LOCKHEED MARTIN

Lockheed Martin
Scientific, Engineering, Response and Analytical Services
2890 Woodbridge Ave, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200 Facsimile: 732-494-4021

DATE: September 24, 2013

TO: Gary Newhart, U.S. EPA/ERT Work Assignment Manager

THROUGH: Dennis Miller, SERAS Program Manager

FROM: Philip Solinski, SERAS Task Leader

SUBJECT: MAYFIELD HEIGHTS VAPOR INTRUSION SITE, MAYFIELD HEIGHTS, OH
WORK ASSIGNMENT #SER00211 – SOIL SAMPLING TRIP REPORT

BACKGROUND

The original purpose of this investigation was to evaluate the potential for volatile organic compounds (VOCs) to migrate into buildings near a suspected source in the vicinity of the 6000 Block of Mayfield Road in Mayfield Heights, Ohio (OH). While investigating a gasoline spill on the block, the Ohio Environmental Protection Agency (OEPA) found chlorinated VOC contamination. Residential and commercial properties surround the suspected source, a former drycleaner.

In early June 2013, at the request of the EPA/Environmental Response Team (ERT), Scientific, Engineering, Response and Analytical Services (SERAS) contract personnel mobilized to the Site in Mayfield Heights, OH, installed and sampled sub-slab sampling ports at 32 locations (residential and commercial). Grab samples were collected in Tedlar® bags from 45 sub-slab soil gas ports and were analyzed on-site for select VOCs using an Agilent gas chromatograph/mass spectrometer (GC/MS) system. Additionally, SUMMA® canisters were collected over 24-hour periods from five of the sub-slab sampling ports.

In late July 2013, at the request of the EPA/ERT, SERAS contract personnel mobilized to the Site to perform a groundwater study by installing temporary wells using direct push technology using the GeoProbe Model 6600DT. A layer of sandstone prevented the GeoProbe from advancing beyond the 16.7 to 22.3 foot below ground surface (bgs) layer. As water sampling was unable to be performed, soil cores from the property where the source was located were collected. This Trip Report details the tasks that were performed in July 2013 and presents the results associated with the soil sampling event.

OBSERVATIONS AND ACTIVITIES

By law, an underground utility mark out was requested through Ohio Utilities Protection Service (OUPS) and Oil and Gas Producers Underground Protection Service (OGPUPS) 48-hours prior to intrusive activities. After 72-hours, an inspection of the area revealed that the mark out request was not completed. Multiple calls were placed to OUPS, but water and sewer lines were not marked. With the assistance of the people from the Village of Mayfield Heights contact was made and the water and sewer lines began to be marked one week after the initial calls were placed.

The investigation began by installing temporary groundwater sampling points on public right-of-ways on Sunset Road and Washington Boulevard. The intent was to set up a grid and collect groundwater quality data. As the confining layer was encountered, the on-site focus shifted to collection of soil cores on the property of the suspected source.

As access to the property was given to EPA, a private utility mark out was performed for the property located on the northeast corner of the intersection of Mayfield Road and Sunset Road. The building houses three store fronts and are numbered 6051, 6061 and 6071 Mayfield Road.

Based upon access, 14 points were utilized. Sampling locations were installed using the direct push method (Geoprobe). SERAS provided the equipment. The initial six points (TW-01 to TW-06) were installed in anticipation of intercepting the upper unconfined groundwater surface. The initial locations (TW-01 and TW-02) were installed in the public right of ways on the East side of Sunset Road next to the building under investigation. As no water was produced, TW-03 was installed approximately 400 feet to the north on Sunset Road in front of 1433 Sunset Road. Waterwas not present. TW-04 and TW-05 were installed in the service road adjacent and to the north of the 6051/6061/6071 building. These also failed to produce water. TW-06 was installed on the right of way in front of 1455 Washington Boulevard, located approximately 350 feet east of the building. Water was not produced at TW-06.

After ground water was not reached at the sixth point, the decision was made to collected soil cores from locations surrounding the 6051/6061/6071 building. Soil samples would be collected from depths where the photoionization detector indicated areas of contamination. Locations TW-01, TW-02, TW-04 and TW-05 would be re-installed as close as possible to the original boring point and designated with the prime (') symbol. For example, the new boring at TW-01 would be designated as TW-01'.

A total of 49 samples (46 soil samples and three aqueous blanks) were collected from 28 points (including the blanks). Some samples were screened on-site for VOCs using the Photovac Voyager. Some samples were sent to the SERAS for fixed laboratory VOC analysis. Some samples had both on-site screening and fixed lab analysis performed. A separate jar was collected for each analysis, even though the sample numbers are the same. These samples are considered to be collected from the same point.

On August 2, 2013, soil borings were collected from six locations (TW-07 to TW-12). Sixteen samples were collected (15 soil samples and one cutting shoe rinsate blank).

On August 3, 2013, soil borings were collected from six locations (TW-01', TW-02', TW-04', TW-05', TW-13 and TW-14). Eleven samples were collected (10 soil samples and one cutting shoe rinsate blank). The samples include a sediment sample collected from the storm drain located in the service drive behind the building between TW-12 and TW-13. The trip blank was collected on August 4, 2013.

Table 1 lists all of the sample collection information, including the analysis performed. Figure 1 depicts the soil boring locations that surround the building being investigated. Note that TW-03 and TW-06 are not depicted on the map. Appendix A contains a copy of the field log book from July 30, 2013 through August 4, 2013.

Soil Boring and Sample Collection

The Geoprobe model 6600DT was used to install the soil borings. The Geoprobe is a direct push drilling machine designed for environmental sub-surface investigations of soil, water and air (i.e. collection of soil borings, well installation and soil vapor recovery). An underground utility mark out was requested and utilities were marked prior to commencing drilling activities. In addition, a private utility mark out was performed at the 6051/6061/6071 Mayfield Road property. The locations were labeled as TW-1 to TW-14 as they were expected to be temporary wells. The points were installed to between 16.7 and 22.3 feet bgs). No water was encountered in the study area.

Each section of the soil cores were screened with a photoionization detector. Based on the air monitoring results, if a section of the soil core highly exceeded the background air reading, a soil sample may have been collected. Between one and three soil samples were collected from each soil boring location at varying depths. Soil samples were collected in accordance with SERAS SOP #2012, *Soil Sampling*.

Some samples were collected for on-site screening for VOCs. Other samples were collected for off-site laboratory analysis. Some samples were both screened on site and sent for off-site analysis. All soil collection information was documented in the site log book. Table 1 contains all of the soil boring information including analysis performed.

On-Site Soil Screening for VOCs

On-site screening of the soil samples was conducted using the Photovac Voyager Gas Chromatography instrumentation. The screening procedure was performed in accordance with SERAS SOP #1717, *Headspace Analysis of Volatile Organic Compounds (VOCs) in Soil and Water Using the Photovac Voyager Gas Chromatograph (GC)*. The analyte list consisted of tetrachloroethene (PCE) and trichloroethene (TCE). The reporting limit for each compound was 4 micrograms per kilogram (ug/kg). The screening results from samples 1623 (TW-02' at 14'), 1624 (TW-02' at 16.5') and 1625 (TW-01' at 18.5') should be used with caution as QC requirements (recovery) were not met. The Photovac Voyager On-site Analytical Report can be found in Appendix B.

Laboratory Analysis of Soil Samples for VOCs

Twenty-three samples (including three blanks) were delivered to SERAS to have confirmatory VOCs analysis performed by SERAS Laboratory personnel following SERAS SOP #1807, *Volatile Organic Analysis in Soil/Sediment by Gas Chromatography/Mass Spectrometry (GC/MS)*. The analyte list consists of over 60 VOCs and includes TCE and PCE. The reporting limit for nearly all compounds was approximately 5 ug/kg.

All of the analytical data was validated in accordance with ERT SERAS SOP #1015, *Data Validation Procedures for Routine Volatile Organic Analysis*. Based on those validation procedures, two compounds for sample 1601 (TW-07 at 19' to 20') and 28 compounds (including PCE) for sample 1626 (Storm drain) were determined to be unusable as one of the internal standards was below quality control limits specified within the method. The SERAS Laboratory Final Analytical Report can be found in Appendix C.

SOIL SAMPLING RESULTS

Table 2 contains a summary of the field screening laboratory results. Table 3 contains a summary of the fixed laboratory sampling results. Note that PCE was detected in all of the soil borings collected and analyzed by the SERAS laboratory.

Figure 2 depicts the PCE soil concentrations in the vicinity of 6051/6061/6071 Mayfield Road in Mayfield Heights, OH in ug/kg.

FUTURE ACTIVITIES

Future activities will be determined by ERT and Region V personnel.

cc: Central File WA SER00211 (w/attachments)
Electronic File: I:/Archive/SERAS/211/D/TR/092413
Dennis Miller, SERAS Program Manager (cover page only)

Table 1
Soil Boring Information
Mayfield Heights, OH
September 2013

Sample Number	Location	Depth	SERAS SOP #1717 VOC Screening	SERAS Fixed Lab VOA Analysis	Sample Date	Sample Time	Well Refusal
1600	TW-07	16' to 17'	X		8/2/2013	10:49	
1601	TW-07	19' to 20'	X	X	8/2/2013	10:54	
1602	TW-07	21'	X	X	8/2/2013	11:02	22.3
1603	TW-08	15'	X	X	8/2/2013	11:20	
1604	TW-08	20'	X	X	8/2/2013	11:35	
1605	TW-08	21'	X		8/2/2013	11:41	21.3
1606	TW-09	14' to 15'	X	X	8/2/2013	13:37	
1607	TW-09	16.5'	X	X	8/2/2013	13:56	16.7
1608	TW-10	10'-11'	X		8/2/2013	14:20	
1609	TW-10	14' to 15'	X		8/2/2013	14:10	
1610	TW-10	19.5'	X	X	8/2/2013	14:32	19.7
1611	TW-11	19'	X	X	8/2/2013	15:05	19.1
1612	TW-12	9.5'	X	X	8/2/2013	16:27	
1613	TW-12	14'	X	X	8/2/2013	16:36	
1614	TW-12	17'	X	X	8/2/2013	16:45	19.5
1615	Rinsate Blank	Cutting Shoe	X*	X	8/2/2013	17:00	NA
1616	Rinsate Blank	Cutting Shoe	X*	X	8/3/2013	9:01	NA
1617	TW-13	11' to 12'	X	X	8/3/2013	10:30	
1618	TW-13	19'	X	X	8/3/2013	10:41	19.5
1619	TW-14	19'	X		8/3/2013	11:25	21.3
1620	TW-05'	20.5'	X	X	8/3/2013	12:33	21.5
1621	TW-04'	14'	X	X	8/3/2013	13:03	
1622	TW-04'	15.5'	X	X	8/3/2013	13:12	19.8
1623	TW-02'	14'	X	X	8/3/2013	15:10	
1624	TW-02'	16.5'	X	X	8/3/2013	15:20	18.5
1625	TW-01'	18.5'	X	X	8/3/2013	15:57	19
1626	Storm Drain	Btwn TW12 &13		X	8/3/2013	17:41	NA
1627	Trip Blank	Trip Blank		X	8/4/2013	14:00	NA

* - indicates that the sample was collected, but not analyzed

Table 2
Summary of On-site Laboratory Soil Sampling Screening Results in ug/kg
Mayfield Heights Vapor Intrusion Study
Mayfield Heights, OH
September 2013

Sample Number	*1625	*1623	*1624	1621	1622	1620	1600	1601	1602	1603	1604	1605
Location	TW-01	TW-02	TW-02	TW-04	TW-04	TW-05	TW-07	TW-07	TW-07	TW-08	TW-08	TW-08
Depth	18.5'	14'	16.5'	14'	15.5'	20.5'	16'-17'	19'-20'	21'	15'	20'	21'
Tetrachloroethene	28	600	350	36	ND	190	16	24	32	1300	136	16
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	8	8	ND	ND

Sample Number	1606	1607	1608	1609	1610	1611	1612	1613	1614	1617	1618	1619
Location	TW-09	TW-09	TW-09	TW-09	TW-09	TW-11	TW-12	TW-14	TW-14	TW-13	TW-13	TW-14
Depth	14'-15'	16.5'	10' -11'	14'-15'	19.5'	19'	9.5'	14'	17'	11'-12'	19'	21'
Tetrachloroethene	ND	ND	1950	ND	36	4	1550	188	32	68	140	210
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND

ug/kg - micrograms per kilogram
*- Photovac GC lost sensitivity, sample concentration could be higher
ND - Not Detected above the method detection limit of approximately 4 ug/kg

Table 3
Summary of Fixed Laboratory Soil Sampling Results in ug/kg
Mayfield Heights Vapor Intrusion Study
Mayfield Heights, OH
September 2013

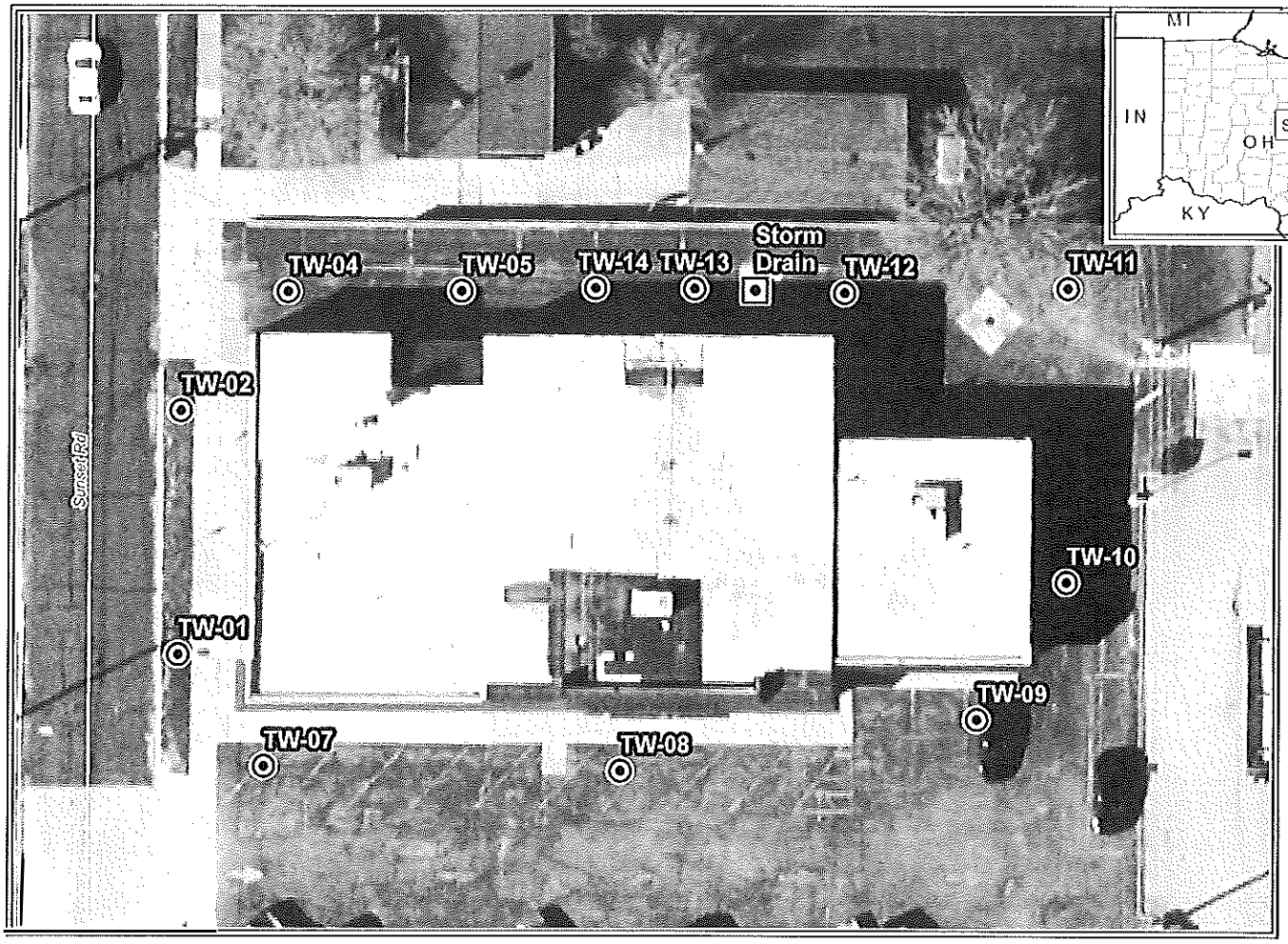
Sample Number	1625	1623	1624	1621	1622	1620	1601	1602	1603	1604	1606
Location	TW-01'	TW-02'	TW-02'	TW-04'	TW-04'	TW-05'	TW-07	TW-07	TW-08	TW-08	TW-09
Depth	18.5'	14'	16.5'	14'	15.5'	20.5'	19' to 20'	21'	15'	20'	14' to 15'
Sample Date	8/3/2013	8/3/2013	8/3/2013	8/3/2013	8/3/2013	8/3/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013
Tetrachloroethene	246	279	4800 J	37.9	62.9	103	5.7	1.92 J	1760 J	2.13 J	17.3
Trichloroethene	ND	ND	9.68	ND	ND	ND	ND	ND	7.69	ND	ND
cis-1,2-Dichloroethene	ND	ND	43.2	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	0.648 J	0.889 J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	1.62 J	8.66	199	ND	0.733 J	ND	ND	ND	14.2	ND	ND
Chloroform	0.582 J	0.692 J	52.0	ND	ND	ND	ND	ND	2.40 J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.667 J	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	0.352 J	1.28 J	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	8.88	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	3.18 J	2.09 J	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	0.758 J	2.28 J	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	1.68 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	0.626 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	13.1	0.956 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	28.2	4.18 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	2.19 J	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	10.1	1.30 J	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	1.03 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	2.05 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	6.45 J	2.63 J	ND	3.47 J	3.57 J	ND	3.68 J	ND	ND	ND
Naphthalene	ND	19.7	1.01 J	ND	ND	ND	0.697 J	ND	ND	ND	ND
n-Propylbenzene	ND	0.44 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	ND	0.714 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	ND	0.538 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ug/kg - micrograms per kilogram
J - Value is estimated.
ND - Not detected above the reporting limit.
R - Data determined did not meet validation requirements and is considered not usable.

