040	16.0	6.13	3012	66.2	↓	↓

D. O. (ppm): 3.76 ODOR: None

COLOR (COBALT 0 - 500): N/A

TURBIDITY (NTU 0 - 200 or 0 - 1000): N/A

Field QC samples collected at this well: N/A

Parameters field filtered at this well: N/A

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK LOCK #: ARCO-KEY

REMARKS: All samples taken

Meter Calibration: Date: 2/12/98 Time: 1030 Meter Serial #: 870m Temperature °F: 60.7

(EC 1000 1010/1000) (DI ___) (pH 7 7651700) (pH 10 9611000) (pH 4 6861400)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 2 of 4

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21725-244.003 SAMPLE ID: MW-3 (141)

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: ↓ LOCATION: Dublin, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.23
DEPTH TO WATER (feet):	6.68	CALCULATED PURGE (gal.):	15.71
DEPTH OF WELL (feet):	14.7	ACTUAL PURGE VOL. (gal.):	5.5

DATE PURGED: 2-18-98 Start (2400 Hr) 1118 End (2400 Hr) 1121

DATE SAMPLED: ↓ Start (2400 Hr) 1128 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1121	5.5	6.70	2447	66.0	Cloudy	Light
___	well	Dry at	5.5	gallons	___	___
1128	recharge	6.51	2501	66.9	Clear	Clear
___	___	___	___	___	___	___
___	___	___	___	___	___	___

D. O. (ppm): 1.02 ODOR: none

COLOR: NR (COBALT 0 - 500)

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- ✓ Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated
- Other: ___

WELL INTEGRITY: OK LOCK #: Micro-Key

REMARKS: All samples taken

Meter Calibration: Date: 2/12/98 Time: ___ Meter Serial #: 87m Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Mark A. Malloy Reviewed By: SA Page 3 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775.044.003 SAMPLE ID: VW-2 (9')

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: ↓ LOCATION: Dublin, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	1.66
DEPTH TO WATER (feet):	6.65	CALCULATED PURGE (gal.):	4.99
DEPTH OF WELL (feet):	9.2	ACTUAL PURGE VOL. (gal.):	2.0

DATE PURGED: 2-13-98 Start (2400 Hr) 1141 End (2400 Hr) 1143

DATE SAMPLED: ↓ Start (2400 Hr) 1150 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1143	2.0	6.90	4116	63.1	Cloudy	Heavy
	Well	Dry at	2.0 gallons			
1150	Recharge	6.86	4102	63.1	↓	↓

D. O. (ppm): 1.76 ODOR: Strong

NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK LOCK #: Arco Key

REMARKS: All sample taken

Meter Calibration: Date: 2/13/98 Time: ___ Meter Serial #: 87m Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: M. A. Gallegos Reviewed By: MA Page 4 of 4

EMCON Associates - Field Services | Historical Monitoring Well Data

1921 Ringwood Avenue | 1998 | ARCO 6041

San Jose, California | **21775-244.003**

						Gallons
						First 30.50
						Second 31.50
Well ID	Quarter	Date	Purge Volume (gallons)	Did well dry	Well Contained Product	**Third** 21.50
						Fourth 20.50
MW-1	First	02/12/98	7.00	YES	NO	
	Second					
	Third	08/20/97	7.50	YES	NO	
	Fourth	11/21/97	6.00	YES	NO	
MW-2	First	02/12/98	16.00	NO	NO	
	Second					
	Third	08/20/97	10.50	NO	NO	
	Fourth	11/21/97	9.50	NO	NO	
MW-3	First	02/12/98	5.50	YES	NO	
	Second					
	Third	08/20/97	4.00	YES	NO	
	Fourth	11/21/97	4.00	YES	NO	
MW-4	First	02/12/98	NA	NA	NO	
	Second					
	Third	08/20/97	NA	NA	NO	
	Fourth	11/21/97	NA	NA	NO	
MW-5	First	02/12/98	NA	NA	NO	
	Second					
	Third	08/20/97	NA	NA	NO	
	Fourth	11/21/97	NA	NA	NO	
MW-6	First	02/12/98	NA	NA	NO	
	Second					
	Third	08/20/97	NA	NA	NO	
	Fourth	11/21/97	NA	NA	NO	
VW-2	First	02/12/98	2.00	YES	NO	
	Second					
	Third	08/20/97	NA	NA	NO	
	Fourth	11/21/97	1.00	YES	NO	
						Steam water (gal) _____

