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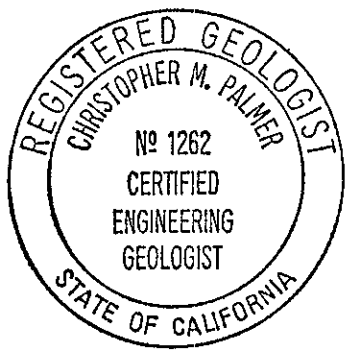
QUARTERLY GROUNDWATER SAMPLING

ENCINAL HIGH SCHOOL
210 CENTRAL AVENUE
ALAMEDA, CALIFORNIA

November 1993

Prepared for:
Mr. Robert Deluca
Alameda Unified School District
2200 Central Avenue
Alameda, CA 94501

Prepared by:



Prepared by:

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Project Geologist

Reviewed by:

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Certified Engineering Geologist

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1.0 INTRODUCTION

This report presents the procedures and findings of quarterly groundwater sampling conducted by ACC Environmental Consultants, Inc., ("ACC") on behalf of Alameda Unified School District, site owner of Encinal High School, 210 Central Avenue, Alameda, California. The project objective is to evaluate the presence or absence of petroleum hydrocarbons in the groundwater by obtaining samples from the existing monitoring wells.

2.0 BACKGROUND

Semco, tank removal contractor, removed one 1,500-gallon capacity underground heating oil tank from Encinal High School yard in April 1992. Two soil samples and one grab water sample were collected from the tank excavation and analyzed for Total Petroleum Hydrocarbons (TPH) ad diesel and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Analysis of the soil samples indicated below detectable levels of the constituents evaluated. Analysis of the water sample identified 640 parts per billion (ppb) of TPH as diesel.

Per request of Alameda County Health Care Services - Hazardous Materials Division, a Preliminary Site Assessment was conducted on-site in June 1993 to further evaluate the groundwater contamination from the heating oil release.

In June 1993, three monitoring wells were installed on-site (Figure 1 illustrates locations of the monitoring wells). Analytical results of soil and groundwater samples collected from the monitoring wells indicated below detectable levels of the constituents evaluated.

3.0 GROUNDWATER SAMPLING

Quarterly groundwater samples are collected on September 23, 1993 from monitoring wells MW-1, MW-2, and MW-3 on-site.

Prior to groundwater monitoring the depth to the surface of the water table was measured from the top of the PVC casing using a Solinst Water Level Meter. Information regarding depths of wells, well elevations and groundwater levels is summarized in Table 1.

TABLE 1
Groundwater Depth Information

Date Sampled	Depth to Groundwater (ft)	Groundwater Elevation (ft)
Well No. MW-1	Elevation of Top of Casing-10.06 MSL	
06/25/93	5.77	4.29
09/23/93	6.13	3.93

TABLE 1 (cont.)
Groundwater Depth Information

Date Sampled	Depth to Groundwater (ft)	Groundwater Elevation (ft)
Well No. MW-2	Elevation of Top of Casing-8.41 MSL	
06/25/93	4.30	4.11
09/23/93	4.62	3.79
Well No. MW-3	Elevation of Top of Casing- 9.55 MSL	
06/25/93	5.34	4.21
09/23/93	5.67	3.88

Notes: All measurements in feet
MSL = Mean Sea Level

During sampling, after water-level measurements were taken, each on-site well was purged by hand using a designated disposable Teflon bailer for each well. Groundwater pH, temperature and electrical conductivity were monitored during well purging. Each well was considered to be purged when these parameters stabilized. Four well volumes were removed to purge each well. Worksheets of groundwater conditions monitored during purging are attached in Appendix A.

After the groundwater had recovered to a minimum of approximately 80 percent of its static level, water samples were obtained using the designated disposable Teflon bailer. For each monitoring well, two liter amber jars and two 40 ml VOA vials, without headspace, were filled from the water collected from the monitoring well.

