



January 19, 2017

Mr. Thomas Mcnerney, P.G.  
Department of Environmental Protection | Environmental Cleanup  
North Central Regional Office  
208 West Third Street Suite 101  
Williamsport, PA 17701

RE: Soil Final Report  
Sunoco Pipeline, L.P.  
Butternut Road Release Site  
Gamble Township, Lycoming County, Pennsylvania

Dear Mr. Mcnerney:

Enclosed please find the Soil Final Report prepared by Groundwater and Environmental Services, Inc. (GES) on behalf of Sunoco Logistics, L.P. for the above-referenced location. This report presents a detailed summary of site activities conducted to date and presents Residential Statewide Health Standard attainment for soil as a result of a release of unleaded gasoline from a subsurface pipeline breach on October 21, 2016. A release of unleaded gasoline occurred due to a breach that was caused when the pipeline was unearthed and damaged by a collapsed bridge during a severe flooding event. Enclosed please find the following items associated with this submittal:

- The original Soil Final Report,
- Transmittal Sheet for Report Submission, and
- Check for \$250.00 to cover the reviewing fee.

This report has been prepared in accordance with Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2). This report has been prepared to satisfy the requirements of Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Title 25, Chapter 250).

Please feel free to call the undersigned or Mr. Brad Fish of Sunoco at (610) 859-6297 if you have any questions or comments.

Sincerely,  
Groundwater & Environmental Services, Inc.

A handwritten signature in blue ink, appearing to read 'Stephanie R. Grillo'.

Stephanie R. Grillo  
Senior Project Manager

Enclosures

Cc: Brad Fish, Sunoco Logistics (electronic submittal w/o analytical)  
Joseph Reighard, Gamble Township Supervisor



## Land Recycling Program Transmittal Sheet for Plan/Report Submission

Instructions: Please provide all requested information in each of the four sections. This transmittal sheet shall accompany any plan/report submitted to the Department under the Land Recycling Program. Proper completion of the Transmittal Sheet will assist Department review and may avoid a finding of plan/report deficiency. The Facility ID number can be obtained from the Department's Environmental Cleanup Program in the region where the site is located.

**Section 1 - Site Identification**

eFACTS Facility ID \_\_\_\_\_

Site Name SXL Butternut Release Site

Site Address Wallis Run Road and Butternut Grove Road

Municipality and County Gamble Township, Lycoming County

**Section 2 - Remediation Standard . . Plan/Report . . Fees**

Identify the remediation standard being pursued and the type of plan/report being submitted. Please note required Department fees follow each type of plan/report.

Check the relevant standard and the type of plan/report being submitted.

- |  |   |
|--|---|
| <input type="checkbox"/> Background Standard<br>Final Report (\$250 fee) | <input checked="" type="checkbox"/> Statewide Health Standard<br>Final Report (\$250 fee) |
| <input type="checkbox"/> Site-Specific Standard                          | <input type="checkbox"/> Special Industrial Area  |
| <input type="checkbox"/> Remedial Investigation Report<br>(\$250 fee)    | <input type="checkbox"/> Work Plan<br>(no fee)  |
| <input type="checkbox"/> Risk Assessment Report<br>(\$250 fee)           | <input type="checkbox"/> Baseline Environmental Report<br>(no fee)                        |
| <input type="checkbox"/> Cleanup Plan (\$250 fee)                        |   |
| <input type="checkbox"/> Final Report (\$500 fee)                        |   |

Ensure your check covers all required fees and is made payable to the **Commonwealth of Pennsylvania**.

**Section 3 - Municipal/Public Notice Confirmation**

There are two stages in the Land Recycling Program where municipal and public notices are required. Read the information associated with each stage. You will be asked to confirm that information establishing your compliance with these notification requirements has been included with this submission.

- Check here if you are planning to meet the Background or Statewide Health Standard and your Final Report has been submitted within 90 days of the release.

Indicate date of release here 10/21/2016

**No further completion of this section is required if your Final Report for these two standards conforms to the 90 day time frame.**

**Stage 1 - Notice of Intent to Remediate (NIR)**

- Check here to confirm you have included proof that a copy of your NIR was provided to each municipality where your site is located. Proof will be a copy of your cover letter and a copy of a signed certified mail receipt slip from the municipality.
- Check here to confirm a copy of a proof of publication document from a newspaper serving the area of your site has been included with this submission.
- Check here to indicate that a Site-Specific Standard or a Special Industrial Area is involved and a municipal request was received for development of a public involvement plan. The plan/report submission shall include municipality and public comments, which were submitted, and your responses to those comments.

**Stage 2 - Cleanup Plan/Report Submission**

\_\_\_\_\_ Place date here that each municipality was notified of any plan or report submitted under any of the three remediation standards.

\_\_\_\_\_ Place the newspaper name and date that your notice of your plan/report submission was published.

**Section 4 - Project Contact**

On the lines below, place the name, company, mailing addresses and business phone number of the individuals who can be contacted regarding this submission:

<p><b>Consultant</b></p> <p>Contact Person/Title: _____</p> <p>Phone Number _____</p> <p>Email Address _____</p> <p>Company Name: _____</p> <p>Mailing Address (street, city, state, zip) _____</p>
<p><b>Remediator</b></p> <p>Contact Person/Title: _____</p> <p>Phone Number _____</p> <p>Email Address _____</p> <p>Company Name: _____</p> <p>Mailing Address (street, city, state, zip) _____</p>
<p><b>Other</b></p> <p>Contact Person/Title: _____</p> <p>Relationship to Site _____ (e.g. owner, participant in cleanup, responsible party, etc.)</p> <p>Phone Number _____</p> <p>Email Address _____</p> <p>Company Name: _____</p> <p>Mailing Address (street, city, state, zip) _____</p>

Account Number: **474168** ▼ PLEASE DETACH AND RETAIN FOR YOUR RECORDS ▼

**COMM9F**

INVOICE NUMBER	DATE	AMOUNT
011717 Statewide Health Standard Final Report Review Fee.	1/17/2017	250.00
<b>TOTAL:</b>		<b>250.00</b>

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60-295/313



**GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.**  
PHONE: (610) 458-1077  
440 CREAMERY WAY, SUITE 500  
EXTON, PA 19341



1/17/2017 NO. **474168**

PAY \*\*\*\*\*250 DOLLARS AND \*\*\*\*\*00 CENTS \$ \*\*\*\*\*250.00

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

TO THE ORDER OF  
Commonwealth of PA - DEP  
Waste Mgmt Program - Permits Service  
208 W Third St  
Williamsport, PA 17701-6448 US

*[Signature]*

AUTHORIZED SIGNATURE

WARNING: THIS DOCUMENT IS VOID IF ACCOUNT NUMBER DOES NOT APPEAR ON THE REVERSE SIDE IN RED

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# SOIL FINAL REPORT

**Butternut Road Release Site  
Gamble Township, Lycoming County  
Pennsylvania**

*Prepared for:*

Bradford Fish, P.G.  
Senior Emergency Response Coordinator  
**Sunoco Logistics, LP**  
100 Green Street  
Marcus Hook, Pennsylvania 19061

*Prepared by:*

**Groundwater & Environmental Services, Inc.**  
440 Creamery Way, Suite 500  
Exton, Pennsylvania 19341

**January 19, 2017**



# SOIL FINAL REPORT

## BUTTERNUT ROAD RELEASE SITE Gamble Township, Lycoming County, Pennsylvania

January 19, 2017

Prepared for:

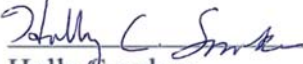
**Sunoco Logistics, LP**  
Bradford Fish, P.G.  
100 Green Street  
Marcus Hook, Pennsylvania 19061

Prepared by:

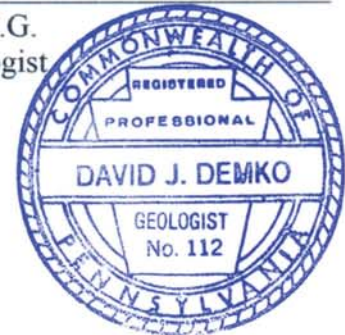
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440 Creamery Way, Suite 500  
Exton, Pennsylvania 19341

Prepared by:

Reviewed by:

  
\_\_\_\_\_  
Holly Smoker  
Senior Environmental Scientist

  
\_\_\_\_\_  
David J. Demko, P.G.  
Senior Hydrogeologist



  
\_\_\_\_\_  
Stephanie R. Grillo  
Senior Project Manager

*By affixing my seal to this document, I am certifying that to the best of my knowledge the information is true and correct. I further certify that I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information.*



## EXECUTIVE SUMMARY

Groundwater & Environmental Services, Inc. (GES) was retained by Sunoco Logistics, LP (SXL) to aid in SXL's environmental response to a catastrophic pipeline release by collecting soils, surface water, groundwater, residential water supply, and vapor data in its assessment of the impact of the release. Final characterization of the impact and attainment of soils is presented in this *Soil Final Report* (Final Report) for the Butternut Road Release Site (site) located at 41.354332, -76.912157, Gamble Township, Lycoming County, Pennsylvania (PA). This Final Report presents a summary of all investigation and remediation activities that were conducted at the site to support a request for a Relief of Liability (ROL) under the Pennsylvania Department of Environmental Protection (PADEP) Residential Statewide Health Standard (SHS) for soil. SXL will continue to monitor groundwater and surface water quality, as outlined in the *Revised Monitoring and Sampling Summary of Results and Work Plan*, dated December 9, 2016, and will submit a Groundwater Final Report requesting an ROL for groundwater at a later date.

The environmental investigation portion related to soils was conducted in accordance with the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2), as defined in Pennsylvania Code, Title 25, Section 250 [PADEP, 2001]. The purpose of the investigation was to: (1) determine the nature and extent of unleaded gasoline impacts in soil; (2) document the remedial activities that were conducted in response to the release; and (3) demonstrate attainment of the Residential SHS for soils.

The release occurred at the confluence of Wallis Run and the Loyalsock Creek and the area of impacted soils is less than two (2) acres in size. The land use immediately surrounding the site is characterized by residential properties and woodlands.

Sensitive receptors identified for the site include Wallis Run, Loyalsock Creek, the West Branch of the Susquehanna River, residential dwellings, and potable wells. It should be noted that there are no buildings or potable wells located within the area of impacted soils. Additionally, other than the SXL pipeline, where the release occurred, there are no known subsurface utilities in the area of the site.

The site is characterized as a release from a subsurface pipeline breach resultant to a flood event that unearthed an eight-inch diameter pipeline that transports liquid petroleum products from Sinking Spring, PA to Buffalo, New York. During the early hours of October 21, 2016, the SXL control center detected a drop in pressure in the pipeline. SXL determined that a release of unleaded gasoline occurred due to a breach that was caused when the pipeline was unearthed and damaged by a collapsed bridge during a severe flooding event. The flooding washed out the bridge that connected Wallis Run Road and Butternut Grove Road, across Wallis Run and ultimately severed the pipeline. SXL immediately dispatched emergency crews who deployed containment booms at four (4) known washout areas downstream of the pipeline breach point. On October 21, 2016, SXL reported to the PADEP that approximately 1,300 barrels of unleaded gasoline were released from the pipeline. Based upon information gathered during pipeline repair work, the estimated volume was revised (reduced) to approximately 1,238 barrels.

Soil at the site was characterized and potential impacts were delineated from a series of samples collected during the initial response, pipeline repair, and bridge reconstruction processes. Soil samples collected by GES were submitted to ESC Lab Sciences and analyzed for the PADEP-required parameters and constituents-of-concern for an unleaded gasoline release (benzene, toluene, ethylbenzene, total xylenes, methyl tert-butyl ether [MTBE], isopropylbenzene, naphthalene, 1,2,4-trimethylbenzene [TMB], and 1,3,5-TMB). Laboratory analytical data indicated that benzene and 1,2,4-TMB were detected in only one (1) sample at concentrations above the PADEP Medium-Specific Concentration (MSC) for a Residential, Used Aquifer. The area of this sample was excavated and the post-excavation data indicated that all



analyzed constituents were either not detected or detected at concentrations below the PADEP MSCs for a Residential, Used Aquifer.

A vapor intrusion and pathway exposure assessment, for soil, was also completed to evaluate any potential exposure pathways for current and future receptors at the site. The results of this assessment demonstrate that vapor intrusion is not a concern and there are no relevant soil exposure pathways for this site.

The constituents-of-concern for the site are benzene, toluene, ethylbenzene, total xylenes, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB. MTBE is not considered a constituent-of-concern because all laboratory analytical data indicated that MTBE was not detected in any of the soil samples. The laboratory analytical results for the constituents-of-concern demonstrate attainment of the Residential SHS. Therefore, an ROL for soil under the Residential SHS is being requested for benzene, toluene, ethylbenzene, total xylenes, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB.



## TABLE OF CONTENTS

	<u>PAGE</u>
<b>1.0 INTRODUCTION</b>	1
<b>2.0 SITE DESCRIPTION AND RELEASE HISTORY</b>	2
<b>3.0 FACILITY DESCRIPTION, BACKGROUND, AND SITE CHARACTERIZATION</b>	3
3.1 Local Land Use	3
3.2 Sensitive Receptor Analysis	3
3.3 Ecological Screening	3
3.4 Environmental Investigation and Remedial Activities	4
3.4.1 Initial Response Activities	4
3.4.2 Ambient Air Monitoring	4
3.4.3 Surface Water Monitoring	5
3.4.4 Residential Potable Well Sampling	6
3.4.5 Shoreline Assessment	8
3.4.6 Sediment and Soil Sampling	8
<b>4.0 CONCEPTUAL SITE MODEL</b>	
4.1 Physiographic Setting	10
4.2 Regional Geology and Hydrogeology	10
4.3 Site Topography	10
4.4 Site Soil	10
4.5 Site Geology	11
4.6 Hydrogeology	11
4.6.1 Surface Water	11
4.6.2 Groundwater	11
4.7 Vapor Intrusion Assessment	12
4.7.1 Vapor Intrusion Conceptual Site Model	12
4.7.2 Soil Screening	14
4.8 Exposure Pathway Assessment	15
4.8.1 Air Exposure Pathways	15
4.8.2 Soil Exposure Pathways	15
4.8.3 Construction/Trench Worker Pathways	16
<b>5.0 SOIL SAMPLING AND ATTAINMENT</b>	
5.1 Sediment Sampling – Shoreline Assessment	17
5.2 Soil/Sediment Sampling – Characterization and Remediation	17
5.3 Selection of Constituents-of-Concern	18
5.4 Statewide Health Standard and Act 2 Demonstration of Attainment	18
5.4.1 Soil SHS	18
5.4.2 Post-Remediation Care Plan	19
<b>6.0 REQUEST FOR RELIEF OF LIABILITY</b>	20



## **ATTACHMENTS**

### **FIGURES**

Figure 1	Site Location Map
Figure 2	Primary Site Map
Figure 3	Sample Location Map – Mid Zone
Figure 4	Sample Location Map – South
Figure 5	Soil Sample Location Map
Figure 6	Bedrock Geology Map – Primary Work Zone North
Figure 7	Bedrock Geology Map – Primary Work Zone South

### **TABLE**

Table 1	Soil Analytical Data Summary
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### **APPENDICES**

Appendix A	Health and Safety Plan
Appendix B	PaGWIS Database Search Results
Appendix C	Cardno Shoreline Assessment Observations
Appendix D	Cardno Sediment Sample Locations
Appendix E	Boring Logs
Appendix F	Soil Laboratory Analytical Reports



## LIST OF ACRONYMS

asl – Above Sea Level  
bgs – Below Ground Surface  
BTEX – Benzene, Toluene, Ethylbenzene, Total Xylenes  
CD – Compact Disc  
CFR – Code of Federal Regulations  
CSM – Conceptual Site Model  
DE - Delaware  
ESC - ESC Lab Sciences  
ELLE - Eurofins Lancaster Laboratories Environmental  
GES – Groundwater & Environmental Services, Inc.  
gpm – Gallons Per Minute  
GPS – Global Positioning System  
HASP – Health and Safety Plan  
HDD – Horizontal Directional Drill  
LEL – Lower Explosive Limit  
LNAPL – Light Non-Aqueous Phase Liquid  
MSC – Medium-Specific Concentration  
mg/L – Milligrams per liter  
MTBE – Methyl *tert*-butyl ether  
NY – New York  
OSHA – Occupational Safety and Health Administration  
PA – Pennsylvania  
PADEP – Pennsylvania Department of Environmental Protection  
PaGWIS – Pennsylvania Groundwater Information System  
PID – Photoionization Detector (with 10.6 eV bulb)  
RF – Radio Frequency  
ROL – Relief of Liability  
SHS – Statewide Health Standard  
SXL – Sunoco Logistics, LP  
TMB - Trimethylbenzene  
TN – Tennessee  
TPH-GRO – Total Petroleum Hydrocarbons – Gasoline Range Organics  
USEPA – United States Environmental Protection Agency  
USGS – United States Geological Survey  
VI – Vapor Intrusion  
VOC – Volatile Organic Compound  
Weston – Weston Solutions  
 $\mu\text{g}/\text{kg}$  – Micrograms per kilogram  
< - Less Than  
% - Percent



## 1.0 INTRODUCTION

GES was retained by SXL to prepare this *Soil Final Report* (Final Report) for the Butternut Road Release Site (site) located at 41.354332, -76.912157, Gamble Township, Lycoming County, PA (**Figure 1**). This Final Report presents a summary of all investigation and remediation activities that were conducted at the site to support a request for an ROL under the PADEP Residential SHS for soil. SXL will continue to monitor groundwater and surface water quality, as outlined in the *Revised Monitoring and Sampling Summary of Results and Work Plan*, dated December 9, 2016, and will submit a Groundwater Final Report requesting an ROL for groundwater at a later date.

GES personnel followed appropriate guidelines per the USEPA and OSHA 29 CFR 1910.120 procedures for all field work. Operations were conducted using Level D protection measures and all work tasks adhered to a site-specific HASP detailing applicable safety precautions, as well as specific emergency procedures included on the CD enclosed with this report (**Appendix A**).

The environmental investigation conducted at the site was performed in accordance with the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2), as defined in Pennsylvania Code, Title 25, Section 250 [PADEP, 2001].



## 2.0 SITE DESCRIPTION AND RELEASE HISTORY

The site is associated with a release of gasoline from an eight-inch diameter pipeline that transports liquid petroleum products from Sinking Spring, PA to Buffalo, NY. The area of this pipeline release is located along Wallis Run, near the intersection of Wallis Run Road and Butternut Grove Road in Gamble Township, Lycoming County, PA (**Figure 1**). Wallis Run is a tributary of the Loyalsock Creek, which then feeds into the West Branch of the Susquehanna River. The subject area is situated at an approximate elevation of 635 feet asl at the confluence of Wallis Run and the Loyalsock Creek. The subject area is located between ranges, comprising of ridges of approximately 1,500 feet asl in elevation, separated by a valley ranging from approximately 600 to 620 feet asl. A map depicting pertinent site features is included as **Figure 2**.

The remedial investigation activities were completed to protect human health and the environment in response to a release of unleaded gasoline that occurred on October 21, 2016. During the early hours of October 21, 2016, the SXL control center detected a drop in pressure in the pipeline. SXL determined that a release of unleaded gasoline occurred due to a breach that was caused when the pipeline was unearthed and damaged by a collapsed bridge during a severe flooding event. The flooding washed out the bridge that connected Wallis Run Road and Butternut Grove Road, across the Loyalsock Creek, and ultimately unearthed and severed the pipeline. SXL immediately dispatched emergency crews who deployed containment booms at four (4) known washout areas downstream of the pipeline breach point. On October 21, 2016, SXL reported to the PADEP that approximately 1,300 barrels of unleaded gasoline were released from the pipeline. Based upon information gathered during pipeline repair work, the estimated volume was revised (reduced) to approximately 1,238 barrels.

### 3.0 FACILITY DESCRIPTION, BACKGROUND, AND SITE CHARACTERIZATION

The following section provides a summary of land use, sensitive receptors, ecological screening, and site characterization activities.

#### 3.1 Local Land Use

The land use immediately surrounding the site is characterized by residential properties (both permanent and seasonal properties) and woodlands (Tiadaghton State Forest). Wallis Run Road (State Route 1003) is located to the west of the release area and runs in a north-south direction while Butternut Grove Road is located to the north of the release area and runs in an east-west direction.

#### 3.2 Sensitive Receptor Analysis

Through field reconnaissance and review of available maps and online databases (PaGWIS), the following sensitive receptors were identified:

- Wallis Run, Loyalsock Creek, and the West Brach of the Susquehanna River,
- domestic potable wells,
- residential homes and basements , and
- one (1) subsurface utility (pipeline).

The release occurred at the confluence of Wallis Run and Loyalsock Creek. The West Branch of the Susquehanna River is located approximately eight (8) miles south of the site.

The PaGWIS software database was utilized to determine information on potable, agricultural, and industrial wells within a ½-mile radius of the site. The PaGWIS search identified one (1) domestic withdrawal well located approximately 1,520 feet northeast of the site. The PaGWIS search results are included as **Appendix B**. However, as outlined in the following sections, other potable wells were identified through site reconnaissance.

Additionally, through site reconnaissance and On Demand (response to individual requests) potable well sampling activities (**Section 3.4.4**) it was confirmed that a number domestic potable wells are located within the vicinity of the site. Several of these residential homes contain basements.

The only known subsurface utility in the vicinity of the site is the SXL pipeline.

#### 3.3 Ecological Screening

The material released from the pipeline was unleaded gasoline and the area of impacted soils and sediments was determined to be less than two (2) acres in size; therefore, an ecological screening was not performed per PA Code 25 §250.311.

SXL retained Cardno of New Castle, DE to investigate potential risk to aquatic life and/or ecological receptors as part of the surface water investigation and as summarized in the *Revised Monitoring and Sampling Summary of Results and Work Plan* submitted to the PADEP on December 9, 2016. Cardno sampled surface water at 25 locations along Wallis Run and the Loyalsock Creek to evaluate any potential risk to aquatic life and/or ecological receptors. The

results (further summarized in **Section 3.4.5** indicated that from an ecological standpoint, no additional surface water sampling at depth or ecological assessment is necessary. The results of the evaluation conducted by Cardno will be submitted to the PADEP as part of the Groundwater Final Report for this site.

### **3.4 Environmental Investigation and Remedial Activities**

The following sections provide a summary of remedial response activities that were completed at the site. Although this Final Report is seeking an ROL for soil only, all remedial investigation activities related to soil, groundwater, and surface water are provided for reference.

#### **3.4.1 Initial Response Activities**

During the early hours of October 21, 2016, the SXL control center detected a drop in pressure in the pipeline. SXL determined that a release of unleaded gasoline occurred due to a breach that was caused when the pipeline was unearthed and damaged by a collapsed bridge during a severe flooding event. The flooding washed out the bridge that connected Wallis Run Road and Butternut Grove Road, across the Loyalsock Creek, and ultimately unearthed and severed the pipeline. SXL immediately dispatched emergency crews who deployed containment booms at four (4) known washout areas downstream of the pipeline breach point. On October 21, 2016, SXL reported to the PADEP that approximately 1,300 barrels of unleaded gasoline were released from the pipeline. Based upon information gathered during pipeline repair work, the estimated volume was revised (reduced) to approximately 1,238 barrels.

#### **3.4.2 Ambient Air Monitoring**

Daily air monitoring was conducted to determine the relative presence or absence of VOCs by scanning the ambient air with a calibrated, hand-held PID and an LEL meter. The frequency of air monitoring was established by Unified Command and consisted of the following three activities:

- On Demand air monitoring,
- Periodic air monitoring, and
- Continuous air monitoring.

On Demand air monitoring was the process established to respond to calls from the community to either the Unified Command post or the toll-free number established by SXL. Calls from the community would be handled by SXL personnel who in turn would notify GES of a request for air monitoring. On Demand air monitoring continued until pipeline repairs were completed on November 11, 2016. The locations and results of the On Demand air monitoring were documented in field notebooks. The results indicated that additional monitoring at these locations is not warranted.

Periodic air monitoring was initially conducted up to three times per day (morning, around noon, and in the late afternoon) at stations determined by Unified Command. On October 21, 2016, air monitoring locations AM1 through AM11 (**Figure 2**) were established to provide frequent monitoring. These locations extended along Loyalsock Creek from the confluence of Wallis Run to a bridge that crosses the creek at State Route 973. In response to observing a “silver, intermittent sheen” in the Loyalsock Creek, air



monitoring location AM12 was established along Wallis Run Road on October 27, 2016. The locations of AM1 through AM12 are depicted on **Figure 2**.

Initially, these stations were monitored by GES, as well as Weston. Weston was retained by the USEPA and terminated their periodic air monitoring on, or about, October 25, 2016. The monitoring frequency was increased during the evening on October 28, 2016, due to excavation activities (**Section 3.4.6**). Due to the absence of VOC detections, on October 31, 2016, the frequency of periodic air monitoring was reduced to two (2) times per day (morning and late afternoon) and again reduced on November 5, 2016 to one time per day. Periodic air monitoring was terminated on November 11, 2016, following the completion of pipeline repairs. Results of the periodic air monitoring show that VOCs were never detected at any of the monitoring locations. A summary of the periodic air monitoring results was previously submitted to the PADEP under separate cover.

