



February 14, 1996

SOIL ASSESSMENT REPORT  
ASE JOB NO. 2607  
at  
Former Alameda Max's Service Station  
1357 High Street  
Alameda, California

Submitted by:  
AQUA SCIENCE ENGINEERS, INC.  
2411 Old Crow Canyon Road, #4  
San Ramon, CA 94583  
(510) 820-9391



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NOTICE  
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## 1.0 INTRODUCTION

This report outlines the methods and findings of Aqua Science Engineers, Inc. (ASE)'s soil assessment at the former Alameda Max's service station located at 1357 High Street, Alameda, California (*Figure 1*). This assessment was performed to (1) determine whether free phase hydrocarbons were still present in soil and water in the vicinity of monitoring well MW-2 at the site, and (2) to determine whether polynuclear aromatic hydrocarbons (PNAs) are present in soil beneath this area. The proposed site assessment activities were initiated by the property owner, Mr. James A. Phillipson, in accordance with a letter received from the Alameda County Health Care Services Agency (ACHCSA) dated January 25, 1996 (Appendix A).

## 2.0 SITE HISTORY

A gasoline service station formerly occupied the site (*Figure 2*). On March 26, 1993, ASE removed one (1) 6,000-gallon gasoline storage tank, one (1) 5,000-gallon gasoline storage tank, one (1) 4,000-gallon gasoline storage tank, one (1) 550-gallon gasoline storage tank, one (1) 150-gallon waste oil storage tank and one (1) 150-gallon oil and water separator from the site. All of the tanks were steel. The 550-gallon gasoline storage tank had a hole in the tank upon inspection, and strong petroleum odors were present around the tank. The 150-gallon waste oil storage tank did not contain any apparent holes or cracks, however, a strong petroleum odor was emanating from the excavation. No holes, cracks or petroleum odors were identified upon inspection of the other tanks. Up to 140 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G), 2,200 ppm total petroleum hydrocarbons as diesel (TPH-D) and 12,000 ppm oil and grease (O&G) were detected in soil samples collected from the tank pits.

On November 22, 1993, ASE overexcavated soil from the former waste-oil storage tank pit and removed the soil stockpiles that were generated during the tank removal operations. A total of approximately 88 tons of contaminated soil were overexcavated and removed from the site. Only 2 ppm O&G were detected in a confirmation sample collected at the bottom of northern sidewall of the waste oil tank excavation.

On March 31, 1994, ASE drilled borings BH-A through BH-C at the site and installed groundwater monitoring wells MW-1 through MW-3 in the borings. Up to 7,500 ppm O&G and 1,400 ppm TPH-D were detected in a soil sample collected from boring BH-B near the waste oil tank. Relatively low TPH-G concentrations (7.4 ppm) were detected in shallow unsaturated

soil from boring BH-C. No hydrocarbons were detected in the soil sample collected in boring BH-A.

On April 4, 1994, ASE collected groundwater samples from the wells. 6,200 parts per billion (ppb) O&G, 150 ppb TPH-G and low benzene, toluene, ethylbenzene and total xylenes (BTEX) and trichloroethene (TCE) concentrations were in groundwater samples from monitoring well MW-2, located near the waste oil tank. 1,200 ppb TPH-G, 180 ppb TPH-D and between 3 and 230 ppb BTEX were detected in groundwater samples collected from monitoring well MW-3, at the downgradient edge of the site.

On August 2, 1994, monitoring well MW-2 contained 0.16-feet of oil floating on the groundwater surface. 60 ppb TPH-G, 500 ppb TPH-D and no BTEX were detected in monitoring well MW-1. 2,700 ppb TPH-G and between 6 ppb and 470 ppb BTEX were detected in the groundwater sample collected from monitoring well MW-3.

On September 30, 1994, ASE drilled soil boring BH-D and installed monitoring well MW-4 in the boring. This boring is located in High Street downgradient of the site. No hydrocarbons were detected in a soil sample collected from the capillary zone in this boring, and 500 ppb TPH-G, 200 ppb TPH-D and between 2 and 70 ppb BTEX were detected in groundwater samples collected from this well on October 4, 1994.

