A REPORT DOCUMENTING THE PURGING AND SAMPLING OF THREE GROUNDWATER MONITORING WELLS ON TWO CONSECUTIVE QUARTERS AND THE DETERMINATION OF GROUNDWATER GRADIENT FOR SIX CONSECUTIVE MONTHS:

ALAMEDA FIRE STATION #2 635 PACIFIC STREET ALAMEDA, CALIFORNIA

3-8-93

prepared by:

Helen Mawhing of ENVIRONMENTAL TECHNICAL SERVICES

Helen Mawhinney

Senior Environmental Specialist

TABLE OF CONTENTS

1.0	INTRODUCTION1							
2.0	PREVIOUS ENVIRONMENTAL INVESTIGATIONS1							
2.1	TANK REMOVAL1							
2.2	EXCAVATION OF CONTAMINATION SOIL1							
	TABLE 1A, ORIGINAL EXCAVATION ANALYTICAL RESULTS, 8/17/922							
	TABLE 1B, ADDITIONAL EXCAVATION ANALYTICAL RESULTS, 8/18/922							
3.0	SCOPE OF SERVICES3							
3.1	GROUNDWATER PURGING & SAMPLING3							
3.2	GROUNDWATER ANALYSIS3							
3.3	GROUNDWATER ANALYTICAL RESULTS4							
	TABLE II, GROUNDWATER ANALYTICAL RESULTS 1ST QUARTER SAMPLING, 9/5/924							
	TABLE III, GROUNDWATER ANALYTICAL RESULTS 2ND QUARTER SAMPLING, 1/11/934							
3.4	GROUNDWATER GRADIENT5							
4.0	REPORT							
APPE	NDICES							
	Appendix A							
	MAPS Figure 1. Site Location Map							
	Figure 2. Monitoring Well and Former Tank Location Map							
	Appendix B Groundwater Analytical Results 1st Quarter, September 5, 1992							
	Appendix C Groundwater Analytical Results 2nd Quarter, January 11, 1993							

TABLE OF CONTENTS - continued

Appendix D

Groundwater Development Reports

1.0 INTRODUCTION

The following report documents the sampling of three groundwater monitoring wells and the determination of groundwater gradient at the Alameda Fire Station No. 2, 635 Pacific Street, Alameda, CA.

Groundwater was sampled on two consecutive quarters and groundwater gradient determined for six consecutive months.

The work was performed in response to the discovery of petroleum hydrocarbons beneath the site and has been requested by the Alameda County Environmental Health Department, Hazardous Materials Division.

2.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

2.1 TANK REMOVAL

On November 15, 1991, one (1) 285-gallon gasoline underground storage tank (UST) was removed from the subject site. The tank had previously contained diesel.

One soil sample was collected from the native soil beneath the tank. The sample contained a detectable amount of toluene at 6.5 ppb and total xylenes at 4.4 ppb.

A soil sample was collected from stockpiled fill material removed from the tank pit. This had a detectable amount of total petroleum hydrocarbons as diesel at 220 ppm and xylenes at 52 ppb.

2.2 EXCAVATION OF CONTAMINATED SOIL

Excavation of contaminated soil was completed on August 17, 1992 and four soil samples were collected. A sample was collected from each sidewall vadose/capillary zone. These samples were designated as FSX-1 and FSX-4. Soil sample FSX2-A was collected subsequent to excavation of material around sample FSX2, and confirms removal of the slight contamination present around FSX2. See Table 1A for analytical results.

An existing 2-inch groundwater monitoring well is located adjacent to and within 1.5' of the tank pit cavity. The well was constructed by Aqua Science Engineering on June 3, 1986. The well was constructed in compliance with Assembly Bill 1362 and the Groundwater Monitoring Guidelines for Hazardous Materials Storage drafted by the Alameda County Water District in May 1984. The well was placed in the assumed local down gradient direction. Gradient direction information differed within the area.