On October 23, 2016, as requested by the Lycoming County Department of Public Safety, continuous air monitoring was initiated at two (2) stations using AreaRAE™ continuous monitoring equipment. One (1) station was located immediately south of the pipeline breach, along Wallis Run Road (station identified as WR) and one (1) station was located near a PPL Substation located along Route 87, across the Loyalsock Creek from the pipeline breach area (station identified as PPL). **Figure 2** depicts the location of these continuous air monitoring stations. The AreaRAE™ is a multi-sensor gas detector equipped with a built-in wireless, RF modem that allows the unit to communicate and transmit readings and other information on a real-time basis. The AreaRAEs deployed at the WR and PPL stations recorded carbon monoxide, oxygen, LEL, hydrogen sulfide, and VOC data every minute. The real-time data were downloaded daily for evaluation. Only low-level detections of VOCs were detected sporadically during the course of monitoring.

Additional AreaRAEs were deployed during pipeline repair and installation activities to monitor the work area breathing zone and the immediate perimeter to the SXL property. These stations were deployed at the following work areas:

- location of drill rig for HDD along Wallis Run Road (HDD-S);
- pipeline valve just north of the emergency, temporary bridge (HDD-N); and
- Kellyburg Pump Station (KPS).

Only low-level detections of VOCs were detected sporadically during the course of the monitoring. The AreaRAEs at all locations remained in place until November 14, 2016. The results of the continuous air monitoring activities were previously submitted to the PADEP under separate cover.

### **3.4.3 Surface Water Monitoring**

Surface water monitoring was initiated on October 22, 2016 to investigate potential presence of unleaded gasoline in Wallis Run, Loyalsock Creek, and the West Branch of the Susquehanna River. A total of 16 surface water monitoring locations were established by SXL and other stakeholders, including the PADEP and the USEPA. Surface water monitoring locations are depicted on **Figures 2, 3, and 4**. Due to the distance from the breach (release) point to the furthest downstream location on the West Branch of the Susquehanna River, the locations are depicted on three (3) different



figures. During the initial monitoring period, samples were collected by GES, Cardno, and split with the USEPA and/or the PADEP.

Surface water samples collected by GES were collected from near-surface to assess the presence/absence of unleaded gasoline constituents in the surface water. Samples were collected using dedicated, disposable bailers that “skimmed” water from the surface. Samples were placed into laboratory-supplied bottleware, placed on ice, and submitted under proper chain-of-custody documentation to ESC of Mt. Juliet, TN for analysis of the PADEP required parameters for unleaded gasoline (BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB) via USEPA Method 8260B.

The laboratory analytical results for surface water samples collected between October 21, 2016 and October 23, 2016 indicated only minor detections of dissolved constituents at, and immediately downstream of, the pipeline breach location. Benzene was detected at concentrations above the PADEP MSC for a Residential, Used Aquifer in the samples collected at LY-2 and SW-4 on October 23, 2016. Analytical results for subsequent samples collected at these locations indicated that benzene was either not detected or detected at concentrations below the MSC. The remaining analyzed constituents were either not detected or detected at concentrations below the applicable MSCs. The laboratory analytical summary table and associated laboratory reports were previously submitted to the PADEP under separate cover.

Cardno sampled surface water at 25 locations along Wallis Run and the Loyalsock Creek to evaluate any potential impact to aquatic life and/or ecological receptors. The samples were collected from locations at depth in the water bodies to assess for the presence/absence of unleaded gasoline constituents that may adversely affect aquatic life. Samples were collected using laboratory-supplied bottleware and submitted to ELLE of Lancaster, PA under proper chain-of-custody documentation for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB via USEPA Method 8260B and TPH-GRO via USEPA Method 8015B.

Laboratory analytical results indicated only minor detections of analyzed constituents at, and immediately downstream of, the pipeline breach location. None of the constituents-of-concern were detected at concentrations above the PADEP MSCs for a Residential, Used Aquifer or Fish & Aquatic Life Criteria; therefore, from an ecological standpoint, no additional surface water sampling at depth is warranted. The analytical results for these sampling activities were previously submitted to the PADEP under separate cover.

Surface water monitoring continues at the site and the results will be reported to the PADEP under separate cover.

#### **3.4.4 Residential Potable Well Sampling**

Residential potable well sampling was initiated on October 21, 2016 and followed the same “On Demand” process as described in the On Demand air monitoring process (**Section 3.4.2**).

During sampling, GES scanned the exterior of the residence with a PID. If requested by the property owner (or resident), GES also scanned the breathing zone with a PID inside the domicile, as well as the wellhead (if accessible). In addition to the PID measurements; GES collected GPS coordinates of the wellhead, well construction



information (i.e., depth to bottom, depth of pump, etc.), information on any treatment systems associated with the well, and the type of heating system used in the domicile.

Prior to sampling, GES followed the procedures outlined below and attempted to purge each source. GES purged two (2) times the volume of the pressure tank. If a pressure tank was not present, the water was purged for approximately 10 minutes.

Water samples were collected from a pressure or bladder tank. If these locations were not available or accessible, the sample was collected from an alternate location such as an indoor tap or outdoor spigot. Where water treatment systems were present, GES made all reasonable attempts to collect the water sample prior to any treatment system (pre-treatment). If unable to collect a pre-treatment sample, GES documented the conditions and collected after the treatment system (post-treatment).

The samples were collected in clean, laboratory-supplied bottleware, placed on ice, and submitted under proper chain-of-custody documentation to ESC. The samples were analyzed for BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB via USEPA Method 8260B.

Locations of the residential properties that were sampled are shown on **Figures 2, 3, and 4**. As of the date of this report, a total of 52 samples, at 28 locations, have been collected. Laboratory analytical results for these samples indicated that none of the analyzed constituents were detected, except low-level concentrations of toluene in samples collected from the following locations:

- 63 Stoney Creek Drive (October 21, 2016), and
- 6386 Route 87 – an unused well (October 30, 2016).

The concentrations of toluene detected in these samples were below the MSC for a Residential, Used Aquifer.

During sampling at each of these wells (63 Stoney Creek Drive and 6386 Route 87 [unused well]), the sample was collected under static conditions because there was no electric available to the well and pump. Therefore, the wells were not purged prior to sample collection and the samples were collected directly from the well casing using a new, disposable bailer.

The well at 63 Stoney Creek Drive was sampled again on October 28, 2016 when the electric was restored to the property and the well could be purged prior to sample collection. Analytical results for this confirmatory sample indicated that all analyzed constituents were not detected.

The well at 6386 Route 87 (unused well) was sampled again on November 8, 2016 via hand-bailing using a new, disposable bailer. Analytical results for this confirmatory sample indicated that all analyzed constituents were not detected.

The potable well sampling program consisted of a minimum of one (1) initial round of sampling and a minimum of one (1) confirmatory round of sampling from each location within 1.75 miles downstream of the breach (release) point, or On Demand (includes the neighborhood along Harvey Drive, Henry Drive, and Weitzel Drive). The confirmatory



samples were collected on November 8-9, 2016. One (1) new well, 65 Weitzel Drive, was sampled in this timeframe. The confirmation sample was collected on December 2, 2016. The analytical results for potable well confirmation sampling indicated that all analyzed constituents were not detected.

Based upon the data collected to date, the low-level toluene detections observed at 63 Stoney Creek Drive and 6386 Route 87 (unused well) during initial sampling are no longer present. To observe any potential changes due to seasonal fluctuations of the groundwater, three additional rounds of sampling at 63 Stoney Creek Drive and 6386 Route 87 (unused well) during calendar year 2017, over seasonal variations, are proposed to demonstrate the absence of constituents-of-concern. The sampling shall follow the procedures outlined above.

A summary of the laboratory analytical data and associated laboratory reports for potable well samples collected to date were previously submitted to the PADEP under separate cover. As described above, potable well sampling will continue and the data will be provided to the PADEP in future reports.

#### **3.4.5 Shoreline Assessment**

On October 22-23, 2016, Cardno evaluated the shoreline of Wallis Run and the Loyalsock Creek from an ecological perspective. The map provided in **Appendix C** depicts the shoreline assessment observations. This map conveys the lack of oil throughout most of the Loyalsock Creek, between the breach location and the West Branch of the Susquehanna River. There was an approximate  $\frac{3}{4}$ -mile reach along the right descending bank immediately downstream of the release where trace amounts of sheen (<1% surface coverage) were observed within a narrow (approximately one [1] meter) band along the shoreline when bottom sediments were agitated. The density of spot-checks and consistency of “no impact” observations in the downstream reaches provided reasonable assurance against any false-positives (e.g., shoreline impacts exist, but have been missed). Based on the minimal observations, no further shoreline assessment surveys are recommended until spring (i.e., late First Quarter 2017) to observe conditions under higher flow conditions.

The results of the shoreline assessments completed to date were previously submitted to the PADEP under separate cover. The results of future shoreline assessments will be submitted to the PADEP in future reports.

#### **3.4.6 Sediment and Soil Sampling**

This section provides a summary of the soil characterization and remediation activities that occurred at the site. A summary and review of the soil analytical results are provided in **Section 5.0**.

Cardno initiated sediment sampling as a quantitative measurement to confirm the shoreline qualitative observations. Sediment grab samples were collected on October 23-24, 2016 by Cardno and submitted to ELLE for laboratory analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH-GRO. The sediment sample locations are depicted on the map included in **Appendix D**.



GES initiated grab soil/sediment sampling on October 24, 2016 at the following locations (**Figure 5**):

- soil pile staged on Wallis Run Road (from excavation around pipeline),
- trench from pipeline to Loyalsock Creek,
- wash out area on the north side of the bridge, and
- sand bar area at confluence of Wallis Run and Loyalsock Creek (pre- and post-excavation).

Soil samples were collected from the above-referenced areas at depths ranging from 1 to 2 feet bgs using hand tools (i.e., hand auger and shovels). Soil samples were screened with a PID to determine the relative presence or absence of VOCs, collected in laboratory-provided bottleware, placed on ice, and submitted under proper chain-of-custody documentation to ESC for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB via USEPA Method 8260B.

During sample collection, elevated PID readings at SS-28 (**Figure 5**) were measured. Therefore, SXL initiated excavation of the northeastern tip of the sand bar area where the measurements occurred. Excavation activities were conducted on October 28, 2016 and approximately 30 tons of sand, gravel, cobbles, and sediment were excavated. The excavated materials were placed into lined roll-off containers for offsite disposal at Cycle Chem, Inc. in Lewisberry, PA.

Upon completion of the excavation, four (4) post-excavation soil samples (SS-34(b), SS-35(b), SS-36(b), and SS-37(b)) were collected to demonstrate that the limited extent of impacts observed at SS-28 were removed. The samples were submitted to ESC for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB.

On November 15, 2016, six (6) soil borings (SS-38 through SS-43) were installed to complete vertical delineation in the area of the pipeline breach. The soil borings were spaced along the confluence of Wallis Run and Loyalsock Creek to evaluate soil conditions at the former depth of the pipeline (approximately five [5] feet below the stream bed).

Each boring was advanced via direct push drilling technology to approximate depths ranging from 1 to 2 feet below the depth of the former pipeline location. This resulted in the borings being advanced to depths ranging from 5.5 to 12 feet bgs. During drilling, samples were collected and GES recorded the color, composition, moisture content, and lithology on drilling logs (**Appendix E**). The soil samples were screened with a PID to determine the relative presence or absence of VOCs. Soil samples were submitted to ESC for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB via USEPA Method 8260B.

## 4.0 CONCEPTUAL SITE MODEL

The following sections provide the CSM for the Butternut Road Release Site.

### 4.1 Physiographic Setting

The site is located on the USGS 7.5-minute Montoursville North topographic map, in northeastern Lycoming County, PA, as shown on **Figure 1**. Dissected uplands of the Appalachian Plateaus province form the northern third of the area, and the remainder of the area, south of the Allegheny Front, consists of rolling hills of the Valley and Ridge province.

### 4.2 Regional Geology and Hydrogeology

The geology exposed in the area are sedimentary rocks of Devonian through Pennsylvanian age and a thin cover of surficial materials of Pleistocene and Holocene age (Bucek, 1980).

The Devonian rocks comprise, in ascending order, the Old Port, Onondaga, Marcellus, Mahantango, Harrell, Brallier, Lock Haven, and Catskill Formations, and part of the Huntley Mountain Formation. The Mississippian rocks consist of part of the Huntley Mountain Formation, and the Pocono and Mauch Chunk Formations. The only Pennsylvanian unit preserved is the Pottsville Formation. The rock units of the area are composed of various amounts of sandstone, siltstone, shale, mudstone, and conglomerate. Limestone occurs in the Tully Member of the Mahantango Formation and in the Old Port Formation. Unconsolidated surficial materials cover about 51% of the area, and comprise Pleistocene glacial till, sand and gravel, and colluvium, and Holocene alluvium and colluvium.

The structure of the area is characterized by a belt of a few broad, open folds and a wide area of low to moderate homoclinal dip. Extensive fracturing, a few faults having small displacement, and rare fracture cleavage occur. The area is crossed by several moderately to weakly developed lineaments (Bucek, 1980).

Most bedrock units are moderately to deeply weathered, well drained, and moderately difficult to excavate. Foundation strength is generally sufficient for large structures, and cut-slope stability is, in most places, good except where the bedding (or jointing) has been undercut. Groundwater is generally of good quality and available from moderate depths in sufficient quantity for domestic, farm, or light industrial use. There are few significant geological hazards, the most common involving slope failures.

Bedrock geology maps for the site are included as **Figure 6** and **7**.

### 4.3 Site Topography

A review of **Figure 1** shows the deeply incised stream valleys and drafts cut into the plateau sediments with elevations at and near the site ranging from approximately 620 feet asl at Loyalsock Creek and Wallis Run to 1,500 feet asl at the surrounding ridges.

### 4.4 Site Soil

The site soil and nearby soils are dominated by glaciofluvial outwash from the terminus of the Muncy Ice Sheet that was located immediately east of the site. The Loyalsock Valley acted as a meltwater channel during deglaciation and was filled with thick glaciofluvial sands and gravels.

The periglacial processes resulted in the deposition of widespread colluvial, fluvial, and eolian deposits. Further development of colluvial deposits has continued to the present.

Specifically, the soils listed on the banks of the streams and in the floodplain of Loyalsock Creek are of the Lordstown and Oquaga loams and the Barbour loam. The Basher loam is described as nearly level and formed in recent alluvium adjacent to streams. They are occasionally to frequently flooded, deep, moderately well drained to somewhat poorly drained soils. The Lordstown and Oquaga soils are very stoney loams with 25% to 70% slopes found on the sides of and tops of the valley ridges. These are moderately deep and well-drained soils.

#### **4.5 Site Geology**

The geology underlying the site at Wallis Run and Loyalsock Creek is the Mississippian-aged portion of the Huntly Mountain Formation (MDhm). The Huntly Mountain consists of sequences of flaggy sandstone; minor mudstone and shale interbeds; very fine grained argillaceous sandstones that are cross-bedded to planar. At the base of the formation is light olive gray and grayish red; subfissile to fissile mudstone and shale. The formation is up to 600 feet thick and forms moderate to steep slopes in the Allegheny Plateau.

A review of the USGS geologic map of the area indicates that the site is on the north limb of a west-plunging syncline. Strike of the formation at the site is east-west with dip to the south of eight (8) degrees. Fractures and jointing in the area are generally north-northwest and east-west to southwest-northeast. These fractures form the basis of many of the stream and runs in the area, including Wallis Run.

Joints are reported abundant, moderately well developed, planar to irregular, discontinuous, and generally open, and have moderate to wide spacing. Excavation is relatively easy using heavy power equipment, particularly in shale or siltstone units; sandstone intervals may require blasting; natural slopes are generally quite low and very stable; foundation strength is probably sufficient for heavy structures.

The Huntly Mountain Formation is considered a possible source of material for lightweight aggregate (siltstone and shale) while the sandstones are possibly a source for crushed aggregate of moderate durability.

#### **4.6 Hydrogeology**

##### **4.6.1 Surface Water**

The site is set in the Loyalsock Creek drainage basin at the confluence with Wallis Run. Surface water in the area drains off the steep slopes of the incised plateau to the streams and drafts that feed the Loyalsock Creek. Loyalsock Creek flows south from the site to the confluence with the West Branch Susquehanna River at the town of Montoursville, PA. Regionally, surface waters are part of the Susquehanna River Basin.

##### **4.6.2 Groundwater**

Groundwater for the site and area are described as present in both stream alluvium and bedrock (Orville B. Lloyd, 1981). The aquifers that form the groundwater reservoir in the region is composed of consolidated fractured rocks and overlying unconsolidated deposits. The fractured rocks consist of carbonate rocks, shale, siltstone, and sandstone



that range in age from Ordovician to Pennsylvanian. The unconsolidated deposits are Quaternary in age.

The average yield of wells located and constructed for high yield is about 300 gpm from unconsolidated deposits, 200 gpm from carbonate rocks, 150 gpm from sandstone, 100 gpm from shale, and 75 gpm from siltstone. The maximum yields that have been obtained range from 2.5 to 10 times these amounts (Orville B. Lloyd, 1981).

Typically, water from the carbonate rocks has a pH of 7.0, is very hard (200 mg/L), and has about 450 mg/L dissolved solids. Water from the non-carbonate rocks generally has a pH of 6.9, is moderately hard (85 mg/L), and has approximately 150 mg/L dissolved solids. Concentrations in excess of the USEPA standards for iron, manganese, sulfate, chloride, dissolved solids, hydrogen sulfide, barium, cadmium, lead, nitrate, and zinc are found locally (Orville B. Lloyd, 1981).

Locally, the alluvial deposits are reported to supply a number of residential wells from deposits ranging to over 40 feet deep within the Loyalsock Creek flood plain.

#### **4.7 Vapor Intrusion Assessment**

Title 25 Pa. Code §250.312 requires an assessment of the vapor intrusion (VI) exposure pathway in an SHS final report. This section has been incorporated to assist in satisfying the requirements of Act 2 and the regulations published in Chapter 250 of the PA Code. The specific guidance provides multiple options for addressing VI including soil and groundwater screening values, alternative assessment options, mitigation with an environmental covenant, and remediation. For the VI exposure pathway to exist there must be a source of volatile substances in the unsaturated soil zone or groundwater at the water table, current or future inhabited buildings, and a transport pathway along which vapors may migrate from the source into the inhabited building(s). Inhabited buildings are buildings with enclosed air space that are used or planned to be used for human occupancy.

An exposure pathway assessment that includes VI is required by 25 Pa. Code §250.404. VI must be addressed for existing inhabited buildings and undeveloped areas of the property where inhabited buildings are planned to be constructed in the future. The VI evaluation process includes the development of the CSM, identification of soil and groundwater constituents, screening for potential VI sources via the identification of preferential pathways and application of proximity distances, and delineation of potential VI sources. If soil and groundwater screening value exceedances and LNAPL are not within proximity distances of preferential pathways or current or planned inhabited structures, no further VI analysis is necessary. If soil or groundwater screening value exceedances or LNAPL are within proximity distances to preferential pathways or current or planned inhabited structures, additional delineation of the potential VI sources may be warranted. The steps in the VI evaluation process applicable to this site are detailed in the sections below.

##### **4.7.1 Vapor Intrusion Conceptual Site Model**

The goal of the VI CSM is to describe how site characteristics, such as subsurface and building conditions, might influence both the distribution of substances of VI concern in soil gas and the potential indoor air quality of structures in the vicinity of a soil or groundwater source of substances of VI concern. Concentrations of substances of VI concern in soil gas attenuate, or decrease, as the substances of VI concern move away from the source, through the soil, through the foundation, and into indoor air. The extent



of attenuation is related to site conditions, building characteristics, and chemical properties.

### Receptors

The area of the site is conservatively identified to be residential. There are no buildings present in the area of the soil/sediment impacts and the closest building (residential property) is located approximately 275 feet northeast (upgradient) of the site. The closest building downgradient of the site is located approximately 530 feet towards the south-southeast. The soil impacts were contained to the immediate vicinity of the pipeline breach location and the analytical results indicated that all analyzed constituents-of-concern were either not detected or detected at concentrations below the PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer. Private, onsite utilities service the residential properties and the only known subsurface utility in the area is the SXL pipeline.

### Sources of Impacts and Constituents-of-Concern

During the early hours of October 21, 2016, the SXL control center detected a drop in pressure in the pipeline. SXL determined that a release of unleaded gasoline occurred due to a breach that was caused when the pipeline was unearthed and damaged by a collapsed bridge during a severe flooding event. The flooding washed out the bridge that connected Wallis Run Road and Butternut Grove Road, across the Loyalsock Creek, and ultimately severed the pipeline.

Through soil characterization and remediation activities, soil/sediment samples were collected and submitted for laboratory analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB. The laboratory analytical results indicated that all analyzed constituents were either not detected or detected at concentrations below the PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer. Based on the laboratory analytical data for soil/sediment samples; benzene, toluene, ethylbenzene, total xylenes, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,4-TMB are considered the constituents-of-concern for this site. MTBE is not considered a constituent-of-concern because MTBE has never been detected in any of the soil/sediment samples.

Groundwater and surface water monitoring activities are ongoing and the results of these activities will be submitted to the PADEP as part of the Groundwater Final Report.

### Transport Mechanisms

Transport mechanisms include the route from source to indoor air and the preferential pathways. The impacted soil area was contained to the immediate vicinity of the pipeline breach location and is greater than 50 feet from the closest residential buildings. The only known subsurface utility is the SXL pipeline.

### Proximity Distance

A proximity distance is the minimum distance, in the absence of a preferential pathway, which a potential VI source must be from a building or where a future inhabited building is planned to be constructed, to not pose a potential unacceptable VI risk. The presence of LNAPL or exceedances of soil or groundwater VI screening values within a proximity distance constitute a potential VI source. For petroleum substances, the horizontal



proximity distance is 30 feet. The vertical proximity distance for petroleum hydrocarbons is five (5) feet for adsorbed- or dissolved-phase contamination and 15 feet for LNAPL. The use of proximity distances requires the presence of acceptable soil or soil-like material, which is present at the site as detailed above.

During initial response activities, a sheen was observed at certain locations along the Loyalsock Creek; however, LNAPL has never been observed at the site.

The laboratory analytical data for soil/sediment samples indicated that all analyzed constituents were either not detected or detected at concentrations below the PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer.

Groundwater and surface water monitoring activities are ongoing and the results of these activities will be evaluated and submitted to the PADEP as part of the Groundwater Final Report.

The minimal soil impacts that remain at the site are well below the PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer and are located greater than 50 feet from the closest residential buildings and, therefore, are not within the 30-foot horizontal proximity distance.

#### 4.7.2 Soil Screening

Unsaturated soil analytical data were compared to the PADEP soil screening values to delineate potential VI sources at the site. The maximum unsaturated soil concentration observed at the site and the applicable standards are presented in the table below.

Regulated Substance	Maximum Unsaturated Soil Concentration (µg/kg)	Residential Soil SHS VI Screening Value (SV <sub>SOIL</sub> ) (µg/kg)	Unsaturated Soil-to-Groundwater MSC for a Residential, Used Aquifer
Benzene	ND(1.25)	130	500
Toluene	ND(6.23), 6.00	44,000	100,000
Ethylbenzene	11.0	46,000	70,000
Total Xylenes	68.2	990,000	1,000,000
MTBE	ND(1.25)	280	2,000
Isopropylbenzene	ND(1.25), 1.12	600,000	600,000
Naphthalene	22.5	25,000	25,000
1,2,4-TMB	21.2	8,400	8,400
1,3,5-TMB	6.56	74,000	74,000

- ND(#) = Not detected, number is laboratory reporting limit
- For toluene and isopropylbenzene, the maximum laboratory reporting limit was higher than the maximum detected concentrations; therefore, both values are shown for comparison.
- Soil Screening Values were obtained in accordance with the *Land Recycling Program Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2*, dated January 18, 2017.
- Note: Soil screening values (SV<sub>SOIL</sub>) apply throughout the volume of impacted soil in the unsaturated zone.

Based on a review of the laboratory analytical data for samples collected as part of the soil characterization and remediation sampling activities (saturated and unsaturated samples), none of the PADEP-required parameters for an unleaded gasoline release were detected at concentrations above the PADEP Soil-to-Groundwater MSCs for a Residential, Use Aquifer. The maximum, unsaturated soil concentrations were compared to the Residential SHS VI Screening Values (table above) and the results of the VI screening assessment demonstrate that none of the soil, constituents-of-concern exceed the VI Screening Values. Therefore, there is not a VI concern associated with soil at the site and a further VI evaluation was not completed.

#### **4.8 Exposure Pathway Assessment**

Using PADEP-approved USEPA and ASTM guidance, this assessment identified potential current and future exposure pathways for human receptors, per Pennsylvania Code §250.402. Where appropriate, incomplete exposure pathways and constituents that were not detected in environmental media exceeding the statewide health criteria were eliminated from further consideration.

Human or ecological receptors can be exposed to constituents-of-concern through five (5) major pathway categories: 1) air, 2) groundwater, 3) soil, 4) surface water, and 5) construction/trench worker. Within each pathway category are specific exposure pathway scenarios. As previously stated, the groundwater and surface water investigations at the site are ongoing and this Final Report is seeking an ROL for soil only; therefore, only exposure pathways associated with soil are evaluated below. A pathway exposure assessment for groundwater will be completed as part of the Groundwater Final Report for this site.