Table 3
Summary of Fixed Laboratory Soil Sampling Results in ug/kg
Mayfield Heights Vapor Intrusion Study
Mayfield Heights, OH
September 2013

Sample Number	1607	1610	1611	1612	1613	1614	1617	1618	1626
Location	TW-09	TW-10	TW-11	TW-12	TW-12	TW-12	TW-13	TW-13	Storm Drain
Depth	16.5'	19.5'	19'	9.5'	14'	17'	11' to 12'	19'	Btwn TW12 &13
Sample Date	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/3/2013	8/3/2013	8/3/2013
Tetrachloroethene	2.73 J	191	95.1	4730 J	2530 J	7.48	162	74.4	R
Trichloroethene	ND	ND	ND	58.7 J	1.13 J	ND	ND	ND	3.71 J
cis-1,2-Dichloroethene	ND	ND	ND	1540 J	2.54 J	ND	0.621 J	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	R
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	4200 J
Carbon Tetrachloride	ND	ND	1.14 J	45.1 J	0.663 J	ND	ND	ND	ND
Chloroform	ND	ND	ND	6.79 J	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	2.24 J
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	0.553 J	0.315 J	ND	ND	ND	R
1,1,1-Trichloroethane	ND	ND	ND	1.20 J	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	R
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	3.29 J
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	40.9 J
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	209 J
Naphthalene	ND	ND	ND	ND	ND	ND	ND	0.756 J	R
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	27.4 J
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	R
trans-1,2-Dichloroethene	ND	ND	ND	1.45 J	ND	ND	ND	ND	ND

ug/kg - micrograms per kilogram
J - Value is estimated.
ND - Not detected above the reporting limit.
R - Data determined did not meet validation requirements and is considered not usable



Feet
0 5 10 20 30 40 50

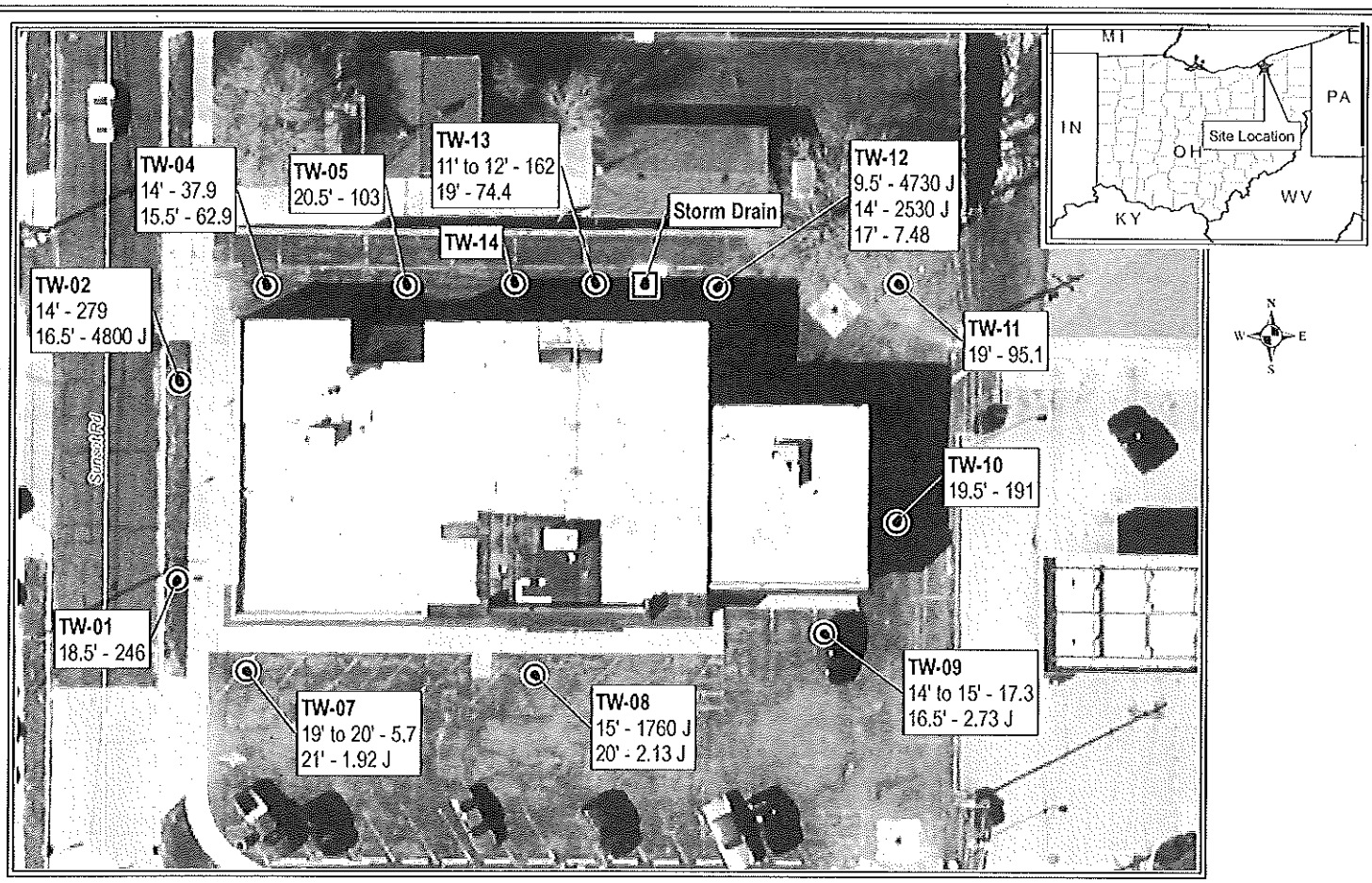
Legend

- Boring Locations
- Storm Drain

Note: TW-03 and TW-06 are not located in this field of view

U.S. EPA Environmental Response Team
Scientific, Engineering, Response and Analytical Services
EP-W-09-031
W.A.# 0-211

Figure 1
Soil Boring Locations
Mayfield Heights Vapor Intrusion Site
Mayfield Heights, Ohio
September 2013



Legend

- Boring Locations
- Storm Drain
- **18.5'** Depth in feet
- J Indicates Value is Estimated
- µg/kg micrograms per kilogram
- **Note:** TW-03 and TW-06 are not located in this field of view

U.S. EPA Environmental Response Team
Scientific, Engineering, Response and Analytical Services
EP-W-09-031
W.A. #0-211

Figure 2
Fixed Lab Subsurface
PCE Soil Sampling Results in µg/kg
Mayfield Heights Vapor Intrusion Site
Mayfield Heights, Ohio
September 2013

APPENDIX A
Copy of Field Log Book from July 30, 2013 through August 4, 2013
Mayfield Heights Vapor Intrusion Site
Mayfield Heights, OH
September 2013

Outdoor writing products • for Outdoor writing people

Rite in the Rain

A patented, environmentally responsible, all-weather writing paper that sheds water and remains legible to write anywhere, in any weather.

Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

J. L. DARLING CORPORATION
Tacoma, WA 98424-1017 USA
www.RiteintheRain.com

Made in the USA
USPat No. 6,663,940

Forestry Suppliers, Inc.
Sales Call Toll-free
800-647-5368
www.forestry-suppliers.com
Stock No. 49329

SERAS-B-0201

Rite in the Rain
ALL-WEATHER
FIELD
№ 351

MAYFIELD HTS
WA # SERAS-211

INCH

Rite in the Rain
ALL-WEATHER WRITING PAPER

If Found, Please Return To:
Name: _____

LOCKHEED MARTIN/SERAS
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679
Phone: (732) 321-4200

COC & SampleShipping Procedures

Peer review COC Record Remove pink copy for the Task Leader Place original COC record in a plastic bag, seal and secure to lid inside the cooler Tape and seal the cooler.	Call Sample Receiving Hotline at (732) 548-1905 or SRT's cell phone (609) 865-9306. Give the following information • FedEx tracking number • COC Record Number(s) • # of Coolers • # of Samples and Matrices • Analyses Requested • Subcontract Lab Info Fax COC record to (732) 494-4021 (SERAS or subcontract analyses) Follow-up to confirm sample receipt

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation

SERAS-B-D201

CONTENTS

PAGE	REFERENCE	DATE
3	Field Certificates for	7/30/13
6	Field Certificates for	7/31/13
9	Field Certificates for	8/1/13
13	Field Certificates for	8/2/13
18	Field Certificates for	8/3/13
21	Field Certificates for	8/4/13

8/6/13

7/30

853 SOLINSKI, PULLEN, BALL, VEGA + NEWHART arrive on site at Mayfield Heights City hall
901 - 930, RE-ARRANGE Vehicles + unload Geoprobe.
931-933 - HASP meeting with Pullen, Ball, Solinski Newhart.
935-1005 PULLEN, NEWHART, SOLINSKI perform area re-con of markouts on Mayfield Rd, Sunset Rd, Washington BLVD, Elgiers Rd, Miner Rd, Landis Road
1005 - 1028 CALL OUTS 1800-362-2764 for re-mark outs of TICKET
1034 CALLED BACK and informed that it will be an additional 48 hours # 330-351-7383 for Thom gas + electric
1045 GAS calls (TELECOMMUNICATIONS should be in area ~ 1130. We will meet to discuss markouts

7/30/13 [signature] Rite in the Rain

1048 Call from GAS/ELEC/Phone Markout (CHMS) 330 351 7383 Returns call. Should be in the area this afternoon. I told him to call me with any questions
1048 - Bull has been setting up his instrument since the H+S Meeting.
1100 - 1130 SOLINSKI, PULLEN, NEWHART WALK WASHINGTON, ALGIERS, SUNSET look for more markout info
1142 Meet G+S. All His lines are one WAYFIELD. SOUTHSIDE, and are clearly marked.
1150 - 1210 SOLINSKI, PULLEN, NEWHART look at alley behind Suspected source.
1220 - 1300 Make contact w/ City of Mayfield Heights about water + SEWER. TALK w/ ANDY + RENE AND ANDY CONTACTS OUPS AGAIN OUPS Re-issued S ticket for Water and Sewer Markout. City does not perform markout. OUPS Should

[signature] 7/30/13

be performing markout S
1500 Depart for Drainage Drill to pick up Sand and bentonite.
1540 Call Drilling company no answer
1600 Depart Property without sand or bentonite
1620 Back at City Hall
1630 Send Pullen Back to Hotel.
1630 - 1800 Newhart/Solinski Patrol Neighborhood look for additional Markout GAS is now marked out on Sunset Rd
1800 Depart Site

[signature] 7/30/ Return in the Rain

800 NEWHART, PULLEN, BALL, SOUNDER ONSITE. BALL STAYS AT CITY HALL. NEWHART, PULLEN, JOHNSON RECON NEIGHBORHOOD LOOKING FOR MORE MARK OUTS.

830 BACK AT CITY HALL, NO MORE MARKOUTS HAVE BEEN CERTIFIED

837 CALL GEAUGA DRILLING + ORDER 25 BAGS OF 3/8" BENTONITE

900-1100 ATTEMPT TO FIND OUT WHY MARKOUT OF WATER/SEWER HAVE NOT BEEN PERFORMED CONTACT CHRIS WHO IS PERFORMING GAS/ELECTRIC/PHONE AND HE STATED THAT WATER/SEWER RARELY MARKOUTS SONIA ENLISTS TOWN FOR ASSISTANCE CALL OUPS AGAIN 4th/time

1150-1210 CONTACT OUPS SUPERVISOR (330) 301-1800 CHUCK GREEN. HE STATED THAT WE ARE WITHIN OUR RIGHTS TO BEGIN WORK. HE SAID THAT WATER + SEWER DO NOT MARK OUT ALL OF THE TIME.

1215-1330 ATTEMPT CALLING WATER + SEWER

[signature] 7/31/13

1330 WITHOUT SUCCESS

1452 contacted by RON JORDAN OF CLEVELAND WATER. THEY WILL BE ON SITE MARKING LINES on 8/1/13 (tomorrow)

1457 contacted by ERIC of NORTHEAST OHIO REGIONAL SEWER DISTRICT. I GIVE HIM OUR STREETS OF INTEREST AND HE STATES THEY HAVE NO LINES IN THAT AREA. MUST BE MAINTAINED BY CUYAHOGA COUNTY 216 641-9010 X 2411

1539 RON JORDAN SUPERVISOR CONTACTS ME TO MAKE SURE HE TALKED TO US ABOUT MARKOUTS CONTACT BLOODHOUND DETECTIVES FOR A MARKOUT OF THE PROPERTY AT 6051 MAYFIELD ROAD SUSPECTED SOURCE

1610 CONTACTED BY ADRIANNE OF COUNTY PAW 216 443 8277. I GIVE HER THE STREETS OF INTEREST SHE SAYS IT MAY TAKE SOME TIME BUT THEY WILL START TOMORROW. I ASKED HER TO START ON SUNSET

[signature] 7/31/17 Rite in the Rain

PUBLIC WORKS DIRECTOR NAME BONITA TEEUWEN 216 348 3800.
TO SUMMARIZE BOTH WATER AND SEWER WILL BE ON SITE 8/1/13 for area Markouts. Blood-hound detectives will be onsite at 1130.

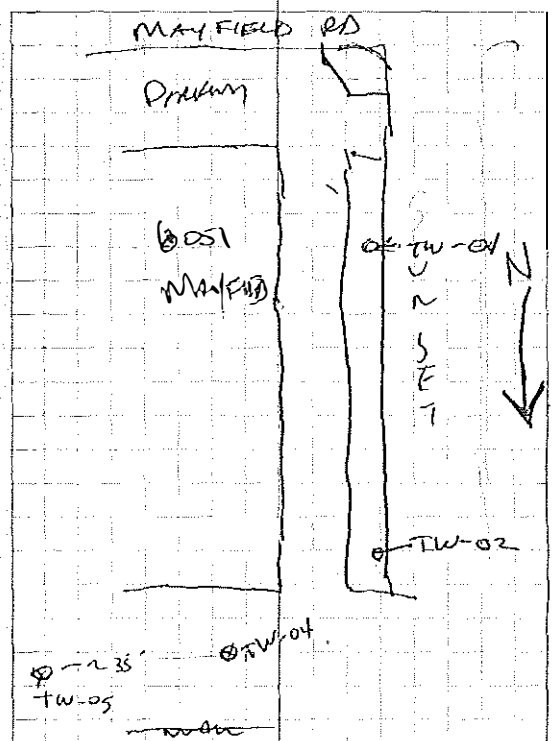
[signature] 7/31/13

802 AT city Hall with BALL, NEWHART PULEN & SOLINSKI
849 Ron from Cleveland water Calls he will meet him at SUNSET Mayfield ~ 900 his number is 216 570 0920
910 Meet Ron Jordan and explain our Study area
1030 GET A CALL FROM CUYAHOGA COUNTY SEWER THEY ARE GOING ACTIVATE A GREEN NOW WATER MARK OUTS CONTINUE ON SUNSET.
1106 Blood Hound Markout arrives at City HALL + CALLS. I tell them to meet me at 6051 Mayfield Road
1113 Blood Hound @ 6051 Mayfield. Meet DEAN. NEWHART + explain study and perform walk around of the building.
1125 Complete 6051 Mayfield Walk around.
1130 Cuyahoga DPW arrives. Meet

[signature] 8/1/13 Rite in the Rain

Santo & Charles. Explain Study and areas where we will be working.
1215 GEOPROBE IN POSITION on sunset. Next to 6051 Mayfield
1225 Begin at TW 1. GARY NEW HART WILL BE CHECKING CORES
1246 Refusal at 19 feet. Wet ~12 feet. 530 ppb in core at 15 feet as a max. of PID
1302 Move to TW-02
1332 Refusal at 18 1/2 Feet
1400 Break. In front of 1433
1500 Sunset TW-03
1528 Refusal at 19 feet
1540 Move Geoprobe to Celly Behind 6051 Mayfield
1550-1615 Debriefed by Bloodhound verbally. Property and documentation from Bloodhound is in process.
1620 Begin at Corner in Celly at 6051 Mayfield Road.
1640 Refusal at 19.8 feet