3.0 SCOPE OF SERVICES

3.1 Groundwater Purging & Sampling

The three existing groundwater monitoring wells were purged and sampled on September 5, 1992 and January 11, 1993. The wells were developed (purged using a clean stainless steel bailer (1.5" diameter by 3' length). Subsequent to purging each well was sampled using a clean stainless steel bailer. A separate bailer was dedicated to each well for the sampling event. At consistent intervals throughout sampling groundwater parameters (pH, conductivity, salinity, and temperature) were monitored to evaluate stabilization of the wells.

A water sample was decanted from the sampling bailer into three one-liter amber bottles and three 40-ml volatile organics analysis vials (VOAs) to a positive meniscus eliminating headspace.

The samples were transported to a Certified Hazardous Analytical Laboratory under chain of custody for analysis.

Refer to Appendix D, Groundwater Development Report.

3.2 Groundwater Analysis

Each groundwater sample was analyzed for Total Petroleum Hydrocarbons as Gasoline, benzene, toluene, ethylbenzene, total xylenes (TPHg & BTEX, using EPA Method 5030/602) and Total Petroleum Hydrocarbons as Diesel (TPHd using EPA Method 3510)

3.3 Groundwater Analytical Results

TABLE II GROUNDWATER ANALYTICAL RESULTS

FIRST QUARTER SAMPLING September 5, 1992

Results reported in ug/L

Sample#	TPHq	TPHd	<u>B</u>	Ţ	E	<u>x</u>
MW-2	N D	ND	ND	ND	ND	ND
M W-3	ND	ND	ND	ND	ND	ND
MW-4	ИД	ND	ND	ND	ND	ND

ND = Not detected at lower detection limit for this compound

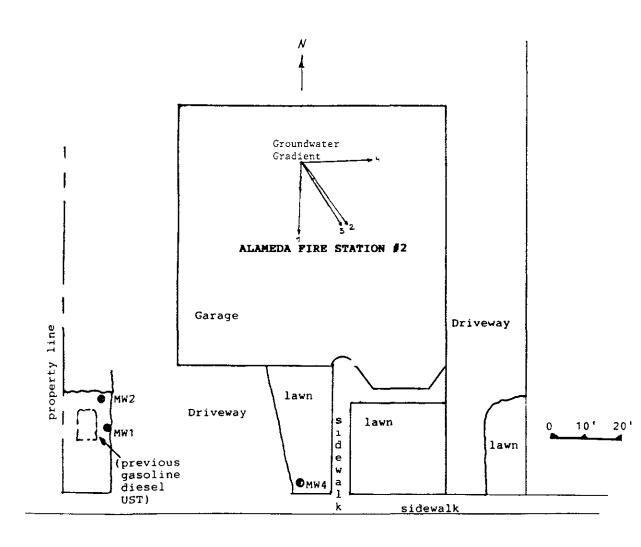
TABLE III GROUNDWATER ANALYTICAL RESULTS SECOND QUARTER SAMPLING JANUARY 11, 1993

Results reported in ug/L

Sample#	TPHg	TPHd	<u>B</u>	Ţ	E	X
MW-2	ND	ND	ND	ND	ND	ND
MW-3	ND	ND	ND	ND	ND	ND
MW-4	ND	ND	ND	ND	ND	ND

ND= Not detected at lower detection limit for this compound

3.4 Groundwater Gradient



GROUNDWATER GRADIENT DATA

Key#	<u>Date</u>	<u>E4</u>	Flow	<u>Grad.</u>
1	10/14/92	3.02	183	.0020
2	11/10/92	3.06	143	.0026
3	12/11/92	3.98	146	.0027
4	01/11/93	5.36	89	.0082

NOTES

- (1) Water elevation in MW4(2) Flow Azimuth (east of N)
- (3) Gradient (ft/ft)