##### **4.8.1 Air Exposure Pathways**

- *Inhalation of vapors volatilized from subsurface soils to the ambient air:* None of the constituents-of-concern were detected at concentrations above the PADEP MSCs in soil samples collected as part of the site characterization and remediation sampling activities. In addition, the assessment of the VI pathway in **Section 4.7** demonstrates that the conditions for a potential VI source are not met for the site. Since Act 2 does not provide ambient air standards, soil analytical data and the results of the VI assessment will be used as the screening criteria for volatilization to ambient air. Therefore, the potential for vapors volatilized from subsurface soils to the ambient air is not a concern for the site and this pathway was not deemed relevant for this site.
- *Inhalation of vapors volatilized from subsurface soils into an enclosed space:* This scenario includes vapors entering basements, crawl spaces or subsurface utility vaults, and in some situations, enclosed buildings. None of the constituents-of-concern were detected at concentrations above the PADEP MSCs in soil samples collected as part of the site characterization and remediation sampling activities. In addition, the assessment of the VI pathway in **Section 4.7** demonstrates that the conditions for a potential VI source are not met for the site. As a result, the potential for vapor volatilized into an enclosed space is not a concern for the site. Therefore, this pathway was not deemed relevant for this site.

##### **4.8.2 Soil Exposure Pathways**

- *Dermal contact and direct ingestion of contaminated soils:* None of the constituents-of-concern were detected at concentrations above the PADEP MSCs in soil samples

collected as part of the site characterization and remediation sampling activities. In addition, none of the target parameters were detected at concentrations above the PADEP Residential Direct Contact (0-15 feet) MSCs; therefore, this pathway was not deemed relevant for this site.

#### **4.8.3 Construction/Trench Worker Pathways**

- *Incidental soil ingestion, dermal contact with soil, and inhalation of particulates and volatiles from soil for a construction/trench worker:* Under current and future conditions, construction and excavation workers are assumed to be engaged in subsurface disturbance activities that may extend to 10 feet bgs. Such activities may include utility work, repairs, maintenance, and construction. The laboratory analytical data for soil samples collected during soil characterization and remediation activities indicated that none of the constituents-of-concern were detected at concentrations above the PADEP Residential Soil-to-Groundwater or Direct Contact MSCs. Furthermore, a construction/trench worker is assumed to spend the entire duration of the work shift exposed to outdoor ambient air and is assumed to follow the requirements as stated in CFR Title 29 Part 1910.120(g)(5) Personal Protective Equipment Program administered by OSHA. Therefore, this pathway was not considered relevant for this site.

Based on the pathway evaluation for soil, no potential exposure pathways were identified for current and future receptors at the site.

## 5.0 SOIL SAMPLING AND ATTAINMENT

The following section summarizes the delineation and remediation of impacted soil/sediment to demonstrate attainment of the Residential SHS at the site.

### 5.1 Sediment Sampling – Shoreline Assessment

Cardno initiated sediment sampling as a quantitative measurement to confirm the shoreline qualitative findings. Sediment grab samples were collected on October 23-24, 2016 by Cardno and submitted to ELLE for laboratory analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH-GRO. Laboratory analytical results indicated that all analyzed constituents were either not detected or detected at concentrations below the Soil-to-Groundwater MSCs for Unsaturated/Saturated Soil in a Residential, Used Aquifer. The laboratory analytical results are summarized in **Table 1**. The sediment sample locations are depicted on the map included in **Appendix C**.

### 5.2 Soil/Sediment Sampling – Characterization and Remediation

GES initiated grab soil/sediment sampling on October 24, 2016 at the following locations (**Figure 5**):

- soil pile staged on Wallis Run Road (from excavation around pipeline),
- trench from pipeline to Loyalsock Creek,
- wash out area on the North side of the bridge, and
- sand bar area at confluence of Wallis Run and Loyalsock Creek (pre- and post-excavation).

Refer to **Section 3.4.6** for a description of the sampling procedures used by GES.

Soil samples were collected from the above-referenced areas at depths ranging from 1 to 2 feet bgs and submitted to ESC for analysis of the PADEP unleaded gasoline parameters (BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB) via USEPA Method 8260B.

Soil analytical results indicated the following:

- The laboratory detection limit for benzene was elevated (979  $\mu\text{g}/\text{kg}$ ) at a concentration above the PADEP Soil-to-Groundwater MSC for a Residential, Used Aquifer in one (1) sample (SS-28) collected at the tip of the sand bar area.
- 1,2,4-TMB was detected at a concentration (71,300  $\mu\text{g}/\text{kg}$ ) above the PADEP Soil-to-Groundwater MSC for a Residential, Used Aquifer in sample SS-28.
- The remaining analyzed constituents were either not detected or detected at concentrations below the applicable MSCs.

During sample collection, elevated PID readings at SS-28 were observed. Therefore, SXL initiated excavation of the northeastern tip of the sand bar area. Excavation activities were conducted on October 28, 2016 and approximately 30 tons of sand, gravel, cobbles, and sediment were excavated. The excavated materials were placed into lined roll-off containers for offsite disposal at Cycle Chem, Inc. in Lewisberry, PA.

Upon completion of the excavation, four (4) post-excavation soil samples (SS-34(b), SS-35(b), SS-36(b), and SS-37(b)) were collected to demonstrate that the limited extent of impacts observed

at SS-28 were removed. The samples were submitted to ESC for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB. Laboratory analytical results for the post-excavation samples indicated that all analyzed constituents were either not detected or detected at concentrations below the PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer.

On November 15, 2016, six (6) soil borings (SS-38 through SS-43) were installed to complete vertical delineation in the area of the pipeline breach. The soil borings were spaced along the confluence of Wallis Run and Loyalsock Creek to evaluate soil conditions at the former depth of the pipeline (approximately five [5] feet below the stream bed).

Soil samples were submitted to ESC for analysis of BTEX, MTBE, isopropylbenzene, naphthalene, 1,2,4-TMB, and 1,3,5-TMB via USEPA Method 8260B. The laboratory analytical results indicated that all analyzed constituents were either not detected or detected at concentrations below the applicable PADEP Soil-to-Groundwater MSCs for a Residential, Used Aquifer.

Soil/sediment sample locations are depicted on **Figure 5**. The laboratory analytical data are summarized in **Table 1** and the laboratory analytical reports are included as **Appendix F**.

### **5.3 Selection of Constituents-of-Concern**

Unleaded gasoline was released from the pipeline; therefore, the constituents-of-concern are those required by the PADEP's list of parameters associated with unleaded gasoline. More specifically, the PADEP's unleaded gasoline parameters include benzene, toluene, ethylbenzene, total xylenes, MTBE, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB.

### **5.4 Statewide Health Standard and Act 2 Demonstration of Attainment**

Below is a summary of how the MSCs were selected for soil and a demonstration of attainment of the Residential SHS for soil at the site.

#### **5.4.1 Soil SHS**

The release of unleaded gasoline caused minimal impacts to the soil/sediment in the immediate vicinity of the pipeline breach. Samples were collected from saturated and unsaturated soil conditions. The soil samples were analyzed for the PADEP list of parameters associated with unleaded gasoline (BTEX, MTBE, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB).

The applicable MSCs selected for soil at the site were determined based on the following criteria:

- Residential – Although the impacted soil area within the confluence of Wallis Run and Loyalsock Creek, the surrounding area is residential. Therefore, the future use is conservatively assumed to be residential and the Residential standard was selected.
- Used Aquifer – The local hydrogeology and land use suggest the water bearing materials in the subsurface should be considered a used aquifer.
- Total Dissolved Solids – Total dissolved solids are assumed to be less than or equal to 2,500 mg/L.

- Sample Depth – Samples were collected from approximately 1 to 12 feet bgs.
- Soil Saturation – Samples were collected from saturated and unsaturated soil conditions.

Based on the above criteria, the applicable MSCs for the constituents-of-concern for a Residential, Used Aquifer scenario are listed below. These MSCs are also provided in **Table 1**.

<b>Analytical Parameter</b>	<b>PADEP SHS MSCs Residential, Direct Contact Values 0-15 Feet (µg/kg)</b>	<b>PADEP SHS MSCs Residential, Used Aquifer Soil-to-Groundwater (µg/kg)</b>
Benzene	57,000	500
Toluene	10,000,000	100,000
Ethylbenzene	180,000	70,000
Total Xylenes	1,900,000	1,000,000
MTBE	1,700,000	2,000
Isopropylbenzene	7,700,000	600,000+, 84,000*
Naphthalene	160,000	25,000+, 10,000*
1,2,4-TMB	130,000	8,400+, 1,500*
1,3,5-TMB	2,200,000	74,000+, 42,000*

+ = Unsaturated

\* = Saturated

The soil characterization and post-excavation data demonstrate that benzene, toluene, ethylbenzene, total xylenes, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB were not detected at concentrations above the applicable PADEP MSCs and attain the PADEP Residential SHS.

All soil samples were analyzed for MTBE and the laboratory analytical data indicated that MTBE was not detected in any of the samples. Therefore, MTBE is not a constituent-of-concern and a demonstration of attainment is not being made for MTBE.

#### **5.4.2 Post-Remediation Care Plan**

A post-remediation care plan associated with the ROL for soil is not required for the site. The analytical results for the characterization and post-excavation samples demonstrate that the concentrations of the constituents-of-concern attain the Residential SHS.



## **6.0 REQUEST FOR RELIEF OF LIABILITY**

The potential impacts of a release of unleaded gasoline to soil, groundwater, and surface water have been investigated at the site. The investigation of potential impact to groundwater and surface water is ongoing and an ROL for groundwater will be requested in the future.

For soil; benzene, toluene, ethylbenzene, total xylenes, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB are considered the constituents-of-concern. The soil characterization and post-excavation analytical data demonstrate attainment of the Residential SHS. Therefore, an ROL for soil under the Residential SHS is being requested for benzene, toluene, ethylbenzene, total xylenes, naphthalene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB.



## **REFERNECES**

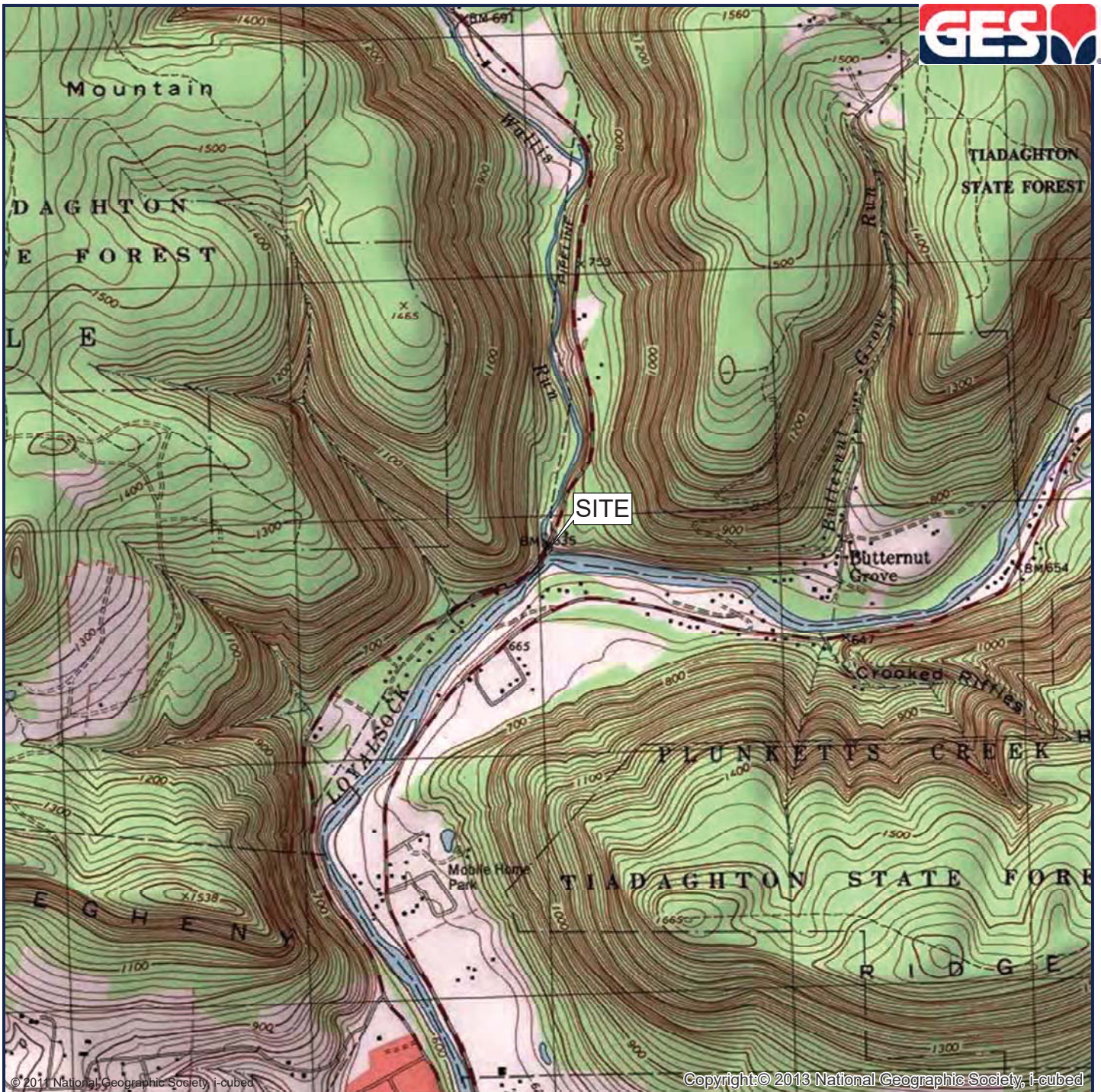
Bucek, R.B., 1980. *Geology and Mineral Resources of the Montoursville North and Huntersville Quadrangles, Lycoming County, Pennsylvania*. Harrisburg: Pennsylvania Geologic Survey.

GES, 2016. *Revised Monitoring and Sampling Summary of Results and Work Plan*. Groundwater & Environmental Services, Inc. December 9, 2016.

Orville, B. Lloyd, J. a 1981. *Groundwater Resources of the Williamsport Region, Lycoming County, Pennsylvania*. Topographic and Geologic Survey, Pennsylvania Department of Environmental Resources Management. Harrisburg: Pennsylvania Geologic Survey.

PADEP, 2001. Pennsylvania Code, Title 25, Environmental Protection, Department of Environmental Protection, Chapter 250, Administration of Land Recycling Program. November 24, 2001.





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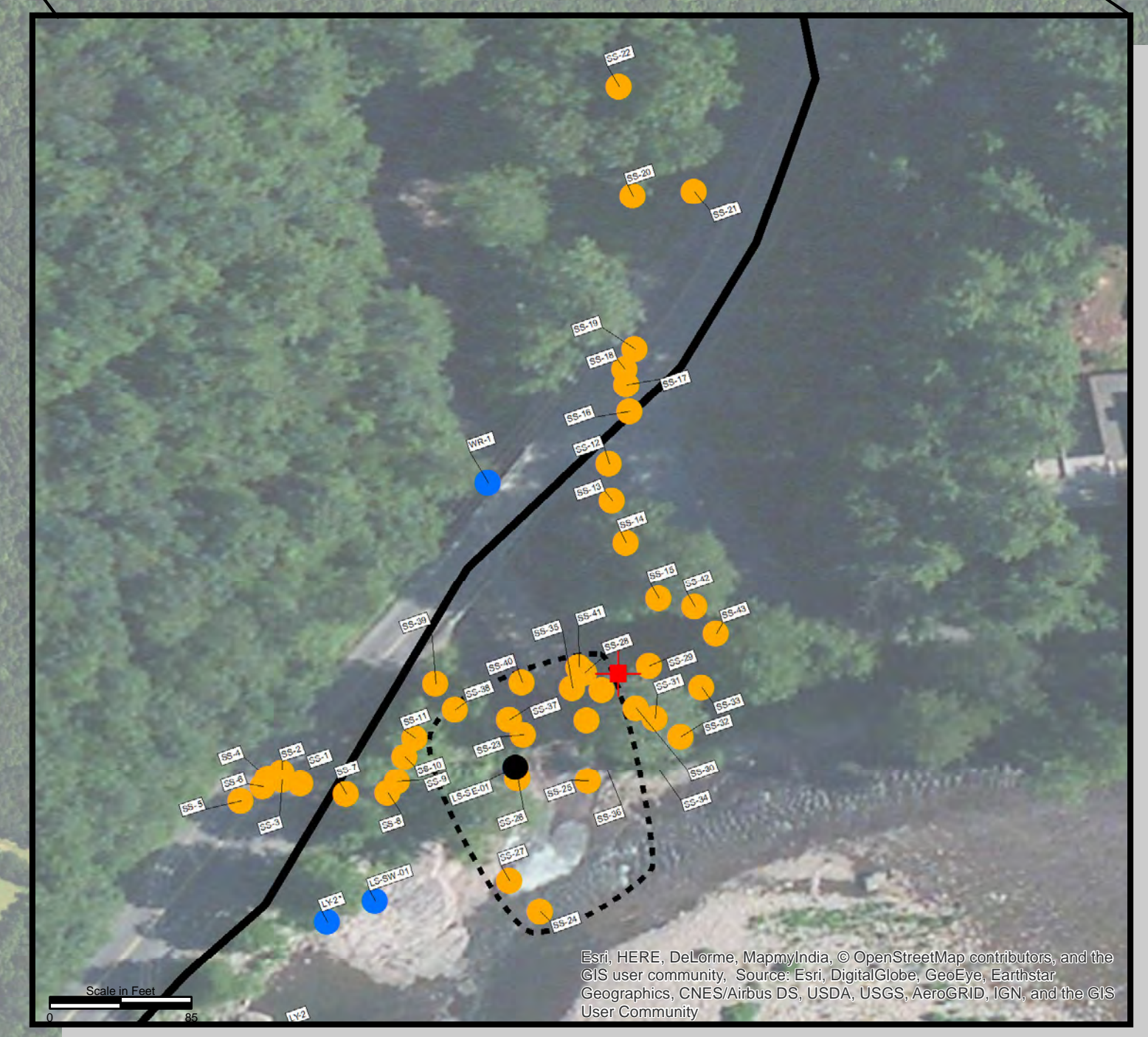
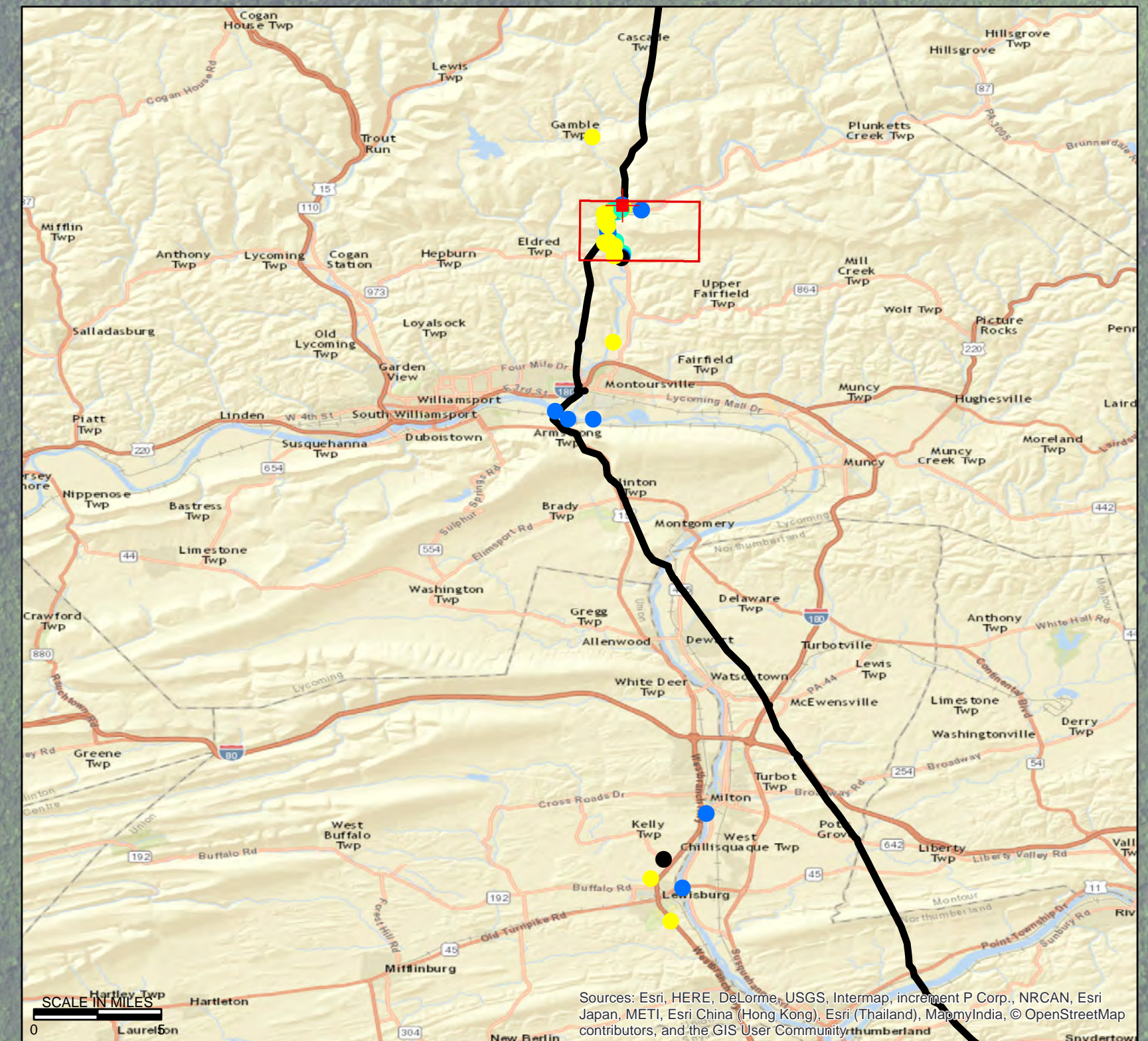
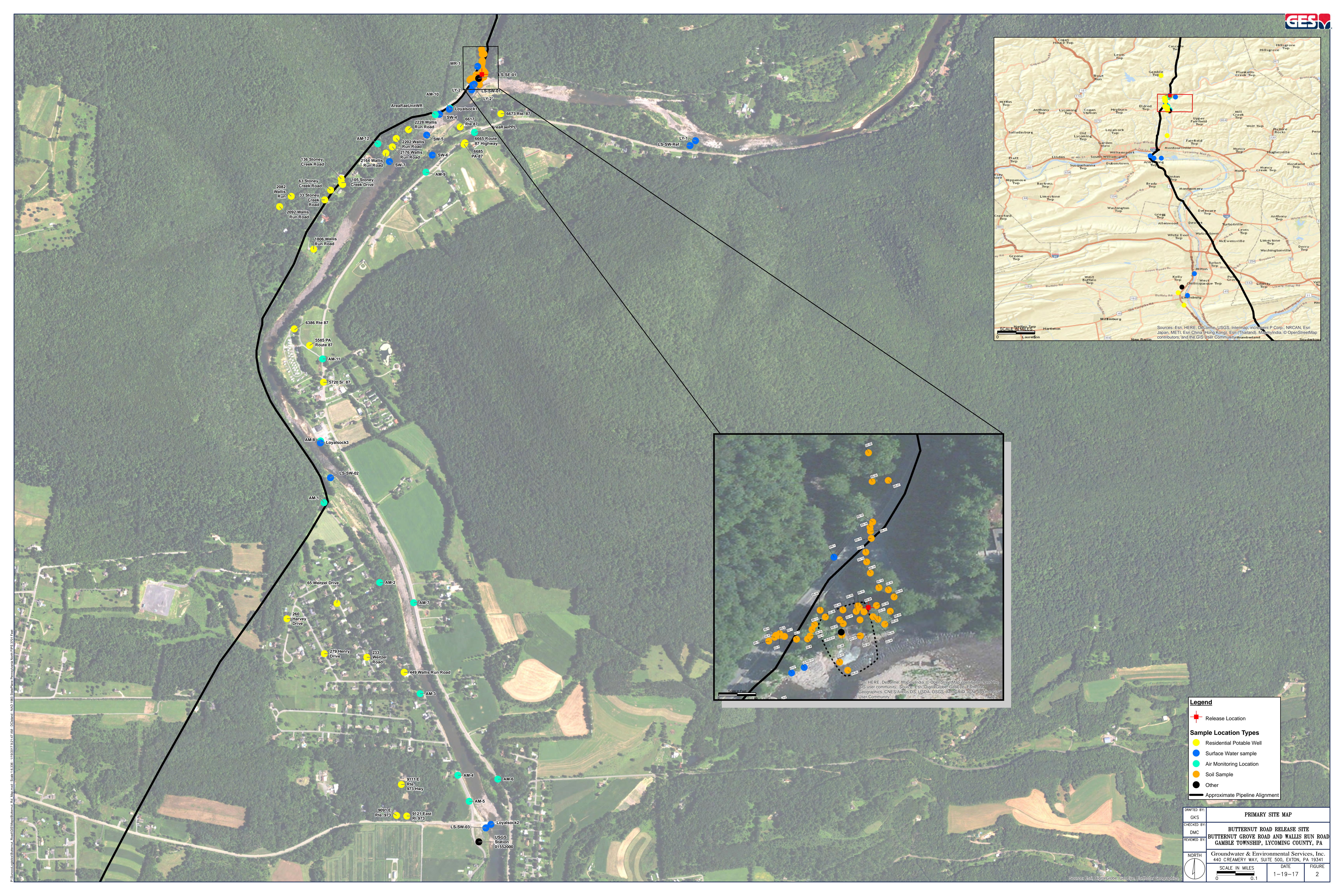
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**Sources:**

