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

June 14, 1993
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 and Treatment System Decommissioning
6707 Bay Street
Emeryville, California

Dear Mr. Oliva:

This letter records the results of a groundwater monitoring event and treatment system decommissioning performed by Subsurface Consultants, Inc. (SCI) at the referenced site in May 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 remediation has been performed. Treatment system and monitoring well locations are shown on the attached Site Plan, Plate 1.

Quarterly Monitoring Event

In accordance with the workplan dated April 22, 1993, groundwater monitoring has been implemented at the site. During our site reconnaissance, we were able to locate four existing wells. Initially, groundwater levels in these wells were measured. The groundwater level measurements are presented in Table 1. Groundwater surface contours 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

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 precleaned 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.

Treatment System Decommissioning

In accordance with the workplan, the surface piping and four soil vapor wells were removed. The surface piping was disconnected and stockpiled on-site. The vapor wells were abandoned by pulling out the 2-inch PVC well casing, over drilling the wells with hollow stem augers and backfilling the borings with cement grout. The PVC piping was disposed of at an appropriate landfill.

Conclusions

The groundwater level data indicates that the groundwater flow direction is toward the northwest at a gradient of approximately 2 percent. The flow direction is consistent with past studies by others. Groundwater contours for the May 1993 event are presented on Plate 1.

Methyl isobutyl ketone, MIBK (4-methyl-2 pentanone) was detected in Well 8 at a concentration of 100,000 ug/l. 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 the area immediately adjacent to the previous tanks.

If you have any questions, please call.

Yours very truly,

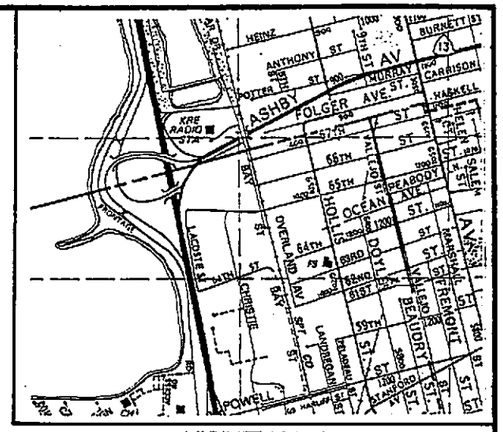
Subsurface Consultants, Inc.

R. William Rudolph

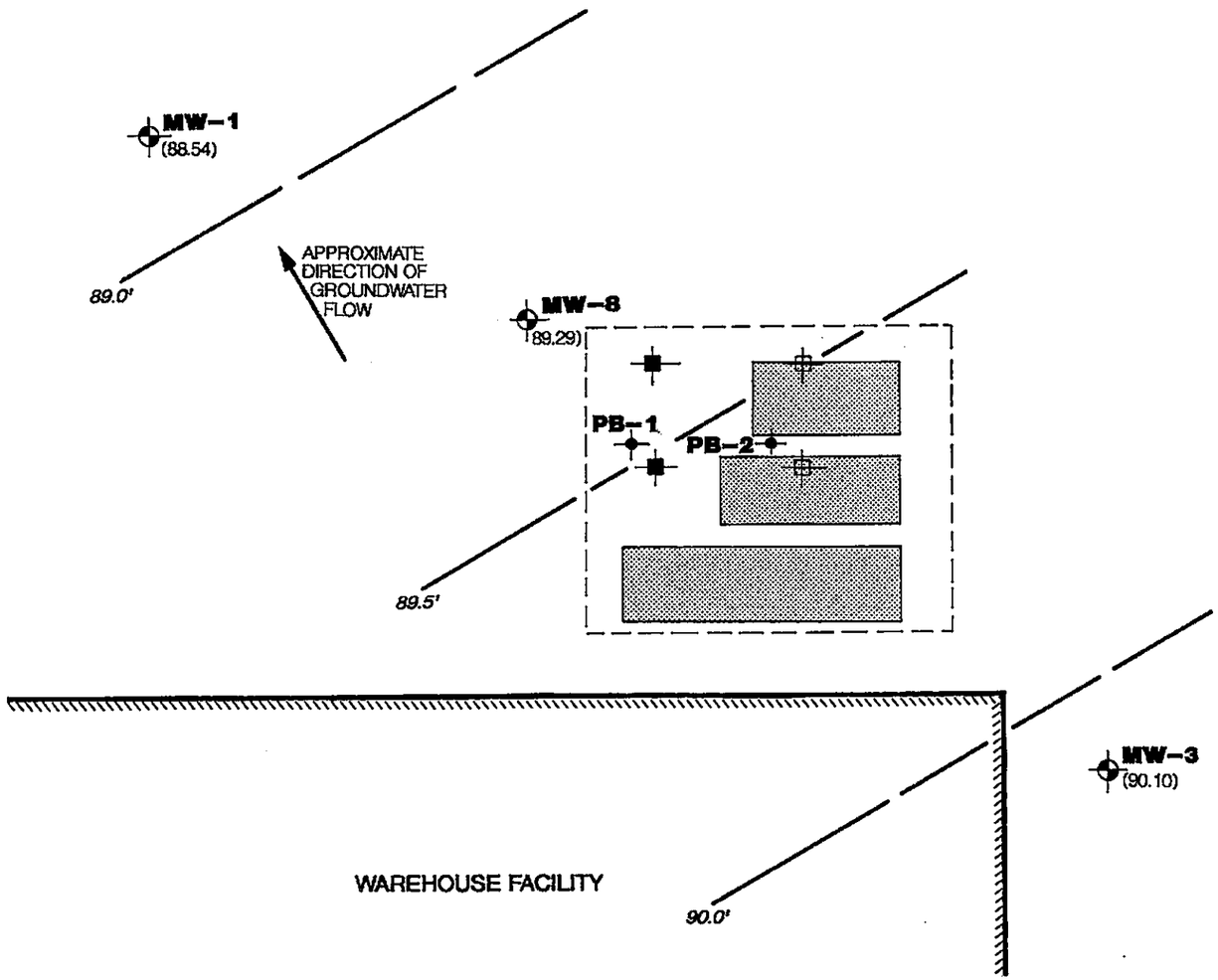
R. William Rudolph
Geotechnical Engineer 741 (expires 12/31/96)

MK:RWR:egh

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



VICINITY MAP



- 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 ELEVATION CONTOURS (feet)
- (89.10) GROUNDWATER ELEVATION (feet)

N

APPROXIMATE SCALE (feet)

0 10 20

SITE PLAN

Subsurface Consultants

6707 BAY STREET – EMERYVILLE, CA

JOB NUMBER	DATE	APPROVED
820.001	6/14/93	

PLATE 1

Table 1.
Groundwater Elevation Data

Well	Date	TOC Elevation (feet)	Depth to groundwater (feet)	Groundwater Elevation (feet)
MW-1	05/20/93	99.99	10.25	89.74
	06/04/93		11.45	88.54
MW-3	05/20/93	99.46	8.55	90.91
	06/04/93		9.36	90.10
MW-7	06/04/93	99.74	12.67	87.07
MW-8	05/20/93	100.10	9.55	90.55
	06/04/93		10.81	89.29

[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**
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	40	<5	<5	--	ND
	05/20/93	**<5**	**<10**	**<10**	**<20**	**<10**	**NR**	**<5**	**<5**	**--**	**ND**
MW8	01/10/90	--	160,000	<6,000	NR	NR	NR	2,100	<1,000	<100	ND
	12/10/90	--	47,000	<150	3,200	10,000	130,000	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**

1 Milligrams per liter
2 Micrograms per liter
3 Test not requested
4 Not reported
5 Not detected above reporting limits

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 05/20/93
DATE REPORTED: 05/26/93

LABORATORY NUMBER: 110974

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 820.001

LOCATION: 6707 BAY ST

RESULTS: SEE ATTACHED

Reviewed by

Reviewed by

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 110974

Project Name: 6707 Bay St.
Project Number: 820.001

Report Date: 26 May 93

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

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
110974-002	MW 3	Water	20-MAY-93	20-MAY-93	25-MAY-93	ND	mg/L	5	TR	9343
110974-003	MW 1	Water	20-MAY-93	20-MAY-93	25-MAY-93	ND	mg/L	5	TR	9343
110974-004	MW 8	Water	20-MAY-93	20-MAY-93	25-MAY-93	ND	mg/L	5	TR	9343

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

Curtis & Tompkins, Ltd.

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

Client: Subsurface Consultants
Project Name: 6707 Bay St.
Project Number: 820.001

Laboratory Login Number: 110974
Report Date: 26 May 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 9343**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	25-MAY-93

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	88%	SMWW 17:5520BF	25-MAY-93
BSD	85%	SMWW 17:5520BF	25-MAY-93

		Control Limits
Average Spike Recovery	86%	80% - 120%
Relative Percent Difference	3.5%	< 20%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 110974-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY ST
SAMPLE ID: MW 3

DATE SAMPLED: 05/20/93
DATE RECEIVED: 05/20/93
DATE ANALYZED: 05/25/93
DATE REPORTED: 05/26/93

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
cis-1,2-Dichloroethene	ND	5
trans-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	10
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	111 %
Toluene-d8	98 %
Bromofluorobenzene	98 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 110974-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY ST
SAMPLE ID: MW 1

DATE SAMPLED: 05/20/93
DATE RECEIVED: 05/20/93
DATE ANALYZED: 05/25/93
DATE REPORTED: 05/26/93

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
cis-1,2-Dichloroethene	ND	5
trans-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	10
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	110 %
Toluene-d8	99 %
Bromofluorobenzene	100 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 110974-4
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY ST
SAMPLE ID: MW 8