4.0 REPORT

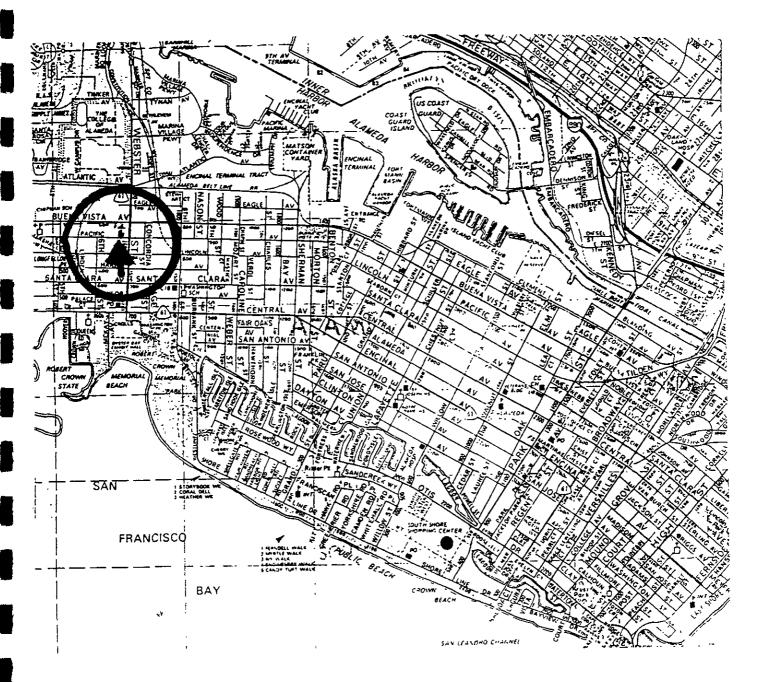
Please forward copies of this report, chain of custody documentation, and laboratory analytical reports to the San Francisco Regional Water Quality Control Board, and the Alameda County Department of Environmental Health Hazardous Materials Division.

The following addresses have been included for your convenience:

Water Quality Control Board San Francisco Bay Region 2101 Webster Street Room 500 Oakland, CA 94621

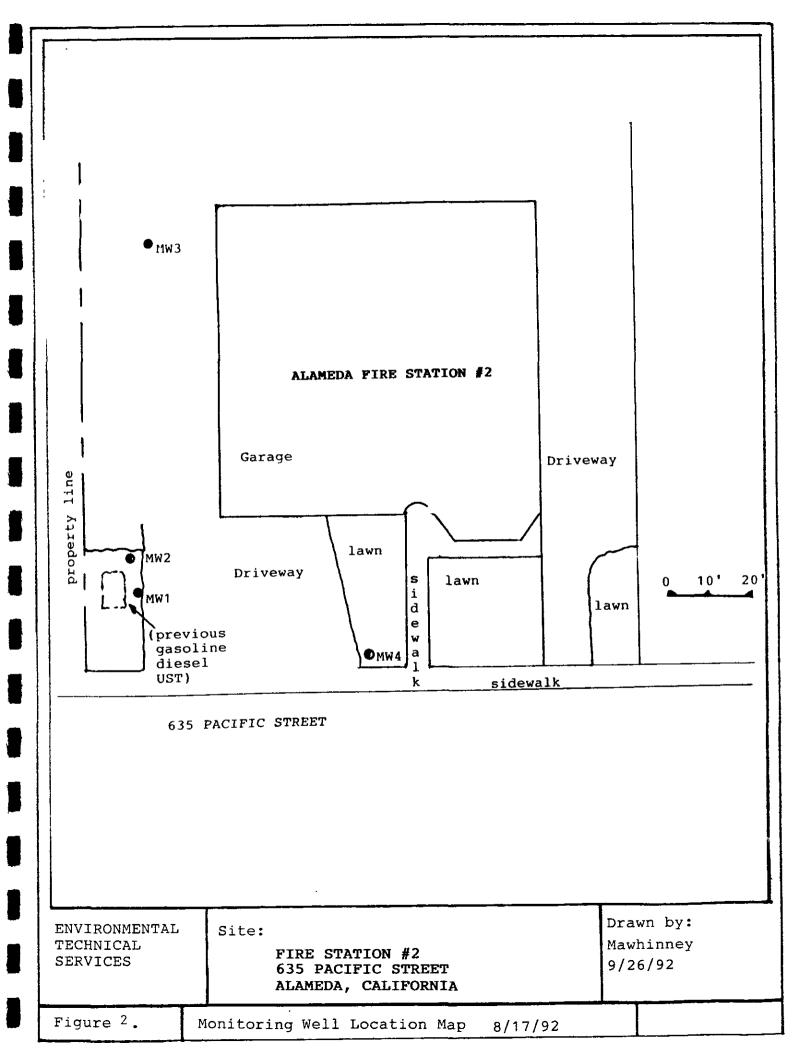
Alameda County Department of Environmental Health Hazardous Materials Division 80 Swan Way, Room 200 Oakland, CA 94621 APPENDIX A