USGS 7.5 Minute Series Topographic Quadrangles  
Montoursville North



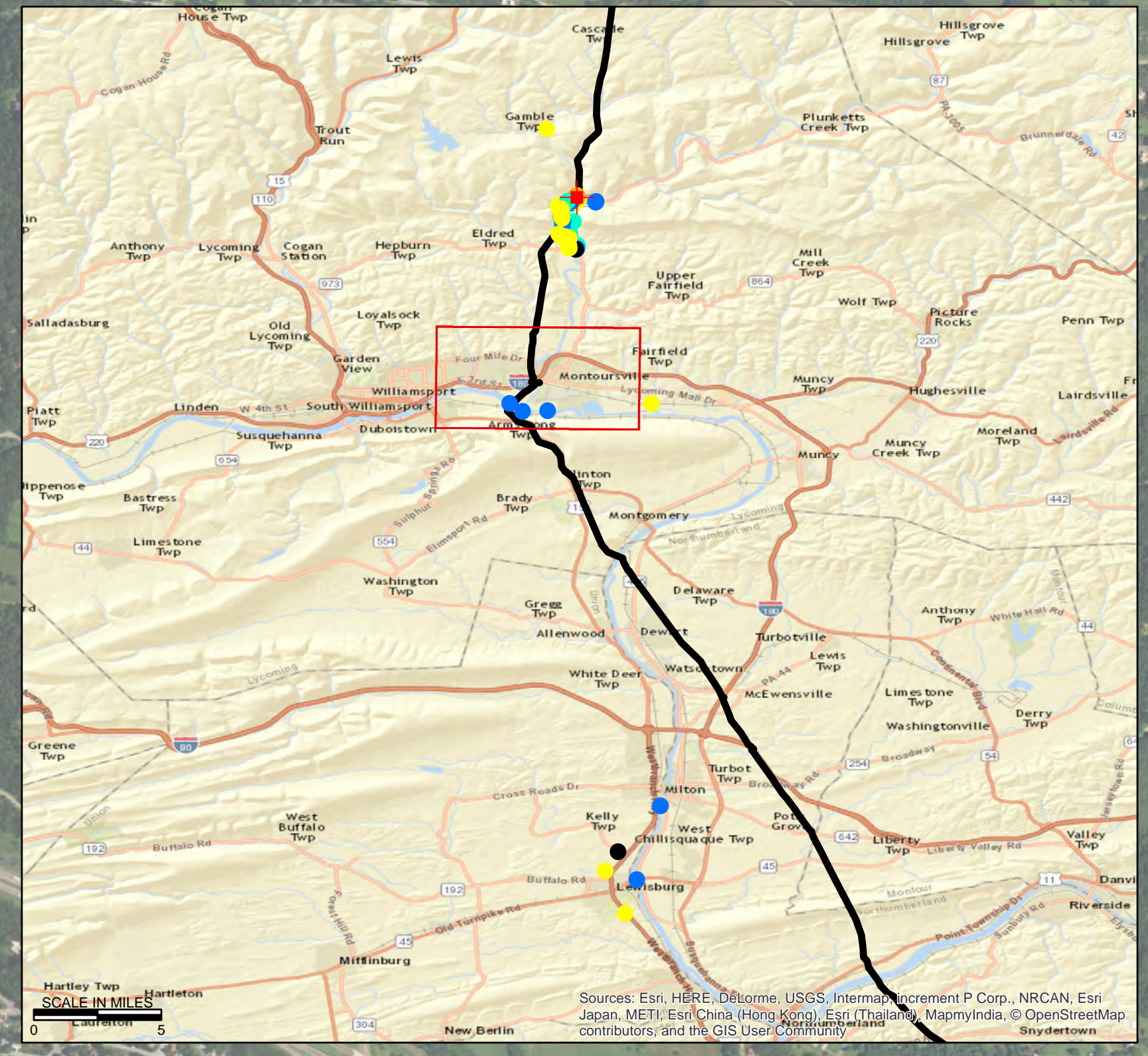
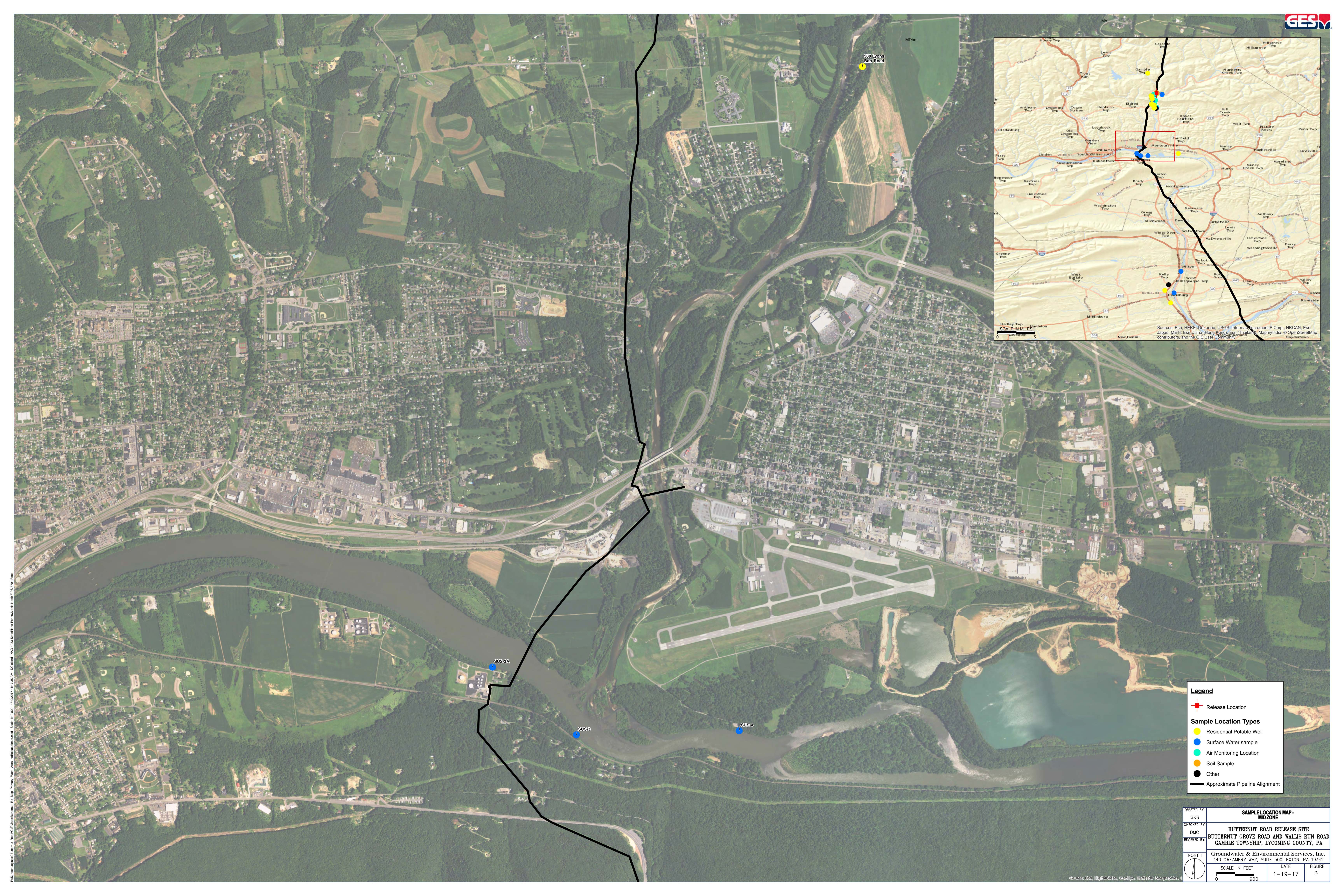
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CHECKED BY: DMC		
REVIEWED BY: MA	<b>BUTTERNUT ROAD RELEASE SITE BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD GAMBLE TOWNSHIP, LYCOMING COUNTY, PA</b>	
NORTH 	Groundwater & Environmental Services, Inc. 440 CREAMERY WAY, SUITE 500, EXTON, PA 19341	
	SCALE IN FEET  0 2,000	DATE 11-3-16



**Legend**

- Release Location
- Sample Location Types**
- Residential Potable Well
- Surface Water sample
- Air Monitoring Location
- Soil Sample
- Other
- Approximate Pipeline Alignment

DRAFTED BY:	PRIMARY SITE MAP		
CHECKED BY:	BUTTERNUT GROVE ROAD RELEASE SITE		
REVIEWED BY:	BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD		
	GAMBLE TOWNSHIP, LYCOMING COUNTY, PA		
NORTH	Groundwater & Environmental Services, Inc.		
	440 CREAMERY WAY, SUITE 500, EXTON, PA 19341		
	SCALE IN MILES	DATE	FIGURE
	0 0.1	1-19-17	2



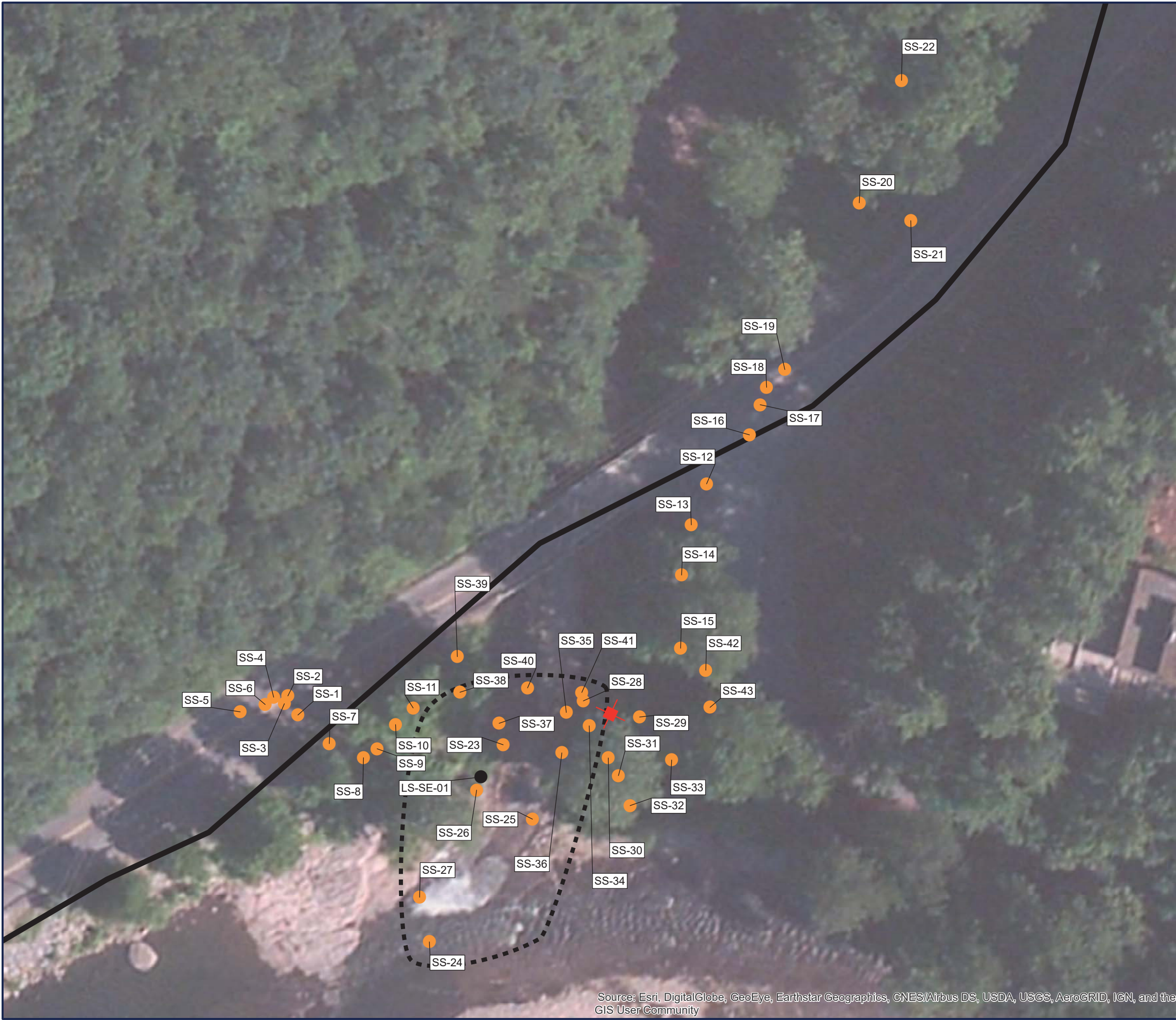
**Legend**

- Release Location
- Sample Location Types**
- Residential Potable Well
- Surface Water sample
- Air Monitoring Location
- Soil Sample
- Other
- Approximate Pipeline Alignment

DRAFTED BY: GKS	<b>SAMPLE LOCATION MAP - MID ZONE</b>		
CHECKED BY: DMC	BUTTERNUT ROAD RELEASE SITE		
REVIEWED BY:	BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD		
	GAMBLE TOWNSHIP, LYCOMING COUNTY, PA		
NORTH	Groundwater & Environmental Services, Inc. 440 CREAMERY WAY, SUITE 500, EXTON, PA 19341		FIGURE
	SCALE IN FEET	DATE	3
		1-19-17	



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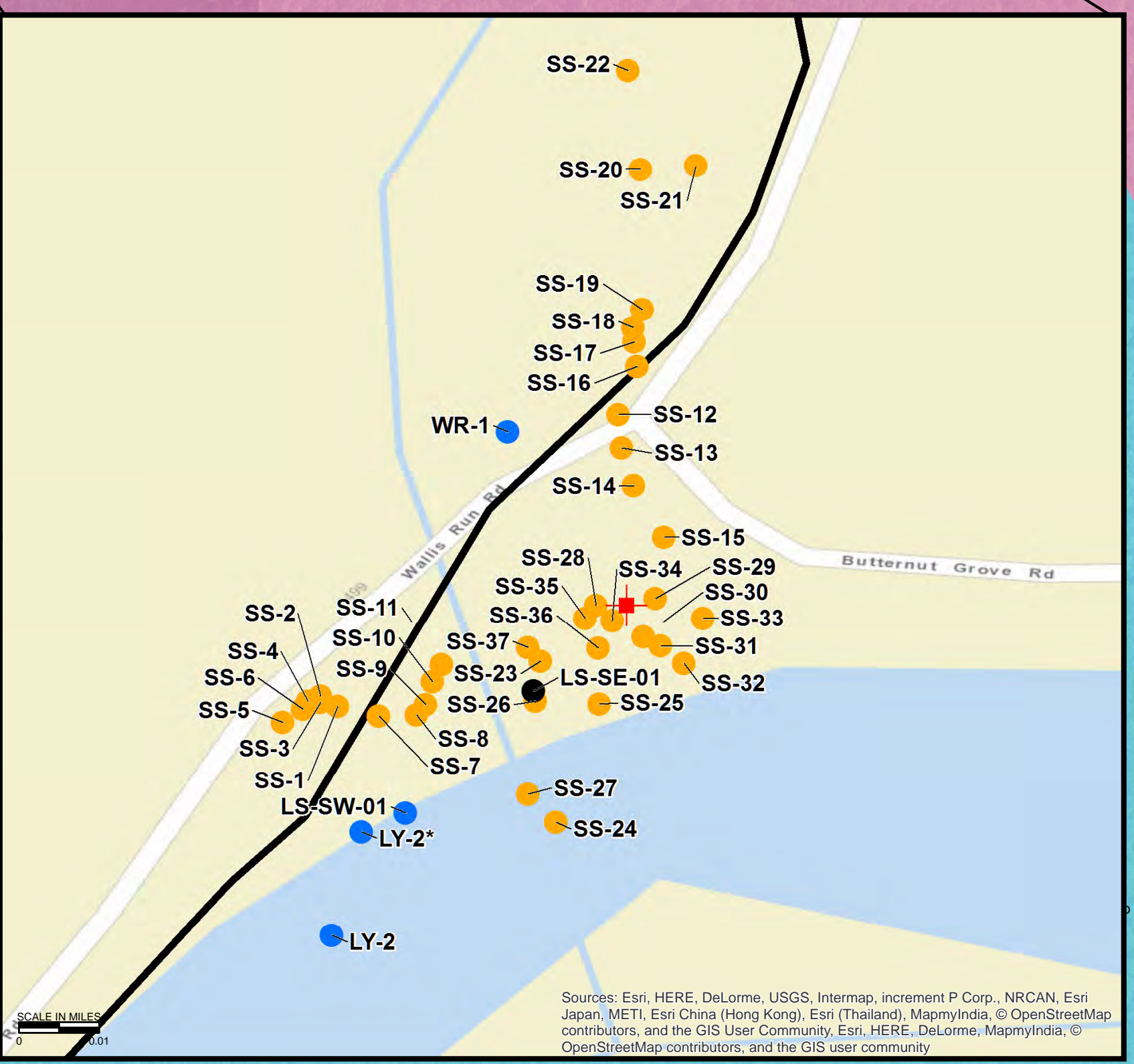
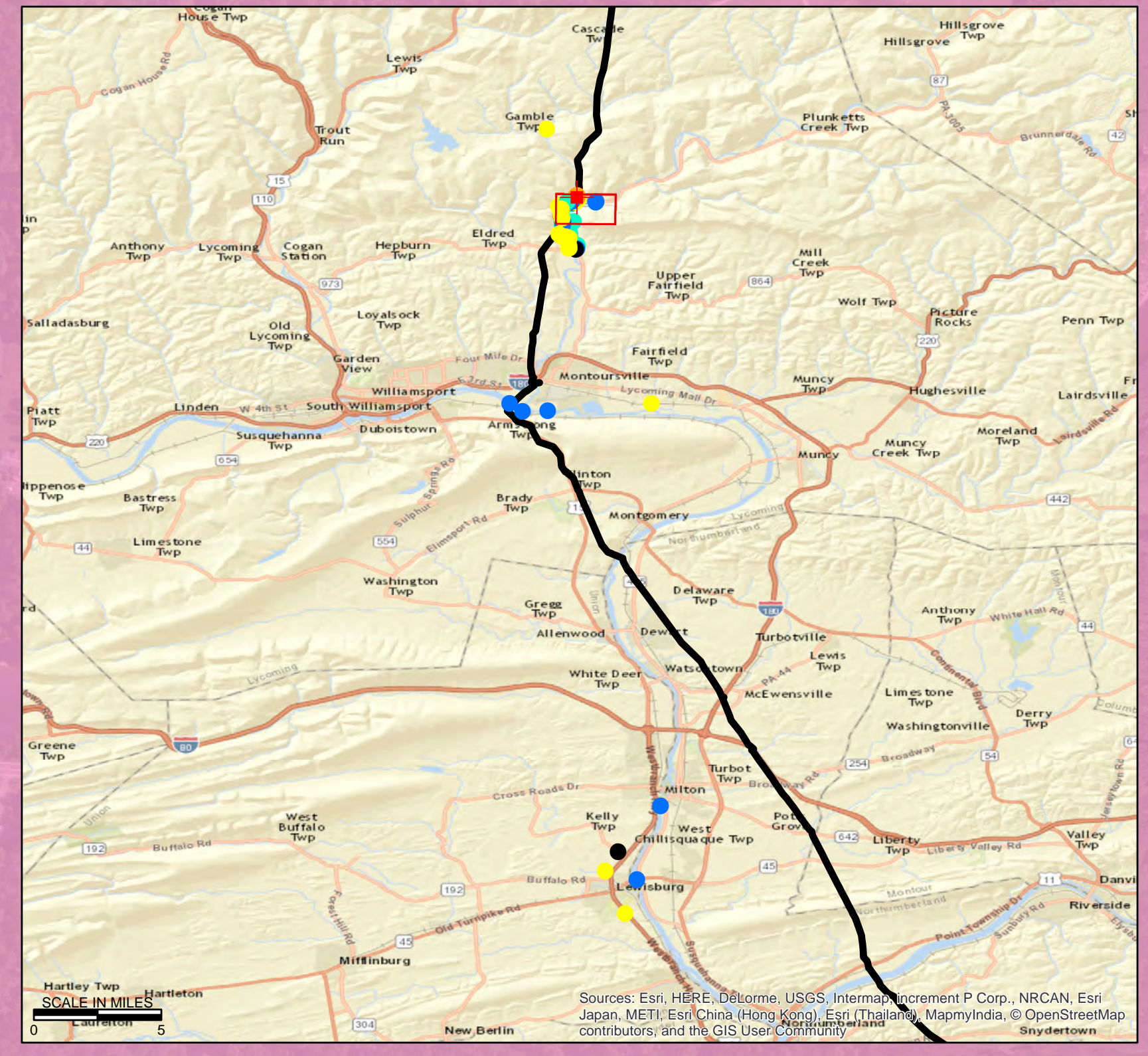
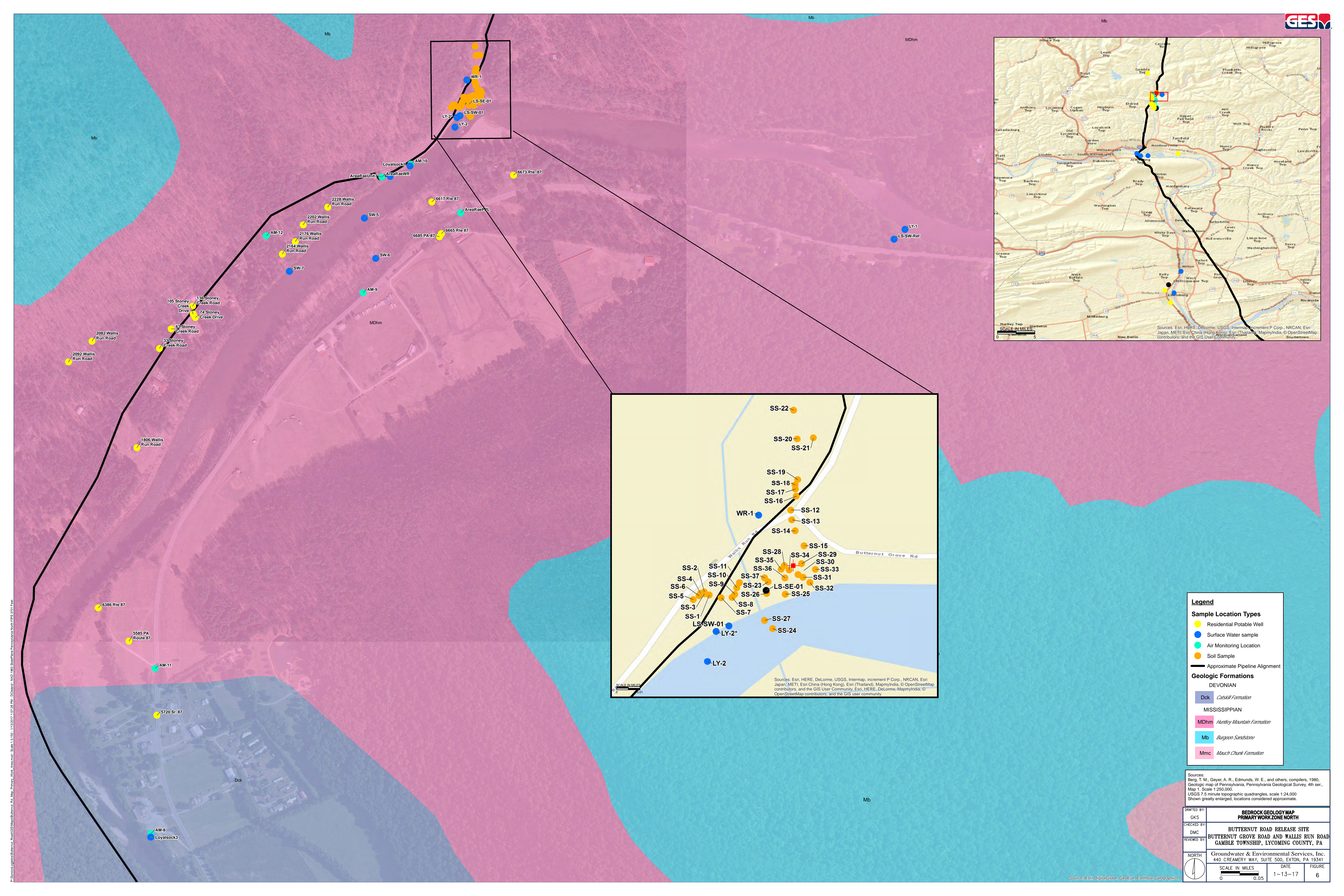


**Legend**

- Release Location
- Approximate Pipeline Alignment
- Gravel Bar
- Sample Location Types**
- Sediment Sample
- Soil Sample

DRAFTED BY: DMC	<b>SOIL SAMPLE LOCATION MAP</b>		
CHECKED BY: SG	<b>BUTTERNUT RAOD RELEASE SITE BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD GAMBLE TOWNSHIP, LYCOMING COUNTY, PA</b>		
REVIEWED BY:	Groundwater & Environmental Services, Inc. 440 CREAMERY WAY, SUITE 500, EXTON, PA 19341		
NORTH 	SCALE IN FEET	DATE	FIGURE
		12-5-16	5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**Legend**

- Residential Potable Well
- Surface Water sample
- Air Monitoring Location
- Soil Sample
- Approximate Pipeline Alignment