On July 31, 1995, ASE drilled six soil borings in High Street to determine whether groundwater contamination extended across High Street or whether contamination may have migrated along underground utility lines buried under High Street. The analytical results showed that the hydrocarbon plume had not yet crossed High Street and that it appeared that underground utility lines have not acted as a conduit for the spread of contamination along High Street.

Between September 15, 1995 and November 7, 1995, an oil skimmer operated in monitoring well MW-2 to remove the free-floating oil that had been present in that well. Approximately 65 gallons of oil and water were removed from the well during this period. Only a sheen is now present on the surface of groundwater in that well.

The site has been on a quarterly groundwater sampling plan since December 1994. During this period, hydrocarbon concentrations have been generally consistent at the site. Monitoring well MW-2 has consistently contained a layer of free-floating motor oil. Groundwater samples collected from monitoring well MW-1 have contained up to 200 ppb

TPH-G, 1,600 ppb TPH-D and low BTEX concentrations. Groundwater samples collected from monitoring well MW-3 have contained up to 2,700 ppb TPH-G, 300 ppb TPH-D, 9 ppb benzene, 30 ppb toluene, 78 ppb ethylbenzene and 470 ppb total xylenes. Groundwater samples collected from monitoring well MW-4 have contained up to 2,900 ppb TPH-G, 620 ppb TPH-D, 9 ppb benzene, 48 ppb toluene, 180 ppb ethylbenzene, and 450 ppb total xylenes. Groundwater has consistently flowed to the southeast toward High Street during this period.

### 3.0 SCOPE OF WORK (SOW)

Based on the site history and requirements outlined in the ACHCSA January 25, 1996 letter, ASE's SOW was to:

- 1) Drill a soil boring near the former waste oil tank excavation in the vicinity of monitoring well MW-2 with a hand auger;
- 2) Collect a soil sample for analyses;
- 3) Analyze the soil sample for PNAs by EPA Method 8270;
- 4) Backfill the boring with neat cement;
- 5) Report the methods and findings of this assessment.

Details of this assessment follow.

### 4.0 DRILLING SOIL BORINGS AND COLLECTING SAMPLES

On January 29, 1996, ASE environmental specialist Scott Ferriman drilled soil boring B-A approximately 2-feet northwest from monitoring well MW-2 with a hand auger. A soil sample was collected from approximately 4-feet below ground surface in this boring. The sample was contained in a laboratory supplied glass jar, labeled, and cooled on ice for transport to Curtis and Tompkins, LTD. (C&T) of Berkeley, California (ELAP #1459) under chain of custody.

*Disruption of this sample?*

Following collection of this soil sample, free-floating oil was noted on the surface of the groundwater in this boring. Samples of this oil were collected by lowering a strip of polyethylene into the well with twine, removing the polyethylene strip from the well, and allowing the oil that coated the polyethylene to drip into 40-ml volatile organic analysis (VOA) vials. This procedure was repeated until two VOA vials were full of the oil.

The samples were labeled and then cooled on ice for transport to C&T under chain of custody.

Beyond this scope of work, ASE drilled boring B-B approximately 5-feet northeast of monitoring well MW-2 to further define the extent of free-floating oil at the site. This boring also contained free-floating oil. No samples were collected from this boring.

## 5.0 ANALYTICAL RESULTS FOR SOIL

The soil sample was analyzed by C&T for PNAs by EPA Method 8270. The analytical results are presented in Table One, and the certified analytical report is presented in Appendix B. The oil sample was placed on hold and was not analyzed.

**TABLE ONE**  
Summary of Chemical Analysis of **BH-A 4.0'** SOIL Samples

Compound	Concentration (parts per billion)
Naphthalene	2,400
Acenaphthylene	150
Fluorene	130
Phenanthrene	520
Other 8270 Compounds	<100

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

Naphthalene, acenaphthene, fluorene and phenanthrene were detected in soil in the area of the proposed overexcavation at concentrations between 130 and 2,400 parts per billion.

Free-floating hydrocarbons were detected in the two soil borings drilled during this assessment. It appears that the free-floating oil at the site is so viscous that the oil skimmer that was operating in monitoring well MW-2 was not able to remove the large amount of free-floating oil at the site.