[signature] 8/1/13



NOTE THAT TW-03 is on Tree lawn of 1433 SUNSET

[signature] 8/1/13 Rite in the Rain

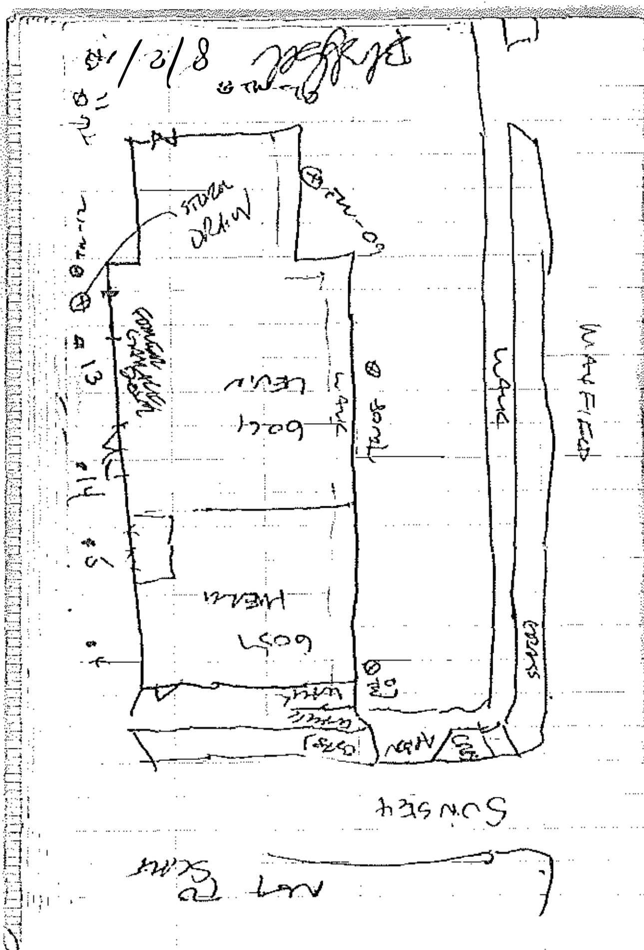
1650 POWER Recharged
N_2 on GEOProbe in
hopes of breaking 19.8
barrier on TW-04
1700-1702 Retry at TW-04
No movement. Again
BAU onsite and returns to
City HAU ~~[illegible]~~ 8/1/13 to Return
1713 PT Photovac.
~~1[illegible]~~ Rods Removed from TW-04
1730 PS 1/13 ~~1550~~ Move to TW-05. GBAC
RENRNS W/TH PHOTVAC
1750 REFUSAL @ 21 feet
1800-1820 Pack up bgs
1830 Depart 6051 Hoyfield
1835-1920 Discuss option
Tentative plan is to collect
soil samples around
6051 Mayfield Road
1945 at Hotel

[signature] 8/1/13

815 On site at city hall
Preparations for Bay begin
and GEOProbe
830 Calibrate Multiplex B09944
use ambient air for zero air
10 ppm lot # 11491048 Instrument
reads 10,040 ppb
after Calibration
912 at Tree lawn Between
Burgers and 1455 Washington Blvd for TW-06
to see if we can hit water
913 Begin pushing w/ GEOProbe
no soil buys here
928 Refusal at 16½ Feet. Well
to be set.
1027 Refusal at TW-07 in front
of 6051 Mayfield See map on
page 14. Depth at 22.3 feet
We will [illegible] Gerald [illegible]
Some Soil Samples with PHOTVAC
and send all soils to SERAS
for analysis. Nearest Fire
Samples and collects notes on [illegible]

[signature] 8/2/13

Rite in the Rain



1019 Collect Sample from Core
TW-07 at 16-17' for
PhotoVAC only. ~~Rc~~ RB 8/2/13
1024 Collect TW-07 between
19' to 20' for PhotoVAC and
for SERAS analysis Sample
numbers:
1600 for TW07 (16'+17')
1601 for TW07 19 to 20')
1102 Begin Push at TW-08
Sample #1602 Collected
from Soil Core TW-07 at 21'
1120 TW-08 @ 15' Soil Sample
#1603 Collected.
1123 TW-08 Refusal at 23'
1135 Soil Sample #1604 Collected
from TW-08 at 20'
Soil Sample #1605 Collected
1147 at 21' from TW-08 PhotoVac only
1202-1259 Lunch
1313 Work (ASH TECHNOLOGY)
BEGINS AT TW 09
1331 Refusal at 16 7 feet
1337 #1606 Collected at TW-09
14' to 15'

[signature] 8/2/13
Rite in the Rain.

1350 @ TW-10 begin
1356 #1607 Collected from TW-09 @ 16.5
1359 Refusal @ 19.7 feet at TW-10
1420 #1608 TW-10 @ 10' to 11' for Photovac only
1410 #1609 TW-10 @ 14'-15' PhotoVAC only
1432 #1610 TW-10 @ 19.5 for Both PhotoVAC + [illegible]
1444 @ TW-11 Begin
1457 Refusal @ TW11 @ 19.1 feet
1505 #1611 Collected from TW11 @ 19'
1601 @ TW-12
1617 Refusal @ 19.5 @ TW-12
1627 #1612 TW12 @ 9.5 feet
POWER PULLING WELLS and BACK FILLING W/SAND
1636 [illegible] #1613 Collected from TW-12 at 14 feet
1645 #1614 collected from TW-12 @ 17' below ground surface
[signature] 8/2/13

1658 Cleaning up on site & 1605 Mayfield Continues
1742 All vehicles back at City Hall Parking lot.
1815 Depart City Hall.

[signature] 8/2/13

830 Neubert, Puller, Solistic + Hegg arrived at City Hall. Bull has been viewing samples and has been on site.
832 Puller begin Geoprobe checkout and stock replacement. Solistic replaces AA batteries and performs Bump test on Multirae.
838 Bump test on Multirae passes @ 9100 ppb on a 10 000 ppb standard same as used yesterday.
841 Plan for today is to collect one more mill boring in alley and sample if necessary. Also collect samples from TW-1 TW-2 TW-4 and TW5 in close proximity to original location. Puller collects cutting shoe rinsate blank for 8/3/13
* NOTE from 8/2/13 Cutting shoe rinsate blank from 8/2/13 #1615 was collected at 1700 8/2/13 *
[signature] 8/3/13

901 Rinsate Blank from 8/3/13 is #1616 2 VOA VIALS collected for PHOTOVAC and 3 preserved with HCl (pH less than 2) for SERAS FIXED LAB
957 Start up at TW-13
1028 Refusal @ 19.5
1030 #1617 Collected from TW-13 @ 11' to 12' ~~#1618~~
1041 Sample #1618 collected 8/3/13 at TW 13 from 19' Sample #1618
1049 Move Geoprobe to TW 14
Refusal at 21.3' at TW 14
1115 No Samples will be collected from TW 14 as PID ready are lower than other TWs
1124 Check - Sample 1619 will be collected for Photovac TW 14 @ 21 feet
1175 at TW 5' (AKA PRIME)
1215 Collect #1620 from TW05' at 20.5 feet (PID 13000 ppb)
TW05' is about 1 foot South of TW5
[signature] 8/3/13

1301 @ TW-04'
1312 TW-04' @ 15.5 #1622
1303 TW-04' @ 14 #1621
TW-05' + TW-04' [illegible]
1325 with their original boring
soil TW-04' is [illegible]
approximately 1ft north [illegible]
1335 @ TW-04 8/3/13
1500 @ TW-02' #1[illegible]
1510 #1623 collected from TW-
02' @ 14 feet PID reads [illegible]
1520 #1624 Collected from TW-02
@ 16.5" PID reads 28ppm
TW-02' is approximately 18"
north of TW-02
1531 at TW-01'
1557 #1625 Collected from
TW-01' @ 18.5 PID reading
at 38ppm
1607 Cleanup operations by
1741 #1628 Collect 24 oz
VAR Samples for SEMS LAB
from Storm Drain in Alley
[signature] 8/3/13

800 G Bull Informs me
that PHOTOVAC has issue
and that the results from
1623 1624, and 1625 are
likely higher than reported
830-1230 Scribe and pack-
ing and Cleanup at Mey-
field HTS city hall. All
samples received
300-1330 Map created
in Google Earth
1400 Trip Blank #1627 Collected
in 3 VOA vials w/ 5 drops
of HCl in each
[signature]
8/4/13

Rite in the Rain

APPENDIX B
Photovac Voyager On-site Analytical Report
Mayfield Heights Vapor Intrusion Site
Mayfield Heights, OH
September 2013

0211-DTR-092413

LOCKHEED MARTIN

Lockheed Martin
Scientific, Engineering, Response and Analytical Services
2890 Woodbridge Ave, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200 Facsimile: 732-494-4021

DATE: September 20, 2013

TO: Philip Solinski, SERAS Task Leader

THROUGH: Jay Patel, SERAS Analytical Task Leader

FROM: Gerald Ball, Sr. GC/MS Chemist

SUBJECT: MAYFIELD HEIGHTS VAPOR INTRUSION SITE, MAYFIELD HEIGHTS, OH
WORK ASSIGNMENT #SER00211 – PHOTOVAC GC FIELD SCREENING REPORT

INTRODUCTION

This report contains the results for 24 soil samples received on 08/02/13 and 08/03/13 on chain of custody (COC) records 6701 through 06704 and 06707 through 06709. These samples were prepared and analyzed for trichloroethene (TCE) and tetrachloroethene (PCE) using a SERAS Photovac Gas Chromatograph (GC). The samples were handled, prepared and analyzed following SERAS standard operating procedure (SOP) #1717, *Headspace Analysis of Volatile Organic Compounds (VOCs) in Soil and Water Using the Photovac Voyager Gas Chromatograph (GC).*

METHODOLOGY

Soil samples were analyzed by the Voyager equipped with a 10.6 electron Volt (eV) ultraviolet (UV) light source and a photoionization Detector (PID). External standards are used to tentatively identify and quantitate compounds of interest. Gaseous contaminants are ionized as they emerge from the column. The ions are then attracted to an oppositely charged electrode which causes a current and sends an electronic signal to the Voyager internal microprocessor.

A 5-gram (g) aliquot of sample was weighed into a 40-milliliter (mL) volatile organic analysis (VOA) vial. A total of 20 mL of reagent water was then added to the vial. The vial was shaken for a minute and placed into a hot block that was capable of reaching 60 degrees Centigrade (°C) for 30 minutes to achieve vapor phase equilibration. A 250-microliter (µL) aliquot of headspace is removed using a gas-tight syringe and injected into the injection port.

The Voyager was calibrated using a 4-point calibration range of 1, 5, 10, and 50 part per billion (ppb). The standards are typically prepared using an intermediate 2.0 microgram per milliliter (µg/mL) standard in 20mL of reagent water at ambient temperature. Refer to Appendix A for the initial calibration data. The vial was shaken for a minute and placed into a hot block that was capable of reaching 60°C for 30 minutes to achieve vapor phase equilibration. A 250-microliter (µL) aliquot of headspace was removed using a gas-tight syringe and injected into the injection port. The correlation coefficient (r) must be greater or equal to 0.98 for the curve to be valid. An Initial Calibration Verification (ICV) standard was analyzed immediately following the initial calibration at the mid-point using a secondary source prior to the analysis of any samples.

A Continuing Calibration Verification (CCV) standard (10ppb) was analyzed at the beginning of each day prior to sample analysis, after every six hours of operation and at the end of the day. A percent difference (% D) criterion of ±25 was used to verify the integrity of the system.

RESULTS

Results for TCE and PCE can be found in Table 1. Several samples were diluted since their concentrations exceeded the linear calibration range. The highest concentrations of PCE were found in samples TW-09 (10'-11') at 1950 ppb, TW-12 (9.5') at 1550 ppb and TW-08 (15') at 1300 ppb. Chain of custody records can be found in Appendix B.

Correlation coefficients for TCE and PCE were 0.9980 and 0.9959, respectively. Internal standard recoveries of all samples were within QC limits.

Replicate analyses (Table 2) were performed on samples 1608 (TW-09-10" to 11') and 1610 (TW-09-19.5'). The relative percent difference (RPD) for TCE in both replicate samples was within ±25%; however, the RPD for PCE was exceeded in both samples.

The Photovac GC lost some sensitivity during the analysis on samples 1622 (TW-02-14'), 1624 (TW-02-16.5') and 1625 (TW-01 18.5'); therefore, these concentrations may be higher than reported. Please use these results with discretion.

Cc: Central Files, WA #SERAS-211
Electronic Files, I:\Archive\SERAS\211\D\LP\092013

TABLES
Analytical Results
Mayfield Heights Photovac Report
September 2013

Table 1 - Results of the Analysis for VOC (ppb) In Soil by Photovac Voyager GC
WA# 0-211, Mayfield Heights

Method: SERAS SOP#1717

Sample Number	1600		1601		1602		1603		1604	
Sample Location	TW-07 (16'-17')		TW-07 (19'-20')		TW-07 (21')		TW-08 (15')		TW-08 (20')	
Time/Date	080213/10:49		080213/10:50		080213/11:02		080213/11:20		080213/11:35	
Analyte	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb
Trichloroethene	U	4	U	4	8	4	8	4	U	4
Tetrachloroethene	16	4	24	4	32	4	1300	50	136	4

Sample Number	1605		1606		1607		1608		1609	
Sample Location	TW-08 (21')		TW-09 (14'-15')		TW-09 (16.5)		TW-09 (10' TO 11')		TW-09 (14'-15')	
Time/Date	080213/11:41		080213/13:37		080213/13:56		080213/14:20		080213/14:10	
Analyte	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb
Trichloroethene	U	4	U	4	U	4	U	4	U	4
Tetrachloroethene	16	24	U	4	U	4	1950	50	U	4

Sample Number	1610		1611		1612		1613		1614	
Sample Location	TW-09 (19.5')		TW-11 (19')		TW-12 (9.5')		TW-14 (14')		TW-14 (17')	
Time/Date	080213/11:41		080213/15:05		080213/16:27		080213/16:36		080213/16:45	
Analyte	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb
Trichloroethene	U	4	U	4	U	50	U	4	U	4
Tetrachloroethene	36	4	4	4	1550	50	188	4	32	4

Sample Number	1617		1618		1619		1620		1621	
Sample Location	TW-13 (11'-12')		TW-13 (19')		TW-14 (21')		TW-05 (20.5')		TW-04 (14')	
Time/Date	080313/10:30		080313/10:41		080313/11:25		080313/10:49		080313/13:03	
Analyte	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb
Trichloroethene	U	4	12	4	U	4	U	4	U	4
Tetrachloroethene	68	4	140	10	210	10	190	10	36	4

Sample Number	1622		*1623		*1624		*1625	
Sample Location	TW-04(15.5')		TW-02 (14')		TW-02 (16.5')		TW-01 (18.5')	
Time/Date	0803313/13:12		080313/15:10		080313/15:20		080313/16:25	
Analyte	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb	Results ppb	*RL* ppb
Trichloroethene	U	4	U	4	U	4	U	4
Tetrachloroethene	U	4	600	50	350	50	28	4

A - Assumed volume for Blanks
B - <3 times Method Blank value
C - Compound Calibration r>0.98
E - Concentration exceeded calibration limit
*- Photovac GC lost sensitivity, concentration possible higher
U - Not Detected
N/A - Not Applicable

Table 2 Results of the Duplicate Analysis for VOC in Soil Headspace
WA# 211, Mayfield Hights

Sample: 1608

Analyte	Initial Analysis ppb	Duplicate Analysis ppb	RPD	QC Limit RPD
Trichloroethene	U	U	0	≤25
Tetrachloroethene	1950	1150	31	≤25

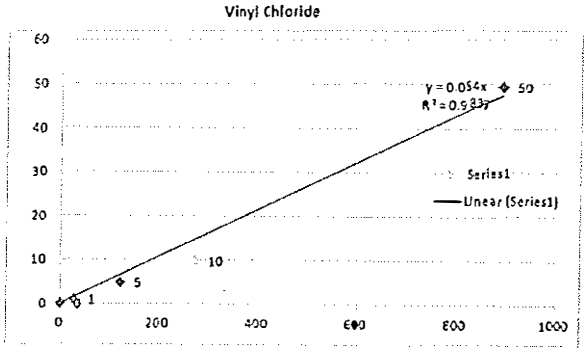
Sample: 1610

Analyte	Initial Analysis ppb	Duplicate Analysis ppb	RPD	QC Limit RPD
Trichloroethene	U	U	0	≤25
Tetrachloroethene	36.0	16.0	51	≤25

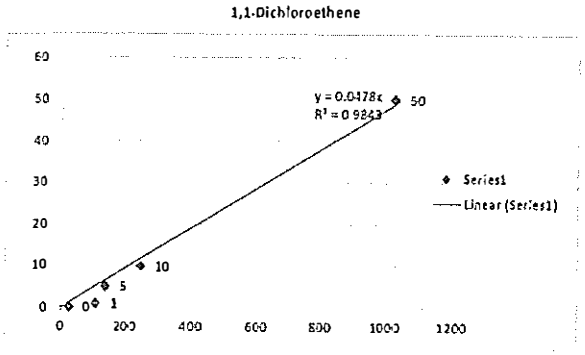
APPENDIX A
Initial Calibration Curves
Mayfield Heights Photovac Report
September 2013

Voyager Portable GC PID Soil Gas Calibration Range 073113

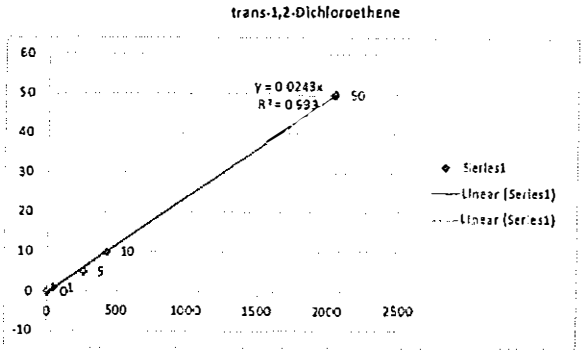
Area (mVs)	Concentrations	STDEV
0	0	
28 3	1	
124	5	
273	10	
894	50	
		368 046



Area (mVs)	Concentrations	STDEV
22 8	0	
113	1	
136	5	
248	10	
1022	50	
		406.9224



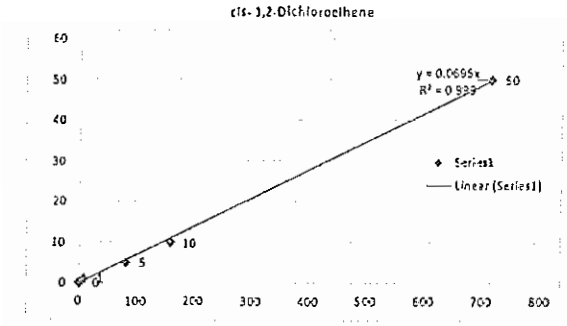
Area (mVs)	Concentrations	STDEV
0	0	
45 3	1	
256	5	
424	10	
2045	50	
		850 6591



Calibration Range-1 ppb, 5 ppb, 10 ppb and 50 ppb
Standard Prep - 072713-01, 072713-02, 072713-03 and 072713-04; Exp:1/27/14
All Standard were prep from a stock standard compound mix @2ppm

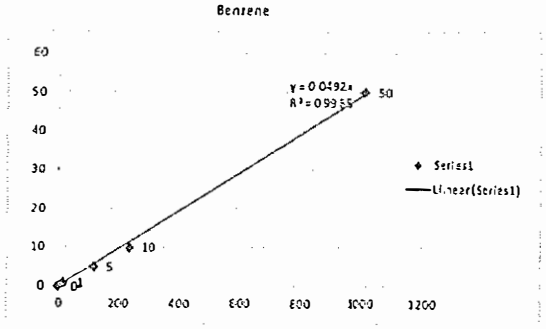
Voyager Portable GC PID Soil Gas Calibration Range 073113

Area (mVs)	Concentrations	STDEV
0	0	
7.7	1	
81.1	5	
158	10	
715	50	
		259.0876



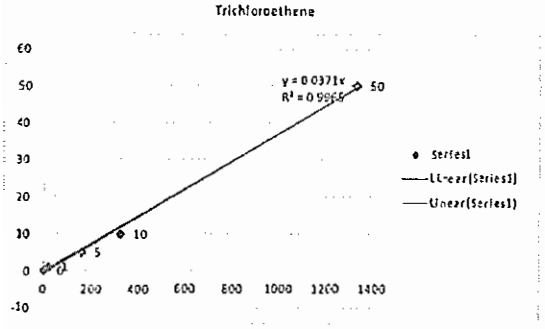
cis-1,2-DCE
R=.999

Area (mVs)	Concentrations	STDEV
0	0	
19	1	
115	5	
232	10	
1009	50	
		420.5253



Benzene
R=0.999

Area (mVs)	Concentrations	STDEV
0	0	
19.8	1	
157	5	
330	10	
1331	50	
		554.5269

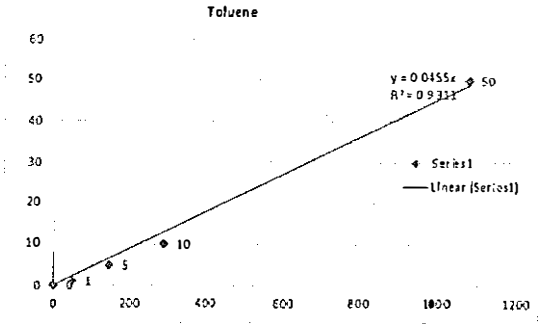


TCE
R=0.998

Calibration Range-1 ppb, 5 ppb, 10 ppb and 50 ppb
Standard Prep - 072713-01, 072713-02, 072713 03 and 072713 04; Exp:1/27/14
All Standard were prep from a stock standard compound mix @2ppm

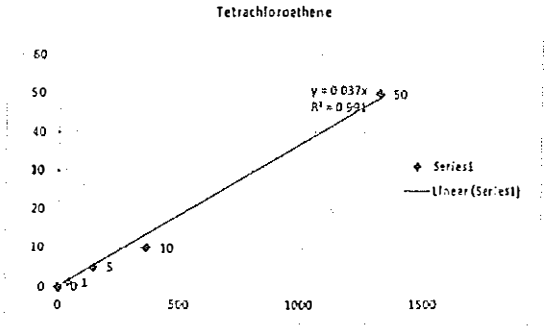
Voyager Portable GC PID Soil Gas Calibration Range 073113

Area (mVs)	Concentrations	STDEV
0	0	
48.9	1	
145	5	
250	10	
1073	50	
		439.9027



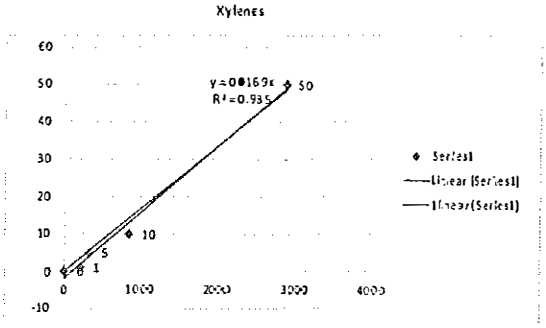
Tol
R= 593

Area (mVs)	Concentrations	STDEV
0	0	
43.4	1	
148	5	
371	10	
1320	50	
		5466129



PCE
R=0.9959

Area (mVs)	Concentrations	STDEV
0	0	
209	1	
320	5	
839	10	
2869	50	
		1171 615



Xylenes
R=0 593

Calibration Range-1 ppb, 5 ppb, 10 ppb and 50 ppb
Standard Prep - 072713-01, 072713-02, 072713-03 and 072713-04, Exp 1/27/14
All Standard were prep from a stock standard compound mix @2ppm

APPENDIX B
Chain of Custody Records
Mayfield Heights Photovac Report
September 2013

~~REAC~~, Edison, NJ
(732) 321-4200
EPA Contract ~~68-C99-223~~ PS 8/2/13
ERW-09-~~FPA~~ W PS 8/2/13
-031

CHAIN OF CUSTODY RECORD

Project Name: MAYFIELD
Project Number: 211
LM Contact: SOLINGEL Phone: 732 321 4200

No: 06701
Sheet 01 of 01 (Do not copy)
(for addnl samples use new form)

Sample Identification | Analyses Requested

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PHOTOVAC (1)	SERAS LAB (2)			
	1600	TW-07 (16'-17')	S	8/2/13	1	4oz JAR/MET ICE	✓	NO			
	1601	TW-07 (19'-20')	S	↓	2	↓	✓	✓			
	1602	TW-07 (21')	S	↓	2	↓	✓	✓			

Matrix:

A-Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue
PW- Potable Water
S- Soil
SD-Sediment
SL- Sludge
SW-Surface Water
TX-TCLPE xtract
W- Water
X-Other

Special Instructions:

PLEASE HOLD SERAS SAMPLES
(1) PHOTOVAC SOIL SCREENING ON SITE
(2) SERAS LAB ANALYSIS TO BE PERFORMED

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL ANALYSIS	[signature]	8/2/13	[signature]	8/2/13	11:15						

~~REAC~~, Edison, NJ
(732) 321-4200
EPA Contract ~~68-C99-223~~ PS 8/6/13
EP-W-09-031

CHAIN OF CUSTODY RECORD

Project Name: MAYFIELD
Project Number: 211
LM Contact: SOLINSKE Phone: 4283

No: 06702
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification							Analyses Requested				
REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Photovac (1)	Seras (2)			
	1603	TW-08 (15')	S	8/2/13	2	4 oz JAR / NET/KE	✓	✓			
	1604	TW-08 (20')	S	↓	2	↓	✓	✓			
	1605	TW-08 (21')	S	↓	1	↓	✓	NO			

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:

(1) PHOTO VAC SOIL SCREENING
(2) SERAS FIXED LAB VOA ANALYSIS
PLEASE HOLD SERAS SAMPLES
UNTIL IT CAN BE DECIDED IF
THEY WILL BE ANALYZED

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	8/2/13	[signature]	8/2/13	12:45						

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: MAYFIELD
Project Number: 2011
LM Contact: [illegible] Phone: 4583

No: 06703
Sheet 01 of 01 (Do not copy)
(for addnl samples use new form)

Sample Identification / **Analyses Requested**

REAC#	SampleNo	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Photo (1)	SERAS (2)			
	1606	TW-09 (14'-15')	S	8/2/13	2	40mL+4oz/ WET ICE	✓	✓			
	1607	TW-09 (16.5')	S		2	40mL UAY	✓	✓			
	1608	TW-10 (10'-11')	S		1	40mL+4oz	✓	NO			
	1609	TW-10 (14'-15')	S		2	40 mL UAY	✓	NO			
	1610	TW-10 (19.5')	S		2	40mL UAY	✓	✓			

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:

(1) ON SITE PHOTVAC ANALYSIS
(2) OFF SITE SERAS VOA SOIL ANALYSIS
PLEASE HOLD

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL ANALYSIS	[signature]	8/2/13	[signature]	8/2/13	15:00						

~~REAC~~, Edison, NJ
(732) 321-4200
EPA Contract ~~68-C99-223~~ FS 8/2/13
EP-W-09-031

CHAIN OF CUSTODY RECORD

Project Name: MAYFIELD
Project Number: 211
LM Contact: SOLINSKI Phone: 4283

No: 06704
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification / **Analyses Requested**

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PINTAGE	SERAS			
	1611	TW-1 @ 19'	S	8/2/13	2	40 mL VOA/WET	✓	✓			
	1612	TW 12 @ 9.5'	S		2		✓	✓			
	1613	TW 12 @ 14'	S		2		✓	✓			
	1614	TW 12 @ 17'	S	↓	2	↓	✓	✓			

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:

(1) ONSITE SCREENING WITH PHOTOVAC
(2) SERAS FIXED LAB VOA ANALYSIS

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	8/2/13	[signature]	8/2/13	16:00						

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: MAYFIELD
Project Number: 211
LM Contact: SOUNSY 1 Phone: 4-8-3

No: 06707
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification | **Analyses Requested**

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PHOTO (1)	SERAS (2)			
	1617	TW13 (11' to 12')	S	8/3/13	2	40 ml VOA VIAL/ICE	✓	✓			
	1618	TW13 (19')	S	↓	2	↓	✓	✓			
	1619	TW14 @ 21	S	↓	1	↓	✓	NO			

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:

(1) Photo - on site Voyager analysis
(2) SERAS FIXED LAB ANALYSIS

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
SEAS/ANALYSIS	[signature]	8/3/13	[signature]	8/3/13	11:00						

REAC, Edison, NJ
(732) 321-4200
EPA Contract ~~68-C99-223~~ PS 8/3/13
EP-W-09-031

CHAIN OF CUSTODY RECORD

Project Name: MAVFIED
Project Number: 211
LM Contact: SOLINSKI Phone: 4283

No: 06708
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification / **Analyses Requested**

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	SERAS (1)	PHOTO (2)			
	1620		S	8/3/13	2	4 ML VOA/ICE	✓	✓			
	1621		S	↓	2	↓	✓	✓			
	1622		S	↓	2	↓	✓	✓			

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:

(1) SERAS FIXED LAB ANALYSIS
(2) PHOTOVAC ON SITE ANALYSIS

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/AWING	[signature]	8/3/13	[signature]	8/3/13	1130						

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: [illegible]
Project Number: [illegible]
LM Contact: [illegible] Phone: [illegible]

No: 06709
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

Sample Identification							Analyses Requested				
REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	[illegible]	SEMS	PID (ppm)		
	1623	TW-02 @ 14'	S	8/3/13	2	40mL VOA / ICE	✓	✓	178		
	1624	TW-02 @ 16.5'	S	↓	2	↓	✓	✓	28		
	1625	TW-01 @ 18.5	S	↓	2	↓	✓	✓	38		

Matrix:

A-Air
AT-Animal Tissue
DL-Drum Liquids
DS-Drum Solids
GW-Groundwater
O-Oil
PR-Product
PT-Plant Tissue
PW-Potable Water
S-Soil
SD-Sediment
SL-Sludge
SW-Surface Water
TX-TCLP Extract
W-Water
X-Other

Special Instructions:
(1) onsite screening with Photovac Voyager
(2) SEMS FIXED LAB ANALYSIS

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
Analysis	[illegible]	8/3/13	[illegible]	8/3/13	17:00						

APPENDIX C
SERAS Laboratory Final Analytical Report
Mayfield Heights Vapor Intrusion Site
Mayfield Heights, OH
September 2013

ANALYTICAL REPORT

Prepared by
Lockheed Martin Information Systems and Global Services/Environmental Services
Scientific, Engineering, Response and Analytical Services

Mayfield Heights Vapor Study
Mayfield Heights, Ohio

September 2013

EPA Work Assignment No. SERAS-211
LOCKHEED MARTIN Work Order SER00211
EPA Contract No. EP-W-09-031

Submitted to
G. Newhart
EPA-ERT
26 W. Martin Luther King Drive
Cincinnati, OH 45268

9/13/13

D. Killeen
QA/QC Officer

Date

9/14/13

D. Miller
Program Manager

Date

Analysis by:
ERT/SERAS

Prepared by:/Validated by:
Y. Mehra/R. Varsolona

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of the ERT/SERAS Laboratory

Table of Contents

Topic

Testing Laboratories Information
Detailed Sample Information
Introduction
Case Narrative
Summary of Abbreviations

Section I

Results of the Analysis of VOC in Soil	Table 1.1
Results of the TICs for VOC in Soil	Table 1.1a
Results of the Analysis of VOC in Water	Table 1.2
Results of the TICs for VOC in Water	Table 1.2a

Section II

Results of the LCS Analysis for VOC in Soil	Table 2.1
Results of the MS/MSD Analysis for VOC in Soil	Table 2.2
Results of the LCS/LCSD Analysis for VOC in Water	Table 2.3

Section III

Chain of Custody

Appendices

Appendix A Data for VOC in Soil and Water	Y 171

Appendix A will be furnished on request.

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

TESTING LABORATORIES INFORMATION

Analysis of Volatile Organic Compounds in Soil by SERAS SOP# 1807, "*Volatile Organic Analysis in Soil/Sediment by GC/MS*"

Analysis of Volatile Organic Compounds in Water by SERAS SOP# 1806, "*Volatile Organic Analysis in Water by GC/MS*"

ERT/SERAS Laboratory
2890 Woodbridge Avenue
Edison, NJ 08837

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

ERT/SERAS Laboratory is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID # 12023 for VOC analysis in soil and water.

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of the ERT/SERAS Laboratory

Detailed Sample Information

SERAS Sample #	Field Sample #
R308004-01	1601
R308004-02	1602
R308004-03	1603
R308004-04	1604
R308004-05	1606
R308004-06	1607
R308004-07	1610
R308004-08	1611
R308004-09	1612
R308004-10	1613
R308004-11	1614
R308004-12	1615
R308004-13	1616
R308004-14	1617
R308004-15	1618
R308004-16	1620
R308004-17	1621
R308004-18	1622
R308004-19	1623
R308004-20	1624
R308004-21	1625
R308004-22	1626
R308004-23	1627

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Introduction

SERAS personnel, in response to WA# SERAS-211, provided analytical support for environmental samples collected from the Mayfield Heights Vapor Study Site, in Mayfield Heights Ohio as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

The samples analyzed at SERAS were treated with procedures consistent with those specified in SERAS SOP #1008, *Sample Receiving, Handling and Storage* and SERAS SOP# 1009, *Operation of Sample Refrigeration Units.*

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
5-080413-102110-0002	11	08/02/13	08/06/13	08/14/13 through 08/16/13	Soil	VOC/ SERAS SOP# 1807	ERT/SERAS	Y 171
	8	08/03/13						
	1				Sedimen			
	1	08/02/13		08/15/13	Water	VOC/ SERAS SOP# 1806		
	1	08/03/13						
	1	08/04/13						

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

<u>VOC in Soil and Water Package Y 171</u>

The soil method blank of (8/16/2013) contained naphthalene below the reporting limit (RL). The naphthalene result for sample 1626 is qualified non-detect (U). Naphthalene was subsequently qualified unusable (R) in this sample by the internal standard (see below).

The response factor (RF) of bromoform was below QC criterion for the 5 and 20 part per billion (ppb) points of the water initial calibration curve of 8/14/2013. The RL for bromoform has been raised to 50 ppb for sample numbers 1615, 1616, 1627 and water blank C081513-1.

Acetone, 2,2-dichloropropane and 1,2-dichloroethane did not meet the percent difference (%D) criterion for the continuing calibration of 8/16/2013. Acetone results for sample numbers 1604, 1614, 1626 and soil blank B081613-1 are qualified estimated (J or UJ).

The percent recovery (%R) of the surrogate toluene-d_8 was below QC limits for sample 1612. All results for this sample are qualified estimated (J or UJ).

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of the ERT/SERAS Laboratory

The area of the internal standard chlorobenzene-d_5 was below QC limits for sample 1626. Results for 4-methyl-2-pentanone, 2-hexanone, tetrachloroethene, chlorobenzene, 1,1,1,2-tetrachloroethane, ethylbenzene, m/p-xylene, o-xylene, styrene, isopropylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, n-propylbenzene, bromobenzene, 1,3,5-trimethylbenzene, 2-chlorotoluene, 4-chlorotoluene, tert-butylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, n-butylbenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, hexachlorobutadiene and naphthalene are qualified unusable (R) for sample 1626.

The percent (%) moisture of sample 1626 exceeded 70%. The following results are qualified estimated (J or UJ): dichlorofluoromethane, chloromethane, vinyl chloride, bromomethane, chloroethane, trichlorofluromethane, 1,1-dichloroethene, methylene chloride, carbon disulfide, methyl tert-butyl ether, trans-1,2-dichloroethene, 1,1-dichloroethane, 2-butanone, 2,2-dichloropropane, cis-1,2-dichloroethene, chloroform, 1,1-dichloropropene, 1,2-dichloroethane, 1,1,1-trichloroethane, carbon tetrachloride, benzene, 1,2-dichloropropane, bromodichloromethane, dibromomethane, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,1,2-trichloroethane, 1,3-dichloropropane, dibromochloromethane, 1,2-dibromomethane and bromoform.

Tetrachloroethene exceeded the linear calibration range for samples 1603, 1612, 1613 and 1624 and cis-1,2-dichloroethene for sample 1612. The tetrachloroethene results for samples 1603, 1612, 1613 and 1624 and the cis-1,2-dichloroethene result for sample 1612 are qualified estimated (J).

4-Methyl-2-pentanone and 2-hexanone were below the % recovery criteria and above the %RPD criterion for the MS/MSD of sample 1601. The results for 4-methyl-2-pentanone and 2-hexanone are qualified unusable (R) for this sample.

Since the limit of detection (LOD) study for waters analyzed on instrument "C" indicated that 4-methyl-2-pentanone, 2-hexanone and styrene were not recovered at the 5.0 µg/L concentration, the RLs for these compounds have been raised to 20 µg/L for water blank C081513-1 and samples 1615, 1616 and 1627.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Summary of Abbreviations

BFB	Bromofluorobenzene
C	Centigrade
CLP	Contract Laboratory Program
COC	Chain of Custody
conc	concentration
cont	continued
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
D	(Surrogate Table) value is from a diluted sample and was not calculated
Dioxin	Polyehlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/MS	Gas Chromatography/ Mass Spectrometry
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MS (BS)	Matrix Spike (Blank Spike)
MSD (BSD)	Matrix Spike Duplicate (Blank Spike Duplicate)
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
SOP	Standard Operating Procedure
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
PQL	Practical Quantitation Limit
PAL	Performance Acceptance Limit
QA/QC	Quality Assurance/Quality Control
QL	Quantitation Limit
RL	Reporting Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SERAS	Scientific, Engineering, Response and Analytical Services
SIM	Selected Ion Monitoring
Sur	Surrogate
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanogrampg	picogram pCi		picocurie	s	sigma	

Data Validation Flags

J	Value is estimated	R	Value is unusable
J+	Value is estimated high (metals only)	U	Not detected
J-	Value is estimated low (metals only)	UJ	Not detected and RL is estimated
N	Presumptively present (Aroclors only)		

Rev. 1/14/09

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Environmental Response Team/Scientific Engineering, Response and Analytical Services
2890 Woodbridge Avenue, Building 209 Annex
Edison NJ 08837

Table 1.1 Result of the Analysis for VOC in Soil
WA #SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number			R308004-01		R308004-02		R308004-03	
Sample Number	Soil Blank B 081413-2		1601		1602		1603	
Sample Location			TW-07		TW-07		TW-08	
Sublocation			19' to 20'		21'		15'	
Percent Solids	100		89		90		89	
Analyte	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.00	U	5.62	U	5.56	U	5.62
Chloromethane	U	5.00	U	5.62	U	5.56	U	5.62
Vinyl Chloride	U	5.00	U	5.62	U	5.56	U	5.62
Bromomethane	U	5.00	U	5.62	U	5.56	U	5.62
Chloroethane	U	5.00	U	5.62	U	5.56	U	5.62
Trichlorofluoromethane	U	5.00	U	5.62	U	5.56	U	5.62
Acetone	U	20.0	U	22.5	3.68 J	22.2	U	22.5
1,1-Dichloroethene	U	5.00	U	5.62	U	5.56	U	5.62
Methylene Chloride	U	5.00	U	5.62	U	5.56	U	5.62
Carbon Disulfide	U	5.00	U	5.62	U	5.56	U	5.62
Methyl tert-Butyl Ether	U	5.00	U	5.62	U	5.56	U	5.62
trans-1,2-Dichloroethene	U	5.00	U	5.62	U	5.56	U	5.62
1,1 Dichloroethane	U	5.00	U	5.62	U	5.56	U	5.62
2-Butanone	U	5.00	U	5.62	U	5.56	U	5.62
2,2-Dichloropropane	U	5.00	U	5.62	U	5.56	U	5.62
cis-1,2-Dichloroethene	U	5.00	U	5.62	U	5.56	U	5.62
Chloroform	U	5.00	U	5.62	U	5.56	2.40 J	5.62
1,1-Dichloropropene	U	5.00	U	5.62	U	5.56	U	5.62
1,2-Dichloroethane	U	5.00	U	5.62	U	5.56	U	5.62
1,1,1-Trichloroethane	U	5.00	U	5.62	U	5.56	U	5.62
Carbon Tetrachloride	U	5.00	U	5.62	U	5.56	14.2	5.62
Benzene	U	5.00	U	5.62	U	5.56	U	5.62
Trichloroethene	U	5.00	U	5.62	U	5.56	7.69	5.62
1,2-Dichloropropane	U	5.00	U	5.62	U	5.56	U	5.62
Bromodichloromethane	U	5.00	U	5.62	U	5.56	U	5.62
Dibromomethane	U	5.00	U	5.62	U	5.56	U	5.62
cis-1,3-Dichloropropene	U	5.00	U	5.62	U	5.56	U	5.62
trans-1,3-Dichloropropene	U	5.00	U	5.62	U	5.56	U	5.62
1,1,2-Trichloroethane	U	5.00	U	5.62	U	5.56	U	5.62
1,3-Dichloropropane	U	5.00	U	5.62	U	5.56	U	5.62
Dibromochloromethane	U	5.00	U	5.62	U	5.56	U	5.62
1,2-Dibromoethane	U	5.00	U	5.62	U	5.56	U	5.62
Bromoform	U	5.00	U	5.62	U	5.56	U	5.62
4-Methyl-2-Pentanone	U	5.00	R		U	5.56	U	5.62
Toluene	U	5.00	U	5.62	U	5.56	U	5.62
2-Hexanone	U	5.00	R		U	5.56	U	5.62
Tetrachloroethene	U	5.00	5.70	5.62	1.92 J	5.56	1760 J	56.2
Chlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,1,1,2-Tetrachloroethane	U	5.00	U	5.62	U	5.56	U	5.62
Ethylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
p&m-Xylene	U	10.0	U	11.2	U	11.1	U	11.2
o-Xylene	U	5.00	U	5.62	U	5.56	U	5.62
Styrene	U	5.00	U	5.62	U	5.56	U	5.62
Isopropylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,1,2,2-Tetrachloroethane	U	5.00	U	5.62	U	5.56	U	5.62
1,2,3-Trichloropropane	U	5.00	U	5.62	U	5.56	U	5.62
n-Propylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
Bromobenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,3,5-Trimethylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
2-Chlorotoluene	U	5.00	U	5.62	U	5.56	U	5.62
4-Chlorotoluene	U	5.00	U	5.62	U	5.56	U	5.62
tert-Butylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,2,4-Trimethylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
sec-Butylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
p-Isopropyltoluene	U	5.00	U	5.62	U	5.56	U	5.62
1,3-Dichlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,4-Dichlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62
n-Butylbenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,2-Dichlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62
1,2-Dibromo-3-Chloropropa	U	5.00	U	5.62	U	5.56	U	5.62
1,2,4-Trichlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62
Hexachlorobutadiene	U	5.00	U	5.62	U	5.56	U	5.62
Naphthalene	U	5.00	0.697 J	5.62	U	5.56	U	5.62
1,2,3-Trichlorobenzene	U	5.00	U	5.62	U	5.56	U	5.62

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.1 (cont) Results of the Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number	R308004-05		R308004-06		R308004-07		R308004-08	
Sample Number	1606		1607		1610		1611	
Sample Location	TW-09		TW-09		TW-10		TW-11	
Sublocation	14' to 15'		16.5'		19.5'		19'	
Percent Solids	92		91		88		90	
Analyte	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.43	U	5.49	U	5.68	U	5.56
Chloromethane	U	5.43	U	5.49	U	5.68	U	5.56
Vinyl Chloride	U	5.43	U	5.49	U	5.68	U	5.56
Bromomethane	U	5.43	U	5.49	U	5.68	U	5.56
Chloroethane	U	5.43	U	5.49	U	5.68	U	5.56
Trichlorofluoromethane	U	5.43	U	5.49	U	5.68	U	5.56
Acetone	U	21.7	U	22.0	U	22.7	U	22.2
1,1-Dichloroethene	U	5.43	U	5.49	U	5.68	U	5.56
Methylene Chloride	U	5.43	U	5.49	U	5.68	U	5.56
Carbon Disulfide	U	5.43	U	5.49	U	5.68	U	5.56
Methyl tert-Butyl Ether	U	5.43	U	5.49	U	5.68	U	5.56
trans-1,2-Dichloroethene	U	5.43	U	5.49	U	5.68	U	5.56
1,1 Dichloroethane	U	5.43	U	5.49	U	5.68	U	5.56
2-Butanone	U	5.43	U	5.49	U	5.68	U	5.56
2,2-Dichloropropane	U	5.43	U	5.49	U	5.68	U	5.56
cis-1,2-Dichloroethene	U	5.43	U	5.49	U	5.68	U	5.56
Chloroform	U	5.43	U	5.49	U	5.68	U	5.56
1,1-Dichloropropene	U	5.43	U	5.49	U	5.68	U	5.56
1,2-Dichloroethane	U	5.43	U	5.49	U	5.68	U	5.56
1,1,1-Trichloroethane	U	5.43	U	5.49	U	5.68	U	5.56
Carbon Tetrachloride	U	5.43	U	5.49	U	5.68	1.14 J	5.56
Benzene	U	5.43	U	5.49	U	5.68	U	5.56
Trichloroethene	U	5.43	U	5.49	U	5.68	U	5.56
1,2-Dichloropropane	U	5.43	U	5.49	U	5.68	U	5.56
Bromodichloromethane	U	5.43	U	5.49	U	5.68	U	5.56
Dibromomethane	U	5.43	U	5.49	U	5.68	U	5.56
cis-1,3-Dichloropropene	U	5.43	U	5.49	U	5.68	U	5.56
trans-1,3-Dichloropropene	U	5.43	U	5.49	U	5.68	U	5.56
1,1,2-Trichloroethane	U	5.43	U	5.49	U	5.68	U	5.56
1,3-Dichloropropane	U	5.43	U	5.49	U	5.68	U	5.56
Dibromochloromethane	U	5.43	U	5.49	U	5.68	U	5.56
1,2-Dibromoethane	U	5.43	U	5.49	U	5.68	U	5.56
Bromoform	U	5.43	U	5.49	U	5.68	U	5.56
4-Methyl-2-Pentanone	U	5.43	U	5.49	U	5.68	U	5.56
Toluene	U	5.43	U	5.49	U	5.68	U	5.56
2-Hexanone	U	5.43	U	5.49	U	5.68	U	5.56
Tetrachloroethene	17.3	5.43	2.73 J	5.49	191	5.68	95.1	5.56
Chlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,1,1,2-Tetrachloroethane	U	5.43	U	5.49	U	5.68	U	5.56
Ethylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
p&m-Xylene	U	10.9	U	11.0	U	11.4	U	11.1
o-Xylene	U	5.43	U	5.49	U	5.68	U	5.56
Styrene	U	5.43	U	5.49	U	5.68	U	5.56
Isopropylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,1,2,2-Tetrachloroethane	U	5.43	U	5.49	U	5.68	U	5.56
1,2,3-Trichloropropane	U	5.43	U	5.49	U	5.68	U	5.56
n-Propylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
Bromobenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,3,5-Trimethylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
2-Chlorotoluene	U	5.43	U	5.49	U	5.68	U	5.56
4-Chlorotoluene	U	5.43	U	5.49	U	5.68	U	5.56
tert-Butylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,2,4-Trimethylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
sec-Butylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
p-Isopropyltoluene	U	5.43	U	5.49	U	5.68	U	5.56
1,3-Dichlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,4-Dichlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56
n-Butylbenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,2-Dichlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56
1,2-Dibromo-3-Chloropropa	U	5.43	U	5.49	U	5.68	U	5.56
1,2,4-Trichlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56
Hexachlorobutadiene	U	5.43	U	5.49	U	5.68	U	5.56
Naphthalene	U	5.43	U	5.49	U	5.68	U	5.56
1,2,3-Trichlorobenzene	U	5.43	U	5.49	U	5.68	U	5.56

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.1 (cont) Result of the Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number	R308004-09			R308004-10		
Sample Number	1612			1613		
Sample Location	TW-12			TW-12		
Subtocation	9.5'			14'		
Percen Solids	85			92		
Analyte	Result µg/Kg		RL µg/Kg	Result µg/Kg		RL µg/Kg
Dichlorodifluoromethane	U	J	5.88	U		5.43
Chloromethane	U	J	5.88	U		5.43
Vinyl Chloride	U	J	5.88	U		5.43
Bromomethane	U	J	5.88	U		5.43
Chloroethane	U	J	5.88	U		5.43
Trichlorofluoromethane	U	J	5.88	U		5.43
Acetone	U	J	23.5	U		21.7
1,1-Dichloroethene	U	J	5.88	U		5.43
Methylene Chloride	U	J	5.88	U		5.43
Carbon Disulfide	U	J	5.88	U		5.43
Methyl tert-Butyl Ether	U	J	5.88	U		5.43
trans-1,2-Dichloroethene	1.45	J	5.88	U		5.43
1,1 Dichloroethane	U	J	5.88	U		5.43
2-Butanone	U	J	5.88	U		5.43
2,2-Dichloropropane	U	J	5.88	U		5.43
cis-1,2-Dichloroethene	1540	J	58.8	2.54	J	5.43
Chloroform	6.79	J	5.88	U		5.43
1,1-Dichloropropene	U	J	5.88	U		5.43
1,2-Dichloroethane	U	J	5.88	U		5.43
1,1,1-Trichloroethane	1.20	J	5.88	U		5.43
Carbon Tetrachloride	45.1	J	5.88	0.663	J	5.43
Benzene	U	J	5.88	U		5.43
Trichloroethene	58.7	J	5.88	1.13	J	5.43
1,2-Dichloropropane	U	J	5.88	U		5.43
Bromodichloromethane	U	J	5.88	U		5.43
Dibromomethane	U	J	5.88	U		5.43
cis-1,3-Dichloropropene	U	J	5.88	U		5.43
trans-1,3-Dichloropropene	U	J	5.88	U		5.43
1,1,2-Trichloroethane	U	J	5.88	U		5.43
1,3-Dichloropropane	U	J	5.88	U		5.43
Dibromochloromethane	U	J	5.88	U		5.43
1,2-Dibromoethane	U	J	5.88	U		5.43
Bromoform	U	J	5.88	U		5.43
4-Methyl-2-Pentanone	U	J	5.88	U		5.43
Toluene	U	J	5.88	U		5.43
2-Hexanone	U	J	5.88	U		5.43
Tetrachloroethene	4730	J	5.88	2530	J	5.43
Chlorobenzene	U	J	5.88	U		5.43
1,1,1,2-Tetrachloroethane	0.553	J	5.88	0.315	J	5.43
Ethylbenzene	U	J	5.88	U		5.43
p&m-Xylene	U	J	11.8	U		10.9
o-Xylene	U	J	5.88	U		5.43
Styrene	U	J	5.88	U		5.43
Isopropylbenzene	U	J	5.88	U		5.43
1,1,2,2-Tetrachloroethane	U	J	5.88	U		5.43
1,2,3-Trichloropropane	U	J	5.88	U		5.43
n-Propylbenzene	U	J	5.88	U		5.43
Bromobenzene	U	J	5.88	U		5.43
1,3,5-Trimethylbenzene	U	J	5.88	U		5.43
2-Chlorotoluene	U	J	5.88	U		5.43
4-Chlorotoluene	U	J	5.88	U		5.43
tert-Butylbenzene	U	J	5.88	U		5.43
1,2,4-Trimethylbenzene	U	J	5.88	U		5.43
sec-Butylbenzene	U	J	5.88	U		5.43
p-Isopropyltoluene	U	J	5.88	U		5.43
1,3-Dichlorobenzene	U	J	5.88	U		5.43
1,4-Dichlorobenzene	U	J	5.88	U		5.43
n-Butylbenzene	U	J	5.88	U		5.43
1,2-Dichlorobenzene	U	J	5.88	U		5.43
1,2-Dibromo-3-Chloroprop	U	J	5.88	U		5.43
1,2,4-Trichlorobenzene	U	J	5.88	U		5.43
Hexachlorobutadiene	U	J	5.88	U		5.43
Naphthalene	U	J	5.88	U		5.43
1,2,3-Trichlorobenzene	U	J	5.88	U		5.43

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.1 (cont) Result of the Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number			R308004-14		R308004-15		R308004-16	
Sample Number	Soil Blank B 081513-2		1617		1618		1620	
Sample Location			TW-13		TW-13		TW-05'	
Sublocation			11' to 12'		19'		20.5'	
Percent Solids	100		95		90		90	
Analyte	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.00	U	5.26	U	5.56	U	5.56
Chloromethane	U	5.00	U	5.26	U	5.56	U	5.56
Vinyl Chloride	U	5.00	U	5.26	U	5.56	U	5.56
Bromomethane	U	5.00	U	5.26	U	5.56	U	5.56
Chloroethane	U	5.00	U	5.26	U	5.56	U	5.56
Trichlorofluoromethane	U	5.00	U	5.26	U	5.56	U	5.56
Acetone	U	20.0	U	21.1	U	22.2	3.57 J	22.2
1,1-Dichloroethene	U	5.00	U	5.26	U	5.56	U	5.56
Methylene Chloride	U	5.00	U	5.26	U	5.56	U	5.56
Carbon Disulfide	U	5.00	U	5.26	U	5.56	U	5.56
Methyl tert-Butyl Ether	U	5.00	U	5.26	U	5.56	U	5.56
trans-1,2-Dichloroethene	U	5.00	U	5.26	U	5.56	U	5.56
1,1 Dichloroethane	U	5.00	U	5.26	U	5.56	U	5.56
2-Butanone	U	5.00	U	5.26	U	5.56	U	5.56
2,2-Dichloropropane	U	5.00	U	5.26	U	5.56	U	5.56
cis-1,2-Dichloroethene	U	5.00	0.621 J	5.26	U	5.56	U	5.56
Chloroform	U	5.00	U	5.26	U	5.56	U	5.56
1,1-Dichloropropene	U	5.00	U	5.26	U	5.56	U	5.56
1,2-Dichloroethane	U	5.00	U	5.26	U	5.56	U	5.56
1,1,1-Trichloroethane	U	5.00	U	5.26	U	5.56	U	5.56
Carbon Tetrachloride	U	5.00	U	5.26	U	5.56	U	5.56
Benzene	U	5.00	U	5.26	U	5.56	U	5.56
Trichloroethene	U	5.00	U	5.26	U	5.56	U	5.56
1,2-Dichloropropane	U	5.00	U	5.26	U	5.56	U	5.56
Bromodichloromethane	U	5.00	U	5.26	U	5.56	U	5.56
Dibromomethane	U	5.00	U	5.26	U	5.56	U	5.56
cis-1,3-Dichloropropene	U	5.00	U	5.26	U	5.56	U	5.56
trans-1,3-Dichloropropene	U	5.00	U	5.26	U	5.56	U	5.56
1,1,2-Trichloroethane	U	5.00	U	5.26	U	5.56	U	5.56
1,3-Dichloropropane	U	5.00	U	5.26	U	5.56	U	5.56
Dibromochloromethane	U	5.00	U	5.26	U	5.56	U	5.56
1,2-Dibromoethane	U	5.00	U	5.26	U	5.56	U	5.56
Bromoform	U	5.00	U	5.26	U	5.56	U	5.56
4-Methyl-2-Pentanone	U	5.00	U	5.26	U	5.56	U	5.56
Toluene	U	5.00	U	5.26	U	5.56	U	5.56
2-Hexanone	U	5.00	U	5.26	U	5.56	U	5.56
Tetrachloroethene	U	5.00	162	5.26	74.4	5.56	103	5.56
Chlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,1,1,2-Tetrachloroethane	U	5.00	U	5.26	U	5.56	U	5.56
Ethylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
p&m-Xylene	U	10.0	U	10.5	U	11.1	U	11.1
o-Xylene	U	5.00	U	5.26	U	5.56	U	5.56
Styrene	U	5.00	U	5.26	U	5.56	U	5.56
Isopropylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,1,2,2-Tetrachloroethane	U	5.00	U	5.26	U	5.56	U	5.56
1,2,3-Trichloropropane	U	5.00	U	5.26	U	5.56	U	5.56
n-Propylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
Bromobenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,3,5-Trimethylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
2-Chlorotoluene	U	5.00	U	5.26	U	5.56	U	5.56
4-Chlorotoluene	U	5.00	U	5.26	U	5.56	U	5.56
tert-Butylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,2,4-Trimethylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
sec-Butylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
p-Isopropyltoluene	U	5.00	U	5.26	U	5.56	U	5.56
1,3-Dichlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,4-Dichlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56
n-Butylbenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,2-Dichlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56
1,2-Dibromo-3-Chloropropa	U	5.00	U	5.26	U	5.56	U	5.56
1,2,4-Trichlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56
Hexachlorobutadiene	U	5.00	U	5.26	U	5.56	U	5.56
Naphthalene	U	5.00	U	5.26	0.756 J	5.56	U	5.56
1,2,3-Trichlorobenzene	U	5.00	U	5.26	U	5.56	U	5.56

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Environmental Response Team/Scientific Engineering, Response and Analytical Services
2890 Woodbridge Avenue, Building 209 Annex
Edison NJ 08837

Table 1.1 (cont) Result of the Analysis for VOC in Soil
WA # SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number	R308004-17		R308004-18		R308004-19		R308004-20	
Sample Number	1621		1622		1623		1624	
Sample Location	TW-04'		TW-04'		TW-02'		TW-02'	
Sublocation	14'		15.5'		14'		16.5'	
Percen Solids	92		90		91		90	
Analyte	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.43	U	5.56	U	5.49	U	5.56
Chloromethane	U	5.43	U	5.56	U	5.49	U	5.56
Vinyl Chloride	U	5.43	U	5.56	U	5.49	U	5.56
Bromomethane	U	5.43	U	5.56	U	5.49	U	5.56
Chloroethane	U	5.43	U	5.56	U	5.49	U	5.56
Trichlorofluoromethane	U	5.43	U	5.56	U	5.49	U	5.56
Acetone	U	21.7	3.47 J	22.2	6.45 J	22.0	2.63 J	22.2
1,1-Dichloroethene	U	5.43	U	5.56	U	5.49	1.68 J	5.56
Methylene Chloride	U	5.43	U	5.56	U	5.49	U	5.56
Carbon Disulfide	U	5.43	U	5.56	U	5.49	U	5.56
Methyl tert-Butyl Ether	U	5.43	U	5.56	U	5.49	U	5.56
trans-1,2-Dichloroethene	U	5.43	U	5.56	U	5.49	U	5.56
1,1 Dichloroethane	U	5.43	U	5.56	U	5.49	0.667 J	5.56
2-Butanone	U	5.43	U	5.56	U	5.49	U	5.56
2,2-Dichloropropane	U	5.43	U	5.56	U	5.49	U	5.56
cis-1,2-Dichloroethene	U	5.43	U	5.56	U	5.49	43.2	5.56
Chloroform	U	5.43	U	5.56	0.692 J	5.49	52.0	5.56
1,1-Dichloropropene	U	5.43	U	5.56	U	5.49	U	5.56
1,2-Dichloroethane	U	5.43	U	5.56	U	5.49	U	5.56
1,1,1-Trichloroethane	U	5.43	U	5.56	U	5.49	8.88	5.56
Carbon Tetrachloride	U	5.43	0.733 J	5.56	8.66	5.49	199	55.6
Benzene	U	5.43	U	5.56	U	5.49	U	5.56
Trichloroethene	U	5.43	U	5.56	U	5.49	9.68	5.56
1,2-Dichloropropane	U	5.43	U	5.56	U	5.49	2.19 J	5.56
Bromodichloromethane	U	5.43	U	5.56	U	5.49	U	5.56
Dibromomethane	U	5.43	U	5.56	U	5.49	U	5.56
cis-1,3-Dichloropropene	U	5.43	U	5.56	U	5.49	U	5.56
trans-1,3-Dichloropropene	U	5.43	U	5.56	U	5.49	U	5.56
1,1,2-Trichloroethane	U	5.43	U	5.56	0.758 J	5.49	2.28 J	5.56
1,3-Dichloropropane	U	5.43	U	5.56	U	5.49	U	5.56
Dibromochloromethane	U	5.43	U	5.56	U	5.49	U	5.56
1,2-Dibromoethane	U	5.43	U	5.56	U	5.49	U	5.56
Bromoform	U	5.43	U	5.56	U	5.49	U	5.56
4-Methyl-2-Pentanone	U	5.43	U	5.56	U	5.49	U	5.56
Toluene	U	5.43	U	5.56	U	5.49	U	5.56
2-Hexanone	U	5.43	U	5.56	U	5.49	U	5.56
Tetrachloroethene	37.9	5.43	62.9	5.56	279	54.9	4800 J	55.6
Chlorobenzene	U	5.43	U	5.56	U	5.49	U	5.56
1,1,1,2-Tetrachloroethane	U	5.43	U	5.56	0.352 J	5.49	1.28 J	5.56
Ethylbenzene	U	5.43	U	5.56	U	5.49	U	5.56
p&m-Xylene	U	10.9	U	11.1	U	11.0	U	11.1
o-Xylene	U	5.43	U	5.56	0.648 J	5.49	0.889 J	5.56
Styrene	U	5.43	U	5.56	U	5.49	U	5.56
Isopropylbenzene	U	5.43	U	5.56	U	5.49	U	5.56
1,1,2,2-Tetrachloroethane	U	5.43	U	5.56	3.18 J	5.49	2.09 J	5.56
1,2,3-Trichloropropane	U	5.43	U	5.56	U	5.49	U	5.56
n-Propylbenzene	U	5.43	U	5.56	0.440 J	5.49	U	5.56
Bromobenzene	U	5.43	U	5.56	U	5.49	U	5.56
1,3,5-Trimethylbenzene	U	5.43	U	5.56	10.1	5.49	1.30 J	5.56
2-Chlorotoluene	U	5.43	U	5.56	U	5.49	U	5.56
4-Chlorotoluene	U	5.43	U	5.56	U	5.49	U	5.56
tert-Butylbenzene	U	5.43	U	5.56	U	5.49	U	5.56
1,2,4-Trimethylbenzene	U	5.43	U	5.56	13.1	5.49	0.956 J	5.56
sec-Butylbenzene	U	5.43	U	5.56	0.538 J	5.49	U	5.56
p-Isopropyltoluene	U	5.43	U	5.56	0.714 J	5.49	U	5.56
1,3-Dichlorobenzene	U	5.43	U	5.56	1.03 J	5.49	U	5.56
1,4-Dichlorobenzene	U	5.43	U	5.56	2.05 J	5.49	U	5.56
n-Butylbenzene	U	5.43	U	5.56	U	5.49	U	5.56
1,2-Dichlorobenzene	U	5.43	U	5.56	28.2	5.49	4.18 J	5.56
1,2-Dibromo-3-Chloroprop	U	5.43	U	5.56	U	5.49	U	5.56
1,2,4-Trichlorobenzene	U	5.43	U	5.56	0.628 J	5.49	U	5.56
Hexachlorobutadiene	U	5.43	U	5.56	4.38 J	5.49	U	5.56
Naphthalene	U	5.43	U	5.56	19.7	5.49	1.01 J	5.56
1,2,3-Trichlorobenzene	U	5.43	U	5.56	U	5.49	U	5.56

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.1 (cont) Result of the Analysis for VOC in Soil
WA # SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number	R308004-21
Sample Number	1625
Sample Location	TW-01'
Sublocation	18.5'
Percen Solids	91

Analyte	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.49
Chloromethane	U	5.49
Vinyl Chloride	U	5.49
Bromomethane	U	5.49
Chloroethane	U	5.49
Trichlorofluoromethane	U	5.49
Acetone	U	22.0
1,1-Dichloroethene	U	5.49
Methylene Chloride	U	5.49
Carbon Disulfide	U	5.49
Methyl tert-Butyl Ether	U	5.49
trans-1,2-Dichloroethene	U	5.49
1,1 Dichloroethane	U	5.49
2-Butanone	U	5.49
2,2-Dichloropropane	U	5.49
cis-1,2-Dichloroethene	U	5.49
Chloroform	0.582 J	5.49
1,1-Dichloropropene	U	5.49
1,2-Dichloroethane	U	5.49
1,1,1-Trichloroethane	U	5.49
Carbon Tetrachloride	1.62 J	5.49
Benzene	U	5.49
Trichloroethene	U	5.49
1,2-Dichloropropane	U	5.49
Bromodichloromethane	U	5.49
Dibromomethane	U	5.49
cis-1,3-Dichloropropene	U	5.49
trans-1,3-Dichloropropene	U	5.49
1,1,2-Trichloroethane	U	5.49
1,3-Dichloropropane	U	5.49
Dibromochloromethane	U	5.49
1,2-Dibromoethane	U	5.49
Bromoform	U	5.49
4-Methyl-2-Pentanone	U	5.49
Toluene	U	5.49
2-Hexanone	U	5.49
Tetrachloroethene	246	54.9
Chlorobenzene	U	5.49
1,1,1,2-Tetrachloroethane	U	5.49
Ethylbenzene	U	5.49
p&m-Xylene	U	11.0
o-Xylene	U	5.49
Styrene	U	5.49
Isopropylbenzene	U	5.49
1,1,2,2-Tetrachloroethane	U	5.49
1,2,3-Trichloropropane	U	5.49
n-Propylbenzene	U	5.49
Bromobenzene	U	5.49
1,3,5-Trimethylbenzene	U	5.49
2-Chlorotoluene	U	5.49
4-Chlorotoluene	U	5.49
tert-Butylbenzene	U	5.49
1,2,4-Trimethylbenzene	U	5.49
sec-Butylbenzene	U	5.49
p-Isopropyltoluene	U	5.49
1,3-Dichlorobenzene	U	5.49
1,4-Dichlorobenzene	U	5.49
n-Butylbenzene	U	5.49
1,2-Dichlorobenzene	U	5.49
1,2-Dibromo-3-Chloropropa	U	5.49
1,2,4-Trichlorobenzene	U	5.49
Hexachlorobutadiene	U	5.49
Naphthalene	U	5.49
1,2,3-Trichlorobenzene	U	5.49

Table 1.1 (cont) Result of the Analysis for VOC in Soil
WA#SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

SERAS Sample Number		R308004-04	R308004-11	R308004-22
Sample Number	Soil Blank B 081613-1	1604	1614	1626
Sample Location		TW-08	TW-12	Storm Drain
Sublocation		20'	17'	Btwn TW12 & 13
Percent Solids	100	90	90	17

Analyte	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg	Result µg/Kg	RL µg/Kg
Dichlorodifluoromethane	U	5.00	U	5.56	U	5.56	U J	29.4
Chloromethane	U	5.00	U	5.56	U	5.56	U J	29.4
Vinyl Chloride	U	5.00	U	5.56	U	5.56	U J	29.4
Bromomethane	U	5.00	U	5.56	U	5.56	U J	29.4
Chloroethane	U	5.00	U	5.56	U	5.56	U J	29.4
Trichlorofluoromethane	U	5.00	U	5.56	U	5.56	U J	29.4
Acetone	U J	20.0	U J	22.2	U J	22.2	209 J	118
1,1-Dichloroethene	U	5.00	U	5.56	U	5.56	U J	29.4
Methylene Chloride	U	5.00	U	5.56	U	5.56	U J	29.4
Carbon Disulfide	U	5.00	U	5.56	U	5.56	U J	29.4
Methyl tert-Butyl Ether	U	5.00	U	5.56	U	5.56	U J	29.4
trans-1,2-Dichloroethene	U	5.00	U	5.56	U	5.56	U J	29.4
1,1 Dichloroethane	U	5.00	U	5.56	U	5.56	U J	29.4
2-Butanone	U	5.00	U	5.56	U	5.56	40.9 J	29.4
2,2-Dichloropropane	U	5.00	U	5.56	U	5.56	U J	29.4
cis-1,2-Dichloroethene	U	5.00	U	5.56	U	5.56	U J	29.4
Chloroform	U	5.00	U	5.56	U	5.56	U J	29.4
1,1-Dichloropropene	U	5.00	U	5.56	U	5.56	U J	29.4
1,2-Dichloroethane	U	5.00	U	5.56	U	5.56	U J	29.4
1,1,1-Trichloroethane	U	5.00	U	5.56	U	5.56	U J	29.4
Carbon Tetrachloride	U	5.00	U	5.56	U	5.56	U J	29.4
Benzene	U	5.00	U	5.56	U	5.56	U J	29.4
Trichloroethene	U	5.00	U	5.56	U	5.56	3.71 J	29.4
1,2-Dichloropropane	U	5.00	U	5.56	U	5.56	U J	29.4
Bromodichloromethane	U	5.00	U	5.56	U	5.56	U J	29.4
Dibromomethane	U	5.00	U	5.56	U	5.56	U J	29.4
cis-1,3-Dichloropropene	U	5.00	U	5.56	U	5.56	U J	29.4
trans-1,3-Dichloropropene	U	5.00	U	5.56	U	5.56	U J	29.4
1,1,2-Trichloroethane	U	5.00	U	5.56	U	5.56	U J	29.4
1,3-Dichloropropane	U	5.00	U	5.56	U	5.56	U J	29.4
Dibromochloromethane	U	5.00	U	5.56	U	5.56	U J	29.4
1,2-Dibromoethane	U	5.00	U	5.56	U	5.56	U J	29.4
Bromoform	U	5.00	U	5.56	U	5.56	U J	29.4
4-Methyl-2-Pentanone	U	5.00	U	5.56	U	5.56	R	
Toluene	U	5.00	U	5.56	U	5.56	4200 J	147
2-Hexanone	U	5.00	U	5.56	U	5.56	R	
Tetrachloroethene	U	5.00	2.13 J	5.56	7.48	5.56	R	
Chlorobenzene	U	5.00	U	5.56	U	5.56	R	
1,1,1,2-Tetrachloroethane	U	5.00	U	5.56	U	5.56	R	
Ethylbenzene	U	5.00	U	5.56	U	5.56	2.24 J	29.4
p&m-Xylene	U	10.0	U	11.1	U	11.1	R	
o-Xylene	U	5.00	U	5.56	U	5.56	R	
Styrene	U	5.00	U	5.56	U	5.56	R	
Isopropylbenzene	U	5.00	U	5.56	U	5.56	R	
1,1,2,2-Tetrachloroethane	U	5.00	U	5.56	U	5.56	R	
1,2,3-Trichloropropane	U	5.00	U	5.56	U	5.56	R	
n-Propylbenzene	U	5.00	U	5.56	U	5.56	R	
Bromobenzene	U	5.00	U	5.56	U	5.56	R	
1,3,5-Trimethylbenzene	U	5.00	U	5.56	U	5.56	R	
2-Chlorotoluene	U	5.00	U	5.56	U	5.56	R	
4-Chlorotoluene	U	5.00	U	5.56	U	5.56	R	
tert-Butylbenzene	U	5.00	U	5.56	U	5.56	R	
1,2,4-Trimethylbenzene	U	5.00	U	5.56	U	5.56	R	
sec-Butylbenzene	U	5.00	U	5.56	U	5.56	R	
p-Isopropyltoluene	U	5.00	U	5.56	U	5.56	27.4 J	29.4
1,3-Dichlorobenzene	U	5.00	U	5.56	U	5.56	R	
1,4-Dichlorobenzene	U	5.00	U	5.56	U	5.56	R	
n-Butylbenzene	U	5.00	U	5.56	U	5.56	R	
1,2-Dichlorobenzene	U	5.00	U	5.56	U	5.56	R	
1,2-Dibromo-3-Chloropropa	U	5.00	U	5.56	U	5.56	R	
1,2,4-Trichlorobenzene	U	5.00	U	5.56	U	5.56	R	
Hexachlorobutadiene	U	5.00	U	5.56	U	5.56	R	
Naphthalene	0.710 J	5.00	U	5.56	U	5.56	R	
1,2,3-Trichlorobenzene	U	5.00	U	5.56	U	5.56	3.29 J	29.4

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.1a Results of the TICs for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Method SERAS SOP 1807

Sample Number	Analyte	Retention Time, mins	Concentration*, µg/Kg
Soil Blank B 081413-2	No TICs Detected		
1601	No TICs Detected		
1602	No TICs Detected		
1603	No TICs Detected		
1606	No TICs Detected		
1607	No TICs Detected		
1610	No TICs Detected		
1611	No TICs Detected		
1612	No TICs Detected		
1613	No TICs Detected		
Soil Blank B 081513-2	No TICs Detected		
1617	No TICs Detected		
1618	No TICs Detected		
1620	No TICs Detected		
1621	No TICs Detected		
1622	No TICs Detected		
1623	Ethyl Methyl Benzene Isomer	18.81	6.00
	Unknown Alkane	19.33	11.0
	Unknown Alkane/C10 Aromatic	19.65	8.26
	Undecane	20.38	53.5
	Ethyl Dimethyl Benzene Isomer	20.62	50.0
	Ethyl Dimethyl Benzene Isomer	21.21	13.6
	C10 Aromatic	21.45	31.2
	Unknown Alkane/C10 Aromatic	21.62	5.58
	Hexachloroethane	21.75	46.1
	Tetramethyl Benzene Isomer	22.22	18.1
	Tetramethyl Benzene Isomer	22.35	32.9
	C11 Aromatic	22.52	12.9
	Unknown	22.75	6.33
	C10 Aromatic	23.2	17.7
	1-Phenyl-1-butene	23.38	10.7
	Tetradecane	26.16	11.2
	Trimethyl Dodecane	27.37	6.49
	Pentadecane	28.33	10.9
1624	No TICs Detected		
1625	No TICs Detected		
Soil Blank B 081613-1	No TICs Detected		
1604	No TICs Detected		
1614	No TICs Detected		
1626	No TICs Detected		

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.2 Result of the Analysis for VOC in Water
WA# SERAS-211 Mayfield Heights

Method SERAS SOP 1806

SERAS Sample Number			R308004-12		R308004-13		R308004-23	
Sample Number	Water Blank C 081513-1		1615		1616		1627	
Sample Location			Rinsate Blank		Rinsate Blank		Trip Blank	
Sublocation			Cutting Shoe		Cutting Shoe		Trip Blank	
Analyte	Result µg/L	RL µg/L	Result µg/L	RL µg/L	Result µg/L	RL µg/L	Result µg/L	RL µg/L
Dichlorodifluoromethane	U	5.00	U	5.00	U	5.00	U	5.00
Chloromethane	U	5.00	U	5.00	U	5.00	U	5.00
Vinyl Chloride	U	5.00	U	5.00	U	5.00	U	5.00
Bromomethane	U	5.00	U	5.00	U	5.00	U	5.00
Chloroethane	U	5.00	U	5.00	U	5.00	U	5.00
Trichlorofluoromethane	U	5.00	U	5.00	U	5.00	U	5.00
Acetone	U	20.0	U	20.0	U	20.0	U	20.0
1,1-Dichloroethene	U	5.00	U	5.00	U	5.00	U	5.00
Methylene Chloride	U	5.00	U	5.00	U	5.00	U	5.00
Carbon Disulfide	U	5.00	U	5.00	U	5.00	U	5.00
Methyl tert-Butyl Ether	U	5.00	U	5.00	U	5.00	U	5.00
trans-1,2-Dichloroethene	U	5.00	U	5.00	U	5.00	U	5.00
1,1 Dichloroethane	U	5.00	U	5.00	U	5.00	U	5.00
2-Butanone	U	5.00	U	5.00	U	5.00	U	5.00
2,2-Dichloropropane	U	5.00	U	5.00	U	5.00	U	5.00
cis-1,2-Dichloroethene	U	5.00	U	5.00	U	5.00	U	5.00
Chloroform	U	5.00	U	5.00	U	5.00	U	5.00
1,1-Dichloropropene	U	5.00	U	5.00	U	5.00	U	5.00
1,2-Dichloroethane	U	5.00	U	5.00	U	5.00	U	5.00
1,1,1-Trichloroethane	U	5.00	U	5.00	U	5.00	U	5.00
Carbon Tetrachloride	U	5.00	U	5.00	U	5.00	U	5.00
Benzene	U	5.00	U	5.00	U	5.00	U	5.00
Trichloroethene	U	5.00	U	5.00	U	5.00	U	5.00
1,2-Dichloropropane	U	5.00	U	5.00	U	5.00	U	5.00
Bromodichloromethane	U	5.00	U	5.00	U	5.00	U	5.00
Dibromomethane	U	5.00	U	5.00	U	5.00	U	5.00
cis-1,3-Dichloropropene	U	5.00	U	5.00	U	5.00	U	5.00
trans-1,3-Dichloropropene	U	5.00	U	5.00	U	5.00	U	5.00
1,1,2-Trichloroethane	U	5.00	U	5.00	U	5.00	U	5.00
1,3-Dichloropropane	U	5.00	U	5.00	U	5.00	U	5.00
Dibromochloromethane	U	5.00	U	5.00	U	5.00	U	5.00
1,2-Dibromoethane	U	5.00	U	5.00	U	5.00	U	5.00
Bromoform	U	50.0	U	50.0	U	50.0	U	50.0
4-Methyl-2-Pentanone	U	20.0	U	20.0	U	20.0	U	20.0
Toluene	U	5.00	U	5.00	U	5.00	U	5.00
2-Hexanone	U	20.0	U	20.0	U	20.0	U	20.0
Tetrachloroethene	U	5.00	U	5.00	U	5.00	U	5.00
Chlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,1,1,2-Tetrachloroethane	U	5.00	U	5.00	U	5.00	U	5.00
Ethylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
p&m-Xylene	U	10.0	U	10.0	U	10.0	U	10.0
o-Xylene	U	5.00	U	5.00	U	5.00	U	5.00
Styrene	U	20.0	U	20.0	U	20.0	U	20.0
Isopropylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,1,2,2-Tetrachloroethane	U	5.00	U	5.00	U	5.00	U	5.00
1,2,3-Trichloropropane	U	5.00	U	5.00	U	5.00	U	5.00
n-Propylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
Bromobenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,3,5-Trimethylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
2-Chlorotoluene	U	5.00	U	5.00	U	5.00	U	5.00
4-Chlorotoluene	U	5.00	U	5.00	U	5.00	U	5.00
tert-Butylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,2,4-Trimethylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
sec-Butylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
p-Isopropyltoluene	U	5.00	U	5.00	U	5.00	U	5.00
1,3-Dichlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,4-Dichlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00
n-Butylbenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,2-Dichlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00
1,2-Dibromo-3-Chloroprop	U	5.00	U	5.00	U	5.00	U	5.00
1,2,4-Trichlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00
Hexachlorobutadiene	U	5.00	U	5.00	U	5.00	U	5.00
Naphthalene	U	5.00	U	5.00	U	5.00	U	5.00
1,2,3-Trichlorobenzene	U	5.00	U	5.00	U	5.00	U	5.00

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 1.2a Results of the TICs for VOC in Water
WA# SERAS-211 Mayfield Heights

Method SERAS SOP 1806

Sample Number	Analyte	Retention Time, mins	Concentration*, µg/L
Water Blank C 081513-1	No TICs Detected		
1615	No TICs Detected		
1616	No TICs Detected		
1627	No TICs Detected		

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Environmental Response Team/Scientific Engineering, Response and Analytical Services
2890 Woodbridge Avenue, Building 209 Annex
Edison NJ 08837

Table 2.1 Results of the LCS Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights

Sample ID: LCS 03/14/13

Analyte	LCS Spike Added µg/Kg	LCS Recovered µg/Kg	LCS % Recovery	QC Limits % Recovery
Dichlorodifluoromethane	50.0	36.9	74	61 - 163
Chloromethane	50.0	32.0	64	59 - 146
Vinyl Chloride	50.0	36.6	73	52 - 170
Bromomethane	50.0	50.7	101	57 - 166
Chloroethane	50.0	49.1	98	50 - 158
Trichlorofluoromethane	50.0	48.7	97	53 - 165
Acetone	50.0	60.8	122	20 - 200
1,1-Dichloroethene	50.0	61.1	122	68 - 142
Methylene Chloride	50.0	53.7	107	70 - 126
Carbon Disulfide	50.0	48.1	96	70 - 136
Methyl-t-butyl Ether	50.0	47.1	94	61 - 120
trans-1,2-Dichloroethene	50.0	50.2	100	68 - 130
1,1-Dichloroethane	50.0	48.8	98	70 - 129
2-Butanone	50.0	35.3	71	26 - 200
2,2-Dichloropropane	50.0	56.4	113	63 - 147
cis-1,2-Dichloroethene	50.0	54.2	108	70 - 131
Chloroform	50.0	55.8	112	72 - 131
1,1-Dichloropropene	50.0	54.7	109	70 - 140
1,2-Dichloroethane	50.0	55.6	111	72 - 131
1,1,1-Trichloroethane	50.0	49.0	98	68 - 137
Carbon Tetrachloride	50.0	50.1	100	66 - 144
Benzene	50.0	46.4	93	67 - 133
Trichloroethene	50.0	49.4	99	68 - 135
1,2-Dichloropropane	50.0	41.8	84	68 - 130
Bromodichloromethane	50.0	47.8	96	70 - 131
Dibromomethane	50.0	48.7	97	69 - 130
cis-1,3-Dichloropropene	50.0	43.8	88	69 - 136
trans-1,3-Dichloropropene	50.0	49.1	98	74 - 143
1,1,2-Trichloroethane	50.0	48.2	96	70 - 132
1,3-Dichloropropane	50.0	46.4	93	68 - 132
Dibromochloromethane	50.0	48.3	97	70 - 131
1,2-Dibromoethane	50.0	47.4	95	69 - 129
Bromoform	50.0	48.6	97	67 - 129
4-Methyl-2-Pentanone	50.0	26.7	53	53 - 126
Toluene	50.0	44.6	89	64 - 136
2-Hexanone	50.0	27.5	55	51 - 180
Tetrachloroethene	50.0	48.0	96	65 - 141
Chlorobenzene	50.0	48.1	96	68 - 135
1,1,1,2-Tetrachloroethane	50.0	46.6	93	71 - 133
Ethylbenzene	50.0	45.9	92	66 - 138
p&m-Xylene	100.0	98.9	99	67 - 142
o-Xylene	50.0	50.3	101	69 - 140
Styrene	50.0	46.5	93	69 - 138
Isopropylbenzene	50.0	52.3	105	76 - 160
1,1,2,2-Tetrachloroethane	50.0	46.1	92	66 - 129
1,2,3-Trichloropropane	50.0	47.7	95	70 - 129
n-Propylbenzene	50.0	53.3	107	67 - 146
Bromobenzene	50.0	46.8	94	68 - 135
1,3,5-Trimethylbenzene	50.0	50.0	100	64 - 142
2-Chlorotoluene	50.0	52.7	105	67 - 141
4-Chlorotoluene	50.0	52.5	105	68 - 144
tert-Butylbenzene	50.0	56.4	113	69 - 143
1,2,4-Trimethylbenzene	50.0	51.6	103	64 - 143
sec-Butylbenzene	50.0	56.9	114	66 - 147
p-Isopropyltoluene	50.0	57.1	114	68 - 149
1,3-Dichlorobenzene	50.0	58.2	116	67 - 144
1,4-Dichlorobenzene	50.0	53.8	108	66 - 144
n-Butylbenzene	50.0	54.4	109	61 - 155
1,2-Dichlorobenzene	50.0	55.8	112	69 - 140
1,2-Dibromo-3-chloropropane	50.0	42.6	85	61 - 130
1,2,4-Trichlorobenzene	50.0	52.3	105	59 - 154
Hexachlorobutadiene	50.0	52.5	105	63 - 150
Naphthalene	50.0	42.9	86	56 - 129
1,2,3-Trichlorobenzene	50.0	51.7	103	62 - 142

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 2.2 Results of the MS/MSD Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Sample ID: 1601

Analyte	Sample Conc. µg/Kg	MS/MSD Spike Added µg/Kg	MS Recovered µg/Kg	MS % Recovery	MSD Recovered µg/Kg	MSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Dichlorodifluoromethane	U	56.2	43.4	77	44.6	79	3	25	50 - 150
Chloromethane	U	56.2	45.4	81	49.1	87	8	25	50 - 150
Vinyl Chloride	U	56.2	46.5	83	41.9	75	10	25	50 - 150
Bromomethane	U	56.2	54.8	98	56.3	100	3	25	50 - 150
Chloroethane	U	56.2	56.2	104	59.9	107	3	25	50 - 150
Trichlorofluoromethane	U	56.2	58.9	105	53.0	94	10	25	50 - 150
Acetone	U	56.2	44.7	80	42.9	76	4	25	50 - 150
1,1-Dichloroethene	U	56.2	66.2	118	61.6	110	7	25	50 - 150
Methylene Chloride	U	56.2	54.8	98	50.6	90	8	25	50 - 150
Carbon Disulfide	U	56.2	44.8	80	41.3	74	8	25	50 - 150
Methyl tert-Butyl Ether	U	56.2	56.2	100	50.7	90	10	25	50 - 150
trans-1,2-Dichloroethene	U	56.2	59.0	105	53.1	95	10	25	50 - 150
1,1 Dichloroethane	U	56.2	57.4	102	51.9	92	10	25	50 - 150
2-Butanone	U	56.2	33.5	60	30.6	54	9	25	50 - 150
2,2-Dichloropropane	U	56.2	53.7	96	47.4	84	12	25	50 - 150
cis-1,2-Dichloroethene	U	56.2	56.5	101	49.7	88	13	25	50 - 150
Chloroform	U	56.2	64.4	115	56.9	101	12	25	50 - 150
1,1-Dichloropropene	U	56.2	57.4	102	50.7	90	12	25	50 - 150
1,2-Dichloroethane	U	56.2	74.3	132	65.5	117	13	25	50 - 150
1,1,1-Trichloroethane	U	56.2	63.7	113	57.9	103	10	25	50 - 150
Carbon Tetrachloride	U	56.2	68.0	121	60.2	107	12	25	50 - 150
Benzene	U	56.2	58.0	103	52.1	93	11	25	50 - 150
Trichloroethene	U	56.2	57.4	102	51.9	92	10	25	50 - 150
1,2-Dichloropropane	U	56.2	59.2	105	52.7	94	12	25	50 - 150
Bromodichloromethane	U	56.2	66.5	118	58.9	105	12	25	50 - 150
Dibromomethane	U	56.2	61.5	109	54.3	97	12	25	50 - 150
cis-1,3-Dichloropropene	U	56.2	51.3	91	45.6	81	12	25	50 - 150
trans-1,3-Dichloropropene	U	56.2	60.6	108	53.4	95	13	25	50 - 150
1,1,2-Trichloroethane	U	56.2	62.5	111	54.6	97	13	25	50 - 150
1,3-Dichloropropane	U	56.2	60.1	107	52.9	94	13	25	50 - 150
Dibromochloromethane	U	56.2	65.6	117	58.5	104	11	25	50 - 150
1,2-Dibromoethane	U	56.2	60.9	108	54.5	97	11	25	50 - 150
Bromoform	U	56.2	65.7	117	57.9	103	13	25	50 - 150
4-Methyl-2-Pentanone	U	56.2	15.1	27 *	9.78	17 *	43 *	25	50 - 150
Toluene	U	56.2	54.3	97	49.9	89	8	25	50 - 150
2-Hexanone	U	56.2	4.18	7 *	2.57	5 *	48 *	25	50 - 150
Tetrachloroethene	5.70	56.2	51.8	82	46.9	73	10	25	50 - 150
Chlorobenzene	U	56.2	57.2	102	52.4	93	9	25	50 - 150
1,1,1,2-Tetrachloroethane	U	56.2	63.1	112	56.3	104	8	25	50 - 150
Ethylbenzene	U	56.2	55.7	99	50.9	91	9	25	50 - 150
p&m-Xylene	U	112	118	105	108	96	9	25	50 - 150
o-Xylene	U	56.2	62.9	112	57.3	102	9	25	50 - 150
Styrene	U	56.2	54.9	98	50.0	89	9	25	50 - 150
Isopropylbenzene	U	56.2	63.5	113	57.9	103	9	25	50 - 150
1,1,2,2-Tetrachloroethane	U	56.2	58.2	104	53.6	95	8	25	50 - 150
1,2,3-Trichloropropane	U	56.2	69.1	123	62.0	110	11	25	50 - 150
n-Propylbenzene	U	56.2	60.1	107	54.5	97	10	25	50 - 150
Bromobenzene	U	56.2	60.1	107	54.7	97	9	25	50 - 150
1,3,5-Trimethylbenzene	U	56.2	57.2	102	52.0	93	9	25	50 - 150
2-Chlorotoluene	U	56.2	61.2	109	56.0	100	9	25	50 - 150
4-Chlorotoluene	U	56.2	57.8	103	52.2	93	10	25	50 - 150
tert-Butylbenzene	U	56.2	66.7	119	61.2	109	9	25	50 - 150
1,2,4-Trimethylbenzene	U	56.2	57.4	102	51.8	92	10	25	50 - 150
sec-Butylbenzene	U	56.2	64.9	116	59.6	106	9	25	50 - 150
p-Isopropyltoluene	U	56.2	59.6	106	54.0	96	10	25	50 - 150
1,3-Dichlorobenzene	U	56.2	57.0	101	51.7	92	10	25	50 - 150
1,4-Dichlorobenzene	U	56.2	51.7	92	46.5	83	11	25	50 - 150
n-Butylbenzene	U	56.2	51.6	92	46.4	83	11	25	50 - 150
1,2-Dichlorobenzene	U	56.2	60.3	107	55.4	99	9	25	50 - 150
1,2-Dibromo-3-Chloropropane	U	56.2	58.5	104	53.7	96	9	25	50 - 150
1,2,4-Trichlorobenzene	U	56.2	38.4	68	34.7	62	10	25	50 - 150
Hexachlorobutadiene	U	56.2	53.5	95	49.6	88	8	25	50 - 150
Naphthalene	0.697	56.2	50.6	89	47.8	84	6	25	50 - 150
1,2,3-Trichlorobenzene	U	56.2	48.0	85	43.5	77	10	25	50 - 150

Table 2.2 (cont) Results of the MS/MSD Analysis for VOC in Soil
WA# SERAS-211 Mayfield Heights
Results Based on Dry Weight

Sample ID: 1604

Analyte	Sample Conc. µg/Kg	MS/MSD Spike Added µg/Kg	MS Recovered µg/Kg	MS % Recovery	MSD Recovered µg/Kg	MSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Dichlorodifluoromethane	U	55.6	38.6	69	42.7	77	10	25	50- 150
Chloromethane	U	55.6	34.3	62	45.4	82	28	25	50 - 150
Vinyl Chloride	U	55.6	45.2	81	49.4	89	9	25	50 - 150
Bromomethane	U	55.6	42.1	76	49.1	88	15	25	50 - 150
Chloroethane	U	55.6	45.9	83	53.9	97	16	25	50 - 150
Trichlorofluoromethane	U	55.6	50.4	91	51.6	93	2	25	50 - 150
Acetone	U	55.6	74.9	135	66.4	120	12	25	50 - 150
1,1-Dichloroethene	U	55.6	59.7	107	58.0	104	3	25	50 - 150
Methylene Chloride	U	55.6	47.7	88	45.2	81	5	25	50 - 150
Carbon Disulfide	U	55.6	42.2	76	40.6	73	4	25	50 - 150
Methyl tert-Butyl Ether	U	55.6	47.1	85	44.2	80	6	25	50 - 150
trans-1,2-Dichloroethene	U	55.6	57.0	103	53.9	97	6	25	50 - 150
1,1 Dichloroethane	U	55.6	52.0	94	49.6	89	5	25	50 - 150
2-Butanone	U	55.6	45.6	82	38.7	70	16	25	50- 150
2,2-Dichloropropane	U	55.6	64.0	115	59.9	108	7	25	50 - 150
cis-1,2-Dichloroethene	U	55.6	52.0	94	48.6	87	7	25	50- 150
Chloroform	U	55.6	59.1	106	53.7	97	10	25	50 - 150
1,1-Dichloropropene	U	55.6	56.2	101	53.2	96	5	25	50- 150
1,2-Dichloroethane	U	55.6	67.9	122	59.9	108	13	25	50- 150
1,1,1-Trichloroethane	U	55.6	62.1	112	58.0	104	7	25	50 - 150
Carbon Tetrachloride	U	55.6	66.4	120	60.9	110	9	25	50 - 150
Benzene	U	55.6	53.2	96	48.9	88	8	25	50 - 150
Trichloroethene	U	55.6	53.8	97	50.0	90	7	25	50 - 150
1,2-Dichloropropane	U	55.6	51.2	92	46.9	84	9	25	50 - 150
Bromodichloromethane	U	55.6	59.0	106	52.9	95	11	25	50 - 150
Dibromomethane	U	55.6	53.7	97	47.6	86	12	25	50- 150
cis-1,3-Dichloropropene	U	55.6	51.6	93	45.9	83	12	25	50 - 150
trans-1,3-Dichloropropene	U	55.6	59.9	108	52.7	95	13	25	50 - 150
1,1,2-Trichloroethane	U	55.6	57.7	104	49.0	88	16	25	50 - 150
1,3-Dichloropropane	U	55.6	54.2	98	46.8	84	15	25	50 - 150
Dibromochloromethane	U	55.6	60.3	109	51.4	93	16	25	50 - 150
1,2-Dibromoethane	U	55.6	55.2	99	48.2	87	14	25	50 - 150
Bromoform	U	55.6	56.7	102	49.3	89	14	25	50 - 150
4-Methyl-2-Pentanone	U	55.6	43.3	78	36.2	65	16	25	50- 150
Toluene	U	55.6	52.9	95	47.2	85	11	25	50 - 150
2-Hexanone	U	55.6	44.9	81	36.1	65	22	25	50 - 150
Tetrachloroethene	2.13	55.6	73.8	129	66.1	115	11	25	50 - 150
Chlorobenzene	U	55.6	55.3	100	49.3	89	11	25	50- 150
1,1,1,2-Tetrachloroethane	U	55.6	57.3	103	51.0	92	12	25	50 - 150
Ethylbenzene	U	55.6	55.6	100	49.8	90	11	25	50- 150
p,m-Xylene	U	111	121	109	108	97	11	25	50 - 150
o-Xylene	U	55.6	60.3	109	53.7	97	12	25	50 - 150
Styrene	U	55.6	53.9	97	47.7	86	12	25	50 - 150
Isopropylbenzene	U	55.6	62.0	112	56.3	101	10	25	50 - 150
1,1,2,2-Tetrachloroethane	U	55.6	53.7	97	47.4	85	12	25	50- 150
1,2,3-Trichloropropane	U	55.6	60.0	108	53.6	96	11	25	50 - 150
n-Propylbenzene	U	55.6	61.8	111	56.1	101	10	25	50 - 150
Bromobenzene	U	55.6	56.9	102	50.0	90	13	25	50 - 150
1,3,5-Trimethylbenzene	U	55.6	58.2	105	53.0	95	9	25	50 - 150
2-Chlorotoluene	U	55.6	60.3	109	54.8	99	10	25	50- 150
4-Chlorotoluene	U	55.6	60.8	109	54.7	98	11	25	50 - 150
tert-Butylbenzene	U	55.6	63.1	114	58.4	105	8	25	50- 150
1,2,4-Trimethylbenzene	U	55.6	59.0	106	53.8	97	9	25	50 - 150
sec-Butylbenzene	U	55.6	62.4	112	58.4	105	7	25	50- 150
p-Isopropyltoluene	U	55.6	62.6	113	57.9	104	8	25	50 - 150
1,3-Dichlorobenzene	U	55.6	61.1	110	55.0	99	11	25	50- 150
1,4-Dichlorobenzene	U	55.6	58.6	102	51.3	92	10	25	50 - 150
n-Butylbenzene	U	55.6	58.2	105	54.4	98	7	25	50- 150
1,2-Dichlorobenzene	U	55.6	58.4	105	53.7	97	9	25	50- 150
1,2-Dibromo-3-Chloropropane	U	55.6	50.9	92	46.6	84	9	25	50- 150
1,2,4-Trichlorobenzene	U	55.6	48.2	87	43.2	78	11	25	50- 150
Hexachlorobutadiene	U	55.6	52.7	95	53.0	95	1	25	50 - 150
Naphthalene	U	55.6	44.4	80	41.0	74	8	25	50 - 150
1,2,3-Trichlorobenzene	U	55.6	46.3	83	41.9	75	10	25	50 - 150

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

Table 2.3 Results of the LCS/LCSD Analysis for VOC in Water
WA# SERAS-211 Mayfield Heights

Sample ID. LCS 08/15/13

Analyte	LCS/LCSD Spike Added ug/L	LCS Recovered ug/L	LCS % Recovery	LCSD Recovered ug/L	LCSD % Recovery	RPD	RPD	QC Limits % Recovery
Dichlorodifluoromethane	50.0	48.4	97	51.7	103	7	25	55 - 166
Chloromethane	50.0	46.3	93	50.1	100	8	25	62 - 124
Vinyl Chloride	50.0	44.1	88	53.6	107	19	25	68 - 142
Bromomethane	50.0	45.3	91	49.4	99	9	25	68 - 138
Chloroethene	50.0	46.4	93	50.3	101	8	25	62 - 134
Trichlorofluoromethane	50.0	48.9	98	53.6	107	9	25	69 - 134
Acetone	50.0	52.0	104	32.7	65	46 *	25	20 - 362
1,1-Dichloroethene	50.0	46.4	93	51.3	103	10	25	79 - 133
Methylene Chloride	50.0	47.4	95	50.5	101	6	25	81 - 119
Carbon Disulfide	50.0	43.9	88	49.1	98	11	25	68 - 134
Methyl-t-butyl Ether	50.0	50.2	100	45.9	92	9	25	78 - 115
trans-1,2-Dichloroethene	50.0	48.4	97	51.6	103	6	25	82 - 119
1,1-Dichloroethane	50.0	49.2	98	50.9	102	3	25	87 - 112
2-Butanone	50.0	47.3	95	43.1	86	9	25	72 - 185
2,2-Dichloropropane	50.0	43.5	87	43.9	88	1	25	58 - 151
cis-1,2-Dichloroethene	50.0	50.6	101	51.3	103	1	25	85 - 112
Chloroform	50.0	49.9	100	51.5	103	3	25	88 - 114
1,1-Dichloropropene	50.0	47.9	96	51.1	102	6	25	79 - 124
1,2-Dichloroethane	50.0	49.5	99	51.4	103	4	25	87 - 119
1,1,1-Trichloroethane	50.0	48.6	97	46.7	93	4	25	89 - 114
Carbon Tetrachloride	50.0	48.2	96	46.8	94	3	25	88 - 120
Benzene	50.0	50.8	102	49.6	99	2	25	85 - 115
Trichloroethene	50.0	50.8	102	49.8	100	2	25	87 - 109
1,2-Dichloropropane	50.0	50.7	101	48.1	96	5	25	89 - 111
Bromodichloromethane	50.0	49.8	100	48.6	97	2	25	85 - 121
Dibromomethane	50.0	50.6	101	46.4	93	9	25	87 - 115
cis-1,3-Dichloropropene	50.0	49.6	99	47.8	96	4	25	89 - 117
trans-1,3-Dichloropropene	50.0	48.7	97	46.4	93 *	5	25	97 - 127
1,1,2-Trichloroethane	50.0	51.2	102	50.2	100	2	25	86 - 119
1,3-Dichloropropane	50.0	50.6	101	50.7	101	0	25	87 - 115
Dibromochloromethane	50.0	45.2	90	46.6	93	3	25	83 - 120
1,2-Dibromoethane	50.0	51.1	102	51.1	102	0	25	87 - 119
Bromoform	50.0	41.2	82	41.4	83	0	25	64 - 131
4-Methyl-2-Pentanone	50.0	47.9	96	46.7	93	3	25	76 - 105
Toluene	50.0	49.0	98	48.1	96	2	25	83 - 111
2-Hexanone	50.0	47.5	95	45.5	91	4	25	68 - 152
Tetrachloroethene	50.0	47.8	96	46.4	93	3	25	85 - 111
Chlorobenzene	50.0	49.1	98	47.5	95	3	25	81 - 116
1,1,1,2-Tetrachloroethane	50.0	48.9	98	47.1	94	4	25	89 - 111
Ethylbenzene	50.0	49.5	99	46.7	93	6	25	85 - 111
p&m-Xylene	100.0	98.1	98	96.5	97	2	25	85 - 114
o-Xylene	50.0	49.7	99	48.7	97	2	25	84 - 120
Styrene	50.0	50.0	100	49.3	99	1	25	87 - 114
Isopropylbenzene	50.0	49.5	99	48.0	96	3	25	94 - 133
1,1,2,2-Tetrachloroethane	50.0	49.9	100	49.6	99	1	25	80 - 121
1,2,3-Trichloropropane	50.0	49.9	100	49.0	98	2	25	83 - 123
n-Propylbenzene	50.0	49.6	99	48.2	96	3	25	83 - 123
Bromobenzene	50.0	49.6	99	48.5	97	2	25	85 - 117
1,3,5-Trimethylbenzene	50.0	50.2	100	47.9	96	5	25	81 - 118
2-Chlorotoluene	50.0	50.6	101	46.0	92	10	25	81 - 122
4-Chlorotoluene	50.0	48.9	98	50.8	102	4	25	81 - 127
tert-Butylbenzene	50.0	49.9	100	46.7	93	7	25	82 - 124
1,2,4-Trimethylbenzene	50.0	50.0	100	47.8	96	4	25	82 - 119
sec-Butylbenzene	50.0	49.9	100	46.4	93	7	25	82 - 123
p-Isopropyltoluene	50.0	49.9	100	46.2	92	8	25	86 - 123
1,3-Dichlorobenzene	50.0	49.6	99	47.6	95	4	25	83 - 122
1,4-Dichlorobenzene	50.0	49.1	98	47.0	94	4	25	85 - 119
n-Butylbenzene	50.0	49.9	100	46.0	92	8	25	78 - 127
1,2-Dichlorobenzene	50.0	49.7	99	47.5	95	5	25	83 - 121
1,2-Dibromo-3-chloropropane	50.0	42.7	85	42.7	85	0	25	88 - 127
1,2,4-Trichlorobenzene	50.0	47.6	95	46.7	93	2	25	82 - 115
Hexachlorobutadiene	50.0	43.7	87	42.4	85	3	25	60 - 145
Naphthalene	50.0	48.7	97	49.1	98	1	25	76 - 124
1,2,3-Trichlorobenzene	50.0	46.3	93	47.8	96	3	25	75 - 121

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of the ERT/SERAS Laboratory

USEPA
DateShipped:
CarrierName:
AirbillNo: WO# R308004

CHAIN OF CUSTODY RECORD
Mayfield Heights
Contact Name:
Contact Phone:

No: 5-080413-102110-0002
Cooler#:
Lab: SERAS
Lab Phone:

Lab#	Sample #	Location	Sub Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Storage	MS/MSD
01	1601	TW-07	19' to20'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	10:54	1	4 oz Jar	None	Wet Ice	N
02	1602	TW-07	21'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	11:02	1	4 oz Jar	None	Wet Ice	N
03	1603	TW-08	15'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	11:20	1	4 oz Jar	None	Wet Ice	N
04	1604	TW-08	20'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	11:35	1	4 oz Jar	None	Wet Ice	N
05	1606	TW-09	14' to 15'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	13:37	1	4 oz Jar	None	Wet Ice	N
06	1607	TW-09	16.5'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	13:58	1	40 mL vial	None	Wet Ice	N
07	1610	TW-10	19.5'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	14:32	1	40 mL vial	None	Wet Ice	N
08	1611	TW-11	19'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	15:05	1	40 mL vial	None	Wet Ice	N
09	1612	TW-12	9.5'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	16:27	1	40 mL vial	None	Wet Ice	N
10	1613	TW-12	14'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	16:36	1	40 mL vial	None	Wet Ice	N
11	1614	TW-12	17'	SERAS Fixed Lab VOA Analysis	Soil	8/2/2013	16:45	1	40 mL vial	None	Wet Ice	N
12	1615	Rinsate Blank	Cutting Shoe	SERAS Fixed Lab VOA Analysis	Water Blank	8/2/2013	17:00	3	40 mL vial	pH<2 by HCl	Wet Ice	N
13	1616	Rinsate Blank	Cutting Shoe	SERAS Fixed Lab VOA Analysis	Water Blank	8/3/2013	09:01	3	40 mL vial	pH<2 by HCl	Wet Ice	N
14	1617	TW-13	11' to 12'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	10:30	1	40 mL vial	None	Wet Ice	N
15	1618	TW-13	19'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	10:41	1	40 mL vial	None	Wet Ice	N
16	1620	TW-05'	20.5'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	12:33	1	40 mL vial	None	Wet Ice	N
17	1621	TW-04'	14'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	13:03	1	40 mL vial	None	Wet Ice	N
18	1622	TW-04'	15.5'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	13:12	1	40 mL vial	None	Wet Ice	N

Special Instructions:

Received 2°C 8/6/13

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis	[signature]	8/6/13	[signature]	8/6/13	10:55	All/Analysis	[signature]	8/6/13	[signature]	8/6/13	12:10

SERAS-211-DAR-091613

018

USEPA
DateShipped:
CarrierName:
AirbillNo:
WO# R308004

CHAIN OF CUSTODY RECORD
Mayfield Heights
Contact Name:
Contact Phone:

No: 5-080413-102110-0002
Cooler#:
Lab: SERAS
Lab Phone:

SERAS-211-DAR-091613

Lab#	Sample#	Location	Sub Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Storage	MS/MSD
19	1623	TW-02'	14'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	15:10	1	40 mL vial	None	Wet Ice	N
20	1624	TW-02'	16.5'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	15:20	1	40 mL vial	None	Wet Ice	N
21	1625	TW-01'	18.5'	SERAS Fixed Lab VOA Analysis	Soil	8/3/2013	15:57	1	40 mL vial	None	Wet Ice	N
22	1626	Storm Drain	Btwn TW12 &13	SERAS Fixed Lab VOA Analysis	Sediment	8/3/2013	17:41	2	4 oz Jar	None	Wet Ice	N
23	1627	Trip Blank	Trip Blank	SERAS Fixed Lab VOA Analysis	Water Blank	8/4/2013	14:00	3	40 mL vial	pH<2 byHCl	Wet Ice	N

Special Instructions:

Received 2°C TM 8/6/13

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All/Analysis	[signature]	8/6/13	[signature]	8/6/13	10:55	All/Analysis	[signature]	8/6/13	[signature]	8/6/13	12:10

019