**Geologic Formations**

DEVONIAN

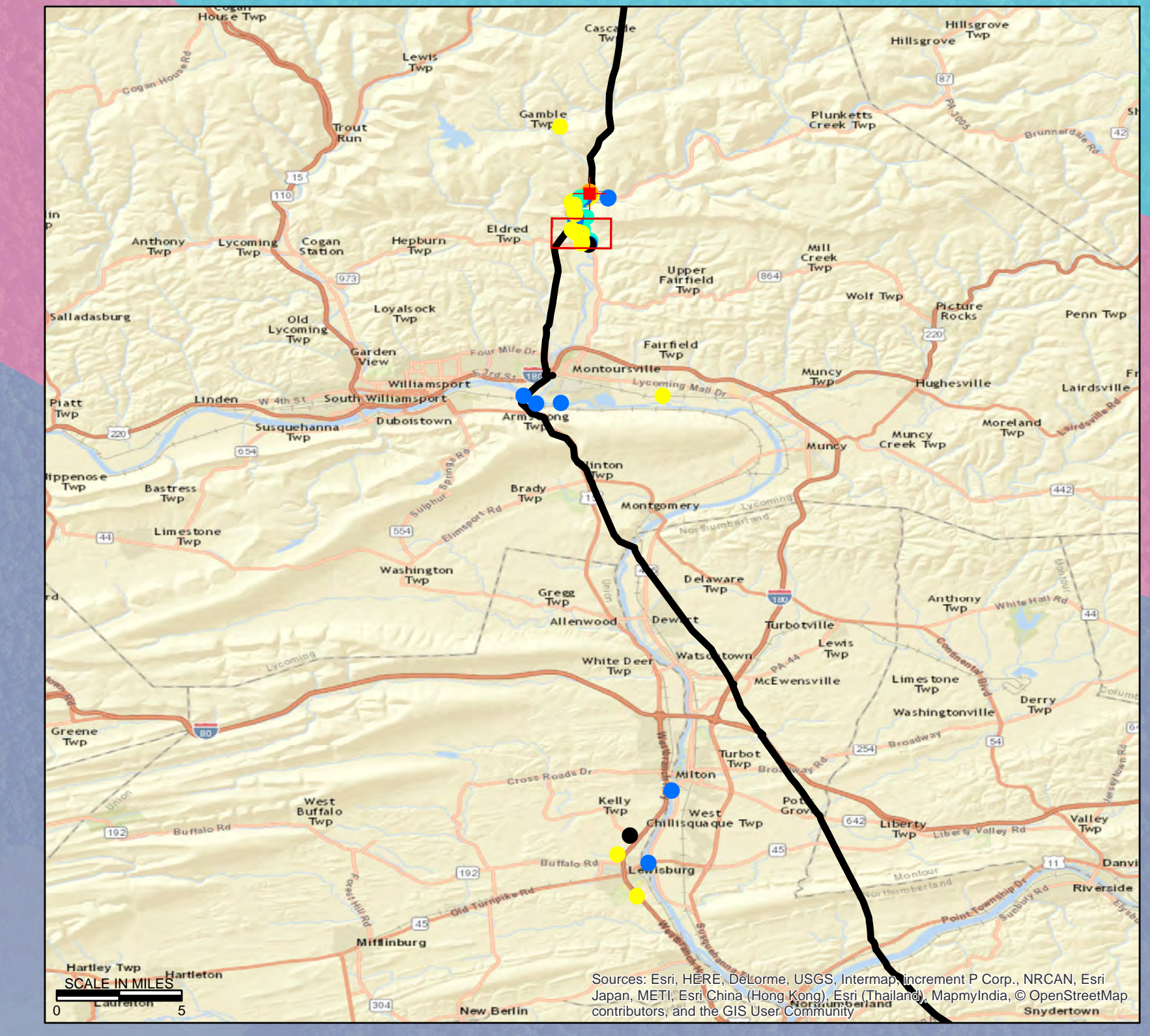
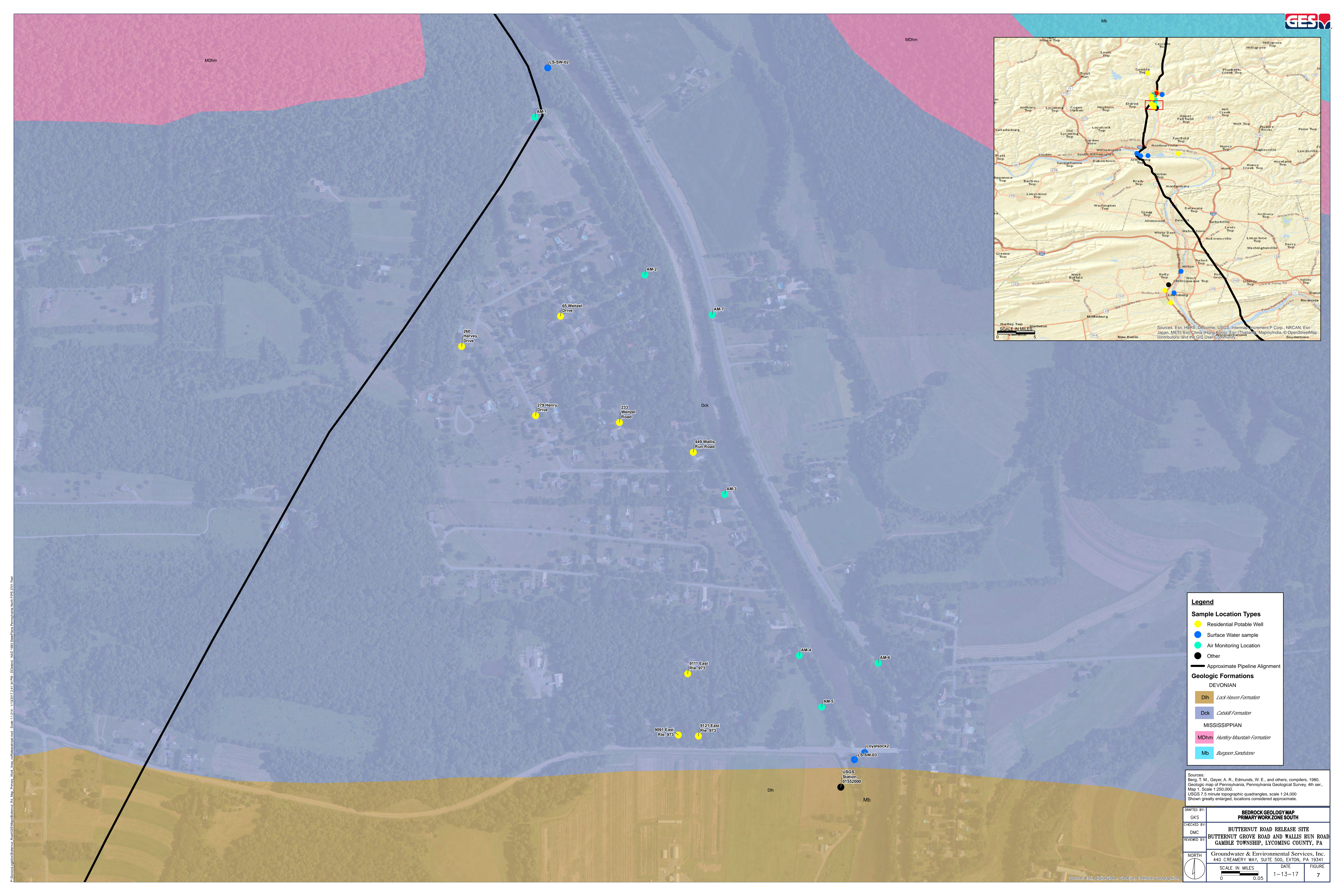
- Dck *Catskill Formation*

MISSISSIPPIAN

- MDhm *Huntley Mountain Formation*
- Mb *Burgoon Sandstone*
- Mmc *Mitch Chunk Formation*

Sources: Berg, T. M., Geyer, A. R., Edmunds, W. E., and others, compilers, 1980, Geologic map of Pennsylvania, Pennsylvania Geological Survey, 4th ser., Map 1, Scale 1:250,000.  
USGS 7.5 minute topographic quadrangles, scale 1:24,000. Shown greatly enlarged, locations considered approximate.

DRAFTED BY:	GKS		
CHECKED BY:	DMC		
REVIEWED BY:	NORTH		
<b>BEDROCK GEOLOGY MAP PRIMARY WORKZONE NORTH</b>			
<b>BUTTERNUT ROAD RELEASE SITE BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD GAMBLE TOWNSHIP, LYCOMING COUNTY, PA</b>			
Groundwater & Environmental Services, Inc. 440 CREAMERY WAY, SUITE 500, EXTON, PA 19341		SCALE IN MILES	DATE
		0 0.05	1-13-17
			FIGURE
			6



**Legend**

**Sample Location Types**

- Residential Potable Well
- Surface Water sample
- Air Monitoring Location
- Other
- Approximate Pipeline Alignment

**Geologic Formations**

DEVONIAN

- Dih *Lock Haven Formation*
- Dck *Catskill Formation*

MISSISSIPPIAN

- MDhm *Huntley Mountain Formation*
- Mb *Burgoon Sandstone*

Sources: Berg, T. M., Geyer, A. R., Edmunds, W. E., and others, compilers, 1980, Geologic map of Pennsylvania, Pennsylvania Geological Survey, 4th ser., Map 1, Scale 1:250,000.  
 USGS 7.5 minute topographic quadrangles, scale 1:24,000  
 Shown greatly enlarged, locations considered approximate.

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NORTH			
	BUTTERNUT ROAD RELEASE SITE BUTTERNUT GROVE ROAD AND WALLIS RUN ROAD GAMBLE TOWNSHIP, LYCOMING COUNTY, PA		
SCALE IN MILES			DATE
	0 0.05		1-13-17
			FIGURE
			7





**TABLE 1**  
**SOIL ANALYTICAL DATA SUMMARY**  
**SUNOCO LOGISTICS, L.P.**  
**BUTTERNUT ROAD RELEASE SITE**  
**GAMBLE TOWNSHIP, LYCOMING COUNTY, PENNSYLVANIA**

Sampling Event	Sample Identification	Approximate Depth (feet)	Sample Date*	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB	TPH-GRO C6-C10
				71-43-2	108-88-3	100-41-4	1330-20-7	1634-04-4	98-82-8	91-20-3	95-63-6	108-67-8	-
Chemical Abstracts Service (CAS) Registry Number				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
<b>PADEP Soil-to-Groundwater MSC for Unsaturated/Saturated Soil in a Residential, Used Aquifer</b>				<b>500</b>	<b>100,000</b>	<b>70,000</b>	<b>1,000,000</b>	<b>2,000</b>	<b>600,000 / 84,000</b>	<b>25,000 / 10,000</b>	<b>8,400 / 1,500</b>	<b>74,000 / 42,000</b>	<b>-</b>
<b>PADEP Residential Direct Contact MSC (0 - 15 feet)</b>				<b>57,000</b>	<b>10,000,000</b>	<b>180,000</b>	<b>1,900,000</b>	<b>1,700,000</b>	<b>7,700,000</b>	<b>160,000</b>	<b>130,000</b>	<b>2,200,000</b>	<b>-</b>
<b>Soil Pile on road (from excavation around pipeline)</b>	SS-1	-	10/24/16	ND<1.12	ND<5.62	ND<1.12	ND<3.37	ND<1.12	ND<1.12	ND<5.62	ND<1.12	ND<1.12	NA
	SS-2	-	10/24/16	ND<1.11	ND<5.55	ND<1.11	ND<3.33	ND<1.11	ND<1.11	ND<5.55	ND<1.11	ND<1.11	NA
	SS-3	-	10/24/16	ND<1.12	ND<5.62	ND<1.12	ND<3.37	ND<1.12	ND<1.12	ND<5.62	ND<1.12	ND<1.12	NA
	SS-4	-	10/24/16	ND<1.14	ND<5.69	ND<1.14	ND<3.41	ND<1.14	ND<1.14	ND<5.69	ND<1.14	ND<1.14	NA
	SS-5	-	10/24/16	ND<1.10	ND<5.50	ND<1.10	ND<3.30	ND<1.10	ND<1.10	ND<5.50	ND<1.10	ND<1.10	NA
	SS-6	-	10/24/16	ND<1.10	ND<5.52	ND<1.10	ND<3.31	ND<1.10	ND<1.10	ND<5.52	ND<1.10	ND<1.10	NA
<b>Trench from pipeline down to Loyalsock</b>	SS-7	5	10/24/16	ND<1.13	ND<5.67	ND<1.13	ND<3.40	ND<1.13	ND<1.13	ND<5.67	ND<1.13	ND<1.13	NA
	SS-8	5	10/24/16	ND<1.11	ND<5.55	ND<1.11	ND<3.33	ND<1.11	ND<1.11	ND<5.55	ND<1.11	ND<1.11	NA
	SS-9	5	10/24/16	ND<1.04	ND<5.21	ND<1.04	ND<3.12	ND<1.04	ND<1.04	ND<5.21	ND<1.04	ND<1.04	NA
	SS-10	5	10/24/16	ND<1.19	ND<5.94	ND<1.19	ND<3.57	ND<1.19	ND<1.19	ND<5.94	ND<1.19	ND<1.19	NA
	SS-11	5	10/24/16	ND<1.23	ND<6.14	ND<1.23	ND<3.68	ND<1.23	ND<1.23	ND<6.14	ND<1.23	ND<1.23	NA
<b>Wash Out Area on North Side</b>	SS-12	-	10/24/16	ND<1.05	ND<5.25	ND<1.05	ND<3.15	ND<1.05	ND<1.05	ND<5.25	ND<1.05	ND<1.05	NA
	SS-13	-	10/24/16	ND<1.07	ND<5.37	ND<1.07	ND<3.22	ND<1.07	ND<1.07	ND<5.37	ND<1.07	ND<1.07	NA
	SS-14	-	10/24/16	ND<1.24	ND<6.22	ND<1.24	ND<3.73	ND<1.24	ND<1.24	ND<6.22	ND<1.24	ND<1.24	NA
	SS-15	2	10/24/16	ND<1.14	ND<5.71	ND<1.14	ND<3.42	ND<1.14	ND<1.14	ND<5.71	ND<1.14	ND<1.14	NA
	SS-16	-	10/24/16	ND<1.07	ND<5.34	ND<1.07	ND<3.20	ND<1.07	ND<1.07	ND<5.34	ND<1.07	ND<1.07	NA
	SS-17	-	10/24/16	ND<1.07	ND<5.33	ND<1.07	ND<3.20	ND<1.07	ND<1.07	ND<5.33	ND<1.07	ND<1.07	NA
	SS-18	-	10/24/16	ND<1.07	ND<5.34	5.07	31.9	ND<1.07	ND<1.07	ND<5.34	11.8	3.81	NA
SS-19	-	10/24/16	ND<1.09	6.00	11.0	68.2	ND<1.09	1.12	ND<5.44	21.2	6.56	NA	
<b>Center of Sand Bar</b>	SS-20	1.5	10/24/16	ND<1.14	ND<5.69	3.58	17.6	ND<1.14	ND<1.14	ND<5.69	1.26	ND<1.14	NA
	SS-21	1.5	10/24/16	ND<1.09	ND<5.46	3.65	18.9	ND<1.09	ND<1.09	ND<5.46	3.69	1.24	NA
	SS-22	1.5	10/24/16	ND<1.03	ND<5.17	ND<1.03	ND<3.10	ND<1.03	ND<1.03	ND<5.17	ND<1.03	ND<1.03	NA
	SS-23	1.5	10/24/16	ND<1.05	ND<5.25	1.21	6.47	ND<1.05	ND<1.05	ND<5.25	ND<1.05	ND<1.05	NA
	SS-24	1	10/26/16	ND<1.18	ND<5.89	3.59	21.3	ND<1.18	ND<1.18	ND<5.89	6.46	2.39	NA
	SS-25	2.5	10/26/16	ND<1.05	ND<5.23	1.53	9.53	ND<1.05	ND<1.05	ND<5.23	2.01	ND<1.05	NA
	SS-26	2.5	10/26/16	ND<1.07	ND<5.33	2.95	19.2	ND<1.07	ND<1.07	ND<5.33	6.70	2.59	NA
	SS-27	3	10/26/16	ND<1.05	ND<5.23	ND<1.05	ND<3.14	ND<1.05	ND<1.05	ND<5.23	ND<1.05	ND<1.05	NA
<b>Tip of Sand Bar</b>	SS-28	2	10/26/16	<b>ND&lt;979</b>	ND<4,890	13,500	86,100	ND<979	2,690	5,340	<b>71,300</b>	22,900	NA
<b>Sand Bar</b>	SS-29	2	10/26/16	ND<1.19	ND<5.94	3.04	14.8	ND<1.19	ND<1.19	ND<5.94	ND<1.19	ND<1.19	NA
	SS-30	2	10/26/16	ND<1.30	7.39	7.87	39.9	ND<1.30	ND<1.30	ND<6.48	3.78	1.85	NA
	SS-31	3.5	10/26/16	ND<1.20	ND<6.01 J3, J6	4.87 J3, J6	24.0 J3, J6	ND<1.20	ND<1.20 J3, J6	ND<6.01 J3, J6	1.80 J3, J6	ND<1.20 J3, J6	NA
	SS-32	1	10/26/16	ND<1.61	ND<8.03	2.41	13.7	ND<1.61	ND<1.61	ND<8.03	3.87	ND<1.61	NA
	SS-33	1	10/26/16	ND<1.23	ND<6.15	4.92	27.2	ND<1.23	ND<1.23	ND<6.15	4.96	1.88	NA
	SS-34(a)	-	10/27/16	ND<1.04	ND<5.21	ND<1.04	ND<3.13	ND<1.04	ND<1.04	ND<5.21	ND<1.04	ND<1.04	NA
	SS-35(a)	-	10/27/16	ND<1.11	ND<5.57	ND<1.11	ND<3.34	ND<1.11	ND<1.11	ND<5.57	ND<1.11	ND<1.11	NA
	SS-36(a)	-	10/27/16	ND<1.03	ND<5.15	ND<1.03	ND<3.09	ND<1.03	ND<1.03	ND<5.15	ND<1.03	ND<1.03	NA
	SS-37(a)	-	10/27/16	ND<1.08	ND<5.38	ND<1.08	ND<3.23	ND<1.08	ND<1.08	ND<5.38	ND<1.08	ND<1.08	NA
<b>Sand Bar Post-Excavation</b>	SS-34(b)	2	10/28/16	ND<1.05	ND<5.25	ND<1.05	ND<3.15	ND<1.05	ND<1.05	ND<5.21	ND<1.05	ND<1.05	NA
	SS-35(b)	2	10/28/16	ND<1.04	ND<5.20	ND<1.04	ND<3.12	ND<1.04	ND<1.04	ND<5.20	ND<1.04	ND<1.04	NA
	SS-36(b)	2	10/28/16	ND<1.06	ND<5.28	ND<1.06	ND<3.17	ND<1.06	ND<1.06	ND<5.28	1.74	ND<1.06	NA
	SS-37(b)	2	10/28/16	ND<1.05	ND<5.25	1.09	8.69	ND<1.05	ND<1.05	17.6	20.9	7.31	NA
<b>Area of PennDOT Proposed Temporary Bridge</b>	SS-38	5.5	11/15/16	ND<1.09	ND<5.45	ND<1.09	ND<3.27	ND<1.09	ND<1.09	ND<5.45	ND<1.09	ND<1.09	NA
	SS-39	6	11/15/16	ND<1.09	ND<5.44	ND<1.09	ND<3.26	ND<1.09	ND<1.09	ND<5.44	ND<1.09	ND<1.09	NA
	SS-40	6	11/15/16	ND<1.09	ND<5.44	ND<1.09	ND<3.26	ND<1.09	ND<1.09	22.5	ND<1.09	ND<1.09	NA
	SS-41	6	11/15/16	ND<1.10	ND<5.50	ND<1.10	ND<3.30	ND<1.10	ND<1.10	ND<5.50	ND<1.10	ND<1.10	NA
	SS-42	8	11/15/16	ND<1.09	ND<5.44	ND<1.09	ND<3.26	ND<1.09	ND<1.09	ND<5.44	ND<1.09	ND<1.09	NA
	SS-42	12	11/15/16	ND<1.15	ND<5.73	ND<1.15	ND<3.44	ND<1.15	ND<1.15	ND<5.73	ND<1.15	ND<1.15	NA
	SS-43	8	11/15/16	ND<1.25	ND<6.23	ND<1.25	ND<3.74	ND<1.25	ND<1.25	ND<6.23	ND<1.25	ND<1.25	NA
SS-43	12	11/15/16	ND<1.13	ND<5.67	ND<1.13	ND<3.40	ND<1.13	ND<1.13	ND<5.67	ND<1.13	ND<1.13	NA	



TABLE 1  
SOIL ANALYTICAL DATA SUMMARY

SUNOCO LOGISTICS, L.P.  
BUTTERNUT ROAD RELEASE SITE  
GAMBLE TOWNSHIP, LYCOMING COUNTY, PENNSYLVANIA

Sampling Event	Sample Identification	Approximate Depth (feet)	Sample Date*	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB	TPH-GRO C6-C10
Chemical Abstracts Service (CAS) Registry Number				71-43-2	108-88-3	100-41-4	1330-20-7	1634-04-4	98-82-8	91-20-3	95-63-6	108-67-8	-
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
PADEP Soil-to-Groundwater MSC for Unsaturated/Saturated Soil in a Residential, Used Aquifer				500	100,000	70,000	1,000,000	2,000	600,000 / 84,000	25,000 / 10,000	8,400 / 1,500	74,000 / 42,000	-
PADEP Residential Direct Contact MSC (0 - 15 feet)				57,000	10,000,000	180,000	1,900,000	1,700,000	7,700,000	160,000	130,000	2,200,000	-
Loyalsock Creek Sediment Sampling	SXL-Z1-E-SE-01	-	10/23/2016+	<7	<7	<7	<7	<7	<7	<7	<7	<7	<1.4
	SXL-Z1-E-SE-02	-	10/23/2016+	<8	<8	<8	10	<8	<8	<8	<8	<8	<1.5
	SXL-Z1-E-SE-03	-	10/24/2016+	<6	<6	<6	<6 Q8	<6	<6	<6	<6 Q8	<6 Q8	<1.2
	SXL-Z1-E-SE-04	-	10/24/2016+	<7	<7	<7	<7 Q8	<7	<7	<7	<7 Q8	<7 Q8	<1.3
	SXL-Z1-W-SE-02	-	10/23/2016+	<12	60	24	160	<12	<12	<12	48	24	<2.3
	SXL-Z1-W-SE-03	-	10/23/2016+	<6	12	<6	21	<6	<6	<6	<6	<6	<1.3
	SXL-Z1-W-SE-03a	-	10/23/2016+	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.0
	SXL-Z2-E-SE-01	-	10/23/2016+	<6	<6	<6	<6	<6	<6	<6	<6	<6	<1.3
	SXL-Z2-W-SE-02	-	10/23/2016+	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.1
	SXL-Z3-E-SE-01	-	10/23/2016+	<7	<7	<7	<7	<7	<7	<7	<7	<7	<1.4
	SXL-Z3-E-SE-02	-	10/23/2016+	<7	<7	<7	7	<7	<7	<7	<7	<7	<1.4
	SXL-Z3-W-SE-01	-	10/23/2016+	<8	<8	<8	<8	<8	<8	<8	<8	<8	<1.5
	SXL-PostN-1-SE-01	-	10/23/2016+	<6	<6	<6	<6	<6	<6	<6	<6	<6	<1.3
SXL-PostN-2-SE-01	-	10/23/2016+	<7	<7	<7	<7	<7	<7	<7	<7	<7	<1.3	

Notes:

MTBE: Methyl *tert*-butyl ether

TMB: Trimethylbenzene

TPH-GRO: Total Petroleum Hydrocarbons - Gasoline Range Organics

NA: Not Analyzed

ND<#: Not detected at, or above, the laboratory reporting limit shown

<#: Not detected at, or above, the laboratory reporting limit shown

µg/kg: Micrograms per kilogram

mg/kg: Milligrams per kilogram

-: Not applicable or not calculated

<sup>+</sup> Indicates sample collected by Cardno and analyzed by Eurofins Lancaster Laboratories Environmental (ELLE)

\*: Sample dates shown on this table represent actual sample dates and may not match sample dates on the chain-of-custody or laboratory report. For some samples; sample submission dates were inadvertently used on the chain-of-custody rather than the sample date.

Q8: DUP RPD (Duplicate Relative Percent Difference)

J3: The associated batch Quality Assurance (QC) was outside the established quality control range for precision.

J6: The sample matrix interfered with the ability to make any accurate determination; spike value is low.

PADEP: Pennsylvania Department of Environmental Protection

MSC: Medium-Specific Concentration

**Bold** values exceed the applicable PADEP Soil-to-Groundwater MSC

PADEP Soil-to-Groundwater MSCs obtained from the Pennsylvania Land Recycling Program Chapter 250 Regulations, Appendix A, Table 3, MSCs for Organic Regulated Substances in Soil, B. Soil-to-Groundwater Numeric Values,

PADEP Direct Contact MSCs obtained from the Pennsylvania Land Recycling Program Chapter 250 Regulations, Appendix A, Table 3, MSCs for Organic Regulated Substances in Soil, A. Direct Contact Numeric Values, revised August 27, 2016.

Soil conditions for the soil samples were based on the moisture content at the time of sampling.

