ENVIRONMENTAL ENGINEERING, INC
2680 Bishop Drive • Suite 203 • San Ramon, CA 94583
TEL (925) 244-6600 • FAX (925) 244-6601

May 16, 2002

Mr. Scott Seery, CHMM
Hazardous Material Specialist
Alameda County Health Agency
Department of Environmental Health
1131 Harbor Way Parkway, 2nd Floor
Alameda, CA 94502

MAY 21 2002

Subject: Status of Free Product in the Subsurface at the Former Glovatorium Site, 3815 Broadway Oakland, California

Dear Scott:

On March 28, 2002, SOMA drilled nine hydropunches (HP-1 through HP-9) for the following purposes:

1. To evaluate the extent of free product in the subsurface;
2. To determine whether or not there is another undiscovered underground storage tank (UTS) inside the building; and
3. To evaluate water quality conditions, especially with respect to Tetrachloroethene (PCE) beneath the former dry-cleaning machines.

Hydropunches (HP-1, HP-2, HP-5, HP-8 and HP-9) were drilled to a total depth of 20 feet to evaluate the extent of free product in close proximity of SOMA-4 and B-8. HP-3 and HP-4 were drilled to 7 feet below ground surface (bgs) to evaluate whether or not there are any undiscovered USTs. These hydropunches could not be drilled deeper due to the accessibility problems inside the building. HP-6 and HP-7 were drilled to a total depth of 20 feet in order to evaluate the presence of PCE in groundwater beneath the former dry cleaning machines. Figure 1 shows the location of the hydropunches.

Due to the fine-grained nature of the subsurface sediments, during the drilling operation no groundwater or free product was encountered. Therefore, SOMA's field staff installed a temporary ¾ inch diameter PVC casing inside each hydropunch hole for later inspection/monitoring of free product, if any. At each hydropunch location, the PVC casing was 20 feet long. The lower 10-foot portion of the casing was perforated while the upper 10-foot was blank.

On April 4, 2002, SOMA's field crew visited the site and measured depth to product and groundwater inside the hydropunches. Data indicated that depth to groundwater occurs at 7.5 to 9.5 feet below surface, well above the perforated interval of the temporary PVC casing. During this visit the thickness of the free product ranged between 0.0 and 0.7 feet. The maximum product thickness was observed in HP-5.

On April 10, 2002, SOMA's staff increased the perforated interval of the temporary casing in HP-1, HP-2, HP-5, HP-8 and HP-9 from 10 to 15 feet. As such, the casing perforations started at five feet below ground surface at those locations. This was done to ensure the flow of free product into the casing.

On April 10 and 29, 2002, SOMA's staff measured depth to water and product inside the hydropunches and the selected B series wells. Table 1 shows the measured product thickness at each hydropunch location and B series well. As Table 1 shows the maximum product thickness was reported in SOMA-4 and the HP-5 locations.

HP-3 and HP-4 due to the physical constraints could not be advanced below seven feet depth, however, no undiscovered USTs were encountered at those locations. On April 5, 2002 groundwater samples were collected from HP-6 and HP-7 and delivered to Curtis & Tompkins Analytical Laboratories for analyses. The results of the laboratory analyses on the two groundwater samples are presented in Table 2.

Results and Recommendation

The results of the current investigation did not reveal the extent of free product beneath the site. This was due to the high watertable elevations as a result of excessive rainfall events during the recent months. However, as data indicate there is still a significant amount of free product, which was encountered at SOMA-4 (3.2 feet), HP-5 (1.25 feet), B-8 and B-3 (0.15 feet). Due to the physical constraints the extent of free product, especially around SOMA-4, could not be defined. SOMA recommends the following action items:

1. Installation of a product removal canister inside SOMA-4;
2. Converting HP-5 and B-8 into 2-inch diameter wells, and installing free product removal canisters inside these wells as an interim groundwater remediation scheme; and
3. Once the water levels have receded, we recommend conducting an additional free product investigation for complete delineation of the free product extent in the subsurface.

