ARCO Products Company
2000 Alameda de las Pulgas
Mailing Address: Box 5811
San Mateo, California 94402
Telephone 415 571 2400

ENVIRONMENTAL
PROTECTION
95 MAR -8 PM 1:02

Date: 3/6/95

Re: ARCO Station #

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

Submitted by:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

~~pg 2-2 What~~
Pg 2 → W/in 45 days of what date will EMCON "respond" of ~~pp~~ County re the addit. well pts ~~to~~ in apartment complex west of site & residential yard South of site?

Pg 2 – Why temporary wells & not permanent wells?

– Where exactly are former tanks located? Current tanks?

– ~~Will~~ Delineation of plume then will be acceptable as delineation of soil cont. in capillary fringe.

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

March 6, 1995
Project 0805-131.02

Ms. Juliet Shin
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502-6577

Re: Workplan addendum, ARCO station 6002, 6235 Seminary Avenue, Oakland, California

Dear Ms. Shin:

This workplan addendum is based on a letter from the Alameda County Health Care Services Agency (ACHCSA) dated February 9, 1995, and a conversation with you during our site visit on February 16, 1995. Based on your letter and our conversation, your agency appears concerned with the following:

- The high total petroleum hydrocarbon as gasoline (TPHG) and benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in groundwater samples collected from well MW-5 as compared with concentrations detected in groundwater samples collected from monitoring wells MW-1 and MW-3, and vapor well VW-1, indicating a potential source area in the vicinity of MW-5

- The delineation of TPHG and BTEX in groundwater west (between well MW-5 and proposed wells MW-7 and MW-8) and southwest of the site

- Utility line trenches intercepting or redirecing groundwater flow underlying the site

EMCON has reviewed previous site assessment and quarterly monitoring data for the site. Based on our review,

- The groundwater flow direction has consistently been to the west. Wells MW-1 and MW-3 are crossgradient and wells MW-5 and VW-1 are downgradient from the former and existing underground storage tanks (USTs). It appears that these four wells were never sampled on the same date (Tables 1, 2, and 3). In January

1994, one standard and one "grab" groundwater sample were obtained from monitoring well MW-1 and vapor well VW-1, respectively. Vapor well VW-1 was never sampled again. Wells MW-2 through MW-5 were first sampled in July 1994 and have been sampled quarterly since then, along with MW-1. Because the grab (VW-1) and standard groundwater (MW-1 through MW-5) samples were not obtained at the same time, comparing these data to identify a concentration gradient or a source area is not valid. EMCON believes the high TPHG and BTEX concentrations in groundwater samples from well MW-5 and the lower (MW-1) or nondetectable (MW-3) concentrations from the crossgradient wells are consistent with one source area in the former UST zone.

- TPHG were detected at a concentration of 1,500 milligrams per kilogram (mg/kg) at a depth of 10.5 feet below the ground surface (BGS) (capillary fringe of the water table) in a soil sample from boring MW-5 (also referred to as B-8) (Table 4). TPHG concentrations were below detection limits in samples above (5.5 feet BGS) and below (24.5 feet BGS) the 10.5-foot sample. Because the groundwater table is at a depth of approximately 13 feet BGS (Table 1), the soil impact is believed to be related to the TPHG-impacted groundwater and not the result of a separate source area. A separate source area would likely be detected in the 5.5-foot sample. Additionally, ARCO has not stored gasoline in this area. **EMCON does not agree that additional soil characterization in this area is warranted.**

- EMCON will move proposed wells MW-7 and MW-8 to the east side of Overdale Avenue, but proposes to install them as temporary well points rather than permanent monitoring wells (Figure 1). The relocation of MW-7 and MW-8 will decrease the distance between well MW-5 and the proposed well points to approximately 170 feet, allowing a more accurate characterization of the dissolved-phase plume. In addition, EMCON plans to evaluate the technical feasibility of installing temporary well points within the apartment complex west and the residential yard south of the site. EMCON will respond to you regarding these additional well points within 45 days. Based on the depth to groundwater, EMCON proposes to install the well points to a depth of approximately 15 feet BGS. Procedures for installing the temporary well points are presented in Appendix A.

- EMCON will perform a utility line check on Sunnymere, Seminary, and Overdale Avenues to insure that utility line trenches are not intercepting or redirecting groundwater underlying the site.

EMCON proposes to perform the work at this site in two phases. At this time, EMCON will install the on-site air-sparge and vapor extraction wells, and begin permitting for well MW-6 as outlined in our workplan dated January 20, 1995. Upon approval of this workplan addendum and EMCON's submittal regarding the feasibility of additional off-site well points (due in 45 days), EMCON will begin permitting for the well points.

If you have questions or comments, please call.

Sincerely,

EMCON

Peter T. Christianson
Project Geologist

John C. Young
Project Manger

Attachments: Table 1 - Groundwater Monitoring Data, Fourth Quarter 1994
Table 2 - Historical Groundwater Elevation Data
Table 3 - Historical Groundwater Analytical Data
Table 4 - Summary of Soil Analyses
Figure 1 - Proposed Well Location Map
Appendix A - Temporary Well Point Installation Procedures

cc: Michael Whelan, ARCO Products Company

Table 1
Groundwater Monitoring Data
Fourth Quarter 1994
Summary Report

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 02-10-95
Project Number: 0805-131.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		ppb	ppb	ppb	ppb	ppb
MW-1	11-21-94	247.06	7.27	239.79	ND	SW	0.07	11-21-94	12000	2800	160	640	1300
MW-2	11-21-94	249.30	7.83	241.47	ND	SW	0.07	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	11-21-94	248.35	6.80	241.55	ND	SW	0.07	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	11-21-94	242.91	9.14	233.77	ND	SW	0.07	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-21-94	244.82	12.45	232.37	ND	SW	0.07	11-21-94	38000	3100	<50	3100	4100

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
TPHG = Total petroleum hydrocarbons as gasoline
ppb = Parts per billion or micrograms per liter (µg/l)
ND = None detected
SW = Southwest

esj/h:\6002\6002mdb.xls\Table 1:dcl
0805-131.01

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 02-10-95
Project Number: 0805-131.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-1	01-21-94	247.06	7.82	239.24	ND	NR	NR
MW-1	07-08-94	247.06	8.32	238.74	ND	W	0.08
MW-1	09-24-94	247.06	8.84	238.22	ND	WSW	0.08
MW-1	11-21-94	247.06	7.27	239.79	ND	SW	0.07
MW-2	07-08-94	249.30	9.51	239.79	ND	W	0.08
MW-2	09-24-94	249.30	10.02	239.28	ND	WSW	0.08
MW-2	11-21-94	249.30	7.83	241.47	ND	SW	0.07
MW-3	07-08-94	248.35	7.75	240.60	ND	W	0.08
MW-3	09-24-94	248.35	8.14	240.21	ND	WSW	0.08
MW-3	11-21-94	248.35	6.80	241.55	ND	SW	0.07
MW-4	07-08-94	242.91	10.97	231.94	ND	W	0.08
MW-4	09-24-94	242.91	11.81	231.10	ND	WSW	0.08
MW-4	11-21-94	242.91	9.14	233.77	ND	SW	0.07
MW-5	07-08-94	244.82	12.94	231.88	ND	W	0.08
MW-5	09-24-94	244.82	13.60	231.22	ND	WSW	0.08
MW-5	11-21-94	244.82	12.45	232.37	ND	SW	0.07

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
ND = None detected
NR = Not reported: data not available or not measurable
W = West
WSW = West-southwest
SW = Southwest

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 03-06-95
Project Number: 0805-131.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
VW-1*	01-21-94	19000	1100	180	720	2800
VW-2*	01-21-94	11000	620	1500	330	1400
MW-1	01-21-94	18000	1300	1600	250	1900
MW-1	07-08-94	21000	5200	<50	1000	1500
MW-1	09-24-94	13000	2900	37	830	640
MW-1	11-21-94	12000	2800	160	640	1300
MW-2	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	09-24-94	140	<0.5	<0.5	<0.9	<0.5
MW-4	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	07-08-94	41000	3300	<50	2200	2900
MW-5	09-24-94	28000	4000	<50	2400	2100
MW-5	11-21-94	38000	3100	<50	3100	4100

TPHG = Total petroleum hydrocarbons as gasoline

ppb = Parts per billion or micrograms per liter (µg/l)

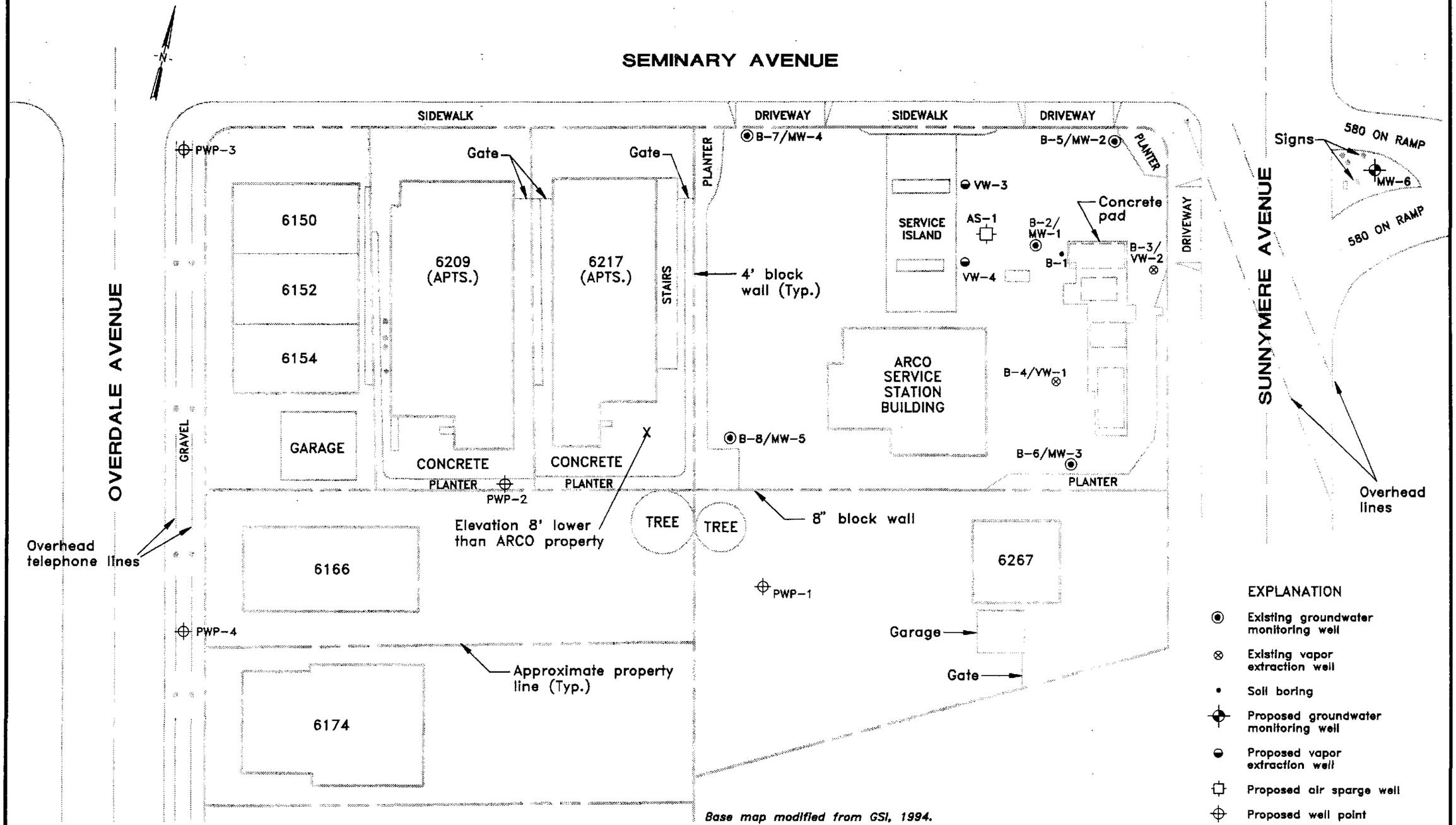
* = Grab samples collected from vapor wells as a one-time sampling event

Table 4

Summary of Soil Analyses
ARCO Station No. 6002
Oakland, California

Boring No.	Sample ID	Sample Depth (feet)	TPHG (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)
January 1994							
B-1	S-5-B1	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-1	S-8.5-B1	8.5	3.8*	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-5.5-B2	5.5	3.8	0.031	0.022	0.013	<0.060
B-2	S-7.5-B2	7.5	7.2	0.030	0.042	0.027	0.16
B-2	S-10.5-B2	10.5	420**	<0.0050	<0.0050	5.5	14
B-2	S-13.5-B2	13.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-18-B2	18	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-20.5-B2	20.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-23.5-B2	23.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-27-B2	27	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-32.5-B2	32.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-2	S-36-B2	36	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-3	S-5-B3	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-3	S-10-B3	10	<1.0	0.014	0.013	0.0060	0.026
B-3	S-14.5-B3	14.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-4	S-5-B4	5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-4	S-10-B4	10	3.9	0.014	<0.0050	<0.0050	0.041
B-4	S-15.5-B4	15.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
Soil Stockpile	01140SP-(A-D)	—	3.1	<0.0050	<0.0050	<0.0050	<0.0050
June 1994							
B-5	B-5-5.5	5.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-5	B-5-7.5	7.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-5	B-5-21	21	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-6	B-5-5.5	5.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-6	B-5-7	7	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-6	B-5-24.5	24.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-7	B-7-5.5	5.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-7	B-7-8.5	8.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-7	B-7-10	10	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-7	B-7-24	24	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-8	B-8-5.5	5.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-8	B-8-10.5	10.5	1500**	<0.50	2.4	17	43
B-8	B-8-24.5	24.5	<1.0	<0.0050	<0.0050	0.0070	0.013
Soil Stockpile	SP-0629 (Comp.A-D)	—	110**	<0.01	0.13	1.0	2.3

TPHG = Total petroleum hydrocarbons calculated as gasoline
ppm = parts per million
< = less than detection limit
* = laboratory reported the chromatogram pattern to indicate a "non-gas mix>C8."
** = laboratory reported the chromatogram pattern to indicate "weathered gas."



EMCON Associates

SCALE: 0 30 60 FEET

ARCO PRODUCTS COMPANY
SERVICE STATION 6002, 6235 SEMINARY AVE.
WORK PLAN
OAKLAND, CALIFORNIA

PROPOSED WELL LOCATION MAP

FIGURE NO. 1

PROJECT NO. 805-131.02

G:\805-131\G03 REV 0 03/03/95 11:14:02 KAJ

APPENDIX A

TEMPORARY WELL POINT INSTALLATION PROCEDURES

TEMPORARY WELL POINT INSTALLATION PROCEDURES

The well point will consist of a 1 1/4-inch diameter galvanized steel riser attached to a screen with a pointed end. The riser and screen are available in 5-foot lengths. Prior to installation, the well point and riser(s) will be steam-cleaned to remove any contaminants which may have accumulated during manufacturing operations.

The well point will be installed using a jack hammer. Once at the appropriate depth, the well point will be secured by installing a locking cap and a 7-inch diameter traffic-rated well vault at the surface encased in concrete. The well vault will be set approximately 1/2-inch above grade to inhibit surface water from draining into the vault.

Upon completion of installation, the well point will be developed by surging and bailing approximately 4 casing volumes of groundwater. The well point will be allowed to recharge for approximately 48-hours prior to groundwater sampling. Groundwater samples will be obtained with a bailer using the same groundwater sampling procedures as used for monitoring wells.

NOTES

(from Jan 20 95 w.p.)

1) If weathered gas has been identified in boring B-8 (Well MW-5), could there have been a tank in that location in the past? Also, considering conc. at Well MW-5 higher than other wells.

2) The gradient has flowed primarily to the west at the site in the past, so why is Well MW-8 proposed so far to the north? Why are both Well MW-7 and MW-8 proposed over 100 feet from the site? Gradient is steep - why?

3) The extent of soil contamination observed in Well MW-5 needs to be delineated, however, it may not be adequately delineated with Well MW-7,.which is located so far from the site.

4) Are there any utility lines located along Sunneymere Ave. or Overdale Ave that may redirect the flow of ground water? Any beneath the residential area that might?

5) A minimum of how many soil samples will be analyzed at a lab? At least one.

- Future reports shall include a accompanying cover letter, signed by the R.P., acknowledging review + concurrence of report.

Response by Rob Davis:

1) No records of tanks in different configuration 1967 plan reviewed

4) G.W. at ~15' bgs in past, but has been as shallow as 10' bgs.

Looks like finer grain zone in Well MW-5.
Explain more about highest conc.

Get another qtr of data
(check to see if they've been conducting qtlies)

- Although gradient to west, to southwest.
why Well MW-5 so high
∴ No way of knowing whether 8 + 7 would adequately address plume

What's inside the ARCO Service Station bldg, located upgradient of Well MW-5?

Z 033 417 574

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Juliet Shin Alameda County E.H.S	
Street and No. 1131 Harbor Bay Pkwy. #250	
P.O., State and ZIP Code Alameda, CA 94502	
Postage	$1,24
Certified Fee	1.10
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	1.00
TOTAL Postage & Fees	$3,34
Postmark or Date	

PS Form 3800, March 1993