MAPS



635 Pacific Avenue, Alameda, California

Figure 1. Site Location Map



APPENDIX B

GROUNDWATER ANALYTICAL RESULTS FIRST QUARTER



Drinking Water
Waste Water o Asbestos
Hazardous Waste — Soil
Calderon Testing — Air

14072 W. Park Avenue Boulder Creek, CA 95006 (408) 338-3053

Laboratory Report

Client Report Date
Erry icontranental Tech. Services 09/29/92
1548 Jacob Ave.
San Jose CA 95118

Sample Site
Alam Fire Dept
635 Pacific Street
Alameda
Alam Fire #2

Date Received 09/05/92

Analysis Requested
Total Hydrocarbons - Gas
Total Hydrocarbons - Diesel
BTEX

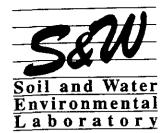
Procedure EPA 5030 EPA 3510 EPA 602 Date Analyzed
09/05/52

S&W Ref. #	Client Ref. #	Matrix/Analysis	Concentration	Detection Limit		
2492-ET1-A	MH-2	Water/TPH-G	#	50	ppb	
2492-ET1-A	MM-C	Water/TPH-D	#		ppb	
2492-ET1-A	MH-S	料画も由い/於TEX			, , , , , , , , , , , , , , , , , , ,	
		Berizeria	₩-	0.5	ppb	
		Toluene	*		ppb	
		Ethylberizene	#		ppb	
		Xylerms	*		ppb	
	Min Alphaeire mini man.					
2432-ET1-B	Mi-4	料画も参加了下戸村一日	₩	50	ppb	
2492-ET1-B	MI-4	M&も要性/TPH-D	*		ppb	
2492-ET1-R	M4-4	好象も物か了設丁匠X			•	
		Renzene	#	0.5	dqq	
		Toluene	*		ppb	
		Ethylbenzene	#		ppb	
		Xylenes	*		ppb	
		-			• •	

* No detectable amount @ detection limit

Analyst Signature

R. W. Larray



Drinking Water
Waste Water
Asbestos
Hazardous Waste
Soil
Calderon Testing
Air

14072 W. Park Avenue Boulder Creek, CA 95006 (408) 338-3053

Analysis Requested

Total Hydrocarbons - Gas Total Hydrocarbons - Diesel BTEX

Laboratory Report

Client Report Date

Enviornmental Tech. Services 09/10/92 1548 Jacob Ave.

San Jose CA 95118

Sample Site

Alameda Fire Det.