This concludes our recommendations. Please do not hesitate to call me at (925) 244-6600, or Dr. Bruce Page at (510) 526 4650, if have any questions or comments.

Sincerely,

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

cc: Dr. Bruce Page
Mr. Stuart Depper
Mr. Albert M. Cohen
Ms. Betty Graham

Table 1: Free Product Measurements at Former Glovatorium 3815 Broadway Oakland, California

Date	Well	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)
4/4/02	HP1		8.14	0.00
	HP2	8.09	8.10	0.01
	HP5	8.80	9.50	0.70
	HP8	9.33	9.34	0.01
	HP9		7.50	0.00
Date	Well	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)
4/10/02	Soma 4	9.58	12.45	2.87
	B8	8.09	8.22	0.13
	B9	-	8.00	0.00
	B3	7.15	7.27	0.12
	B2	-	7.95	0.00
	HP1	-	8.56	0.00
	HP2	-	8.36	0.00
	HP5	9.25	10.28	1.03
	HP8	9.77	9.80	0.03
	HP9	-	8.15	0.00
Date	Well	Depth to pr	Depth to P	Depth to Water (ft)	Product Thickness (ft)
4/29/02	Soma 4	9.80		13.00	3.20
	B8	8.45		8.55	0.10
	B9	-		8.30	0.00
	B3	7.42		7.57	0.15
	B2	-		7.40	0.00
	HP1	-		8.40	0.00
	HP2	-		8.80	0.00
	HP5	8.45		9.70	1.25
	HP8	-		10.15	0.00
	HP9	-		8.60	0.00

Table 2: Results of Laboaratory Analyses on HP-6 and 7
Former Glovatorium 3815 Broadway
Oakland, California

Sample Location	Date	cis-1,2 DCE	TCE	PCE	Propylbenzene	1,3,5- Tri-Metylbenzene	1,2,4-Tri Metylbenzene
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
HP-6	4-Apr-02	5400	320	320	<200	<200	<200
HP-7	4-Apr-02	120	26	320	20	43	18

