

James P. Bowers, PE
R. William Rudolph, Jr., PE

ALCO
HAZMAT
94 JAN -5 PM 3:23

January 8, 1994
SCI 820.001

Mr. Brian Oliva
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

**Quarterly Groundwater Monitoring
November 1993
6707 Bay Street
Emeryville, California**

Dear Mr. Oliva:

This letter records the results of a groundwater monitoring event performed by Subsurface Consultants, Inc. (SCI) at the referenced site in November 1993.

Three underground tanks used to store methyl isobutyl ketone and possibly methyl ethyl ketone were removed from the site in October 1989 by others. Soil and groundwater adjacent to the previous tanks were shown, through studies by others, to have been impacted by past organic chemical releases. Soil vapor extraction and groundwater treatment systems were subsequently installed in 1990 to remediate contaminated soil and groundwater. The treatment systems were in operation till early 1991. Since 1991, no additional remediation has been performed. Treatment system and monitoring well locations are shown on the Attached Site Plan, Plate 1.

Initially, groundwater levels in the four wells were measured. The groundwater level measurements are presented in Table 1. Groundwater surface contours for the November 1993 event are shown on Plate 1.

For this event, Wells 1, 3 and 8 were sampled. Prior to sampling, these wells were purged with a clean disposable bailer until measurements of water pH, conductivity and temperature stabilized. A minimum of 4 well volumes were removed from each well. The purged water was placed in 55 gallon drums and left on-site.

■ **Subsurface Consultants, Inc.**

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

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After the wells had recharged to within 80 percent of the initial volume they were sampled using a pre-cleaned sampling device. The water samples were retained in pre-cleaned containers, placed in an iced cooler, and kept refrigerated until delivery to the analytical laboratory. Chain-of-Custody documents accompanied the samples to the laboratory.

Analytical testing was performed by Curtis & Tompkins, Ltd., a California Department of Health Services certified analytical laboratory for the test performed. The samples were analytically tested for the following.

1. Volatile organic chemicals - EPA 8240, and
2. Oil & grease - SMWW 17:5520 E&F

A summary of the current and previous analytical test results are presented in Table 2. Analytical test reports and Chain-of-Custody documents are attached.

Conclusions

The groundwater level data indicate that groundwater flow direction is toward the northwest at a gradient of approximately 2 percent and the water level in the tank area is approximately 0.5 to 1 foot lower than levels previously recorded. This flow direction and gradient remain consistent with previous measurements.

Methyl isobutyl ketone, MIBK (4-methyl-2 pentanone) and oil and grease were detected in Well MW 8 at concentrations of 840 ug/l and 14 mg/l, respectively. No other volatile organic chemicals (EPA 8240) nor oil and grease were detected at concentrations in excess of the analytical detection limits in the wells being monitored. For this reason, it appears that the MIBK contaminant plume is limited to an area immediately adjacent to the previous tanks. The MIBK concentration detected in Well MW-8 is significantly lower than previously detected.

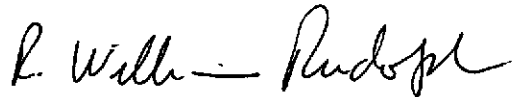
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If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.



R. William Rudolph
Geotechnical Engineer 741 (expires 12/31/96)

MK:RWR:sld

Attachments: Table 1 - Groundwater Elevation Data
Table 2 - Contaminant Concentrations in Groundwater
Plate 1 - Site Plan
Chain-of-Custody Records
Analytical Test Reports

cc: Kirk Jamieson, Pettit & Martin
John R. Boos, Pettit & Martin
James McClay, Scenic Art - MRCP

Table 1.
Groundwater Elevation Data

<u>Well</u>	<u>Date</u>	<u>TOC Elevation (feet)</u>	<u>Depth to Groundwater (feet)</u>	<u>Groundwater Elevation (feet)</u>
MW-1	05/20/93	99.99	10.25	89.74
	06/04/93		11.45	88.54
	08/25/93		11.20	88.79
	11/18/93		11.65	88.34
MW-3	05/20/93	99.46	8.55	90.91
	06/04/93		9.36	90.10
	08/25/93		9.42	90.04
	11/18/93		10.03	89.43
MW-7	06/04/93	99.74	12.67	87.07
	08/25/93		12.44	87.30
	11/18/93		13.13	86.61
MW-8	05/20/93	100.10	9.55	90.55
	06/04/93		10.81	89.29
	08/25/93		10.93	89.17
	11/18/93		11.72	88.38

¹ Elevation reference: Building corner is assumed to be at elevation 100.00 feet

Table 2.
Contaminant Concentrations in Groundwater

Well	Date	Oil & Grease (mg/l) ¹	4-Methyl-2 Pentanone (ug/l) ²	Vinyl Chloride (ug/l)	Acetone (ug/l)	2-Butanone (ug/l)	4-Methyl-2 Pentanol (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Bis (2-Ethyl Hexyl) Phthalate (ug/l)	Other Organic Chemicals (ug/l)
MW1	07/06/89	-- ³	NR ⁴	<0.3	NR	NR	NR	<0.3	<0.3	-- ⁴	ND ⁵
	09/07/89	<10	<20	<4	<20	<20	NR	<2	<2	40	ND
	01/10/90	--	NR	<30	NR	NR	NR	<5	<5	<100	ND
	09/07/91	--	<10	<10	<20	<20	NR	7	8	--	ND
	05/20/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	08/25/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	11/18/93	<5	<10	<10	<40	<10	ND	<5	<5	--	ND
MW3	09/07/89	<10	<20	<4	<20	<20	NR	<2	<2	80	ND
	01/10/90	--	NR	<30	NR	NR	NR	<5	<5	<100	ND
	09/07/91	--	<10	<10	<20	<20	NR	<5	<5	--	ND
	05/20/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	08/25/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	11/18/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
MWB	01/10/90	--	160,000	<6,000	NR	NR	NR	2,100	<1,000	<100	ND
	12/10/90	--	47,000 ⁶	<150	3,200 ⁶	10,000 ⁶	130,000 ⁶	160	<25	--	ND
	09/05/91	--	150,000	<10,000	<5,000	<20,000	NR	<10,000	<10,000	--	ND
	05/20/93	<5	100,000	<5,000	<10,000	<5,000	NR	<3,000	<3,000	--	ND
	08/25/93	<5	48,000	<3,000	<5,000	<3,000	NR	<1,000	<100	--	ND
	11/18/93	14	840	<50	<100	<50	NR	<25	<25	--	ND

¹ Milligrams per liter

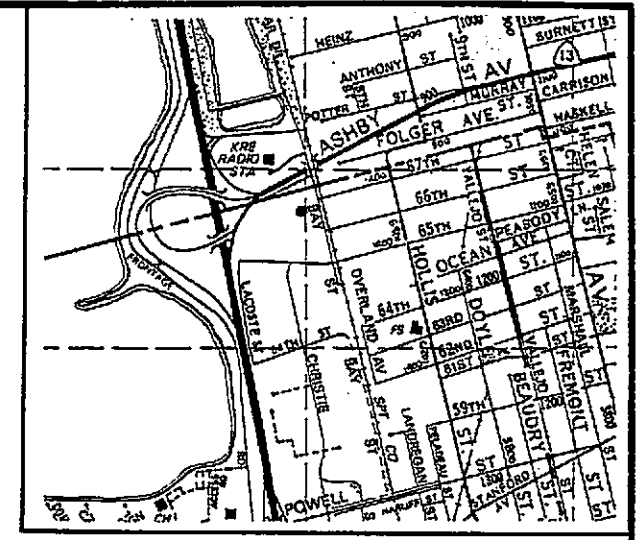
² Micrograms per liter

³ Test not requested

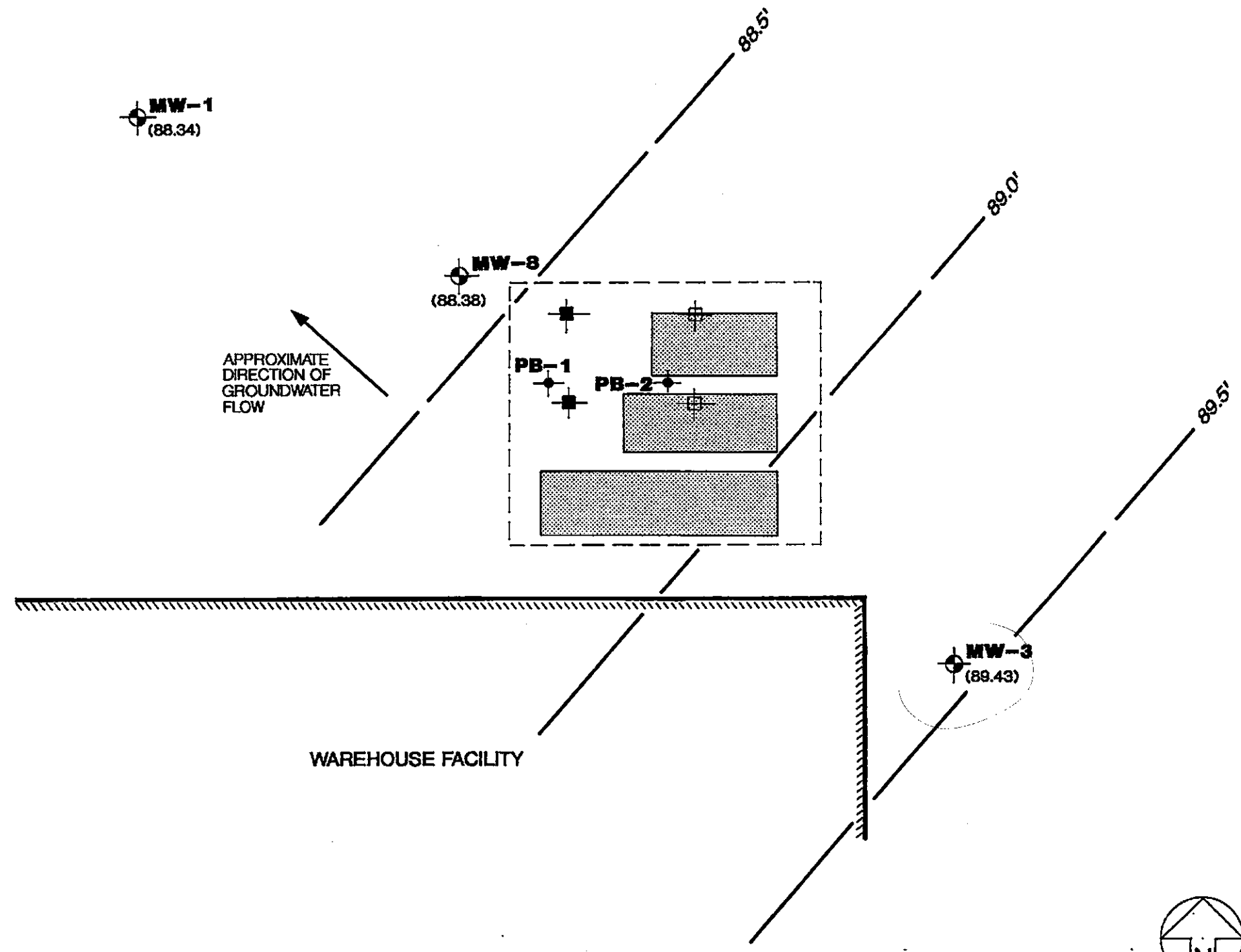
⁴ Not reported

⁵ Not detected above reporting limits

⁶ Tentatively identified compound concentrations



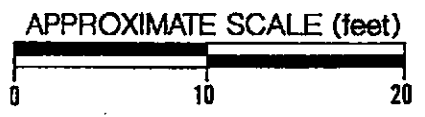
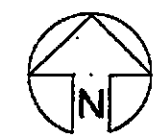
VICINITY MAP



APPROXIMATE DIRECTION OF GROUNDWATER FLOW

WAREHOUSE FACILITY

- MONITORING WELL
- TEST BORING
- VAPOR EXTRACTION WELL
- PASSIVE VAPOR RECHARGE WELL
- APPROXIMATE LOCATION OF PREVIOUS UNDERGROUND STORAGE TANK
- APPROXIMATE EXTENT OF TANK EXCAVATION
- PROPERTY LINE
- GROUNDWATER CONTOURS (feet)
- (90.04) GROUNDWATER ELEVATION (feet)



SITE PLAN			PLATE 1
6707 BAY STREET - EMERYVILLE, CA			
JOB NUMBER 820.001	DATE 11/24/93	APPROVED <i>llc</i>	

Subsurface Consultants



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: 30-NOV-93
Lab Job Number: 113251
Project ID: 820.001
Location: 6707 Bay St.

Reviewed by: _____

Reviewed by: _____

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LABORATORY NUMBER: 113251-01
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 80.001
 LOCATION: 6707 BAY ST.
 SAMPLE ID: MW-1

DATE SAMPLED: 11/18/93
 DATE RECEIVED: 11/18/93
 DATE ANALYZED: 11/24/93
 DATE REPORTED: 11/30/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	40
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
cis-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	50
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	103 %
Toluene-d8	107 %
Bromofluorobenzene	102 %



LABORATORY NUMBER: 113251-02
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 80.001
LOCATION: 6707 BAY ST.
SAMPLE ID: MW-3

DATE SAMPLED: 11/18/93
DATE RECEIVED: 11/18/93
DATE ANALYZED: 11/24/93
DATE REPORTED: 11/30/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
cis-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	50
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	104 %
Toluene-d8	102 %
Bromofluorobenzene	99 %



LABORATORY NUMBER: 113251-03
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 80.001
LOCATION: 6707 BAY ST.
SAMPLE ID: MW-8

DATE SAMPLED: 11/18/93
DATE RECEIVED: 11/18/93
DATE ANALYZED: 11/24/93
DATE REPORTED: 11/30/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	50
Bromomethane	ND	50
Vinyl chloride	ND	50
Chloroethane	ND	50
Methylene chloride	ND	100
Acetone	ND	100
Carbon disulfide	ND	25
Trichlorofluoromethane	ND	25
1,1-Dichloroethene	ND	25
1,1-Dichloroethane	ND	25
trans-1,2-Dichloroethene	ND	25
cis-1,2-Dichloroethene	ND	25
Chloroform	ND	25
Freon 113	ND	25
1,2-Dichloroethane	ND	25
2-Butanone	ND	50
1,1,1-Trichloroethane	ND	25
Carbon tetrachloride	ND	25
Vinyl acetate	ND	250
Bromodichloromethane	ND	25
1,2-Dichloropropane	ND	25
cis-1,3-Dichloropropene	ND	25
Trichloroethene	ND	25
Dibromochloromethane	ND	25
1,1,2-Trichloroethane	ND	25
Benzene	ND	25
trans-1,3-Dichloropropene	ND	25
Bromoform	ND	25
2-Hexanone	ND	50
4-Methyl-2-pentanone	840	50
1,1,2,2-Tetrachloroethane	ND	25
Tetrachloroethene	ND	25
Toluene	ND	25
Chlorobenzene	ND	25
Ethyl benzene	ND	25
Styrene	ND	25
Total xylenes	ND	25

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	107 %
Toluene-d8	96 %
Bromofluorobenzene	94 %



LABORATORY NUMBER: 113251
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 80.001
LOCATION: 6707 BAY ST.
SAMPLE ID: METHOD BLANK

DATE ANALYZED: 11/23/93
DATE REPORTED: 11/30/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
cis-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	8	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	50
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	100 %
Toluene-d8	100 %
Bromofluorobenzene	105 %



LABORATORY NUMBER: 113251
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 80.001
LOCATION: 6707 BAY ST.
SAMPLE ID: METHOD BLANK

DATE ANALYZED: 11/24/93
DATE REPORTED: 11/30/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
cis-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	50
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	106 %
Toluene-d8	103 %
Bromofluorobenzene	98 %



MS/MSD Report

Matrix Sample Number: 113224-001

Lab No: QC53042 QC53043

Matrix: WATER

Batch No: 11584 939416 939417 939411

Date Analyzed: 24-NOV-93

Spike File: >BKN17

Spike Dup File: >BKN18

Analyst: CW

	Instrdrg	SpikeAmt	% Rec	Limits
<u>MS RESULTS</u>				
1,1-Dichloroethene	51.62	50	100 %	61-145%
Trichloroethene	54.89	50	110 %	71-120%
Benzene	54.45	50	102 %	76-127%
Toluene	55.56	50	92 %	76-125%
Chlorobenzene	53.21	50	106 %	75-130%
Surrogate Recoveries				
1,2-Dichloroethane-d4	49.66	50	99 %	76-114%
Toluene-d8	52.86	50	106 %	88-110%
Bromofluorobenzene	50.82	50	102 %	86-115%
<u>MSD RESULTS</u>				
1,1-Dichloroethene	47.43	50	92 %	61-145%
Trichloroethene	51.76	50	104 %	71-120%
Benzene	53.28	50	100 %	76-127%
Toluene	54.71	50	90 %	76-125%
Chlorobenzene	51.02	50	102 %	75-130%
Surrogate Recoveries				
1,2-Dichloroethane-d4	48.45	50	97 %	76-114%
Toluene-d8	50.8	50	102 %	88-110%
Bromofluorobenzene	47.95	50	96 %	86-115%
<u>MATRIX RESULTS</u>				
1,1-Dichloroethene	1.45			
Trichloroethene	0			
Benzene	3.48			
Toluene	9.81			
Chlorobenzene	0			
<u>RPD DATA</u>				
1,1-Dichloroethene	8 %			< 14%
Trichloroethene	6 %			< 14%
Benzene	2 %			< 11%
Toluene	2 %			< 13%
Chlorobenzene	4 %			< 13%

Results within Specifications - PASS CW 11/24/93



MS/MSD Report

Matrix Sample Number: 113289-006

Lab No: QC53117 QC53118

Matrix: WATER

Batch No: 11605 939439 939440 939436

Date Analyzed: 24-NOV-93

Spike File: >BKO13

Spike Dup File: >BKO14

Analyst: CK

	Instrdrg	SpikeAmt	% Rec	Limits
<u>MS RESULTS</u>				
1,1-Dichloroethene	42.34	50	85 %	61-145%
Trichloroethene	48.33	50	97 %	71-120%
Benzene	49.39	50	97 %	76-127%
Toluene	46.27	50	93 %	76-125%
Chlorobenzene	50.29	50	100 %	75-130%
Surrogate Recoveries				
1,2-Dichloroethane-d4	52.31	50	105 %	76-114%
Toluene-d8	49.97	50	100 %	88-110%
Bromofluorobenzene	51.04	50	102 %	86-115%
<u>MSD RESULTS</u>				
1,1-Dichloroethene	43.21	50	86 %	61-145%
Trichloroethene	50.4	50	101 %	71-120%
Benzene	51.08	50	100 %	76-127%
Toluene	47.12	50	94 %	76-125%
Chlorobenzene	50.63	50	100 %	75-130%
Surrogate Recoveries				
1,2-Dichloroethane-d4	53.88	50	108 %	76-114%
Toluene-d8	52.02	50	104 %	88-110%
Bromofluorobenzene	50.78	50	102 %	86-115%
<u>MATRIX RESULTS</u>				
1,1-Dichloroethene	0			
Trichloroethene	0			
Benzene	.891			
Toluene	0			
Chlorobenzene	.482			
<u>RPD DATA</u>				
1,1-Dichloroethene	2 %			< 14%
Trichloroethene	4 %			< 14%
Benzene	3 %			< 11%
Toluene	2 %			< 13%
Chlorobenzene	1 %			< 13%

Results within Specifications - PASS



Client: Subsurface Consultants

Laboratory Login Number: 113251

Report Date: 30 November 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

METHOD: SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
113251-001	MW-1	Water	18-NOV-93	18-NOV-93	18-NOV-93	ND	mg/L	5	TR	11545
113251-002	MW-3	Water	18-NOV-93	18-NOV-93	18-NOV-93	ND	mg/L	5	TR	11545
113251-003	MW-8	Water	18-NOV-93	18-NOV-93	18-NOV-93	14.	mg/L	5	TR	11545

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

 Laboratory Login Number: 113251
 Report Date: 30 November 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 11545

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	18-NOV-93

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	86%	SMWW 17:5520BF	18-NOV-93
BSD	88%	SMWW 17:5520BF	18-NOV-93

		Control Limits
Average Spike Recovery	87%	80% - 120%
Relative Percent Difference	2.4%	< 20%