Since there is a significant area of free-floating oil beneath the site, and an oil skimmer was not effective in removing the oil from such a large area, it appears that the only way to remove this oil in a cost effective manner is by overexcavation. Although there appears to be only a limited health risk

*↑ Based on what?*

associated with the degradation of groundwater from oil, this oil is far too shallow to be left in place. Since very strong odors and free-floating hydrocarbons are present only three feet or less below ground surface, and future construction on the property is likely to match the surrounding residential zoning, this highly contaminated soil will most likely be encountered during any future construction at the site. ASE recommends that the overexcavation proceed as proposed in ASE's January 22, 1996 workplan. In addition to the work proposed in the workplan, ASE suggests that the excavation be dewatered with a vacuum truck during overexcavation activities to remove as much free-floating oil as possible prior to backfilling.

## 7.0 REPORT LIMITATIONS

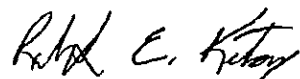
The results of this investigation represent conditions at the time of the soil sampling, at the specific locations at which the samples were collected, and for the specific parameters analyzed for by the laboratory.

It does not fully characterize the site for contamination resulting from unknown sources, or for parameters not analyzed for by the laboratory. All of the laboratory work cited in this report was prepared under the direction of an independent state certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

Aqua Science Engineers appreciates the opportunity to assist you with your environmental needs. Should you have any questions or comments, please feel free to call us at (510) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