635 Pacific St.

Alameda, CA

Alam Fire #2

Date Received

09/05/92

Procedure

EPA 5030 EPA 3510 EPA 602 Date Analyzed

09/06/92

S&W Ref. #	Client Ref. #	Matrix/Analysis	Concentration	Detection Limit
2492-ET1-C	MW-3	Water/TFH-G	*	50 ppb
2492-ET1-C	MW-3	Water/TPH-D	₩	50 ppb
2492-ET1-C	MW-3	Water/BTEX		
		Benzene	*	0.5 ppb
		Toluene	*	0.5 ppb
		Ethylbenzene	*	0.5 ppb
		Xylenes	*	0.5 ppb

* No detectable amount @ detection limit

Analyst Signature

M. Lamon

SHAIN OF OCCIOE! HECCH

PROJECT N		1/.		SITE	NAME & ADD	Л			ANAL	YSES	REQ	UEST	ED (1)	
MW AlAM6 Julies	WITNES	SING AGI	ENCY	la	-0/J (OC PECTOR NAMI M - ///AL		îmala(u F	oline) &	10261) & X, & E	Total Off & Grease	Halogenated HC's	т.	Metals	land	REMARKS
IDANO.	DATE	THE	SOL	WATER	SAI	MPLING LOCAT	TON	TPH (G:	TPH (Diesel) (B, T, X, & E	Total CI	Hałoger	B,T,X&E	Heavy Metals	10tal	
MW-1	9/4/92			X				V	<u> </u>					Z	
mw-2	1			X,				1/	-				_	1	
$m\omega \cdot 3$	*			X				#	-		<u></u>	 		1	
				_				-				 	 		
			 	-		······································									
			 	-	-										
												L			
			-									-	-	l a	See attached "Table 2" for specific analysis method.
Retriguished by		nure)	1	1.7	2 1:16	Received by:			ter an	ralysis:	•				he laboratory accepting samples is been stored in ice?
Relinguished by	~~~~		<u>-</u>		late/Time	Received by:	(Signature)		1						analyzed?
Relinquished by	r: (Signa	iture)			onte/Time	Received by:	(Signature)		t						s have heed space? ers and properly packaged?
Railinguished by	r. (Signa	ture)			see/Time	P	oratory by: (Sign			Signate					Title Date

Rev. 12-88

APPENDIX C

GROUNDWATER ANALYTICAL RESULTS SECOND QUARTER

Soil and Water Environmental Laboratory

Drinking Water
Waste Water o Asbestos
Hazardous Waste — Soil
Calderon Testing — Air

14072 W. Park Avenue Boulder Creek, CA 95006 (408) 338-3053

Analysis Requested

Laboratory Report

Procedure

Chent Report Date
Elivicerraneratal Tech. Services 01/15/93
1548 Jacob Ave.
Slars Jose CA 95118

Sample Site
Filam Fire Station #2
635 Pacific Ave
Alameda
EMMALAMFIRE2

Date Received 01/12/93

Date Analyzed

	carbons - Gas carbons - Diesel	EPA 5030 EPA 3510			rte Analyzed 01/14/93
Total Dil &		EPA 503e			
RTEX		EPA 602			
S&W Ref. #	Client Ref. #	Mutrix/Analysis	Concentration	De	tection Limit
0123-ET2-A	MU-2	Water/TPH-G	₩-	50	ppb
0123-ET2-A	MW-2	Hatem/TPH-D	*		ppb
0123-ET2-A	MW-C	Water/TOG	*		ppm
0123-ET2-A	MH-2	Waitem/BTEX			
		Ber:zene	*	0.5	ppb
		Tolluene	*		ppb
		Ethylberizerie	*		dad
		Xyitenes	#	0.5	ppb
 0123-ET2-B		Water/TPH-0		50	p pb
0123-ET2-B	MH-3	Water/TPH-D	*		ppb
0123-ET2-B	M4-3	Water/TOB	*		ppin
0123-ET2-B	MH-3	Water/BTEX			F-12.77
		Bernzerie	*	0.5	peb
		Tolluene	*		ppb
		Ethylbenzene	#		ppb
		Xylenes	*		ppb
0123-ET2-C		Administration of the second			
0123-E12-C	Mi-4	Water-/TPH-G	₩		ppb
	MH-4	Water/TPH-D	*		bbp
0123-ET2-C	MU-4	Water/TOG	*	5	bb m
0123-ET2-C	MU-4	Wat (Ith / RTEX			_
		Benzene	₩.	0.5	
		Toluene	*	0.5	
		Ethylbevizene	*	0.5	
		XXIENSE	#	0.5	p pp