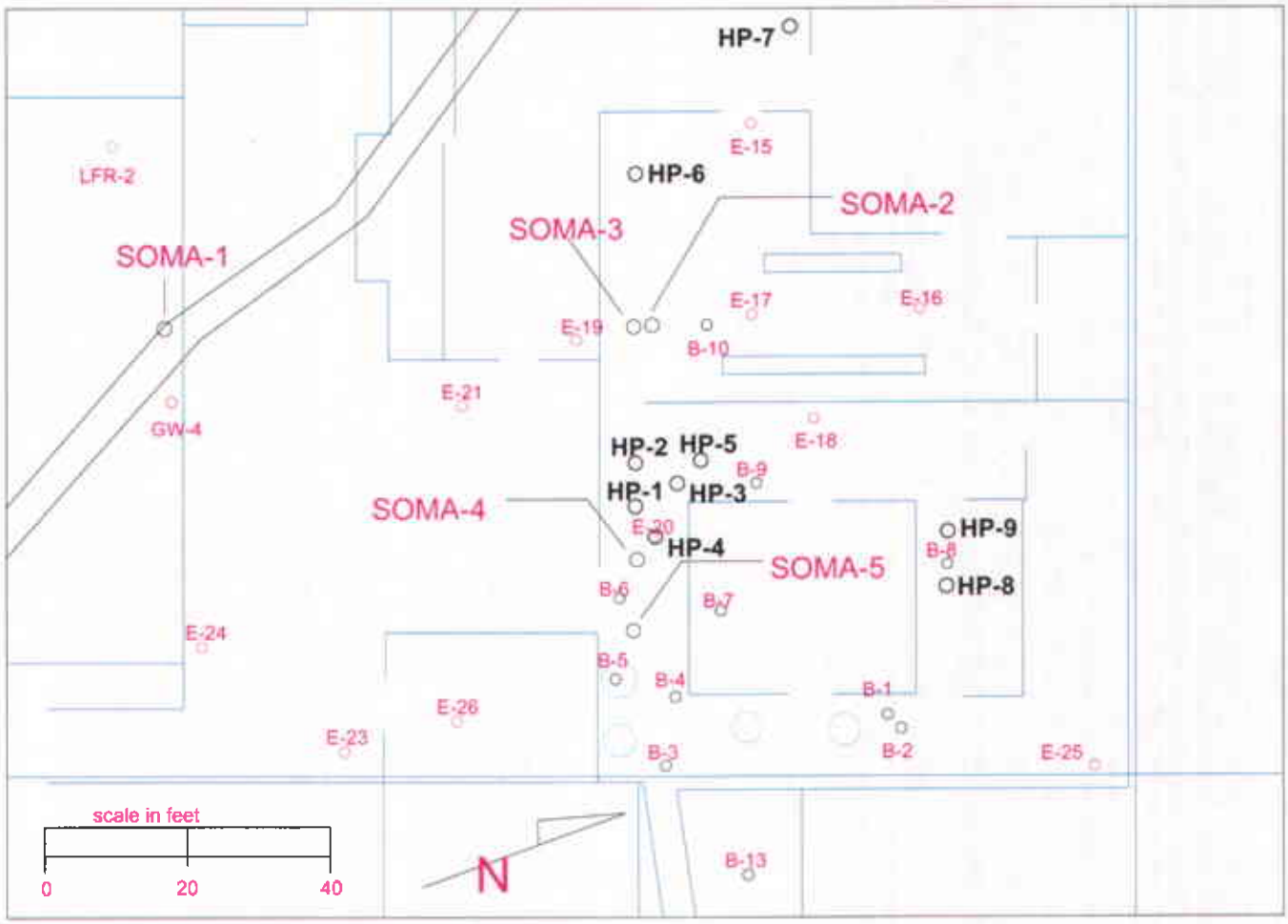

Figure 1: Location of New Installed Groundwater Monitoring Wells

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:

SOMA Environmental Engineering Inc.
2680 Bishop Dr.
Suite 203
San Ramon, CA 94583

Date: 12-APR-02
Lab Job Number: 157962
Project ID: 2513
Location: Glovatorium

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: Paul Prendergast
Project Manager

Reviewed by:
Operations Manager

CHAIN OF CUSTODY FORM

Page 1 of 1

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

C&T LOGIN # 157962

Sampler: Naser Pakiou

Report To: Mansour Sepehr

Company: SOMA

Telephone: 925 244 6600

Fax: 925 244 6601

Project No: 2513

Project Name: Glovatorium

Project P.O.:

Turnaround Time: Standard

Laboratory Number	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCL	Preservative: H_2SO	Preservative: HNO_3	Preservative: ICE	Field Notes	Analyses: VOCs 8260
1	HP-6	4/4/02 1:40		✓		3	✓			✓	Full list	✓
2	HP-7	4/4/02 1:50		✓		3	✓			✓	″	✓
For Laboratory Use												

Notes:

RELINQUISHED BY:

Naser Pakiou 4/5/02 12:00 DATE/TIME

Signature

Joyce Robek 4/5/02 1:25 DATE/TIME

DATE/TIME

RECEIVED BY:

DATE/TIME

DATE/TIME

DATE/TIME

1:25

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Field ID:	HP-6	Batch#:	71497
Lab ID:	157962-001	Sampled:	04/04/02
Matrix:	Water	Received:	04/05/02
Units:	ug/L	Analyzed:	04/09/02
Diln Fac:	40.00		