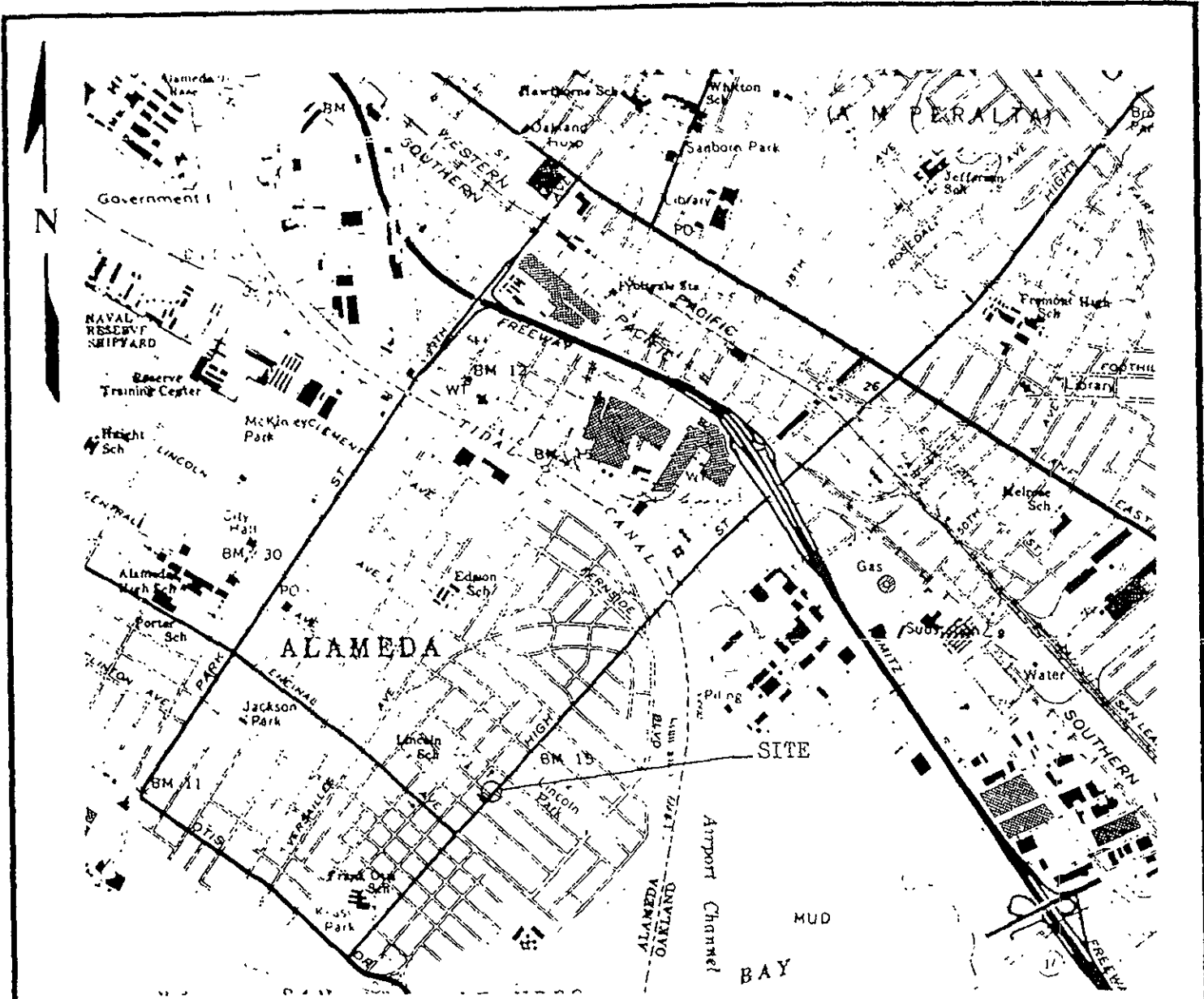


Robert E. Kitay, R.E.A.  
Project Geologist



Attachments: Figures 1 and 2  
Appendices A and B

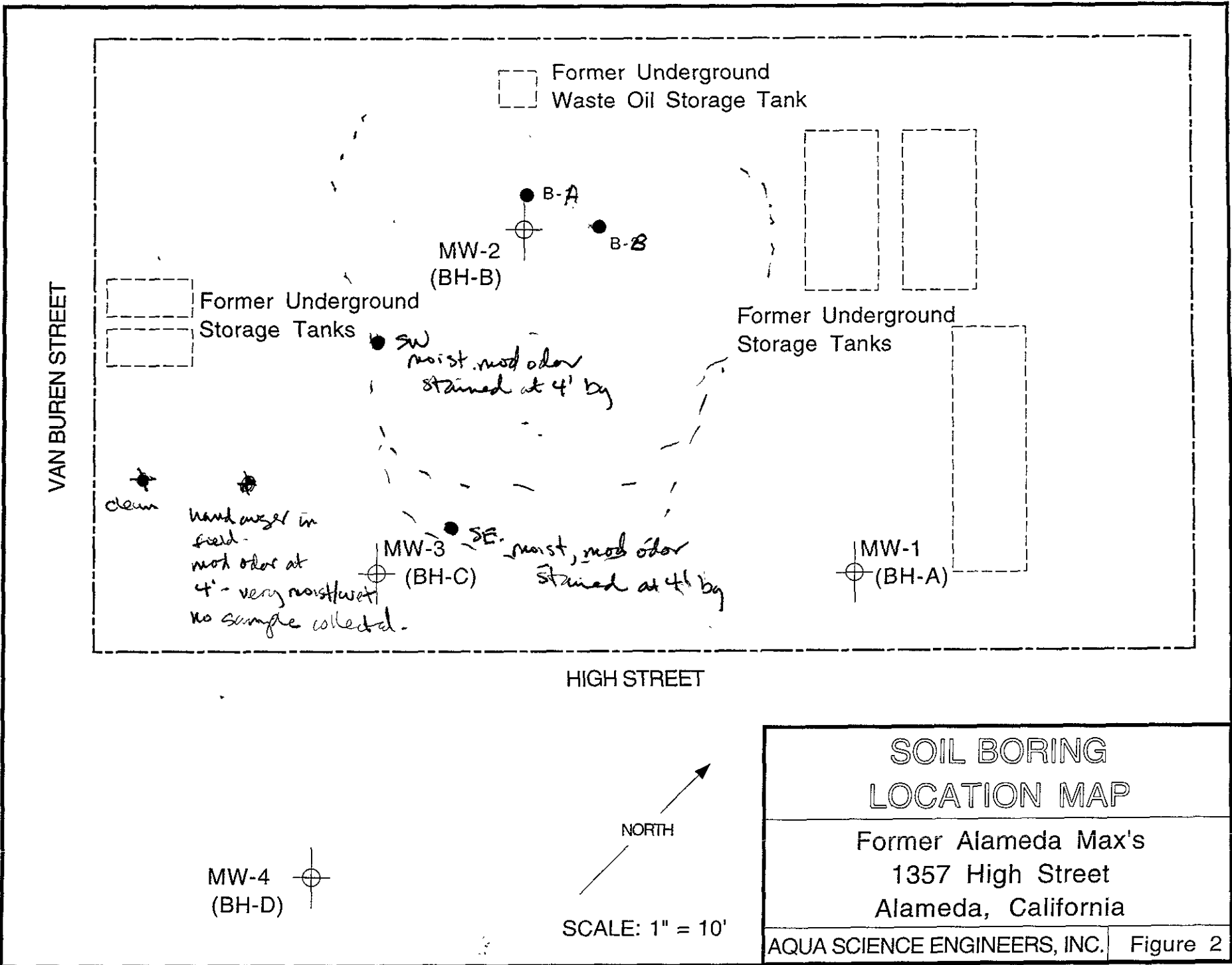
## **FIGURES**



<b>SITE LOCATION MAP</b>	
Alameda Max's 1357 High Street Alameda, California	
Aqua Science Engineers	Figure 1

BASE: Oakland East and Oakland West 7.5 minute quadrangle topographic map, dated 1980, scale 1:24,000





## **APPENDIX A**

Alameda County Health Care Services Agency  
"Direction" Letter

ALAMEDA COUNTY  
HEALTH CARE SERVICES

AGENCY  
DAVID J. KEARS, Agency Director



RAFAT A. SHAHID, Assistant Agency Director

Alameda County Environmental Health Dept.  
Environmental Protection Division  
1131 Harbor Bay Parkway, Room 250  
Alameda CA 94502-6577  
(510)567-6700 fax: (510)337-9335

January 25, 1996

Mr. James A. Phillipsen  
3111 Marina Drive  
Alameda, CA 94501

STID 1702

Re: Work plan for excavation at Former Alameda Max's Property, located at 1357 High Street, Alameda, California

Dear Mr. Phillipsen,

This office has reviewed Aqua Science Engineers' work plan, dated January 22, 1996, which proposes the destruction and replacement of Well MW-2 and overexcavation of the area adjacent to the former waste oil UST to eliminate the source of the observed floating oil in Well MW-2. However, according to the lab results from the last groundwater sampling event in December 1995, it appears that the floating oil has dissipated, leaving only a light sheen, probably due to the former operation of the oil skimmer in Well MW-2. Due to the present disappearance of the floating oil and the fact that, to date, this oil has not apparently migrated to the downgradient wells MW-1 and MW-3, located roughly 20 feet from Well MW-2, it appears that overexcavation is not required at this time.