* No detectable amount @ detection limit

Arialyst Signature

GR. H. Lamon

Environmental Technical Services

(408) 267-6427

CHAIN - OF - CUSTODY

Project Number	Sito No.	mo and Ac	Idrose								T		
Project Number AMWAIAM FIRE 2 Witnessing Agency/Insp	AIAM	Fire S	#10 #2		Type and Number of	Α	Malys	is Re	quire	d	Laboratory ID		Comments
2 MWAIAM FIRE2	635 Y	Pagistic	Aug. Alon	ueda.	Containers]
Witnessing Agency/Insp	ector Nam	e and Date	2			TPH-G + BTEX		- 1			Condition		
AlAM. Co. Env	HLTH	DEAT	. Juliett	Chan		ا ن	TPH-D+	İ			of Samples		1
Alam. Co. Envy Sample ID Date	Time	Matrix	Sample Location	1		ΉÆ	Hai	ğ			1 - Good 2 - See Reverse		
1/1					2 liters	,	_		_	+	Z SCC Reverse	 	
mw-2 1/1/93		420	1st CW		2 VOA5	/	/						
	1	1/60	1		1				-			}	
mw-3						/	$ \sqrt{ }$						
1 1						/	/				T		
mw-4 V		V	$oxed{oxed}$		√	V	🗸	-					
					1]]	- })		<u>}</u>
											1		
												· ···	
		• • • • • • • • • • • • • • • • • • • •						\neg	_				
								- 1	1	1 1	1		
									十				
		····					П	1		 - - 			
								- 1					
									\dashv				
									- 1				[
									\dashv				
Relinquished by: (Signa	ture)		Date/Time	Received by	: (Signature)		<u>-</u> Н	L Date/	Time		Remarks:	L	<u> </u>
Helen 11 hulus			Date/Time 4:30 1/11/93	ETS FR									
Relinguished by: (Siona	ture		Date/Time	Received by:			I	Date/1	Γime		COMPANS		
	00	20 P									COMPANY: ADDRESS:		
Relinquished by: (Signe	iture)	7	Datg/Time	Received by	Lab: (Signature	e)	I	Date/	Time	a 116			
Relinquished by: (Signatural)	ケノスイン	5	1/12/93	Q.M.	Kima	m	l	112/	14	g: ul	PHONE:		FAX:

APPENDIX D GROUNDWATER DEVELOPMENT REPORTS

MONITORING WELL SAMPLING DATA MONITORING WELL NO.1

		MONITORING I	WELL NO.1					
PROJECT	NAME:		WELI	. #				
ALAMEDA	FIRE STATION	N #2	MW-	·1				
DATE:	TANIADY 11		······································					
	JANUARY 11	1, 1993						
NAME:			TIME	TIME BEGAN:				
Helen Ma	whinney		12:45					
DEPTH OF	WELL(FT.)	DEPTH OF	WATER(FT.)	WELL DIAM.				
19.2		5.	7	2"				
TIME	GALLONS	рН	TEMP.	COND.				
10:45	1	7.3	61.0	1.49				
10:50	2	7.2	61.0	1.48				
10:55	3	7.3	61.0	1.49				
11:05	4	7.2	59.0	1.49				
11:15	5	7.2	61.0	1.49				
11:19	7	7.2	61.0	1.49				
VOLUME EVACUATE	D	PURGING EQU	IP. SA	AMPLING EQUIP.				
8 gallon	s	Stainless St Bailer		ainless Steel .ler				
DEPTH TO	WATER UPON	COMPLETION (OF SAMPLING					
Not meas	ured. Recha	arge very god	od					
SHEEN	FLOATIN	NG PRODUCT	SAMPLE CO	OLOR ODOR				
no	no		gold	no				
SEDIMENT	SEDIMENT/FOREIGN MATTER: Sample clear							
SAMPLE I	D#	ANALYSIS	LABO	PRATORY				
MW-1		TPHg, BTEX	S &	W Lab.				
SAMPLE CO	ONTAINERS VOAs			<u>VATIVE</u> 24 hr.analysis)				

MONTTORING WELL SAMPLING DATA

MONITORING WELL SAMPLING DATA MONITORING WELL NO.2									
PROJECT	NAME:		WEI	L#					
ALAMEDA FIRE STATION #2 MW-2									
DATE:	DATE: JANUARY 11, 1993								
NAME:			TIM	IE BEGAN	<u>:</u>				
Helen Ma	whinney		11:	25					
DEPTH OF	WELL(FT.)	DEPTH OF V	VATER (FT.)	WEL	L DIAM.				
17.7		5.3	5.3 2"						
TIME	GALLONS	На	TEMP.	<u>c</u> 0	ND.				
11:25	1	7.96	60.4	3.	47				
11:30	2	7.94	60.5	3.	47				
11:35	3	7.93	60.5	3.	48				
11:40	4	7.90	60.5	3.	51				
11:45	5	7.90	60.4	3.	53				
11:50	7	7.90	60.4	3.	53				
VOLUME EVACUATE	תי	PURGING EQUII	<u> </u>	SAMPLING	EQUIP.				
8 gallor		Stainless Ste Bailer		Stainles Bailer	s Steel				
DEPTH TO		COMPLETION OF	SAMPLING						
SHEEN no		IG PRODUCT	SAMPLE (COLOR old	ODOR no				
SEDIMENT	FOREIGN MAT	TER: sample o	clear						
SAMPLE I	.D#	ANALYSIS TPHg, BTEX		ORATORY W Lab					
SAMPLE CONTAINERS 3/ 40-ml VOAs PRESERVATIVE none (24 hr. analysis)									

MONITORING WELL SAMPLING DATA MONITORING WELL NO.3

PROJECT NAME:		WELL #					
ALAMEDA FIRE STATI	ION #2	MW	-3				
DATE: JANUARY 11, 1993							
NAME:		ጥተል	E BEGAN:				
Helen Mawhinney		12:	00p 				
DEPTH OF WELL (FT.)	DEPTH OF WA	TER(FT.)	WELL DIAM.				
17.6	6.0		2"				
TIME GALLONS	рН	TEMP.	COND.				
12:00 1	7.68	57.1	1.53				
12:05 2	7.68	57.3	1.52				
12:10 3	7.67	57.3	1.52				
12:15 4	7.63	57.4	1.53				
12:20 5	7.65	57. 5	1.53				
12:25 7	7.65	57.5	1.53				
VOLUME EVACUATED	PURGING EQUIP.	<u>S</u> .	AMPLING EQUIP.				
8 gallons	Stainless Stee Bailer	Steel Stainless Steel Bailer					
DEPTH TO WATER UPO	ON COMPLETION OF	SAMPLING					
Not measured. Rec	charge very good						
SHEEN FLOAT	ING PRODUCT	SAMPLE C	OLOR ODOR				
no	no	gold	no				
SEDIMENT/FOREIGN M	MATTER: very litt	le silt					
SAMPLE ID#	ANALYSIS	LAB	ORATORY				
MW-3	TPHg, BTEX	S &	W Lab.				
SAMPLE CONTAINERS 3/ 40-ml VOAs		<u>PRESERVATIVE</u> none (24 hr.analysis)					