ANALYTICAL DATA QC WORKSHEET

EMCON

PROJECT No. 20805-132.003
CLIENT/PROJECT ARCO - 6041 Dublin
EPA METHOD Gas, BTXE, MTBE
LABORATORY CAS-S
Reporting limits (check one): MDLs/PQLs_____ MRLs X

LAB No. S98000308
CHEMIST Lisa Fernandez
PROJ. MGR. Gary Messerotti
OFFICE SJ
DATE 3-3-98

Sample ID	Assoc. QC or Field Sample	Date Sampled	Extraction Holding Time: _____ Days	Analysis HoldingTime: 14 Days	Extracted/ Analyzed Within Holding Time		Compounds Detected		Surrogate Recovery Within Limits	
(A) FIELD SAMPLES			Date Extracted	Date Analyzed	Yes	No	Yes	No	Yes	No
VW-2 (9)		2-12-98	NA	2/18, 22	X		X		X	
MW-2 (14)		↓	↓	2/17, 22	↓		↓		↓	
MW-1 (17)				↓						
MW-3 (14)										

(B) FIELD QC SAMPLES (Field blanks, trip blanks, field duplicates)

(C) LAB QC SAMPLES (Method blanks, matrix spikes, laboratory control samples)

QC Sample ID	Assoc. Field Sample	Date Extracted	Date Analyzed	Compounds Detected		Surrogate Recovery Within Limits		MS/DMS (LCS/DLCS) Within Limits		RPD Within Limits	
				Yes	No	Yes	No	Yes	No	Yes	No
MB1		NA	2-17-98		X	X		NA		NA	
MB1		↓	2-18-98		X	↓		↓		↓	
MB1			2-22-98		X						
MS	Batch		2/18, 19		X	X		X		X	
DMS	↓		↓		X	X		X		X	
ICV			2-17-98	NA		NA		X		NA	

Comments:

ALISTO ENGINEERING GROUP

FACSIMILE TRANSMISSION SHEET

DATE: 6/12/98

TO: Ute

COMPANY: Environmental Solutions

FAX NO: 977-9030

FROM: Patti

NUMBER OF PAGES INCLUDING THIS SHEET: 2

MESSAGE: BP 11116
Village Parkway Dublin.

Joint Data

Please call if you do not receive this facsimile in full.

ALISTO ENGINEERING GROUP
1575 Treat Boulevard, Suite 201
Walnut Creek, California 94598
TEL: 510-295-1650 FAX: 510-295-1823

6041

ALISTO ENGINEERING GROUP

FACSIMILE TRANSMISSION SHEET

DATE: March 3, 1998/April 20, 1998 / June 12, 1998

TO: Erica, Blaine
Steve Horton, Emcon

FROM: Patti Yelton

NUMBER OF PAGES INCLUDING THIS SHEET: 2

RE: Joint Monitoring / February 12,1998

BP Oil 11116
7197 Village Parkway
Dublin, Ca.

Arco 6041 / Emcon
7249 Village Parkway
Dubllin, Ca. / Ute

WELL ID	TOTAL DEPTH	DEPTH TO WATER
MW-1	25.80	4.40 N/S
MW-2	25.45	4.10 N/S
MW-3	25.90	4.22 N/S
AW-4	34.15	3.99 N/S
AW-5	32.90	7.57
AW-6	16.50	5.07

Is Shell still on hold?
Thanx, Patricia Yelton

ALISTO ENGINEERING GROUP
Phone (510) 295-1650
FAX (510) 295-1823

WELL GAUGING DATA

Project # 960823-YL Date 8-23-96 Client Shell

Site 7194 AMADOR VALLEY BLVD. DUBLIN CA.

Well I.D.	Well Size (in.)	Sheen/ Odor	Depth to Immiscible Liquid (feet)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to Water (feet)	Depth to Well Bottom (feet)	Survey Point: TOB or TOC
MW-1	4"					6.23	25.12	TOC
MW-2	4"					10.29	24.51	
MW-3	4"					10.00	24.20	
MW-4	4"	ODOR				9.84	24.72	
MW-6	4"					8.88	22.88	
MW-13	4"					8.66	17.04	
(	spoke with Monica on 6/12 :							
	wells not sheduled for survey,							
	other wells (ex: MW5, 12) removed from survey							
	program by ENVIRO)							

Post-it® Fax Note 7671 | Date 6/12/98 | # of pages ▶ 1

To UTE | From Monica

Co./Dept. | Co. Blaine Tech

Phone # | Phone #

Fax # (510) 477-9030 | Fax #