In lieu of overexcavation, this office is requesting that quarterly groundwater monitoring resume for all four wells. However, if the floating oil reappears and persists, overexcavation will be reconsidered as an alternative to continued monitoring and skimming of Well MW-2, if it is found to be more cost effective, or if it can be shown that existing soil and groundwater contamination may potentially pose a threat to human health.

Recently, the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) have determined Polynuclear Aromatic Hydrocarbons (PNAs) to be the chemicals of concern in TPHd when evaluating health and safety risk; and the American Society for Testing and Materials (ASTM), whose Risk-Based Corrective Action (RBCA) guidelines were recently incorporated into RWQCB's interim guidelines (see attached), has come up with protective health levels for two of the PNAs, (naphthalene and benzo(a)pyrenes). This office is requesting that the next groundwater sample collected from Well MW-2 be analyzed for PNAs, in addition to TPHg, TPHd, TOG, BTEX, and halogenated volatiles for the following reasons: 1) The recently developed concerns surrounding the potential health hazards of PNAs; 2) the concentrations of PNAs identified in the initial soil sample collected from the

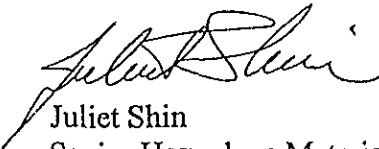
Mr. James A. Phillipsen  
Re: 1357 High St.  
January 25, 1996  
Page 2 of 2

former waste oil tank pit; and 3) the elevated levels of TPHd identified in the soil sample collected from Well MW-2.

**This office is also requesting that at least one soil sample be collected from the vicinity of Well MW-2 and be analyzed for PNAs to aid in more accurately assessing any potential threat to human health from on-site soils.** It is advisable to begin looking at the human health risks associated with the remaining soil and groundwater contaminants to establish acceptable human health protective cleanup levels for residential exposure at the site. The RWQCB has suggested that ASTM RBCA's tiered approach be used as protocol/guidelines for determining human health risk assessments. The initial tier, Tier 1, of this approach provides a look-up table and a more simplified alternative to conducting an elaborate human health risk assessment for some of the contaminants of concern. Other risk assessment resources will obviously be needed in cases where ASTM RBCA does not cover contaminant constituents. Please be aware, though, that some of the parameters used to establish the Tier 1 levels are less conservative than the actual site parameters (e.g., the depth-to-water parameter used for Tier 1 is 300cm or roughly 9-feet below ground surface).

The next quarterly monitoring event should be conducted by March 1995. If you have any questions or comments, please contact me at (510) 567-6763.

Sincerely,



Juliet Shin  
Senior Hazardous Materials Specialist

**ATTACHMENT**

sk cc: Robert E. Kitay  
Aqua Science Engineers, Inc.  
2411 Old Crow Canyon Road #4  
San Ramon, CA 94583

Acting Chief-File

## **APPENDIX B**

Analytical Report and Chain of Custody Form  
For Soil Samples



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L   R E P O R T

Prepared for:

Aqua Science Engineers, Inc.  
2411 Old Crow Canyon Rd  
Suite 4  
San Ramon, CA 94583

Date: 09-FEB-96  
Lab Job Number: 124229  
Project ID: 2607  
Location: Phillipsen

Reviewed by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

This package may be reproduced only in its entirety.

Polynuclear Aromatic Hydrocarbons by GC/MS		
Client: Aqua Science Engineers, Inc.	Analysis Method: EPA 8270	
Project#: 2607	Prep Method: EPA 3550	
Location: Phillipsen	Cleanup Method: EPA 3640	
Field ID: B-A, 4.0'	Sampled: 01/29/96	
Lab ID: 124229-001	Received: 01/29/96	
Matrix: Soil	Extracted: 02/02/96	
Batch#: 25711	Analyzed: 02/07/96	
Units: ug/Kg		
Diln Fac: 1		
Analyte	Result	Reporting Limit
Naphthalene	2400	100
Acenaphthylene	150	100
Acenaphthene	ND	100
Fluorene	130	100
Phenanthrene	520	100
Anthracene	ND	100
Fluoranthene	ND	100
Pyrene	ND	100
Benzo(a)anthracene	ND	100
Chrysene	ND	100
Benzo(b)fluoranthene	ND	100
Benzo(k)fluoranthene	ND	100
Benzo(a)pyrene	ND	100
Indeno(1,2,3-cd)pyrene	ND	100
Dibenz(a,h)anthracene	ND	100
Benzo(g,h,i)perylene	ND	100
Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	37	23-120
2-Fluorobiphenyl	43	30-115
Terphenyl-d14	98	18-137



Lab #: 124229

BATCH QC REPORT

Page 1 of 1

Polynuclear Aromatic Hydrocarbons by GC/MS			
Client: Aqua Science Engineers, Inc.		Analysis Method: EPA 8270	
Project#: 2607		Prep Method: EPA 3550	
Location: Phillipsen		Cleanup Method: EPA 3640	
METHOD BLANK			
Matrix: Soil		Prep Date: 02/02/96	
Batch#: 25711		Analysis Date: 02/07/96	
Units: ug/Kg			
Diln Fac: 1			