SS-34(b) through SS-37(b) were collected at the same locations as SS-34(a) through SS-37(a), after the excavation. The (a) and (b) designations are utilized on this table and do not reflect the sample identifications used in the field documentation or on the laboratory reports.



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**APPENDIX A**  
**(On CD)**

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.

SITE-SPECIFIC HEALTH AND SAFETY PLAN  
FOR

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**EMERGENCY PHONE NUMBERS**

Local Police      \_\_\_\_\_ 911 \_\_\_\_\_

Local Fire        \_\_\_\_\_ 911 \_\_\_\_\_

Local Rescue     \_\_\_\_\_ 911 \_\_\_\_\_

Local Hospital Name, Number & Address

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Directions to Hospital (map attached)

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National Response Center (NRC): 1-800-424-8802

The NRC should be contacted in the event of a significant chemical release. Once notified, the NRC will activate a federal response to the spill. *Please confirm with the client and project manager to determine if the spill should be reported.*

Poison Control Center: 1-800-222-1222

The Poison Control Center should be contacted in the event of accidental poisoning. They will provide information on immediate treatment for the poisoning.

Nearest Telephone: Office: \_\_\_\_\_ Cell: \_\_\_\_\_

Groundwater & Environmental Services, Inc.

\_\_\_\_\_  
Site Supervisor

\_\_\_\_\_  
Cell Phone:

Thomas M. Baylis  
Vice President of Corporate Health and Safety

Cell Phone: 610-587-1124

Client Representative

\_\_\_\_\_

Telephone Number

\_\_\_\_\_

State Agency Representative

\_\_\_\_\_

Telephone Number

\_\_\_\_\_

**DO NOT TRANSPORT SERIOUSLY INJURED  
CALL LOCAL RESCUE**

## HOSPITAL ROUTE MAPS



**A** 41.354332, -76.912157 - SXL Butternut Road Release Site

**32 min, 14.1 mi**

**B** Williamsport Regional Medical Center, 700 High St, Williamsport, PA 17701

Light traffic (28 min without traffic)  
Via Warrensville Rd, I-180 W

Directions from SXL Butternut Road Release Site  
Butternut Grove Road / Wallis Run Road  
UPMC Susquehanna Williamsport Regional Medical Center (570) 321-1000

**A** 41.354332, -76.912157

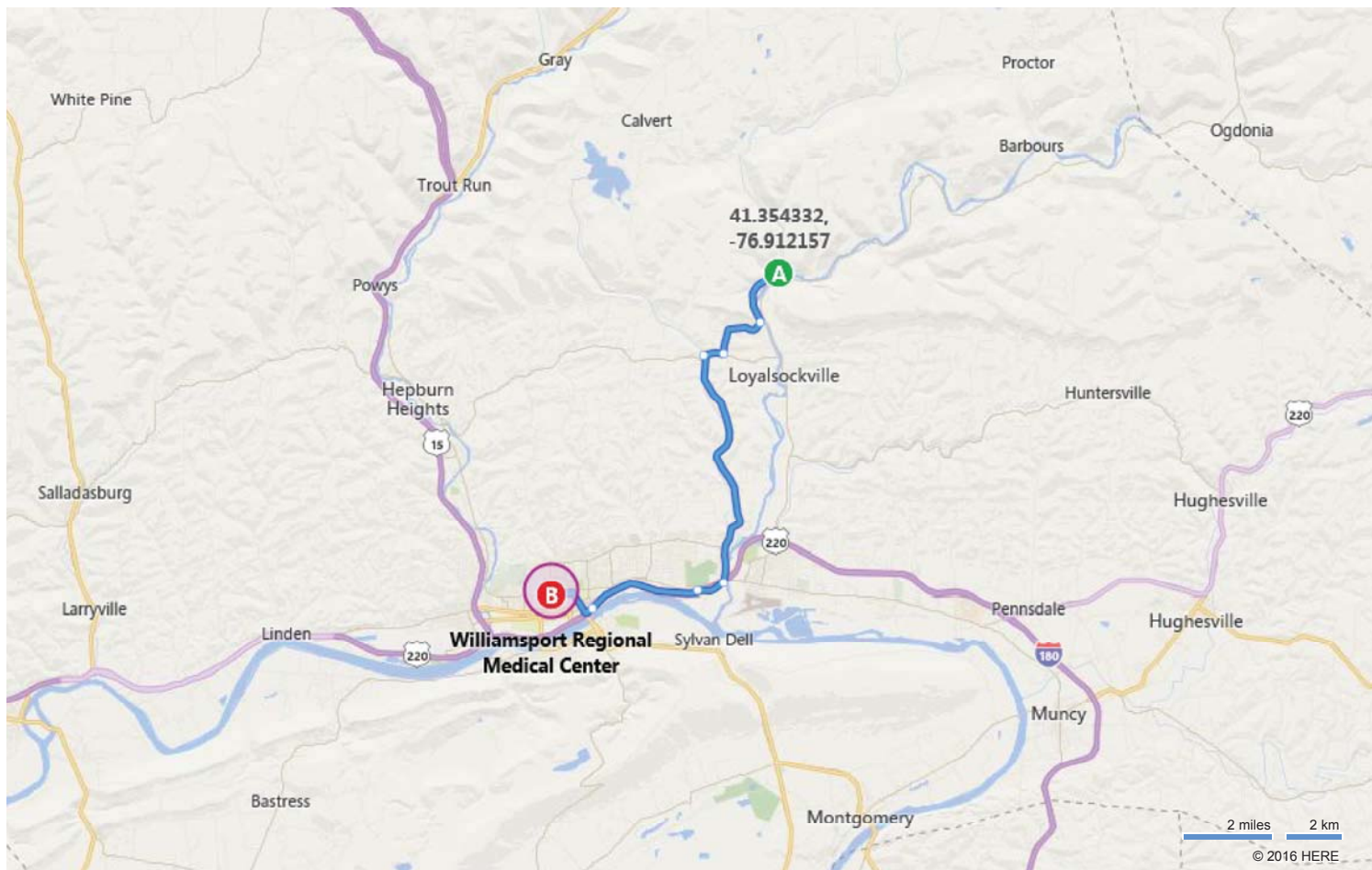
↑	1. Depart <b>Butternut Grove Rd</b> toward Southard Rd	72 ft
↶	2. Turn <b>left</b> onto <b>Wallis Run Rd</b>	1.5 mi
↷	3. Turn <b>right</b> onto <b>Yeagle Rd</b>	1.5 mi
↷	4. Turn <b>right</b> onto <b>PA-973</b>	0.4 mi
↶	5. Turn <b>left</b> to stay on <b>PA-973</b>	0.1 mi
↑	6. Keep <b>straight</b> onto <b>Warrensville Rd</b>	5.8 mi
↷	7. Turn <b>right</b> onto <b>E 3rd St / Old Montoursville Rd</b>	0.7 mi
	8. Take ramp <b>left</b> for <b>I-180 W / US-220 S</b>	2.7 mi
↷	9. At exit <b>27A</b> , take ramp <b>right</b> for <b>US-15 South</b> toward <b>Lewisburg</b>	0.2 mi
↷	10. Turn <b>right</b> onto <b>Market St</b>	0.6 mi
↶	11. Turn <b>left</b> onto <b>W 7th St</b>	518 ft
↷	12. Turn <b>right</b> onto <b>Hepburn St / Pine St</b> , and then immediately turn <b>left</b> onto <b>High St</b>	0.4 mi

13. Arrive at **High St**

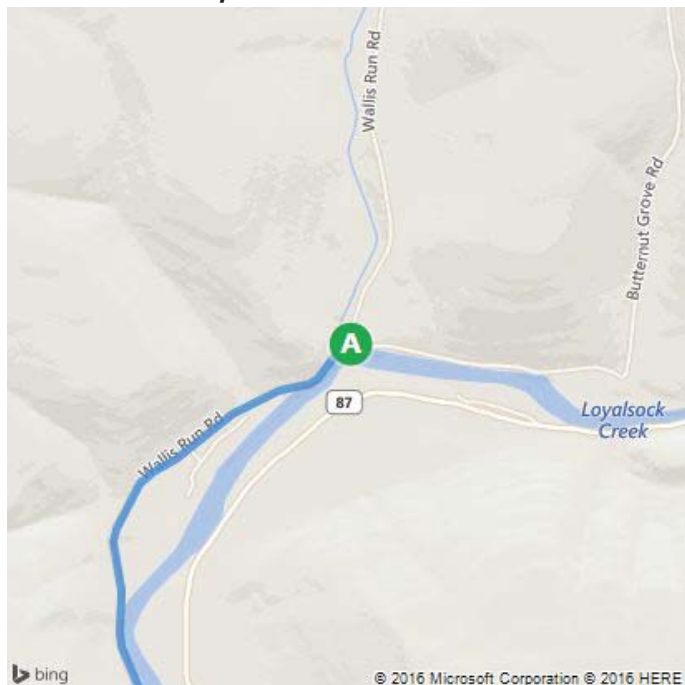
The last intersection is Walnut St

If you reach Spruce St, you've gone too far

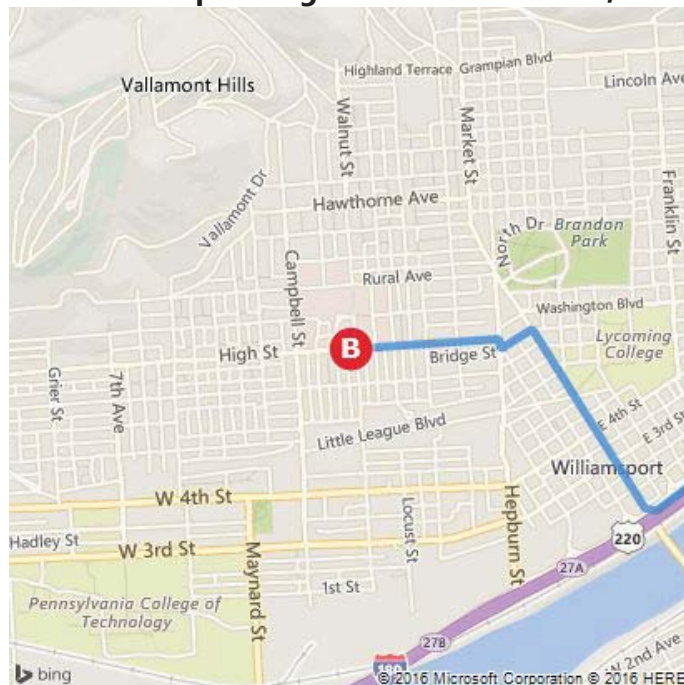
**B** Williamsport Regional Medical Center



**A** 41.354332, -76.912157



**B** Williamsport Regional Medical Center, 70...



These directions are subject to the Microsoft® Service Agreement and are for informational purposes only. No guarantee is made regarding their completeness or accuracy. Construction projects, traffic, or other events may cause actual conditions to differ from these results. Map and traffic data © 2016 HERE™.

## TABLE OF CONTENTS

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Section	Page No.
EMERGENCY PHONE NUMBERS .....	Cover Page
1.0 INTRODUCTION .....	1
1.1 APPROVALS .....	1
1.2 SITE BACKGROUND.....	1
1.3 SCOPE OF WORK.....	1
2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES .....	2
3.0 OSHA TRAINING REQUIREMENTS .....	2
3.1 GENERAL TRAINING REQUIREMENTS.....	2
3.2 PRE-ENTRY MEETING.....	2
3.3 FIRST AID/CPR TRAINING.....	3
4.0 MEDICAL SURVEILLANCE REQUIREMENTS .....	3
4.1 GENERAL MEDICAL SURVEILLANCE REQUIREMENTS.....	3
4.2 DRUG AND ALCOHOL COMPLIANCE .....	3
4.3 ACCIDENT / INCIDENT MEDICAL SURVEILLANCE.....	3
5.0 HAZARD ASSESSMENT .....	4
5.1 CHEMICAL HAZARDS .....	4
5.2 PHYSICAL HAZARDS .....	5
5.3 RADIOLOGICAL HAZARDS .....	9
6.0 SITE CONTROL MEASURES .....	9
6.1 SITE ZONES .....	9
6.2 COMMUNICATIONS .....	10
7.0 PERSONAL PROTECTIVE EQUIPMENT .....	11
7.1 GENERAL.....	11
7.2 LEVEL D PROTECTION .....	11
7.3 MODIFIED LEVEL C PROTECTION.....	11
7.4 LEVEL C PROTECTION .....	11
7.5 LEVEL A AND B PROTECTION.....	12
8.0 DECONTAMINATION .....	12

8.1	GENERAL.....	12
9.0	EMERGENCY ACTION PLAN .....	13
9.1	PERSONAL INJURY WITHIN THE EXCLUSION ZONE.....	13
9.2	PERSONAL INJURY WITHIN THE DECONTAMINATION ZONE.....	14
9.3	PERSONAL INJURY WITHIN THE SUPPORT ZONE.....	14
9.4	FIRE/EXPLOSION.....	15
9.5	PERSONAL PROTECTION EQUIPMENT FAILURE.....	15
9.6	EQUIPMENT FAILURE.....	16
10.0	STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES .....	16
10.1	WORK PERMITS .....	16
10.2	GENERAL SITE RULES.....	16
10.3	ADDITIONAL STANDARD OPERATORING SAFETY PROCEDURES.....	18
	EXPOSURE MONITORING PROGRAM .....	21
	REAL-TIME MONITORING .....	21
	ACTION LEVELS.....	21

## **FIGURES**

Figure 1                      Route to Local Hospital Map

## **LIST OF ATTACHMENTS**

Attachment A	Site Maps
Attachment B	Exposure Monitoring Program for the Contaminants of Concern
Attachment C	Material Safety Data Sheets
Attachment D	Job Safety Analysis Sheets and Daily Site Safety Checklists
Attachment E	Pre-entry Meeting Notes
Attachment F	Sign-off Sheet
Attachment G	Incident/Injury Case Management
Attachment H	Site Specific Decontamination Plan

**1.0**

**INTRODUCTION**

**1.1 APPROVALS**

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_  
                  Connie Johnson - PMA III

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
                  Stephanie Grillo - Senior Project Manager

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
                  Kyle Slabik - Local HSSE

**1.2 SITE BACKGROUND**

Project Name: \_\_\_\_\_

Site Address: \_\_\_\_\_

Nearest Intersection: \_\_\_\_\_

Township/Municipality: \_\_\_\_\_

County: \_\_\_\_\_

Additional Site Information: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**1.3 SCOPE OF WORK**

Task 1 - \_\_\_\_\_

Task 2 - \_\_\_\_\_

Task 3 - \_\_\_\_\_

Task 4 - \_\_\_\_\_

Task 5 - \_\_\_\_\_

Task 6 - \_\_\_\_\_

Task 7 - \_\_\_\_\_

Task 8 - \_\_\_\_\_

Task 9 - \_\_\_\_\_

Task 10 - \_\_\_\_\_

## 2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

<u>Responsibility</u>	<u>Name</u>	<u>Task Description</u>
Project Manager	_____	Oversee and coordinate all budget and technical aspects for the project
Local Health & Safety Officer	_____	Coordinate all health and safety operations for the project site
Site Supervisor	<u>GES Personnel</u>	Oversee and coordinate all health and safety aspects from the project site

## 3.0 OSHA TRAINING REQUIREMENTS

### 3.1 GENERAL TRAINING REQUIREMENTS

All personnel performing activities covered by this plan must be trained in accordance with the requirements of 29 CFR 1910.120(e). The Project Manager will verify and document that all GES personnel meet the applicable training requirements prior to the start of site work, including:

- OSHA 1910.120 initial 40-hour training
- OSHA annual eight-hour refresher training within the last year
- OSHA eight-hour supervisory training for on-site managers and supervisors and GES requirements
- At least one GES employee will have American Red Cross (or equivalent) first aid and CPR training, and will be present on-site at all times

Documentation for training certification will be maintained by the Local HSO.

Subcontractors chosen to perform well drilling, excavation, materials disposal, utility installation in trenches, and any other site activities where the potential exists for contact with contaminants must provide written documentation of HAZWOPER training, for each of his employees who will be involved in activities at this site, before the start of work.

### 3.2 PRE-ENTRY MEETING

A Pre-entry meeting reviewing the Site Specific Health and Safety Plan for all proposed work location personnel shall be held and documented in this HASP and in the site log.

This meeting shall be prior to the commencement of any on-site work activities. A site-specific briefing is provided to all site visitors who enter this site beyond the site entry point. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

### **3.3 FIRST AID/CPR TRAINING**

At least one member of the GES staff assigned to the project will have American Red Cross (or equivalent) First Aid and cardiopulmonary resuscitation (CPR) training. At least one trained individual will be present on-site at all times. The Local HSO will maintain all training documentation.

## **4.0 MEDICAL SURVEILLANCE REQUIREMENTS**

### **4.1 GENERAL MEDICAL SURVEILLANCE REQUIREMENTS**

All personnel performing activities requiring the use of an air-purifying respirator covered by this plan must be active participants in an ongoing medical monitoring program in accordance with the requirements of 29 CFR 1910.120(f). Subcontractors chosen to perform selected site activities must provide written documentation of such, for each employee who will be involved in activities at this site, before the start of work.

### **4.2 DRUG AND ALCOHOL COMPLIANCE**

All personnel performing activities covered by this plan must have had a negative drug and alcohol screen performed within the last 12 months.

### **4.3 ACCIDENT / INCIDENT MEDICAL SURVEILLANCE**

As a follow-up to a work-related injury, all employees are entitled and encouraged to seek medical attention. All accidents and potential exposures must be reported **immediately** to the Local HSO, who will coordinate with CHSSE to arrange for appropriate medical attention. Depending on the type of incident, it may be critical to perform tests within 24 to 48 hours. *Failure to report an injury or incident immediately will result in disciplinary action.* The *GES Incident/Injury Case Management Procedure* can be found in **Attachment G**.

Events surrounding near-miss accidents/injuries will be recorded in the daily log and documented in accordance with the GES Incident Reporting Procedures.

## 5.0

## HAZARD ASSESSMENT

**Job Safety Analyses (JSAs) are required for all appropriate site activities. Each JSA must identify and quantify the health and safety hazards associated with each task and site operation, and to evaluate risks to workers. Using this information, appropriate control methods are selected to mitigate or (preferably) eliminate the identified risks.**

### 5.1 CHEMICAL HAZARDS

#### 5.1.1 Contaminant Characterization and Potential Routes of Exposure

The main routes of exposure for field personnel include:

- Inhalation of contaminant vapors;
- Inhalation of contaminated particulate matter;
- Ingestion of contaminated material; or
- Dermal absorption of contaminated material.
- Injection of contaminated material

Site personnel can reduce their exposure potential by:

- Using the proper PPE;
- Practicing contamination avoidance;
- Following proper decontamination procedures; and
- Observing good personnel hygiene.

#### 5.1.2 General Chemical Data

In order to protect site personnel from the hazards associated with site contaminants of concern found during projects at GES Sites, an Exposure Monitoring Program will be implemented to control potential chemical exposures. **Attachment B** contains this program along with data tables on the contaminants of concern. These tables provide information on each contaminant's characteristics, such as routes of exposure, health hazards, ionization potentials, exposure limits, etc. All hazardous chemicals brought on-site by GES personnel or its subcontractors will be managed in accordance with 29 CFR 1910.1200 and the GES Hazard Communication Program. This will include: proper labeling, an inventory list of all hazardous materials brought onsite, and a copy of each chemical's Material Safety Data Sheet (MSDS) will be maintained on-site. **Attachment C** contains MSDSs of hazardous substances generally used by GES personnel.

## 5.2 PHYSICAL HAZARDS

A variety of physical hazards may be present, but these hazards are similar to those associated with any field project.

### 5.2.1 Slips/Trips/Falls/Cuts

- \* Utilize proper housekeeping practices, such as removal of debris and tools from the work area to keep the area clear of trip hazards.
- \* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.
- \* Replace manhole covers securely to prevent tripping and vehicle accidents.
- \* Use hose cutters when cutting piping.
- \* Walkways and work spaces will be kept clear of cords, hoses, pipes, etc. that cause trip hazards.
- \* If trip hazards cannot be removed from the work area, they shall be taped down and cones shall be placed to identify the hazard.

### 5.2.2 Excessive Noise

- \* Use hearing protection during loud mechanical operations such as drilling, Geoprobng and excavating operations, inside a remedial shed when equipment is operating loudly or in other high decibel situations in accordance with the *GES Hearing Protection Policy*.

### 5.2.3 Airborne Particulate (ears, eyes, nose, mouth, inhalation)

- \* Eye protection is to be worn at all times on site.
- \* Respiratory protection is to be worn when site activities cause excessive particulates, such as performing carbon change-outs.

### 5.2.4 On-site Traffic

- \* Safety vest shall be worn and safety cones placed around the worksite as specified in the *GES Traffic Control Procedures*.
- \* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

### 5.2.5 Ladder Safety

- \* Ladders must be inspected prior to use. Any damaged ladder will be discarded immediately.
- \* Painted ladders are forbidden.
- \* Never stand on the top step of the ladder.
- \* Extension ladders must extend 36" beyond work area.

- \* Pitch ladders at a 4:1 ratio.
- \* Extension and straight ladders must be tied off.
- \* Fall protection must be worn when working at heights six (6) feet or more above ground.

### 5.2.6 Air Compressor

- \* Eye protection is to be worn at all times on site.
- \* Hot steam will burn skin upon contact.
- \* Use proper pressure relief valves before performing O&M on an air compressor.

### 5.2.7 Electrical

- \* Inspect all electrical equipment and extension cords prior to use.
- \* All electrical circuits and equipment must be grounded in accordance with the NEC regulations.
- \* Spark producing equipment is not to be used in operating remedial system sheds.
- \* Lockout/Tagout procedures will be in effect if equipment is to be repaired. Refer to the *GES Lockout Tagout Procedures* for full details.
- \* Use three-pronged plugs and heavy-duty extension cords.
- \* A GFCI is required when using an extension cord.
- \* Workers must not have wet hands or be standing in water while plugging/unplugging energized equipment.
- \* **Plugs and receptacles will be kept out of water (unless they are approved for submersion).**

### 5.2.8 Power Tools

- \* Equipment will be inspected for defects prior to use.
- \* Eye protection is to be worn at all times on site.
- \* Employees using tools that may subject their hands to an injury, such as cuts, abrasions, punctures, or burns will wear protective gloves.
- \* Loose or frayed clothing, dangling jewelry, or loose long hair will not be worn when working with power tools.
- \* A GFCI will be used with all power tool operations.
- \* Shielding or guarding will be in effect if applicable.

### 5.2.9 Back Strain

- \* Utilize proper lifting procedures when loading and unloading heavy equipment.
- \* Bend down at the knees rather than bending the back.
- \* Use a mechanical lifting device or a lifting aid such as hand carts, drum dollies or lift gates when lifting heavy objects.

### 5.2.10 Site Security

- \* Do not permit anyone who is not properly trained and outfitted with the appropriate PPE to enter the Exclusion or Contamination Reduction Zones (this includes GES personnel, clients, etc.)
- \* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.
- \* On sites where it is believed that security is an issue, two employees will be used for all field work. The “buddy-system” will be in place and the two employees will be in constant communication and within each others line of sight. There will be a cellular phone available to call 911 if a violent condition presents itself.
- \* When acts of violence occur or when an employee(s) feels that they are being placed in a threatening position they must immediately leave the site.
- \* All potential acts of violence or threats by non-GES personnel must be immediately reported to the Site Operations Manager and the Local Health and Safety Officer. The situation will be discussed to determine future action on the site in question.
- \* If any GES employee notices suspicious persons or activities in a GES office or in the vicinity of a work area, he or she should immediately report the observation to his or her supervisor or Site Operations Manager.

### 5.2.11 Biological Hazards (insects, snakes, poisonous plants and animals)

- \* Do not touch or contact poisonous plants, such as poison ivy/poison oak.
- \* If available, apply an over-the-counter barrier cream, such as Ivy Block® to prevent contact with plant oils.
- \* Wash hands and arms immediately with soap and water if skin contacts the plants.
- \* Wear long pants with socks pulled over legs to prevent skin contact with plants and insects.
- \* Inspect yourself carefully for insects or ticks after being outdoors.
- \* Spray any wasp/hornet nests with an insect repellent from a safe distance recommended by the product’s manufacturer.
- \* **Do not antagonize snakes or wild animals.**

### 5.2.12 Heat Stress

- \* Know and recognize the signs and symptoms of heat-related illnesses, as follows:
  - Heat cramps
  - Heat exhaustion:
    - Cool, moist, pale, or flushed skin
    - Headache
    - Nausea

- Dizziness, weakness and exhaustion
- Heat stroke:
  - Red, hot, dry, skin
  - Changes in consciousness
  - Rapid, weak pulse
  - Rapid, shallow breathing
- \* Adjust work schedules to provide time intervals for intake of juices, juice products and water in an area free from contamination.

### **5.2.13 Cold Stress**

- \* Know and recognize the signs and symptoms of cold-related illnesses, as follows:
  - Frostbite:
    - Lack of feeling in the affected area
    - Skin that appears waxy, is cold to the touch or is discolored (flushed, white, yellow or blue)
  - Hypothermia:
    - Shivering
    - Numbness
    - Glassy stare
    - Apathy
    - Loss of consciousness
- \* Have appropriate clothing available and dress in layers to protect against cold weather.
- \* Adjust work schedules to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather.