The samples were preserved on ice and submitted to ChromaLab Inc. under chain of custody protocol. Laboratory results with chain of custody forms are attached in Appendix B.

4.0 FINDINGS

4.1 Analytical Results - Groundwater

One groundwater sample from each on-site groundwater monitoring well has been collected quarterly and submitted to ChromaLab for analysis for TPH as diesel by EPA test method 8015-Modified and BTEX by EPA test method 602. Analysis results from the groundwater samples are illustrated in Table 2. Copies of the analytical results are attached in Appendix B.

TABLE 2
Analytical Results - Groundwater

Well Number	Date Sampled	TPH-diesel (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)
MW-1	06/25/93	<50	<0.5	<0.5	<0.5	<0.5
	09/23/93	69	<0.5	<0.5	<0.5	<0.5
MW-2	06/25/93	<50	<0.5	<0.5	<0.5	<0.5
	09/23/93	<50	<0.5	<0.5	<0.5	<0.5
MW-3	06/25/93	<50	<0.5	<0.5	<0.5	<0.5
	09/23/93	<50	<0.5	<0.5	<0.5	<0.5

Notes:
ug/L = micrograms per liter (ppb)

4.2 Groundwater Gradient

Prior to calculating the groundwater gradient, elevations for the on-site monitoring wells were surveyed by Ron Archer Civil Engineer, Inc. to an accuracy of one-hundredth of a foot. The well elevation was surveyed at the top of the PVC well casing. The elevations of the monitoring wells were established relative to a nearby benchmark located in the west curb line of Lincoln and Central Avenues in Alameda, California.

The groundwater gradient was calculated using measurements from the on-site monitoring wells. The location of the wells is shown in Figure 1 - Site Plan.

Groundwater elevation collected from the wells on September 23, 1993 is illustrated on Figure 2. The gradient was evaluated by triangulation using the elevation of the potentiometric surface measured with respect to Mean Sea Level datum.

Table 3 summarizes the historic groundwater gradient and the direction of groundwater flow on-site.

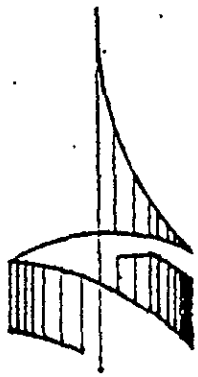
TABLE 3
Historic Groundwater Gradient

Date Monitored	Gradient (foot/foot)	Direction
06/25/93	0.003	west-southwest
09/23/93	0.003	southwest