Analyte	Result	RL
Freon 12	ND	400
Chloromethane	ND	400
Vinyl Chloride	ND	400
Bromomethane	ND	400
Chloroethane	ND	400
Trichlorofluoromethane	ND	200
Acetone	ND	800
Freon 113	ND	200
1,1-Dichloroethene	ND	200
Methylene Chloride	ND	800
Carbon Disulfide	ND	200
MTBE	ND	200
trans-1,2-Dichloroethene	ND	200
Vinyl Acetate	ND	2,000
1,1-Dichloroethane	ND	200
2-Butanone	ND	400
cis-1,2-Dichloroethene	5,400	200
2,2-Dichloropropane	ND	200
Chloroform	ND	200
Bromochloromethane	ND	400
1,1,1-Trichloroethane	ND	200
1,1-Dichloropropene	ND	200
Carbon Tetrachloride	ND	200
1,2-Dichloroethane	ND	200
Benzene	ND	200
Trichloroethene	320	200
1,2-Dichloropropane	ND	200
Bromodichloromethane	ND	200
Dibromomethane	ND	200
4-Methyl-2-Pentanone	ND	400
cis-1,3-Dichloropropene	ND	200
Toluene	ND	200
trans-1,3-Dichloropropene	ND	200
1,1,2-Trichloroethane	ND	200
2-Hexanone	ND	400
1,3-Dichloropropane	ND	200
Tetrachloroethene	320	200

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Field ID:	HP-6	Batch#:	71497
Lab ID:	157962-001	Sampled:	04/04/02
Matrix:	Water	Received:	04/05/02
Units:	ug/L	Analyzed:	04/09/02
Diln Fac:	40.00		

Analyte	Result	RL
Dibromochloromethane	ND	200
1,2-Dibromoethane	ND	200
Chlorobenzene	ND	200
1,1,1,2-Tetrachloroethane	ND	200
Ethylbenzene	ND	200
m,p-Xylenes	ND	200
o-Xylene	ND	200
Styrene	ND	200
Bromoform	ND	200
Isopropylbenzene	ND	200
1,1,2,2-Tetrachloroethane	ND	200
1,2,3-Trichloropropane	ND	200
Propylbenzene	ND	200
Bromobenzene	ND	200
1,3,5-Trimethylbenzene	ND	200
2-Chlorotoluene	ND	200
4-Chlorotoluene	ND	200
tert-Butylbenzene	ND	200
1,2,4-Trimethylbenzene	ND	200
sec-Butylbenzene	ND	200
para-Isopropyl Toluene	ND	200
1,3-Dichlorobenzene	ND	200
1,4-Dichlorobenzene	ND	200
n-Butylbenzene	ND	200
1,2-Dichlorobenzene	ND	200
1,2-Dibromo-3-Chloropropane	ND	200
1,2,4-Trichlorobenzene	ND	200
Hexachlorobutadiene	ND	200
Naphthalene	ND	200
1,2,3-Trichlorobenzene	ND	200

Surrogate	%REC	Limits
Dibromofluoromethane	100	80-121
1,2-Dichloroethane-d4	107	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	107	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Field ID:	HP-7	Batch#:	71497
Lab ID:	157962-002	Sampled:	04/04/02
Matrix:	Water	Received:	04/05/02
Units:	ug/L	Analyzed:	04/09/02
Diln Fac:	2.500		