### **5.2.14 Confined Space (CS) Entry**

- \* Confined Space Entry is prohibited unless authorized by the project manager or local health and safety officer.
- \* The *GES Confined Space Entry Requirements* must be followed, including but not limited to air monitoring, presence of attendant and permit completion.

### **5.2.15 Fall Hazards**

- \* OSHA-approved man-lifts and ladders will be used for access to elevated locations.
- \* Employees must wear a safety belt with a lanyard attached to the boom or basket when working from a man-lift.
- \* If the elevated location is inaccessible by a man-lift, CHSSE shall be contacted to determine the appropriate fall protection.
- \* Complete details are found in the *GES Fall Protection Program*.

### **5.2.16 Hot Work**

- \* A hot work permit will be completed prior to the start of the work.
- \* The Site Supervisor will conduct a safety briefing on hot work rules and procedures, and all hot work participants will sign the permit.
- \* Hot work will not be performed if there is a possibility of an explosive atmosphere or an oxygen-enriched atmosphere.
- \* The Site Supervisor will designate a person for fire watch duty, who will have access to a properly rated fire extinguisher and will remain on-duty for one-half hour after the hot work is complete.
- \* All hot work equipment will be inspected daily, prior to use. If the equipment is found to be defective, it will be removed from the site, or tagged with a "Do Not Use" sign until it is repaired.
- \* All welding and cutting personnel will be trained in the safe operation of their equipment.
- \* Refer to the *GES Hot Work Requirement Policy* for complete details.

## **5.3 RADIOLOGICAL HAZARDS**

If site-specific potential radiological information becomes available, the hazards will be addressed in an addendum to the HASP. Ionizing Radiation action levels can be found in **Attachment B, Table 2.**

## **6.0 SITE CONTROL MEASURES**

### **6.1 SITE ZONES**

A controlled work area should be established in the immediate vicinity of the site activities covered by this plan. Only those persons who can comply with the requirements of this plan should be allowed into this area during any work activities, which may result in exposure to the hazards associated with the specific task being performed. The work site should be marked off with at least the following items from the GES Traffic Control Procedures: Four (4) traffic cones with flags reaching 70 inches in combined height, caution tape, two (2) work area signs or barricades at the site entrances and a flashing amber light on the company vehicle.

When activities involve invasive activities on sites in which the Project Manager, Local HSO or the CHS have determined the area to be highly-contaminated, a three-zone system will be used to control the potential spread of contamination.

These zones are characterized by the presence or absence of chemical and biological hazards and the activities contained within them.

Zone boundaries should be clearly marked at all times and the flow of personnel among the zones must be controlled. The site should be monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean areas. Whenever boundaries are adjusted, zone markings must also be changed and workers immediately notified of the change.

For the purpose of this plan, the following definition of terms is provided:

**Exclusion Zone** - The immediate area of the work activity to be performed or an area fully enclosing the hazards present. Personnel and equipment will enter and exit the Exclusion Zone from the designated access points in the Contamination Reduction Zone (CRZ).

**Contamination Reduction Zone** - The transition area between the contaminated and uncontaminated area. Based on monitoring results, the CRZ boundaries may be adjusted to ensure that the Support Zone remains uncontaminated. Workers and equipment exit the Exclusion Zone through the designated access point(s) into the CRZ. Workers and equipment are then decontaminated in the CRZ, according to the procedures specified in the Decontamination section of this HASP. Workers and equipment then exit the CRZ into the Support Zone through the designated access points.

If necessary, emergency decontamination procedures are implemented. Emergency decontamination procedures are described in **Section 9.2** of this HASP and in **Attachment H** (if necessary).

**Support Zone** - The Support Zone is the clean area of the site, beyond the outer boundary of the CRZ. There should be no contamination in this zone. Administrative, clerical, and other support functions are based in the Support Zone.

Air and surface monitoring are conducted in the Support Zone as needed to ensure that it remains uncontaminated. If contamination is detected, zone boundaries are adjusted until corrective action is taken and monitoring results indicate that this zone is again uncontaminated.

## **6.2 COMMUNICATIONS**

Emergency numbers are listed on the cover of this HASP. Work will not be conducted on-site without access to a telephone, site personnel will be informed of its location. If a telephone is not available on site, a cell phone will be made available for emergency use.

## **7.0**

# **PERSONAL PROTECTIVE EQUIPMENT**

## **7.1 GENERAL**

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices, and PPE are used to protect employees.

The level of protection worn by site personnel will be enforced by the Site Supervisor. Levels of protection may be upgraded or downgraded at the discretion of the Local HSO, or CHS, based on real-time air monitoring data and prior site experience. Any changes in the level of protection will be documented. Levels of protection less than those designated in this HASP must first be approved by the Corporate HSSE Department.

## **7.2 LEVEL D PROTECTION**

Level D PPE provides minimal protection against chemical hazards. A respirator is not required. Level D PPE includes:

- Cotton coveralls or long pants and a shirt with sleeves
- Reflective safety vest or hi-visibility shirt.
- Safety glasses
- Steel-toe/steel-shank work boots
- Work gloves
- Hearing protection (as required by task)
- Hard Hat (as required by task)
- Chemical resistant gloves (as required by task)

## **7.3 MODIFIED LEVEL C PROTECTION**

Modified Level C PPE includes the items listed in Section 7.2 above, and the following items:

- Full-face APR or Half-face APR respirator equipped with the appropriate chemical cartridges

## **7.4 LEVEL C PROTECTION**

Level C PPE provides a higher level of respiratory and skin protection against chemical hazards than Level D. Level C PPE includes the items listed in Section 7.2 above, and the following items:

- Poly-coated Tyvek (yellow) or Saranex® (shiny white)
- Steel-toe/steel-shank work boots and chemical resistant over-boots, or chemical resistant steel-toe/steel shank boots
- Chemical resistant inner gloves
- Chemical resistant outer gloves
- Seal arm, leg, and zipper joints with tape, as required
- Half-face or full-face, air-purifying respirator equipped with appropriate cartridges

## **7.5 LEVEL A AND B PROTECTION**

Level A PPE should be worn when the highest level of respiratory and skin protection is needed, or if the contaminants of concern are unknown. Level B PPE should be worn when the highest level of respiratory protection is required, but a lesser level of skin protection is needed. The tasks covered under this HASP do not require the use of Level A or B PPE.

Separate Health and Safety Plans will be developed for Level A/Level B investigations and for Emergency Responses, which may involve the use of Level A and/or Level B health and safety measures.

## **8.0 DECONTAMINATION**

### **8.1 GENERAL**

At a minimum, the procedures outlined below shall be followed for decontamination:

- Remove gross contamination from tools, respirator, monitoring equipment, boots, etc., prior to leaving the “exclusion zone”, using paper towels, handi-wipes, etc.
- Completely decontaminate soiled equipment in the Contamination Reduction Zone using detergent and water and dispose of all cleaning materials as follows.
  1. Due to the small quantity of waste generated during decontamination, it is allowable in most states to dispose of lightly contaminated materials in the site dumpster. It is important, however, to ensure that there is no chance of vapor generation or fluid leaking from the dumpster. At no time are materials containing free product to be disposed of in this manner. In this case, arrangements must be made for use of labeled drums and proper disposal.

2. All decontamination materials including protective sheeting, rags, sorbents, disposable personal protective equipment, and decontamination fluids should be carefully screened with a Photo-ionization Detector (PID) prior to disposal to determine relative levels of contamination.
3. Lightly contaminated decontamination fluids should either be treated via the site treatment system prior to discharge or disposed of via the sanitary sewer system. Highly contaminated decontamination fluids must be stored in labeled drums and proper disposal arrangements must be made.

**Note:** All Federal, State, County and/or City requirements regarding disposal must be complied with. Below - document specific requirements.

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- Dispose of contaminated gloves, Tyvek suits, used cartridges, paper towels, etc., by placing in a plastic bag and discarding in accordance with applicable standards.
- Wash hands and face thoroughly with soap and water before lunch or coffee breaks, and as soon as practical after finishing work for the day.
- Particular care should be taken to protect any skin injuries. If open wounds exist on hands or forearms, handling chemicals should be restricted or eliminated.
- Shower as soon as possible.
- A site-specific decontamination plan (if required) is located in **Attachment H**.

## **9.0 EMERGENCY ACTION PLAN**

### **9.1 PERSONAL INJURY WITHIN THE EXCLUSION ZONE**

Site operations shall be temporarily halted and all site personnel shall assemble in the Contamination Reduction Zone. The Site Supervisor shall evaluate the nature of the injury and, if indicated by the hazards present on site, the injured person shall be decontaminated to the extent possible prior to movement to the Support Zone.

Contact shall be made for an ambulance and with the designated medical facility (if required). An individual certified in Standard First Aid and Adult CPR may choose to initiate the appropriate first aid. No persons shall reenter the Exclusion Zone until:

- a. The conditions resulting in the emergency have been corrected;
- b. The hazards have been reassessed;
- c. The Site Safety Plan has been reviewed; and
- d. Site personnel have been briefed on any changes in the Site Safety Plan.

## **9.2 PERSONAL INJURY WITHIN THE DECONTAMINATION ZONE**

The Site Supervisor shall evaluate the nature of the injury and, if indicated by the hazards present on site, the injured person shall be decontaminated to the extent possible prior to movement to the Support Zone.

Contact shall be made for an ambulance and with the designated medical facility (if required). An individual certified in Standard First Aid and Adult CPR may choose to initiate the appropriate first aid.

If the injury increases risk to other site workers, all site personnel shall move to the Contamination Reduction Zone and site activities will stop until the risks can be assessed and either removed or minimized.

## **9.3 PERSONAL INJURY WITHIN THE SUPPORT ZONE**

The Site Supervisor will assess the nature of the injury and determine if the cause of injury or loss of the injured person will affect continuation of site operations. If the injury will not affect the safety or performance of other site workers, operations may continue, with the person certified in first aid initiating the appropriate first aid and necessary follow up as stated above.

If the injury increases risk to other site workers, all site personnel shall move to the Contamination Reduction Zone and site activities will stop until the risks can be assessed and either removed or minimized.

## **9.4 FIRE/EXPLOSION**

If a fire is observed in the incipient phase (i.e., when it begins) and if the site personnel witnessing the fire feel secure in attempting to control the fire, the individual can attempt to extinguish the fire by using the onsite fire extinguisher. The fire extinguisher should be a 10 or 20 pound (lb) dry chemical, Class A, B, and C extinguisher and is adequate for paper and wood based products (A), flammable and combustible liquids (B), and electrical (C) type fires.

If there is no fire extinguisher available or if site personnel do not feel secure in attempting to extinguish the fire, site personnel shall perform the following:

- Secure the site, if possible.
- Evacuate the area using the nearest safe pathway from the area.
- Proceed to the nearest phone and call 911 and provide the emergency operator all required information. This will activate the emergency response system.

If more than one individual is on the site team, the individual activating the evacuation plan shall verbally communicate to the other site personnel that there is an emergency condition and that they should evacuate from the work area. If contact cannot be made verbally with the other site personnel, any of the following systems can be used as long as the system is audible above background noise. The system can be the site vehicle horn, a whistle, an air horn, or other acceptable device. The system used for initiating an evacuation from the site shall be discussed during the tailgate meeting with the other site personnel prior to beginning the workday. The system that is decided upon shall be documented in the site logbook.

If an explosion or other unsafe condition occurs that the site supervisor had determined will place the other site personnel at risk, then the evacuation system described above should be activated immediately.

## **9.5 PERSONAL PROTECTIVE EQUIPMENT FAILURE**

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor that person and his/her buddy, if applicable,

shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

## **9.6 EQUIPMENT FAILURE**

If any other equipment on site fails to operate properly, the Site Supervisor shall be notified and then determine the effect of this failure on continuing operations. If the failure will affect the safety of personnel, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions are taken.

## **10.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES**

### **10.1 WORK PERMITS**

Work permits will be required for Confined Space Entry, and Hot Work. These permits must be obtained from the Local Health and Safety Officer prior to site work.

### **10.2 GENERAL SITE RULES**

The following general site rules apply to all personnel while on the site:

- Before daily site operations begin, the daily site safety checklist will be completed, the subcontractor's training documentation will be reviewed (as required by section 3 of this plan), and a pre-entry briefing will be held to review the site's health and safety plan concerns and emergency procedures. This meeting will be registered in this Health and Safety Plan. Attendance will be documented.
- One site worker will be assigned to keep the daily log for all health and safety-specific site activities, unless otherwise specified.
- All personnel will wear steel-toe safety boots. Hard hats will be worn when working near heavy equipment (drill rigs, excavating equipment, etc.), when individuals are working overhead, when required in the Job Safety Analysis (JSA), or when required by the client.
- Eye protection and high visibility clothing/reflective safety vests will be

worn at all times while on site.

- Possession of alcohol or illegal substances on the job site or consumption during hours of site operations is strictly prohibited.
- Food and/or beverages are not permitted in the site's Exclusion or Contamination Reduction Zones. Food and/or beverages will be permitted in the Support Zone, if proper decontamination procedures are being followed.
- Smoking is not permitted on site. Chewing tobacco, snuff, application of cosmetics and/or lip balm is not permitted in the site's Exclusion or Contamination Reduction Zones.
- A change in level of protection will be based on air monitoring equipment readings taken in the breathing zone.
- Field personnel will use air monitoring equipment and not their nose to determine site contamination (i.e., sniffing sampled soils or water in jars, confined spaces, open bore holes or trenches, etc.). Odors detected during the course of standard operating procedures, however, should be noted in the daily log.
- Field personnel should not stand with their head directly over a well when it is being opened.
- First Aid Kit(s) and Fire Extinguisher(s) will be available in all company vehicles and/or within 50 feet of the working area.

**Note: Hot work activities require that a person onsite shall act as a fire watch with a Class A, B, C dry chemical extinguisher within 10 feet of the activity, and all necessary work requirements are satisfied.**

Any revisions to the final Site-Specific Health and Safety Plan must be reviewed by the Project/Case Manager and approved by the Local Health and Safety Officer or a Principal Hydrogeologist, at a minimum.

### **10.3 ADDITIONAL STANDARD OPERATING SAFETY PROCEDURES**

See Attachments.



ATTACHMENT A

SITE MAPS

Butternut Road Release location

Butternut Grove Rd

1003

87



300 ft



ATTACHMENT B

EXPOSURE MONITORING PROGRAM  
FOR THE CONTAMINANTS OF CONCERN

## EXPOSURE MONITORING PROGRAM

### REAL-TIME MONITORING

Photo-ionization Detector (PID): Real-time monitoring for volatile organic compounds (VOCs) will be conducted using a photo-ionization detector (PID). The PID will be used to monitor employee breathing zones during all invasive activities. **Table 1** lists PID action levels and response requirements

Combustible Gas Indicator/Oxygen Level Meter: Real-time monitoring for combustible gases and oxygen levels will be conducted using a Combustible Gas Indicator (CGI)/Oxygen Level Meter. The CGI will test for the presence of combustible gases by continuously monitoring the lower explosive limit (LEL) of organic vapors. The CGI will be used to monitor the LEL prior to, and during, Confined Space (CS) entries and during work near an excavation in contaminated soil. The Oxygen Level Meter will detect an oxygen-deficient or oxygen-enriched atmosphere, and will be used prior to, and during, all CS entry activities. If ionizing radiation is suspected at a site, a Geiger counter will be used to measure exposure under guidance of a Health Physicist. **Table 2** lists CGI, Oxygen Level Meter, and ionizing radiation action levels and response requirements.

Depending on the Contaminants of Concern, other forms of real-time monitoring equipment may be required to quantify chemical hazards and protect workers from exposure. These may include, but are not limited to bio-aerosol monitors, detector tubes, dust monitors, etc.

- Calibration of Real-Time Monitoring Equipment: Monitoring and calibration protocols will be performed in accordance with the manufacturer's guidelines. Calibration will be performed, at a minimum, prior to each day's use.
  
- Calibration logs will be maintained by the Local HSO.

### ACTION LEVELS

Tables 1 and 2 list the action levels and response requirements for a PID and CGI/Oxygen Level Meter. Changing levels of protection, upgrading respiratory protection, or changing work practices is based on maintaining the upper limit of the action level for approximately 10 minutes sustained in the breathing zone (i.e., a non-transient reading) or at the discretion of the Site Supervisor. If changes in protection levels are required, the Site Supervisor will first notify the Local HSO or the CHS to determine if administrative or engineering controls can be implemented to mitigate or eliminate the hazard.

Table 1 provides action levels that must be complied with when petroleum products such as gasoline are the known site contaminants. If the site contains other potential site contaminants, appropriate action levels must be determined based on established chemical exposure limits and monitoring instrument response factors.

<b>TABLE 1 OVM ACTION LEVELS</b>	
<b>Meter Response (Breathing Zone)</b>	<b>Action Required</b>
PID response <5 units above background	No respiratory protection required (i.e., Level D)
PID response >5 units above background (Bkgd) and < 50 units above Bkgd.	Stop work. Investigate the cause of elevated VOC measurements. Contact the Project Manager or office and determine if administrative or engineering controls can be implemented to mitigate or eliminate the elevated readings. If not medically qualified to wear respiratory protection, leave work zone. If the elevated readings cannot be reduced below 5 units above background or eliminated, and if medically qualified, fit tested and trained to wear respiratory protection, then upgrade to Modified Level C, half-face respiratory protection.
PID response >50 units and < 250 units above Bkgd.	Stop work. Investigate the cause of elevated VOC measurements. Contact the Project Manager or office and determine if administrative or engineering controls can be implemented to mitigate or eliminate the elevated readings. If not medically qualified to wear respiratory protection, leave work zone. If the elevated readings cannot be reduced below 5 units above background or eliminated, and if medically qualified, fit tested and trained to wear respiratory protection, then upgrade to Modified Level C, full-face respiratory protection.
PID response > 250 above Bkgd.	Retreat from site*

\*Note 1: If a retreat becomes necessary, the Local HSO, CHSSE or Regional Engineering will be consulted in regard to adding mechanical ventilation or possible changes in work practices. Work will not resume until appropriate corrective measures are implemented.

\*Note 2: Because direct reading instruments cannot indicate or are not compound specific, concentrations shown on the instruments shall be related to units above background and not parts per million (ppm).

<b>TABLE 2</b>	
<b>CGI/O2/RADIATION LEVEL ACTION LEVELS</b>	
Meter Response	Action
CGI response < 10 % LEL	Continue normal operations.
CGI response > 10 % and <20 % LEL	Eliminate all sources of ignition from the work area; implement continuous monitoring. However if work is being done in a confined space, retreat from work area.*
CGI response > 20 % LEL	Discontinue operations; allow to vent; retreat from work area.*
Oxygen level < 19.5%	Retreat from work area.*
Oxygen level > 23.5%	Retreat from work area.*
3X background to <2 mR/hr	Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible source(s) radiation present. Continue investigation with caution. Perform thorough monitoring. <b>Consult with a health physicist.</b>
>2mR/hr	Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of a health physicist

**\*Note 1:** If a retreat becomes necessary, the Local HSO, CHSSE or Regional Engineering will be consulted in regard to adding mechanical ventilation or possible changes in work practices. Work will not resume until appropriate corrective measures are implemented.

**TABLE 3  
RETAIL PETROLEUM MATERIALS OF CONCERN**

<b>Contaminant</b>	<b>OSHA TWA (ppm)</b>	<b>ACGIH TLV (ppm)</b>	<b>Hazards</b>	<b>Entry Routes</b>	<b>IP</b>
Benzene	1	10	1,2,4,5,6,9	Inh, Abs, Ing, Con	9.24
Xylene	100	100	1,2,3,4,5,6,7,10	Inh, Abs, Ing, Con	8.56
Ethylbenzene	100	100	1,2,3,10	Inh, Ing, Con	8.76
Toluene	200	50	1,2,3,4,5,7,10	Inh, Abs, Ing, Con	8.82

TWA = Time Weighted Average in parts per million (ppm)

C = Ceiling

IP = Ionization Potential

1 = irritant to skin

2 = irritant to eyes

3 = irritant to respiratory system

4 = may cause headache

5 = may cause dizziness, lightheadedness

6 = may cause nausea and vomiting

7 = may cause liver and kidney damage

8 = irritant to GI tract

9 = carcinogen/possible carcinogen

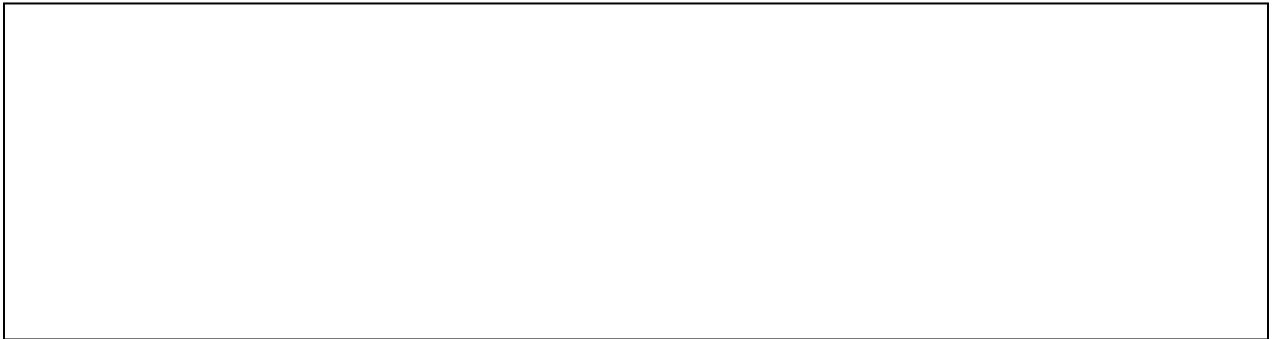
10 = may cause damage to CNS

TABLE 4 *INORGANIC GASES AND VAPORS OF CONCERN					
Contaminant	OSHA TWA (ppm)	ACGIH TLV (ppm)	Hazards	Entry Routes	IP
<p>TWA = Time Weighted Average in parts per million (ppm)  C = Ceiling  IP = Ionization Potential</p> <p>1 = irritant to skin  2 = irritant to eyes  3 = irritant to respiratory system  4 = may cause headache  5 = may cause dizziness, lightheadedness</p> <p>6 = may cause nausea and vomiting  7 = may cause liver and kidney damage  8 = irritant to GI tract  9 = carcinogen/possible carcinogen  10 = may cause damage to CNS</p>					

**\*Notes:** Consult standard reference manuals for air concentration/toxicity data. Action level depends on PEL/REL/TLV.

These Action Levels, if not defined by regulation, is some percent (usually 50%) of the applicable PEL/REL/TLV. That number must also be adjusted to account for instrument response factors.

ATTACHMENT C  
SITE SAFETY DATA SHEETS (SDS)



## SECTION 1: IDENTIFICATION

### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Natural Gasoline

**Synonyms:** Petanes, Pentanes Plus, Field Condensate, Drip Gas

**Chemical Family:** Alkanes

**Formula:** C5 - C8

### 1.2. Intended Use of the Product

**Use of the substance/mixture:** No use is specified.

### 1.3. Name, Address, and Telephone of the Responsible Party

SUNOCO PARTNERS MARKETING & TERMINALS, L.P.

3807 West Chester Pike

Newtown Square, PA 19073

### 1.4. Emergency Telephone Number

**Emergency Number** : CHEMTREC: (800) 424-9300/ (703) 527-3887

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the Substance or Mixture

#### Classification (GHS-US)

Flam. Liq. 1 H224

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Muta. 1B H340

Carc. 1A H350

STOT SE 3 H336

STOT SE 3 H335

STOT RE 1 H372

Asp. Tox. 1 H304

Full text of H-phrases: see section 16

### 2.2. Label Elements

#### GHS-US Labeling

#### Hazard Pictograms (GHS-US)



#### Signal Word (GHS-US)

: Danger

#### Hazard Statements (GHS-US)

: H224 - Extremely flammable liquid and vapor.  
 H304 - May be fatal if swallowed and enters airways.  
 H315 - Causes skin irritation.  
 H319 - Causes serious eye irritation.  
 H335 - May cause respiratory irritation.  
 H336 - May cause drowsiness or dizziness.  
 H340 - May cause genetic defects.  
 H350 - May cause cancer.  
 H372 - Causes damage to organs through prolonged or repeated exposure.

#### Precautionary Statements (GHS-US)

: P201 - Obtain special instructions before use.  
 P202 - Do not handle until all safety precautions have been read and understood.  
 P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.  
 P233 - Keep container tightly closed.  
 P240 - Ground/bond container and receiving equipment.  
 P241 - Use explosion-proof electrical, ventilating, and lighting equipment.  
 P242 - Use only non-sparking tools.  
 P243 - Take precautionary measures against static discharge.  
 P260 - Do not breathe vapors, mist, or spray.  
 P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.

# Natural Gasoline

## Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

P270 - Do not eat, drink or smoke when using this product.  
P271 - Use only outdoors or in a well-ventilated area.  
P280 - Wear protective gloves, protective clothing, and eye protection.  
P301+P310 - If swallowed: Immediately call a poison center or doctor.  
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304+P340 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.  
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308+P313 - If exposed or concerned: Get medical advice/attention.  
P312 - Call a poison center or doctor if you feel unwell.  
P314 - Get medical advice/attention if you feel unwell.  
P321 - Specific treatment (see section 4 on this SDS).  
P331 - Do NOT induce vomiting.  
P332+P313 - If skin irritation occurs: Get medical advice/attention.  
P337+P313 - If eye irritation persists: Get medical advice/attention.  
P362 - Take off contaminated clothing and wash it before reuse.  
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P403+P235 - Store in a well-ventilated place. Keep cool.  
P405 - Store locked up.  
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

### 2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. . Flammable vapors can accumulate in head space of closed systems. . A significant portion of the mixture consists of a substance capable of producing an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death. Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 – Toxicological Information.

### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Natural Gasoline	(CAS No) 68425-31-0	98 - 100	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H336 STOT SE 3, H335 Asp. Tox. 1, H304
Butane	(CAS No) 106-97-8	0 - 2	Simple Asphy, H380 Flam. Gas 1, H220 Liquefied gas, H280
Benzene	(CAS No) 71-43-2	0 - 1.5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 3, H412 Aquatic Chronic 2, H411

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Full text of H-phrases: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible). IF exposed or concerned: Get medical advice/attention.

**First-aid Measures After Inhalation:** Using proper respiratory protection, immediately move the exposed person to fresh air. Seek medical attention immediately.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Gently wash with plenty of soap and water followed by rinsing with water for at least 15 minutes. Call a POISON CENTER or doctor/physician if you feel unwell. Wash contaminated clothing before reuse.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. Obtain medical attention if irritation persists.

**First-aid Measures After Ingestion:** Rinse mouth thoroughly with water. Do NOT induce vomiting. Seek medical attention immediately.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** May be harmful if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause drowsiness and dizziness. May cause respiratory irritation. May cause genetic defects. May cause cancer. Causes damage to organs through prolonged or repeated exposure. Causes damage to organs.

**Symptoms/Injuries After Inhalation:** May cause respiratory irritation. Symptoms may include: Headache, nasal and respiratory irritation, nausea, dizziness, euphoria, breathlessness, drowsiness, fatigue, hearing loss, pneumonitis, pulmonary edema, cardiac irregularities, central nervous system depression, convulsions and loss of consciousness.

**Symptoms/Injuries After Skin Contact:** Causes skin irritation. Symptoms may include: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

**Symptoms/Injuries After Eye Contact:** Causes serious eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

**Symptoms/Injuries After Ingestion:** The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death. Symptoms may include: headache, nasal and respiratory irritation, nausea, dizziness, drowsiness, euphoria, breathlessness, fatigue, pneumonitis, pulmonary edema, cardiac irregularities, central nervous system depression, convulsions and loss of consciousness. Swallowing a small quantity of this material will result in serious health hazard.

**Chronic Symptoms:** May cause genetic defects. May cause cancer. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Alcohol foam, carbon dioxide, dry chemical.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Extremely flammable liquid and vapor.

**Explosion Hazard:** May form flammable/explosive vapor-air mixture.

**Reactivity:** Reacts with (strong) oxidizers: (increased) risk of fire.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

**Protection During Firefighting:** Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

**Other Information:** Refer to Section 9 for flammability properties.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid breathing (vapor, mist, spray). Avoid all contact with skin, eyes, or clothing. No flames, no sparks. Eliminate all sources of ignition.

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

## 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area. Stop leak if safe to do so. Eliminate ignition sources.

## 6.2. Environmental Precautions

Notify Safety and Environmental personnel. Plan ahead for handling spills. Wear appropriate personal protective. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Do not allow to enter drains or water courses. Contact competent authorities after a spill.

## 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Absorb and/or contain spill with inert material. Collect absorbed material and place into a sealed, labelled container for proper disposal. Do not take up in combustible material such as: saw dust or cellulosic material. Use only non-sparking tools.

## 6.4. Reference to Other Sections

For further information refer to section 13. See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed:** Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Handle empty containers with care because residual vapors are flammable. Hot organic chemical vapors or mists are susceptible to spontaneous combustion when mixed with air, ignition may occur below auto ignition temperature. Ignition temperatures will decrease with increasing vapor volumes, vapor air contact time, and pressure changes. Ignition may occur at elevated-temperature process conditions, especially under a vacuum.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Contaminated work clothing should not be allowed out of the workplace.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Ground/bond container and receiving equipment. Use explosion-proof ventilating, lighting, electrical equipment.

**Storage Conditions:** Store in a cool, dry, well-ventilated place. Keep containers tightly closed. Do not store near heat, flame, or other potential ignition sources. Do not store with oxidizers. Do not store in unlabeled containers. Ground all equipment containing this material. All electrical equipment in areas where this material is stored or handled must meet all applicable requirements of the NFPA's National Electrical Code (NEC). Store and transport in accordance with all applicable laws. Detached outside storage is preferable.

**Incompatible Products:** Strong acids, strong bases, strong oxidizers. Heat sources.

### 7.3. Specific End Use(s)

No use is specified.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Benzene (71-43-2)		
USA ACGIH	ACGIH TWA (ppm)	0.5 ppm
USA ACGIH	ACGIH STEL (ppm)	2.5 ppm
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Confirmed Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (ppm)	0.1 ppm
USA NIOSH	NIOSH REL (STEL) (ppm)	1 ppm
USA IDLH	US IDLH (ppm)	500 ppm
USA OSHA	OSHA PEL (TWA) (ppm)	1 ppm
USA OSHA	OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
USA OSHA	OSHA PEL (Ceiling) (ppm)	25 ppm

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Butane (106-97-8)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	1900 mg/m <sup>3</sup>
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Natural Gasoline (68425-31-0)		
USA ACGIH	PEL	300 ppm
USA NIOSH	STEL	500 ppm
USA NIOSH	TLV	300 ppm

## 8.2. Exposure Controls

### Appropriate Engineering Controls

: Gas detectors should be used when flammable gases/vapors may be released. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Ensure all national/local regulations are observed.

### Personal Protective Equipment

: Full protective flameproof clothing. Insufficient ventilation: wear respiratory protection. Protective goggles. Gloves.



### Materials for Protective Clothing

: Wear suitable protective clothing.

### Hand Protection

: Impermeable protective gloves.

### Eye Protection

: Safety glasses with side shields, or goggles, are recommended.

### Skin and Body Protection

: Wear suitable protective clothing. Chemical resistant suit. Rubber apron, boots.

### Respiratory Protection

: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

### Environmental Exposure Controls

: Do not allow the product to be released into the environment.

### Consumer Exposure Controls

: Do not eat, drink or smoke during use.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Clear, Colorless
Odor	: Mild odor, gasoline-like
Odor Threshold	: No data available
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: 29 - 191 °C (84.2 - 375.8 °F)
Flash Point	: -57 - -46 °C (-70.6 - -50.8 °F)
Auto-ignition Temperature	: 280 - 456 °C (536 - 852.8 °F)
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: 10 - 12 lbs RVP
Relative Vapor Density at 20 °C	: > 1
Relative Density	: No data available
Specific Gravity	: 0.65 - 0.70
Solubility	: Negligible.
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: No data available
Lower Flammable Limit	: 1.4 %

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Upper Flammable Limit** : 7.6 %

**Molecular Weight** : 114

**9.2. Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

**10.1. Reactivity:** Reacts with (strong) oxidizers: (increased) risk of fire.

**10.2. Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).

**10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

**10.4. Conditions to Avoid:** Direct sunlight, extremely high or low temperatures, open flames, sources of ignition and incompatible materials.

**10.5. Incompatible Materials:** Strong acids, strong bases, strong oxidizers. Heat sources.

**10.6. Hazardous Decomposition Products:** Dense smoke may be generated while burning. Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity:** Not classified

Benzene (71-43-2)	
LD50 Oral Rat	3306 mg/kg
LD50 Dermal Rabbit	> 8200 mg/kg
LC50 Inhalation Rat	44.66 mg/l/4h
Butane (106-97-8)	
LC50 Inhalation Rat	30957 mg/m <sup>3</sup> (Exposure time: 4 h)

**Skin Corrosion/Irritation:** Causes skin irritation.

**Serious Eye Damage/Irritation:** Causes serious eye irritation.

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** May cause genetic defects.

**Carcinogenicity:** May cause cancer.

Benzene (71-43-2)	
IARC group	1
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity, Known Human Carcinogens.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
OSHA Specifically Regulated Carcinogen List	In OSHA Specifically Regulated Carcinogen list.

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** May cause drowsiness or dizziness. May cause respiratory irritation.

**Specific Target Organ Toxicity (Repeated Exposure):** Causes damage to organs through prolonged or repeated exposure.

**Aspiration Hazard:** May be fatal if swallowed and enters airways.

**Symptoms/Injuries After Inhalation:** May cause respiratory irritation. Symptoms may include: Headache, nasal and respiratory irritation, nausea, dizziness, euphoria, breathlessness, drowsiness, fatigue, hearing loss, pneumonitis, pulmonary edema, cardiac irregularities, central nervous system depression, convulsions and loss of consciousness.

**Symptoms/Injuries After Skin Contact:** Causes skin irritation. Symptoms may include: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

**Symptoms/Injuries After Eye Contact:** Causes serious eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

**Symptoms/Injuries After Ingestion:** The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death. Symptoms may include: headache, nasal and respiratory irritation, nausea, dizziness, drowsiness, euphoria, breathlessness, fatigue, pneumonitis, pulmonary edema, cardiac irregularities, central nervous system depression, convulsions and loss of consciousness. Swallowing a small quantity of this material will result in serious health hazard.

**Chronic Symptoms:** May cause genetic defects. May cause cancer. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

Benzene (71-43-2)	
LC50 Fish 1	10.7 - 14.7 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

EC50 Daphnia 1	8.76 - 15.6 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	5.3 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
EC50 Daphnia 2	10 mg/l (Exposure time: 48 h - Species: Daphnia magna)

## 12.2. Persistence and Degradability

Natural Gasoline	
Persistence and Degradability	Not established.

## 12.3. Bioaccumulative Potential

Natural Gasoline	
Bioaccumulative Potential	Not established.
Benzene (71-43-2)	
BCF fish 1	3.5 - 4.4
Log Pow	1.83
Butane (106-97-8)	
Log Pow	2.89

12.4. Mobility in Soil No additional information available

## 12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Sewage Disposal Recommendations:** Do not dispose of waste into sewer. Do not empty into drains; dispose of this material and its container in a safe way.

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

**Additional Information:** Empty containers may have traces of flammable residue. Do not expose containers to heat, flames, or ignition sources. EPA Hazardous Waste Number: D001 (Ignitability). EPA Hazardous Waste Number: D018 (Benzene).

## SECTION 14: TRANSPORT INFORMATION

### 14.1. In Accordance with DOT

Proper Shipping Name : HYDROCARBON LIQUID N.O.S. (NATURAL GASOLINE)  
Hazard Class : 3  
Identification Number : UN3295  
Label Codes : 3  
Packing Group : I  
ERG Number : 117



### 14.2. In Accordance with IMDG

Proper Shipping Name : HYDROCARBON LIQUID N.O.S. (NATURAL GASOLINE)  
Hazard Class : 3  
Identification Number : UN3295  
Packing Group : I  
Label Codes : 3  
EmS-No. (Fire) : F-E  
EmS-No. (Spillage) : S-D  
MFAG Number : 117



### 14.3. In Accordance with IATA

Proper Shipping Name : HYDROCARBON LIQUID N.O.S. (NATURAL GASOLINE)  
Packing Group : I  
Identification Number : UN3295  
Hazard Class : 3  
Label Codes : 3  
ERG Code (IATA) : 3H



## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

Natural Gasoline	
SARA Section 311/312 Hazard Classes	Fire hazard

# Natural Gasoline

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

	Immediate (acute) health hazard Delayed (chronic) health hazard
<b>Natural Gasoline (68425-31-0)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Benzene (71-43-2)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on United States SARA Section 313	
<b>RQ (Reportable quantity, section 304 of EPA's List of Lists)</b>	10 lb
<b>SARA Section 311/312 Hazard Classes</b>	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
<b>SARA Section 313 - Emission Reporting</b>	0.1 %
<b>Butane (106-97-8)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

## 15.2 US State Regulations

<b>Benzene (71-43-2)</b>	
<b>U.S. - California - Proposition 65 - Carcinogens List</b>	WARNING: This product contains chemicals known to the State of California to cause cancer.
<b>U.S. - California - Proposition 65 - Developmental Toxicity</b>	WARNING: This product contains chemicals known to the State of California to cause birth defects.
<b>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</b>	WARNING: This product contains chemicals known to the State of California to cause (Male) reproductive harm.
<b>Natural Gasoline (68425-31-0)</b>	
U.S. - Pennsylvania - RTK (Right to Know) List	
<b>Benzene (71-43-2)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List	
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances	
U.S. - Pennsylvania - RTK (Right to Know) List	
<b>Butane (106-97-8)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	

## SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

<b>Revision Date</b>	: 09/02/2015
<b>Other Information</b>	: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

### GHS Full Text Phrases:

Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1A	Carcinogenicity Category 1A
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 2	Flammable liquids Category 2
Liquefied gas	Gases under pressure Liquefied gas
Muta. 1B	Germ cell mutagenicity Category 1B
Simple Asphy	Simple Asphyxiant
Skin Irrit. 2	Skin corrosion/irritation Category 2

# Natural Gasoline

## Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H225	Highly flammable liquid and vapor
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H350	May cause cancer
H372	Causes damage to organs through prolonged or repeated exposure
H380	May displace oxygen and cause rapid suffocation
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

### NFPA Health Hazard

: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

### NFPA Fire Hazard

: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

### NFPA Reactivity

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



### HMIS III Rating

#### Health

: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

#### Flammability

: 4 Severe Hazard

#### Physical

: 0 Minimal Hazard

#### Personal Protection

: J

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

SDS US (GHS HazCom)

ATTACHMENT D

JOB SAFETY ANALYSIS SHEETS AND DAILY SITE SAFETY CHECKLISTS





GES DAILY SITE SAFETY CHECKLIST

Site Name: SXL Butternut Road Release Site
Address:

Individual's Name: Date:

Task and date of entry:

This checklist is to be completed on a daily basis. The date should be noted in the space provided. The employee completing the checklist should verify that each item is correct and initial in the last space provided.

Date:

- 1. Proper training certificates have been obtained from all onsite personnel.
2. The site-specific HASP has been reviewed and signed by GES employees and GES-hired subcontractors.
3. The daily site-safety meeting has been conducted.
4. Applicable JSAs are onsite, reviewed by staff to ensure all tasks/jobs are covered, and site specific JSA modifications occur when needed.
5. Fire extinguishers are available for use and are fully charged.
6. A fully-stocked first aid kit & eye wash bottle is readily available.
7. Any potential tripping hazards have been removed from site.
8. All vessels containing flammable or corrosive material are properly labeled.
9. Proper personal protective equipment is being used for present conditions.
10. Equipment onsite is checked and in safe working order.
11. Safety cones and flags or barricades have been utilized to mark out work area along with all required signage (No Smoking, No Trespassing, Work Area...).
12. No person onsite has the appearance of being under the influence of motor skill altering substances.
13. All workers onsite are clothed in an appropriate manner (highly visible clothing, no tank tops, muscle shirts or shorts).
14. Electrical power-operated tools shall be properly grounded and used with a Ground-Fault Circuit Interrupter (GFCI).
15. All required permits (GES and/or client) are completed by an authorized individual.
16. When working alone, has a phone call been placed to the PM to discuss site conditions, review the Scope of Work, LPS requirements, and coordinate communications for the day? Note: The frequency/ amount of additional calls from the field should be established during the PM's discussion with the individual. A call must always occur prior to leaving the site.
17. Prior to leaving the site for the day, the GES site supervisor has conducted a meeting with onsite staff to review worker conditions (possible injuries), JSA revisions, discuss possible Near Losses/ Losses, and activities scheduled for the next day.
18. All health and safety concerns have been communicated to the Local Health and Safety Officer and Project Manager

Table with 6 columns and 18 rows for checklist verification.

I verify and initial that the above information is correct by initialing in the boxes to the right:

# Job Safety Analysis (JSA)

JSA Title: **Rapid Response Activities**

JSA revision #: **051**

<b>Date Developed:</b> 02/09/2005
<b>Latest Revised Date:</b> 10/29/13
<b>Initiated/Changed by:</b> Steven Mendez Assoc. Env. Sci. / Amy Lambert (LHSO)
<b>Approved by:</b> Tom Baylis - VP HSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b>	<b>Work Location:</b>
<p><b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b></p>	

**REQUIRED PPE:** Gloves: nitrile, Kevlar, leather. Hard Hat: if working in an area with low overhead clearance. Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: highly visible clothing such as orange coveralls or reflective safety vest. Safety Glasses. Safety Shoes: steel-toed.

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Lock Out/ tag Out kit/ Life vest if working by water bodies

Activity/Sequence of Job Tasks List all tasks required to perform a job in the sequence they are carried out.	POTENTIAL HAZARDS	Eliminate – Control – Protect <b>Risk Control Measures</b>
<b>Please ensure that all necessary JSAs associated with your work scope have been identified and reviewed.</b>		
<p><b>A. Assess Potentially Impacted Area</b></p> <p>1. Evaluate surface and groundwater contamination (sampling)</p>	<p><b>1a.</b> Respiratory tract/ skin irritation that could result from exposure to site contaminants</p> <p><b>1b.</b> Blunt force injury to hands/ arms/ feet/ legs that could result from slips/ trips/ and/ or falls.</p> <p><b>1c.</b> Crushing injuries to fingers that could result from placing fingers between manhole rim and manhole cover.</p>	<p><b>1a.</b> Comply with the applicable JSA for groundwater, surface water, soil, or other sampling and working near water ways.</p> <ul style="list-style-type: none"> <li>➤ Restrict any contact with impacted material.</li> <li>➤ Nitrile gloves (in addition to 1a.) must be worn when handling impacted or unknown material.</li> <li>➤ Wear safety glasses/ long pants/ long-sleeved shirt/ steel-toed shoes.</li> </ul> <p><b>1b.</b> Perform SPSA to identify/ avoid/ remove slip/ trip/ fall hazards in walking pathways.</p> <ul style="list-style-type: none"> <li>➤ Pay attention to changes in elevation (slopes, steps, retaining walls, etc.) and choose the paths with the smallest grade change.</li> <li>➤ Replace manhole covers securely to prevent tripping and vehicle accidents.</li> </ul> <p><b>1c.</b> Wear leather work gloves when removing/ replacing manhole cover.</p> <ul style="list-style-type: none"> <li>➤ Start removal of manhole cover using a J-hook.</li> <li>➤ Squat down prior to kneeling to removing the manhole cover. Assume 3-point of contact with ground to complete kneel.</li> <li>➤ Kneel down/ keep back straight/ grip cover firmly/ pull (slide) lid towards you.</li> <li>➤ Do not lift manhole covers. Ask for assistance when moving/ lifting any objet weighing more 50 lbs or that is awkwardly-shaped.</li> </ul>
<p>2. Assess structures/ building if response is for vapors in building</p>	<p><b>2a.</b> Respiratory tract irritation that could result from inhalation of product vapor.</p> <p><b>2b.</b> Respiratory tract irritation/ odor that could result from indoor air quality affected by product odor.</p> <p><b>2c.</b> Fire/explosion that could result from ignition of flammable vapor by use of non-intrinsically safe equipment.</p>	<p><b>2a.</b> Review and understand action levels noted in the HASP.</p> <ul style="list-style-type: none"> <li>➤ Use a PID to monitor (evaluate) the worker's breathing zone and of any enclosure for hydrocarbon concentrations before entering.</li> <li>➤ Ensure that Level C PPE (air purifying respirator/ contaminant-specific filter cartridges/ dermal protection e.g. Tyvek™ suit &amp; booties) are available for potential upgrade.</li> </ul> <p><b>2b.</b> Open doors and windows to vent building.</p> <ul style="list-style-type: none"> <li>➤ If store employees are complaining of adverse health effects (e.g., headache, watery eyes, nausea) ask them to go outside for fresh air.</li> <li>➤ Scan areas of potential vapor intrusions (e.g., crawl space access, electrical breaker box area, floor drains, and any other openings in floor).</li> </ul> <p><b>2c.</b> Use explosion proof blower to move air out of structure.</p> <ul style="list-style-type: none"> <li>➤ Remove/turn off any potential ignition sources (i.e., pilot lights on hot water heaters and furnaces).</li> <li>➤ If vapor levels are above the LEL for gasoline (1.4%); evacuate building.</li> </ul>
<p><b>B. Initial Remediation Efforts</b></p> <p>1. Construction of initial remediation system</p> <p><i>Note: Must comply with applicable JSA for remediation</i></p>	<p><b>1a.</b> Electrocution/ shock/ burns that could result from use of malfunctioning electrical equipment.</p> <p><b>1b.</b> Blunt force injuries to arms/ legs/ torso/ head that could result from falls from</p>	<p><b>1a.</b> Inspect all power tools and electrical cords prior to use.</p> <ul style="list-style-type: none"> <li>➤ Electrical extension cords must be grounded and connected to a ground fault circuit Interruptor (GFCI).</li> <li>➤ LO/TO requirements must be followed (permit completed) when repair or maintenance is intended for energized electrical systems.</li> </ul> <p><b>1b.</b> Inspect ladders prior to use. Damaged ladders must be tagged and removed from service.</p> <ul style="list-style-type: none"> <li>➤ Ladder rungs must be free of ice or other conditions that may lead to slipping.</li> <li>➤ Never stand on or above the top two rungs of a ladder.</li> </ul>

<p>process.</p>	<p>ladders.</p>	<ul style="list-style-type: none"> <li>➤ Ladders must be placed on level ground.</li> <li>➤ Extension and straight ladders must be positioned at a 4 to 1 ratio and secured at the top and bottom of the ladder.</li> <li>➤ Maintain 3-points of contact with ladder while ascending/ descending ladder.</li> </ul>
<p>2. Vapor removal from building</p> <p><b>Note:</b> <i>This may result in airborne particulate, elevated noise, and potential system failure (flying debris).</i></p>	<p><b>2a.</b> Lacerations to eyes that could result from blower kicking up particles during operation.</p> <p><b>2b.</b> Hearing loss/ reduction that could result from exposure to excessive noise.</p> <p><b>2c.</b> Lacerations to skin that could result from contact with high pressure air.</p> <p><b>2d.</b> Skin lacerations/ blunt force injuries caused by being pulled into inlet of operating vacuum equipment.</p>	<p><b>2a.</b> Position yourself out of the potential path of travel of particles/ debris that may be caused to become airborne as a result of blower operations.</p> <ul style="list-style-type: none"> <li>➤ Wear goggles or face-shield &amp; safety glasses to minimize impact from airborne debris kicked up by blower operation..</li> </ul> <p><b>2b.</b> Stay as far away as possible from operating blower.</p> <ul style="list-style-type: none"> <li>➤ Wear ear plugs when approaching or staying close to operating blower.</li> </ul> <p><b>Note:</b> <i>PVC well caps cannot be used with high pressure or vacuum. Only use pressure rated well seals.</i></p> <p><b>2c.</b> Stay as far away as possible from hoses containing high pressure air.</p> <ul style="list-style-type: none"> <li>➤ Make sure "whip checks" have been installed on all pressurized air hoses prior to startup.</li> <li>➤ Wear leather work gloves/ long-sleeved shirt when handling high pressure air hoses.</li> </ul> <p><b>2d.</b> Stay as far away a possible from the inlet of an operating vacuum blower.</p> <ul style="list-style-type: none"> <li>➤ Do not wear baggy clothing in the vicinity of an intake to an operating vacuum blower inlet.</li> <li>➤ Do not approach an inlet to an operating vacuum blower until the blower has been turned off and has stopped rotating.</li> </ul>
<p>On-site edits:</p>		

**Core Safety Expectations**

1. *Always follow Fall Protection standards when working at elevated heights.*
2. *Always follow Written Permit procedures.*
3. *Always follow Lock Out/Tag Out (LOTO) procedures.*
4. *Always follow Critical Device Defeat procedures.*
5. *Always follow written PPE Requirements for the work being performed.*

# Contingency Plan – Site Specific

**JSA Title: General Site Activities**

<b>Date Developed:</b> 11/01/2004
<b>Latest Revised Date:</b> 10/27/2013
<b>Initiated/Changed by:</b> Jaime Pena (tech)/ Alfonso Munoz (LHSO)
<b>Approved by:</b> Maurice W. Baron, Jr. Regional HSSE - SE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 6	<b>Work Location:</b>
<b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b>	

**REQUIRED PPE:** Gloves: nitrile, Kevlar (Level II), leather. Hard Hat, Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: Tyvek, Long sleeve, highly visible shirt and coveralls can include reflective safety vest. Safety Glasses. Safety Shoes: steel-toed (ASTM F-2413).

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Wheel chocks/ Cones/ Flags/ Caution tape/ Snow shovel/ Temporary ramps

Activity/Sequence of Job Tasks	HAZARDS	Eliminate – Control – Protect Risk Control Measures
<b>Please ensure that all necessary JSAs associated with your work scope have been identified and reviewed.</b>		
<p><b>1. Set up site control (traffic control)</b></p> <p><i>Note: If electrical utilities must be de-energized and locked and tagged out of service, a thorough evaluation must be conducted of the work area to ensure that all electrical service that is required to be de-energized has been de-energized and that no one remains exposed to hazardous electrical energy.</i></p>	<p><b>1a.</b> Blunt force injuries to arms/ legs/ torso that could result from getting stuck by a vehicle.</p> <p><b>1b.</b> Electrocution/ burns or blunt force injury to head/ arms/ torso that may be caused by contacting overhead electrical lines or causing object overhead to fall onto personnel. a</p> <p><b>1c.</b> