

R. William Rudolph, Jr., PE
Thomas E. Cundey, PE
Jeriann N. Alexander, PE

March 29, 1995
SCI 469.009

Mr. Robert Mibach
Director, Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, California 94606

**Quarterly Groundwater Monitoring
February 1995 Event
College of Alameda
555 Atlantic Avenue
Alameda, California**

Dear Mr. Mibach:

This letter presents the results of quarterly groundwater monitoring conducted by Subsurface Consultants, Inc. (SCI) at the referenced site. The monitoring program has been implemented in accordance with Regional Water Quality Control Board and Alameda County Health Care Services Agency (ACHCSA) guidelines due to the presence of petroleum hydrocarbons in the soil beneath previous underground fuel storage tanks. Five wells currently exist at the site. Wells MW-1, MW-3 and MW-5 are being monitored quarterly; wells MW-2 and MW-4 are being monitored semi-annually.

Groundwater Sampling

The sampling event was performed on February 13, 1995. Initially, the depth to water below the top of casing (TOC) was measured in all the wells using an electric well sounder. Current and previous groundwater elevation data are presented in Table 1.

For this event, wells MW-1, MW-2, MW-3 and MW-5 were monitored. Initially, the wells were checked for free floating product using a steel tape with petroleum product sensitive paste. The slow recharging wells, MW-1 and MW-3, were then purged by bailing them dry with a disposable bailer. Wells MW-2 and MW-5 were purged by bailing with a disposable bailer until temperature, pH, and conductivity measurements had stabilized. Well sampling forms are attached.

■ Subsurface Consultants, Inc.

171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 510-268-0461 • FAX 510-268-0137

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The wells were sampled after they had recharged to within 80% of their initial volume. The samples were retained in glass containers pre-cleaned by the supplier in accordance with EPA protocol. The samples were placed in an ice chest and remained refrigerated until transmitted to the analytical laboratory. Chain of Custody records accompanied the samples to the laboratory.

Analytical Testing

Groundwater samples were transmitted to Curtis and Tompkins, Ltd., a State of California Department of Health Services certified analytical laboratory. The testing program included the following analyses:

1. Total extractable hydrocarbons (TEH),
2. Benzene, toluene, ethylbenzene, and xylenes (BTEX), and
3. Total oil and grease (TOG).

The results of all analytical testing events are presented in Table 2. Analytical test reports and Chain-of-Custody records for the current event are attached.

Conclusions

Groundwater level data indicate that groundwater currently flows in a north-northwest direction at a gradient of about 1 percent. Groundwater flow contours for the current event are presented on Plate 2.

TEH within the diesel range were detected in wells MW3 and MW5. The analytical laboratory has indicated that oil range components contributed to the diesel range quantitation. Oil and grease was detected in well MW-3. TEH was not detected in the other wells sampled during this event. BTXE were not detected in the wells sampled during this event.

Ongoing Monitoring

In accordance with the monitoring schedule, the next monitoring event is scheduled for May 1995. During that event, water level readings will be obtained from all the wells and wells MW-1, MW-3, MW-4 and MW-5 will be sampled. The groundwater samples will be analyzed for total extractable hydrocarbons, total oil and grease, and BTXE.

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If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Marianne Watada

Marianne Watada
Project Engineer

MFW:JNA:sld

2 copies submitted

Attachments: Table 1 - Contaminant Concentrations in Groundwater
Table 2 - Groundwater Elevations
Plate 1 - Site Plan
Plate 2 - Study Area Plan
Analytical Test Report
Chain-of-Custody Form
Well Sampling Forms

cc: ✓ Ms. Juliet Shin
Alameda County Health Care Services Agency
Hazardous Materials Division
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

**Table 1.
Groundwater Elevations**

<u>Well</u>	<u>TOC Elevation</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>
MW-1	12.16	02/24/92	1.64	10.52
		03/09/92	4.28	7.88
		03/24/92	4.33	7.83
		04/28/92	4.54	7.62
		06/29/92	5.92	6.24
		07/27/92	5.74	6.42
		08/27/92	6.04	6.12
		09/24/92	6.16	6.00
		12/16/92	6.19	5.97
		01/21/93	6.83	5.33
		02/07/94	6.01	6.15
		05/03/94	5.03	7.13
		06/02/94	5.14	7.02
		08/23/94	5.20	6.96
		11/03/94	5.51	6.65
02/13/95	5.30	6.86		
MW-2	11.07	02/24/92	4.45	6.62
		01/21/93	6.83	4.24
		03/24/92	3.73	7.34
		04/28/92	4.25	6.82
		06/29/92	4.40	6.67
		07/27/92	4.00	7.07
		08/27/92	4.33	6.74
		09/24/92	4.36	6.71
		12/16/92	4.08	6.99
		01/21/93	4.40	6.67
		02/07/94	3.60	7.47
		05/03/94	4.04	7.03
		06/02/94	4.17	6.90
		08/23/94	4.28	6.79
		11/03/94	4.33	6.74
02/13/95	5.95	5.12		
MW-3	12.65	02/24/92	13.12	-0.47
		03/09/92	8.75	3.90
		03/24/92	6.87	5.78
		04/28/92	6.31	6.34
		06/04/92	7.10	5.55
		06/29/92	10.78	1.87
		07/27/92	6.88	5.77
		09/24/92	7.38	5.27
		12/16/92	6.50	6.15

Table 1
Groundwater Elevations
(continued)

<u>Well</u>	<u>TOC Elevation</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>
		01/21/92	10.25	2.40
		02/07/94	11.44	1.21
		05/03/94	7.02	5.63
		06/02/94	9.15	3.50
		08/23/94	7.13	5.52
		11/03/94	7.54	5.11
		02/13/95	5.80	6.85
MW-4	12.22	02/07/94	5.92	6.30
		05/03/94	5.50	6.72
		06/02/94	5.17	7.05
		08/23/94	5.73	6.49
		11/03/94	6.41	5.81
		02/13/95	4.65	7.57
MW-5	12.69	02/07/94	4.89	7.80
		05/03/94	4.50	8.19
		06/02/94	4.49	8.20
		08/23/94	4.83	7.86
		11/03/94	5.14	7.55
		02/13/95	4.19	8.50

TOC = Top of Casing

Groundwater depth measured below TOC

TOC elevation surveyed relative to mean sea level

Table 2
Contaminant Concentrations in Groundwater

	<u>Sampling Date</u>	<u>TVH (ug/l)</u>	<u>TEH</u>		<u>TOG (mg/l)</u>	<u>Benzene (ug/l)</u>	<u>Toluene (ug/l)</u>	<u>Ethyl-Benzene (ug/l)</u>	<u>Total Xylenes (ug/l)</u>	<u>EPA 8010 Chemicals</u>
			<u>Kerosene Range (ug/l)</u>	<u>Diesel Range (ug/l)</u>						
<u>Fuel Oil Tank Area</u>										
MW-1	02/19/92	--	<50	94	--	<0.5	<0.5	<0.5	<0.5	--
	06/29/92	--	<50	110	--	<0.5	<0.5	<0.5	<0.5	--
	09/29/92	--	<50	<50	--	<0.5	<0.5	<0.5	<0.5	--
	12/22/92	--	<50	180	--	<0.5	<0.5	<0.5	<0.5	--
	01/26/94	--	60	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	05/04/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	08/25/94	--	*	480	<5	<0.5	<0.5	<0.5	<0.5	--
	11/07/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	02/13/95	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
MW-4	01/26/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	08/25/94	--	*	530	<5	<0.5	<0.5	<0.5	<0.5	--
<u>Gasoline Tank Area</u>										
Tank Excavation	08/15/91	800	--	--	--	78	99	10	52	--
MW-2	02/19/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	06/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	09/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	12/22/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	01/25/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	05/04/94	--	*	50	<5	<0.5	<0.5	<0.5	<0.5	--
	11/04/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	02/13/95	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--

Table 2.
(continued)
Contaminant Concentrations in Groundwater

	<u>Sampling Date</u>	<u>TVH (ug/l)</u>	<u>TEH</u>		<u>TOG (mg/l)</u>	<u>Benzene (ug/l)</u>	<u>Toluene (ug/l)</u>	<u>Ethyl-Benzene (ug/l)</u>	<u>Total Xylenes (ug/l)</u>	<u>EPA 8010 Chemicals</u>
			<u>Kerosene Range (ug/l)</u>	<u>Diesel Range (ug/l)</u>						
<u>Waste Oil Tank Area</u>										
MW-3	02/19/92	<5000+	680	<50	<5	<50	<50	<50	84	ND
	06/29/92	<50	*	190	<5	<0.5	<0.5	<0.5	<0.5	ND
	09/29/92	<50	*	410	<5	<0.5	<0.5	<0.5	<0.5	ND
	12/21/92	<500	*	400	<5	<5	<5	<5	<5	ND
	01/26/94	--	70	<50	<5	<0.5	<0.5	<0.5	0.8	--
	05/05/94	--	<50	140	<5	<0.5	<0.5	<0.5	<0.5	--
	08/25/94	--	*	900	<5	14.5	5.1	<0.5	<0.5	--
	11/07/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
	02/13/95	--	*	310	5.9	<0.5	<0.5	<0.5	<0.5	--
MW-5	01/25/94	--	*	5,200++	<5	<0.5	<0.5	<0.5	<0.5	--
	05/04/94	--	*	3,500++	<5	<0.5	<0.5	<0.5	<0.5	--
	08/25/94	--	*	5,000++	<5	<0.5	<0.5	<0.5	<0.5	--
	11/04/94	--	*	4,600++	<5	<0.5	<0.5	<0.5	<0.5	--
	02/13/95	--	*	3,000++	<5	<0.5	<0.5	<0.5	<0.5	--

TVH = Total volatile hydrocarbons as gasoline, EPA 8015/5030 modified

TEH = Total extractable hydrocarbons, EPA 3550/8015 modified

TOG = Total oil and grease, EPA 3550 and SMWW 17:5520 B&F

ug/l = Micrograms per liter or parts per billion (ppb)

mg/l = Milligrams per liter or parts per million (ppm)

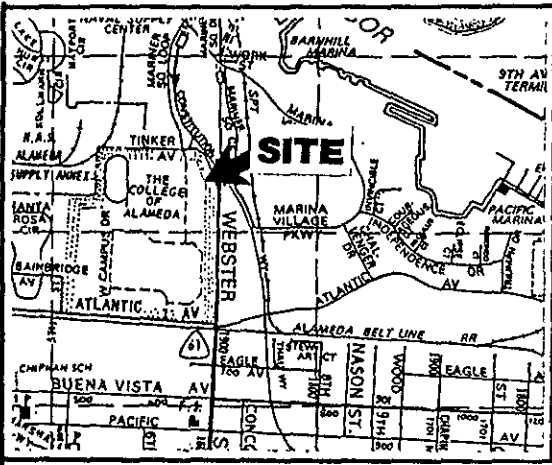
-- = Test not requested

+ = Sample diluted due to foaming during purge and trap extraction

ND = Not detected at or above reporting limits. Reporting limits vary from 1.0 to 20 ug/l. See test reports for individual reporting limits.

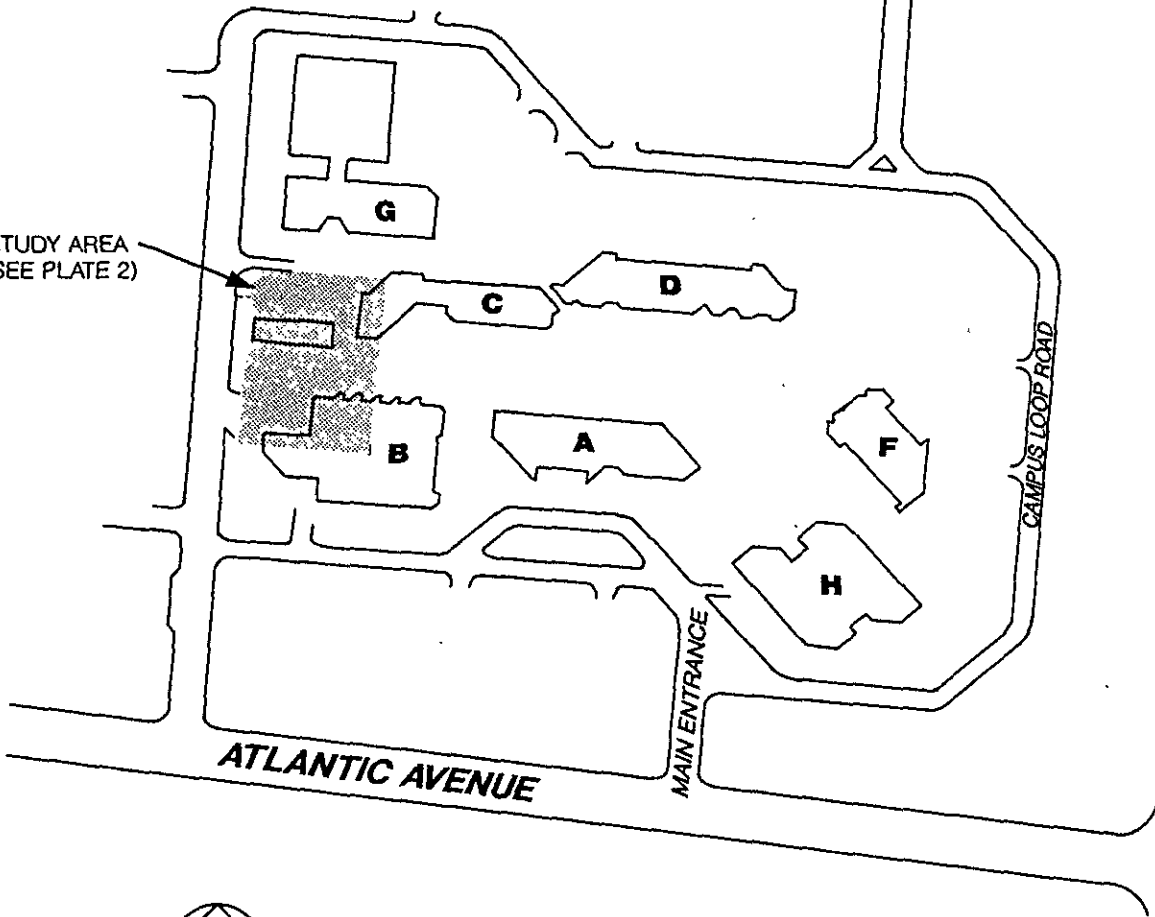
* = Quantitated as diesel range

++ = Laboratory indicates that the sample chromatogram resembles a light weight oil.



VICINITY MAP

STUDY AREA
(SEE PLATE 2)



APPROXIMATE SCALE (feet)



SITE PLAN

COLLEGE OF ALAMEDA - ALAMEDA, CA

PLATE





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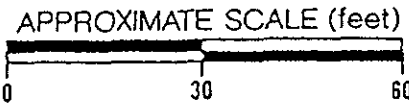
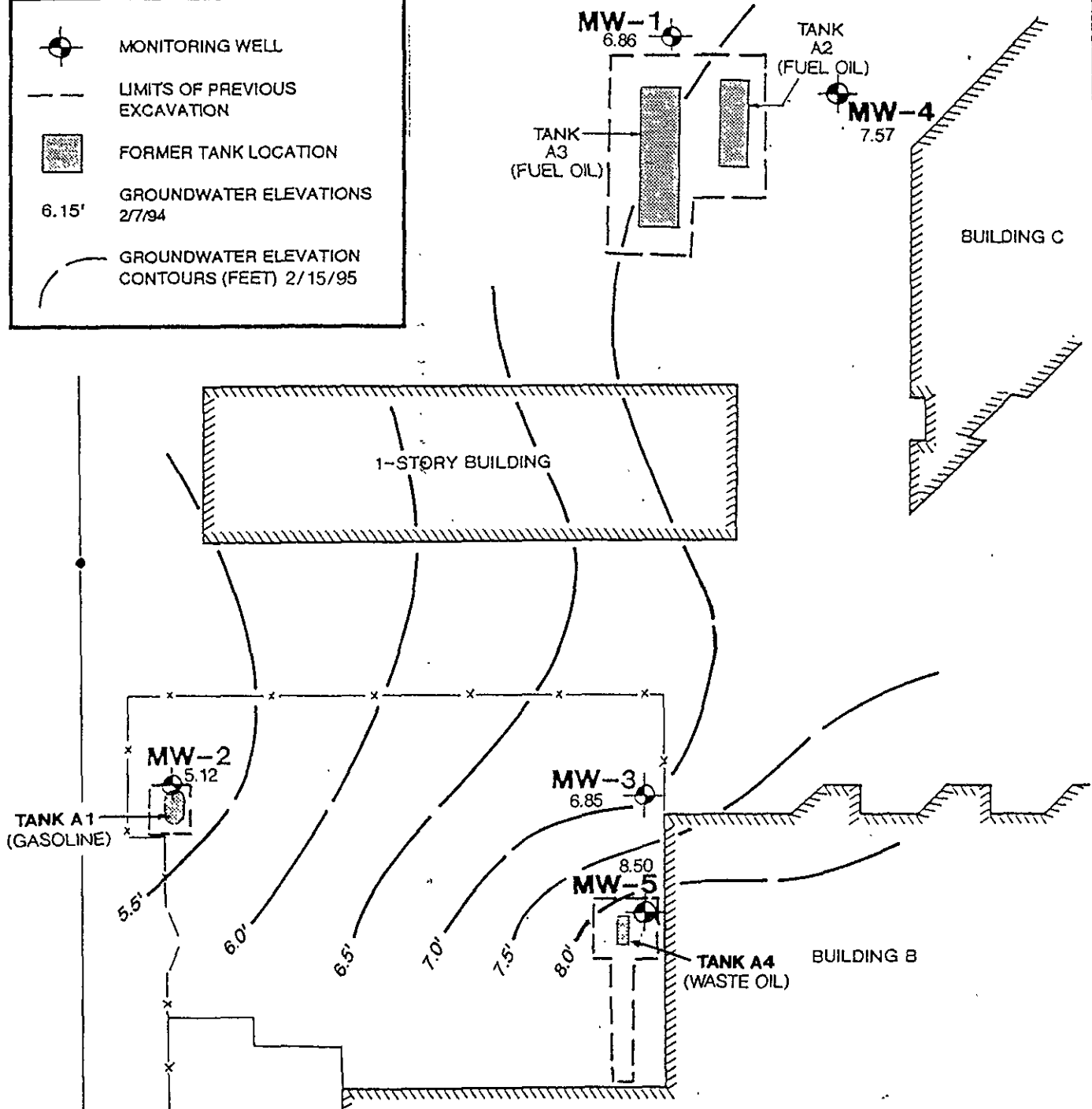
JOB NUMBER
469.009

DATE
3/12/92

APPROVED
UW

1

 MONITORING WELL
 LIMITS OF PREVIOUS EXCAVATION
 FORMER TANK LOCATION
 6.15' GROUNDWATER ELEVATIONS 2/7/94
 GROUNDWATER ELEVATION CONTOURS (FEET) 2/15/95



STUDY AREA PLAN

Subsurface Consultants

COLLEGE OF ALAMEDA - ALAMEDA, CA		
JOB NUMBER 469.009	DATE 3/9/95	APPROVED MW

PLATE
2



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:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 23-FEB-95
Lab Job Number: 119904
Project ID: 469.009
Location: College of Alameda

Reviewed by:

Mary Plasse

Reviewed by:

[Signature]

This package may be reproduced only in its entirety.

LABORATORY NUMBER: 119904
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 469.009
 LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 02/13/95
 DATE RECEIVED: 02/14/95
 DATE ANALYZED: 02/14/95
 DATE REPORTED: 02/22/95
 BATCH NO.: 19040

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT (ug/L)
119904-001	MW-1	ND	ND	ND	ND	0.5
119904-002	MW-2	ND	ND	ND	ND	0.5
119904-003	MW-3	ND	ND	ND	ND	0.5
119904-004	MW-5	ND	ND	ND	ND	0.5
BLANK	N/A	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	98

LABORATORY NUMBER: 119904
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 469.009
 LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 02/13/95
 DATE RECEIVED: 02/14/95
 DATE EXTRACTED: 02/17/95
 DATE ANALYZED: 02/18/95
 DATE REPORTED: 02/22/95
 BATCH NO: 19106

Extractable Petroleum Hydrocarbons in Aqueous Solutions
 California DOHS Method
 LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)
119904-001	MW-1	ND	ND	50
119904-002	MW-2	ND	ND	50
119904-003	MW-3	**	310*	50
119904-004	MW-5	**	3,000*	50
METHOD BLANK	N/A	ND	ND	50

ND = Not detected at or above reporting limit. Reporting limit applies to all analytes.

* Sample chromatogram does not resemble hydrocarbon standard. Oil range components contributed to diesel range quantitation.

** Kerosene range not reported due to overlap of hydrocarbon ranges.

QA/QC SUMMARY:

RPD, %	4
RECOVERY, %	105

Client: Subsurface Consultants

Laboratory Login Number: 119904

 Project Name: College of Alameda
 Project Number: 469.009

Report Date: 22 February 95

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) METHOD: SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
119904-001	MW-1	Water	13-FEB-95	14-FEB-95	21-FEB-95	ND	mg/L	5	TR	19138
119904-002	MW-2	Water	13-FEB-95	14-FEB-95	21-FEB-95	ND	mg/L	5	TR	19138
119904-003	MW-3	Water	13-FEB-95	14-FEB-95	21-FEB-95	5.9	mg/L	5	TR	19138
119904-004	MW-5	Water	13-FEB-95	14-FEB-95	21-FEB-95	ND	mg/L	5	TR	19138

ND = Not Detected at or above Reporting Limit (RL).

Q C B a t c h R e p o r t

Client: Subsurface Consultants
 Project Name: College of Alameda
 Project Number: 469.009

Laboratory Login Number: 119904
 Report Date: 22 February 95

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 19138

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	21-FEB-95

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	87%	SMWW 17:5520BF	21-FEB-95
BSD	87%	SMWW 17:5520BF	21-FEB-95

		Control Limits
Average Spike Recovery	87%	80% - 120%
Relative Percent Difference	.4%	< 20%

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-1
 Job No.: 469.009 Well Casing Diameter: 2 inch
 Sampled By: COA Date: 2/12/95
 TOC Elevation: _____ Weather: overcast

Depth to Casing Bottom (below TOC) 15 feet
 Depth to Groundwater (below TOC) 5.30 feet
 Feet of Water in Well 9.70 feet
 Depth to Groundwater When 80% Recovered _____ feet
 Casing Volume (feet of water x Casing DIA² x 0.0408) 158 gallons
 Depth Measurement Method Tape & Paste Electronic Sounder Other _____
 Free Product _____
 Purge Method to flow back