DATE SAMPLED: 05/20/93
DATE RECEIVED: 05/20/93
DATE ANALYZED: 05/24/93
DATE REPORTED: 05/26/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	5,000
Bromomethane	ND	5,000
Vinyl chloride	ND	5,000
Chloroethane	ND	5,000
Methylene chloride	ND	10,000
Acetone	ND	10,000
Carbon disulfide	ND	3,000
Trichlorofluoromethane	ND	3,000
1,1-Dichloroethene	ND	3,000
1,1-Dichloroethane	ND	3,000
cis-1,2-Dichloroethene	ND	3,000
trans-1,2-Dichloroethene	ND	3,000
Chloroform	ND	3,000
Freon 113	ND	3,000
1,2-Dichloroethane	ND	3,000
2-Butanone	ND	5,000
1,1,1-Trichloroethane	ND	3,000
Carbon tetrachloride	ND	3,000
Vinyl acetate	ND	5,000
Bromodichloromethane	ND	3,000
1,2-Dichloropropane	ND	3,000
cis-1,3-Dichloropropene	ND	3,000
Trichloroethene	ND	3,000
Dibromochloromethane	ND	3,000
1,1,2-Trichloroethane	ND	3,000
Benzene	ND	3,000
trans-1,3-Dichloropropene	ND	3,000
Bromoform	ND	3,000
2-Hexanone	ND	5,000
4-Methyl-2-pentanone	**100,000**	**5,000**
1,1,2,2-Tetrachloroethane	ND	3,000
Tetrachloroethene	ND	3,000
Toluene	ND	3,000
Chlorobenzene	ND	3,000
Ethyl benzene	ND	3,000
Styrene	ND	3,000
Total xylenes	ND	3,000

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	105 %
Toluene-d8	98 %
Bromofluorobenzene	95 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 110974-METHOD BLANK
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY ST

DATE ANALYZED: 05/24/93
DATE REPORTED: 05/26/93

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
cis-1,2-Dichloroethene	ND	5
trans-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	10
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	105 %
Toluene-d8	97 %
Bromofluorobenzene	91 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 110974-METHOD BLANK
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY ST

DATE ANALYZED: 05/25/93
DATE REPORTED: 05/26/93

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
cis-1,2-Dichloroethene	ND	5
trans-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	10
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	113 %
Toluene-d8	99 %
Bromofluorobenzene	98 %

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

PROJECT NAME: 6707 BAY STREET

JOB NUMBER: 820.001 LAB: CURTIS TOMPKINS

PROJECT CONTACT: MARK KAWAKAMI TURNAROUND: NORMAL

SAMPLED BY: REQUESTED BY: MARK KAWAKAMI

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX					CONTAINERS					METHOD PRESERVED					SAMPLING DATE				NOTES	ANALYSIS REQUESTED										
		WATER	SOIL	WASTE	AIR	CARBON	VOA	LITER	PINT	TUBE	GLASS	HCL	H_2SO_4	HNO_3	ICE	NONE	MONTH	DAY	YEAR	TIME		8240	TITLE 16 METALS	D&G	PH							
	C-1					X					X				X		05	28	93			X			X							
	C-2					X					X				X		05	28	93			X	X	X	X							

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
[signature] 5/28/93 3:20		[signature]	5/28/93 3:2[illegible]

COMMENTS & NOTES:

ADD METHYL ETHYL KETONE AND METHYL ISOBUTYL KETONE TO 8240 ANALYSIS

Subsurface Consultants, Inc.

171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607

(510) 268-0461 • FAX: 510-268-0137

Curtis & Tompkins, Ltd.

QC SUMMARY SHEET FOR EPA 8240

Laboratory Number: 110974
Client: Subsurface Consultants
Analysis date: 05/25/93
Sample type: Water
Spike file: ceo21
Spike dup file: ceo22

SPIKE DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	50.76	102 %	OK	61 - 145
Trichloroethene	49.41	99 %	OK	71 - 120
Benzene	52.37	105 %	OK	76 - 127
Toluene	50.47	101 %	OK	76 - 125
Chlorobenzene	51.20	102 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	53.28	107 %	OK	76 - 114
Toluene-d8	49.26	99 %	OK	88 - 110
Bromofluorobenzene	48.66	97 %	OK	86 - 115

SPIKE DUP DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	47.01	94 %	OK	61 - 145
Trichloroethene	47.96	96 %	OK	71 - 120
Benzene	50.19	100 %	OK	76 - 127
Toluene	50.02	100 %	OK	76 - 125
Chlorobenzene	50.90	102 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	53.20	106 %	OK	76 - 114
Toluene-d8	49.70	99 %	OK	88 - 110
Bromofluorobenzene	50.19	100 %	OK	86 - 115

MATRIX RESULTS	
1,1-Dichloroethene	0
Trichloroethene	0
Benzene	0
Toluene	0
Chlorobenzene	0

RPD DATA

SPIKE COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	50.76	47.01	8 %	OK	< 14
Trichloroethene	49.41	47.96	3 %	OK	< 14
Benzene	52.37	50.19	4 %	OK	< 11
Toluene	50.47	50.02	1 %	OK	< 13
Chlorobenzene	51.20	50.90	1 %	OK	< 13