MONITORING WELL SAMPLING DATA/MW-2

Project Name: ALAMEDA FIRE STATION# 2			Wellf				
			M				
Date:	Septem	ber 4, 1992					
Name:		Time Began:					
Mawhinney			3:12				
DEPTH OF V	ELL(ft.)	DEPTH TO	WATER(ft.)	WELL I	DIAM.		
17.7			33	2"			
Time C	allons	Salinity	рΉ	Temp.	Cond.		
3:12	1	.05	7.5	25 C	1.46		
3:30	3	.05	7.3	23 C	1.00		
3:41	5	.04	7.0	23 C	1.26		
3:54	8	.04	7.3	23 C	1.20		
4:11	10	.04	7.3	23 C	1.24		
Volume Evacuated	Purgin	g Equip.	Sampling Equip.				
		ess Steel Bai			el Baile		
		Completion o			·		
Not measure	ed. Re	charge v ery g	pood				
Sheen	Floating Product		Sample	Odor			
no	no		gold	no			
ediment/Fo	reign Ma	tter: sample	clear				
ample ID#	Analysis		Laboratory				
W-2	TPI	fg, BTEX	S & W Lab.				
ample Cont	ainers		Prese	rvative	****		
/ 40-ml Vo	As			(24 hr an			

MONITORING WELL SAMPLING DATA/MW-3

Project Na	ine:		Well#				
ALAMEDA FI	ire stati	ON# 2 MW-3					
Date:	Septem	ber 4, 1992			· <u> </u>		
Name:		Time Began: 4:29					
Mawhinney							
DEPTH OF W	ELL(ft.)	DEPTH TO W	ATER(ft.)	MELL I	DIAM.		
17.73	7.9			2"			
Time G	allons	Salinity	На	Temp.	Cond		
12:21	1	.04	7.6	26 C	1.2		
12:34	3	.05	7.5	25 C	1.3		
12:48	5	.04	7.3	23 C	1.2		
1:01	8	.04	7.2	24 C	1.2		
1:15	10	.04	7.3	23 C	1.2		
Volume Purging Equip.		Sampling Equip.					
		ess Steel Bail		nless Ste	el Baile		
Depth to Wa	ater Upon	Completion of	Sampling	<u> </u>			
Recharge ve	ery good						
heen	Floatin	Ploating Product		Sample Color			
no	no		gold		Odor no		
ediment/Fo	reign Ma	tter: sample c	lear		<u> </u>		
ample ID#	Àn	Analysis		boratory			
W-3	TPHg, BTEX		S & W Lab.				
ample Containers / 40-ml VOAs			<u>Preservative</u> None (24 hr analysis)				

MONITORING WELL SAMPLING DATA/MW-4

Project Name:			Well#				
ALAMEDA FIRE STATION		ON# 2	# 2 MW-4				
Date:	Septem	ber 4, 1992					
Name:	·		Time Be				
Mawhinney			4:29				
DEPTH OF	WELL(ft.)	DEPTH TO	WATER(ft.)	WELL	DIAM.		
19.81		7.	7.26		2"		
	Gallons	Salinity	рН	Temp.	Cond.		
2:01	1	.04	7.6	26 C	1.25		
2:16	3	.05	7.5	25 C	1.38		
2:25	5	.04	7.3	23 C	1.26		
2:45	8	.04	7.2	24 C	1.26		
3:01	10	.04	7.3	23 C	1.24		
olume Purging Equip.			Sampling Equip.				
0 gallons	-	ess Steel Bai	ler Stai	nless Ste	el Baile		
		Completion o	f Sampling				
echarge v	ery good						
heen	Ploating	Product	Sample	Odor			
no	no		gold		no		
	reign Mat	ter: sample o	clear				
imple ID!	Ana	lysis	Lat				
V-4 TPHg, BTEX		g, BTEX	S & W Lab.				
ample Containers / 40-ml VOAs			<u>Preservative</u> None (24 hr analysis)				