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>1</u>	<u>6.06</u>	<u>57.1</u>	<u>9330</u>	_____	_____
<u>2</u>	<u>6.19</u>	<u>57.5</u>	<u>11770</u>	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged 2 (computed) gallons
 Depth to Groundwater Before Sampling (below TOC) _____ feet
 Sampling Method to flow back
 Containers Used 3 40 ml 2 liter _____ pint

Subsurface Consultants

JOB NUMBER

DATE

APPROVED

PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-2
 Job No.: 469.009 Well Casing Diameter: 2 inch
 Sampled By: [Signature] Date: 2/13/95
 TOC Elevation: _____ Weather: Overcast + wet

Depth to Casing Bottom (below TOC) 20 | 15 feet
 Depth to Groundwater (below TOC) 5.95 | 5.95 feet
 Feet of Water in Well 14.05 | 9.05 feet
 Depth to Groundwater When 80% Recovered _____ feet
 Casing Volume (feet of water x Casing DIA² x 0.0408) 2.29 | 1.47 gallons
 Depth Measurement Method Tape & Paste Electronic Sounder Other _____
 Free Product _____
 Purge Method Teflon bridle

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>2</u>	<u>6.69</u>	<u>57.0</u>	<u>1720</u>	_____	_____
<u>4</u>	<u>6.59</u>	<u>57.1</u>	<u>1640</u>	_____	_____
<u>6</u>	<u>6.65</u>	<u>57.3</u>	<u>1700</u>	_____	_____
<u>7</u>	<u>6.64</u>	<u>57.1</u>	<u>1780</u>	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged 7 gallons
 Depth to Groundwater Before Sampling (below TOC) _____ feet
 Sampling Method _____
 Containers Used 3 40 ml 2 liter _____ pint

Subsurface Consultants

JOB NUMBER

DATE

APPROVED

PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-3
Job No.: 469.009 Well Casing Diameter: 2 inch
Sampled By: AD Aru Date: 2/13/95
TOC Elevation: _____ Weather: overcast/wet

Depth to Casing Bottom (below TOC) 15 feet
Depth to Groundwater (below TOC) 5.80 feet
Feet of Water in Well 9.2 feet
Depth to Groundwater When 80% Recovered _____ feet
Casing Volume (feet of water x Casing DIA² x 0.0408) 1.5 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method teflon pump

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>1</u>	_____	_____	_____	_____	_____
<u>2</u>	_____	_____	_____	_____	_____
<u>3</u>	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged 3 emptied gallons
Depth to Groundwater Before Sampling (below TOC) _____ feet
Sampling Method teflon pump
Containers Used 3 40 ml 2 liter _____ pint

Subsurface Consultants

JOB NUMBER		DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-5
 Job No.: 469.009 Well Casing Diameter: 2 inch
 Sampled By: [Signature] Date: 2/13/95
 TOC Elevation: _____ Weather: overcast

Depth to Casing Bottom (below TOC) 20 | 15 feet
 Depth to Groundwater (below TOC) 4.19' | 4.19 feet
 Feet of Water in Well 15.81 | 10.81 feet
 Depth to Groundwater When 80% Recovered _____ feet
 Casing Volume (feet of water x Casing DIA² x 0.0408) 2.5 | 1.76 gallons
 Depth Measurement Method Tape & Paste | Electronic Sounder | Other
 Free Product none
 Purge Method telfon bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>2</u>	<u>6.06</u>	<u>60.4</u>	<u>4260</u>	_____	_____
<u>4</u>	<u>6.23</u>	<u>58.1</u>	<u>4907</u>	_____	_____
<u>6</u>	<u>6.24</u>	<u>57.2</u>	<u>5230</u>	_____	_____
<u>8</u>	<u>6.24</u>	<u>59.4</u>	<u>4795</u>	_____	_____

Total Gallons Purged 8 gallons
 Depth to Groundwater Before Sampling (below TOC) _____ feet
 Sampling Method telfon bailer
 Containers Used 3 40 ml | 2 liter | _____ pint

Subsurface Consultants		PLATE
	JOB NUMBER	DATE