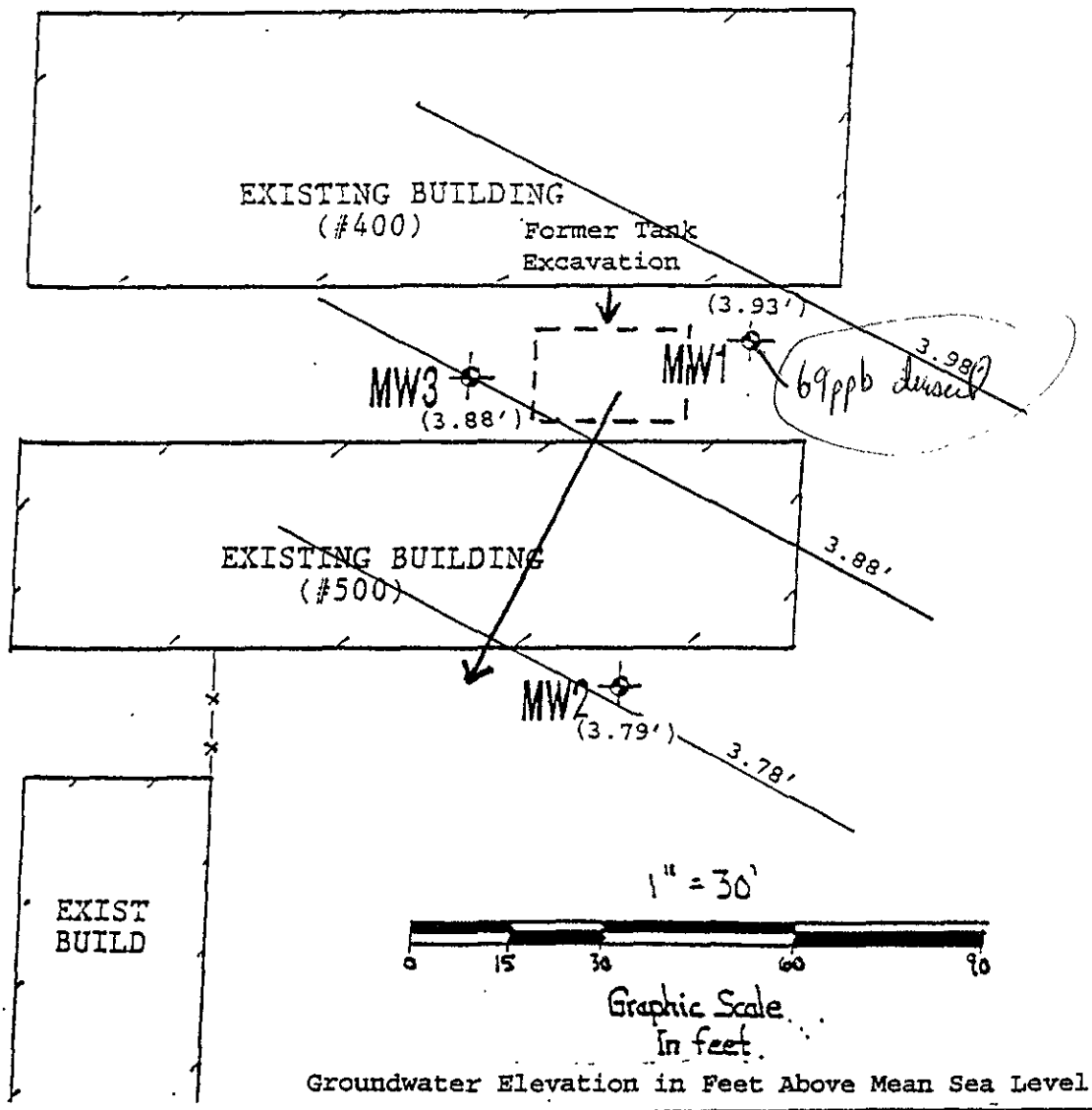
5.0 CONCLUSION

The data and observations discussed herein indicate that groundwater and soil has been impacted due to an unauthorized hydrocarbon release. No levels of TPH as diesel were reported in the soil samples collected during tank removal or drilling. Initial sampling and analysis of the groundwater in June 1993 indicated no release had occurred to impact groundwater. The low concentrations of TPH as diesel observed in MW-1 is interpreted at this time to be a minimal spallage in soil, probably due to historic tank filling.

Pursuant to the Tri-Regional Board guidelines, monitoring of the on-site wells and groundwater sampling will continue on a quarterly basis.



SCALE 1" = 30'



Groundwater Elevation in Feet Above Mean Sea Level

Groundwater Gradient
Encinal High School
Alameda, California

Project #: 6029-4	Drawn By: MCK	Date: 9/23/93	Figure 2

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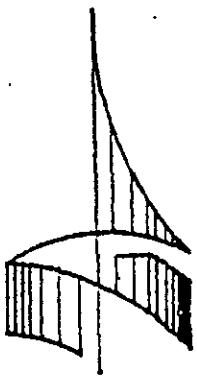

SCALE 1" = 30'

EXISTING BUILDING
(#400)

Former Tank
Excavation

MW3

MW1

EXISTING BUILDING
(#500)

MW2

EXIST
BUILD

1" = 30'

0 15 30 60 90

Graphic Scale
In feet.

Site Map
Encinal High School
Alameda, California

Project #: 6029-4	Drawn By: MCK	Date: 10/25/93	Figure 1

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APPENDIX A

Well Sampling [✓] Well Development [ ] check one

Well Number: MW-1

Job Number: 60295

Job Name: Encinal H, S

Date: 9-23-93

Sampler: Mark Sander

Depth to Water (measured from TOC): 6.13'

Inside Diameter of Casing: 2"

Depth of Boring: 15'

Method of well development/purging: bail

Amount of Water Bailed/Pumped from well: 6 gal

Depth to Water after well development: _____

Depth to water prior to sampling: 6.14'

Bailed water stored on-site ? How ? 55 gal drum

Number of well volumes removed: 4+

TSP wash, distilled rinse, new rope ? yes

Water Appearance:

	yes	no
froth		✓
irridesence		✓
oil		✓
smell		✓
product		✓
other, describe		

Gallons Removed	pH	EC	Temp
6	8.82	19,06	68.8
10	8.47	19,18	68.0
15	8,38	18.89	67.4
20	8.38	18.89	67.3
25			
30			
35			
40			
45			
50			

Samples Obtained:

TPH (gasoline)	[X] NO
TPH (diesel)	[X]
TPH (motor oil)	[ ]
BTXE	[X]
EPA 624	[ ]
EPA 625	[ ]
EPA 608	[ ]
PCBs only	[ ]
Metals	[ ]
Other, specify	[ ]
Field Blank	[ ]

Well Sampling [✓] Well Development [ ] check one

Well Number: MW-3

Job Number: 6029-5

Job Name: Encinal H.S

Date: 9-23-93

Sampler: Mark R. Sander

Depth to Water (measured from TOC): 4.62'

Inside Diameter of Casing: 2"

Depth of Boring: ~~5~~ 13'

Method of well development/purging: Bailing

Amount of Water Bailed/Pumped from well: 5.6 gal.

Depth to Water after well development: _____

Depth to water prior to sampling: 4.63'

Bailed water stored on-site ? How ? ~~55 gal drum~~

Number of well volumes removed: 4+

TSP wash, distilled rinse, new rope ? yes

Water Appearance:

	yes	no
froth		✓
irridesence		✓
oil		✓
smell		✓
product		✓
other, describe		

Gallons Removed	pH	EC	Temp
5.5	8.39	17.81	70.2
10	8.35	14.56	69.3
15	8.27	17.38	68.6
20	8.29	15.33	68.6
25	8.28	15.15	68.5
30			
35			
40			
45			
50			

Samples Obtained:

TPH (gasoline)	
TPH (diesel)	X
TPH (motor oil)	
BTXE	X
EPA 624	
EPA 625	
EPA 608	
PCBs only	
Metals	
Other, specify	
Field Blank	

Well Sampling [✓] Well Development [ ] check one

Well Number: MW-3

Job Number: 10029-5

Job Name: Encinal H.S.

Date: 9-23-93

Sampler: Mark Sander

Depth to Water (measured from TOC): 5.67'

Inside Diameter of Casing: 2"

Depth of Boring: 15

Method of well development/purging: bail

Amount of Water Bailed/Pumped from well: ~~5~~ gal 6.5

Depth to Water after well development: _____

Depth to water prior to sampling: 5.7'

Bailed water stored on-site ? How ? 55 gal drum

Number of well volumes removed: 4+

TSP wash, distilled rinse, new rope ? yes

Water Appearance:

	yes	no
froth		✓
irridesence		✓
oil		✓
smell		✓
product		✓
other, describe		

Gallons Removed	pH	EC	Temp
5	8.52	9.04	71.7
10	8.35	8.05	70.7
15	8.31	10.37	69.7
20	8.25	8.74	69.4
25	8.20	8.35	69.4
30	8.23	8.40	69.5
35			
40			
45			
50			

Samples Obtained:

TPH (gasoline)	
TPH (diesel)	X
TPH (motor oil)	
BTXE	X
EPA 624	
EPA 625	
EPA 608	
PCBs only	
Metals	
Other, specify	
Field Blank	

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

October 1, 1993 ChromaLab File No.: 9309334

ACC ENVIRONMENTAL CONSULTANTS

Attn: Misty Kaltreider

RE: Three water samples for Diesel analysis

Project Name: ENCINAL H. S.
Project Number: 6029-3
Date Sampled: Sept. 23, 1993 Date Submitted: Sept. 24, 1993
Date Extracted: Sept. 29, 1993 Date Analyzed: Sept. 30, 1993

RESULTS:

Sample I.D.	Diesel (µg/L)
MW1	69
MW2	N.D.
MW3	N.D.
BLANK	N.D.
SPIKE RECOVERY	92%
DUP SPIKE RECOVERY	96%
DETECTION LIMIT	50
METHOD OF ANALYSIS	3510/8015

ChromaLab, Inc.

Alex Tam
Analytical Chemist

Eric Tam
Laboratory Director

cc

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(510) 831-1788 • Facsimile (510) 831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 30, 1993 ChromaLab File No.: 9309334

ACC ENVIRONMENTAL CONSULTANTS

Attn: Misty Kaltreider

RE: Three water samples for BTEX analysis

Project Name: ENCINAL H. S.
Project Number: 6029-3
Date Sampled: Sept. 23, 1993 Date Submitted: Sept. 24, 1993
Date Analyzed: Sept. 28, 1993

RESULTS:

Sample I.D.	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Total Xylenes (µg/L)
MW-1	N.D.	N.D.	N.D.	N.D.
MW-2	N.D.	N.D.	N.D.	N.D.
MW-3	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	96%	98%	97%	100%
DUP SPIKE RECOVERY	95%	94%	95%	97%
DETECTION LIMIT	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	602	602	602	602

ChromaLab, Inc.

Billy Thach
Analytical Chemist

Eric Tam
Laboratory Director

cc

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Federal ID #68-0140157

CHROMALAB, INC.

DOHS 1094

SUBM #: 9309334
CLIENT: ACCENV
DUE: 10/01/93
22: REF: 13457

Order # 13457

Chain of Custody

DATE 9/24/93 PAGE 1 OF 1

PROJ. MGR. Misty Kaltreider
COMPANY ACC Environmental
ADDRESS 1000 Atlantic Ave.
Alameda, CA 94501

SAMPLERS (SIGNATURE) Misty Kaltreider (PHONE NO.) (510) 522-9188

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520, B+F, E+F)	PCB (EPA 608, 8080)	PESTICIDES (EPA 608, 8080)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)		METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	TOTAL LEAD	EXTRACTION (TCLP, STLC)			NUMBER OF CONTAINERS
MW-1	9/23/93		W				X	X																3
MW-2	"		"				X	X																3
MW-3	"		"				X	X																3

PROJECT INFORMATION

PROJECT NAME: ENCINAL HS
PROJECT NUMBER: 6029-3
P.O. # 6029-3
TAT: STANDARD 5-DAY | 24 | 48 | 72 | OTHER

SPECIAL INSTRUCTIONS/COMMENTS:

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	9
HEAD SPACE	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	

	1.	2.	3.
RELINQUISHED BY	Misty Kaltreider		
(SIGNATURE) (TIME)	Misty Kaltreider 9/24/93		
(PRINTED NAME) (DATE)	ACC Environmental		
(COMPANY)			
RECEIVED BY			K. Moore 1220
(SIGNATURE) (TIME)			K. Moore 9-24-93
(PRINTED NAME) (DATE)			Chromalab
(COMPANY)			(LAB)

APPENDIX B