Analyte	Result	RL
Freon 12	ND	25
Chloromethane	ND	25
Vinyl Chloride	ND	25
Bromomethane	ND	25
Chloroethane	ND	25
Trichlorofluoromethane	ND	13
Acetone	ND	50
Freon 113	ND	13
1,1-Dichloroethene	ND	13
Methylene Chloride	ND	50
Carbon Disulfide	ND	13
MTBE	ND	13
trans-1,2-Dichloroethene	ND	13
Vinyl Acetate	ND	130
1,1-Dichloroethane	ND	13
2-Butanone	ND	25
cis-1,2-Dichloroethene	120	13
2,2-Dichloropropane	ND	13
Chloroform	ND	13
Bromochloromethane	ND	25
1,1,1-Trichloroethane	ND	13
1,1-Dichloropropene	ND	13
Carbon Tetrachloride	ND	13
1,2-Dichloroethane	ND	13
Benzene	ND	13
Trichloroethene	26	13
1,2-Dichloropropane	ND	13
Bromodichloromethane	ND	13
Dibromomethane	ND	13
4-Methyl-2-Pentanone	ND	25
cis-1,3-Dichloropropene	ND	13
Toluene	ND	13
trans-1,3-Dichloropropene	ND	13
1,1,2-Trichloroethane	ND	13
2-Hexanone	ND	25
1,3-Dichloropropane	ND	13
Tetrachloroethene	320	13

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Field ID:	HP-7	Batch#:	71497
Lab ID:	157962-002	Sampled:	04/04/02
Matrix:	Water	Received:	04/05/02
Units:	ug/L	Analyzed:	04/09/02
Diln Fac:	2.500		

Analyte	Result	RL
Dibromochloromethane	ND	13
1,2-Dibromoethane	ND	13
Chlorobenzene	ND	13
1,1,1,2-Tetrachloroethane	ND	13
Ethylbenzene	ND	13
m,p-Xylenes	ND	13
o-Xylene	ND	13
Styrene	ND	13
Bromoform	ND	13
Isopropylbenzene	ND	13
1,1,2,2-Tetrachloroethane	ND	13
1,2,3-Trichloropropane	ND	13
Propylbenzene	20	13
Bromobenzene	ND	13
1,3,5-Trimethylbenzene	43	13
2-Chlorotoluene	ND	13
4-Chlorotoluene	ND	13
tert-Butylbenzene	ND	13
1,2,4-Trimethylbenzene	18	13
sec-Butylbenzene	ND	13
para-Isopropyl Toluene	ND	13
1,3-Dichlorobenzene	ND	13
1,4-Dichlorobenzene	ND	13
n-Butylbenzene	ND	13
1,2-Dichlorobenzene	ND	13
1,2-Dibromo-3-Chloropropane	ND	13
1,2,4-Trichlorobenzene	ND	13
Hexachlorobutadiene	ND	13
Naphthalene	ND	13
1,2,3-Trichlorobenzene	ND	13

Surrogate	%REC	Limits
Dibromofluoromethane	100	80-121
1,2-Dichloroethane-d4	109	77-130
Toluene-d8	105	80-120
Bromofluorobenzene	104	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC175428	Batch#:	71497
Matrix:	Water	Analyzed:	04/09/02
Units:	ug/L		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	10
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0
Dibromochloromethane	ND	5.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC175428	Batch#:	71497
Matrix:	Water	Analyzed:	04/09/02
Units:	ug/L		

Analyte	Result	RL
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-121
1,2-Dichloroethane-d4	110	77-130
Toluene-d8	102	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	157962	Location:	Glovatorium
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2513	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	71497
Units:	ug/L	Analyzed:	04/09/02
Diln Fac:	1.000		

Type: BS Lab ID: QC175426

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	50.00	47.43	95	71-131
Benzene	50.00	49.68	99	76-120
Trichloroethene	50.00	53.40	107	78-120
Toluene	50.00	51.05	102	79-120
Chlorobenzene	50.00	47.02	94	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-121
1,2-Dichloroethane-d4	111	77-130
Toluene-d8	103	80-120
Bromofluorobenzene	98	80-120

Type: BSD Lab ID: QC175427

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	50.00	42.95	86	71-131	10	20
Benzene	50.00	47.51	95	76-120	4	20
Trichloroethene	50.00	55.69	111	78-120	4	20
Toluene	50.00	46.82	94	79-120	9	20
Chlorobenzene	50.00	46.65	93	80-120	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-121
1,2-Dichloroethane-d4	103	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	97	80-120

RPD= Relative Percent Difference