MB Lab ID: QC14265

Analyte	Result	Reporting Limit
Naphthalene	ND	50
Acenaphthylene	ND	50
Acenaphthene	ND	50
Fluorene	ND	50
Phenanthrene	ND	50
Anthracene	ND	50
Fluoranthene	ND	50
Pyrene	ND	50
Benzo(a)anthracene	ND	50
Chrysene	ND	50
Benzo(b)fluoranthene	ND	50
Benzo(k)fluoranthene	ND	50
Benzo(a)pyrene	ND	50
Indeno(1,2,3-cd)pyrene	ND	50
Dibenz(a,h)anthracene	ND	50
Benzo(g,h,i)perylene	ND	50
Surrogate	%Rec	Recovery Limits
Nitrobenzene-d5	48	23-120
2-Fluorobiphenyl	48	30-115
Terphenyl-d14	47	18-137





Lab #: 124229

BATCH QC REPORT

Page 1 of 1

Polynuclear Aromatic Hydrocarbons by GC/MS			
Client: Aqua Science Engineers, Inc.	Analysis Method: EPA 8270		
Project#: 2607	Prep Method: EPA 3550		
Location: Phillipsen	Cleanup Method: EPA 3640		
LABORATORY CONTROL SAMPLE			
Matrix: Soil	Prep Date: 02/02/96		
Batch#: 25711	Analysis Date: 02/07/96		
Units: ug/Kg			
Diln Fac: 1			

LCS Lab ID: QC14266

Analyte	Result	Spike Added	%Rec #	Limits
Acenaphthene	593.1	1667	36	31-137
Pyrene	593.2	1667	36	35-142
Surrogate	%Rec	Limits		
Nitrobenzene-d5	51	23-120		
2-Fluorobiphenyl	44	30-115		
Terphenyl-d14	46	18-137		

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

Spike Recovery: 0 out of 2 outside limits

# CURTIS & TOMPKINS, LTD. BERKELEY

# LOGIN CHANGE FORM

Reason for change: \_\_\_\_\_ Client Request: By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Initials: \_\_\_\_\_  
 \_\_\_\_\_ Login Review \_\_\_\_\_ Data Review

Current Lab ID	Previous Lab ID	Client ID	Matrix	Add/Cancel	Analysis	Due date
124/229-001		BN-A 401	Soil	cancel	C & G	
-002		BN-A Oil	oil	cancel	& IGC	

12464

Aqua Science Engineers, Inc.  
2411 Old Crow Canyon Road, #4,  
San Ramon, CA 94583  
(510) 820-9391 - FAX (510) 837-4853

# Chain of Custody

DATE 1-29-96 PAGE 1 OF 1

SAMPLERS (SIGNATURE)

(PHONE NO.)

PROJECT NAME

NO. 2607

Scott Ferrman

820-9391

Phillipsen

ADDRESS 1357 High Street Alameda

## ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID. DATE TIME MATRIX NO. OF SAMPLES

TPH- GASOLINE  
(EPA 5030/8015)

TPH- GASOLINE/BTEX  
(EPA 5030/8015- 8020)

TPH- DIESEL  
(EPA 3510/8015)

PURGABLE AROMATICS  
(EPA 602/CC20)

PURGABLE HALOCARBONS  
(EPA 601/8010)

VOLATILE ORGANICS  
(EPA 624/8240)

BASE/NEUTRALS, ACIDS  
(EPA 625/8270)

OIL & GREASE  
(EPA 5520 E&F OF B&F)

LUFT METALS (S)  
(EPA 6010-7000)

TITLE 22 (CAM 17)  
(EPA 6010-7000)

TCLP  
(EPA 1311/1310)

STLC- CAM WET  
(EPA 1311/1310)

REACTIVITY  
CORROSIVITY  
IGU TABILITY

PMA's 8100 List

Total Oil and Grease

1) BH-A, 4.0' 1/29/96 11:15 Soil 1  
2) BH-A, 0.1' 1/29/96 11:15 Oil 1

X  
X

X

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY LABORATORY:

COMMENTS:

Scott Ferrman  
(signature)

(time)

(signature)

(time)

(signature)

(time)

(signature)

(time)

Scott T. Ferrman  
(printed name)

1/29/96  
(date)

(printed name)

(date)

(printed name)

(date)

Tracy Behar  
(printed name)

(date)

Company- ASE, Inc

ASE, Inc

Company-

Company-

Company- Curtos & Tompkins

1/29/96 10511

Use GPC Clean-up  
for PMA Extractive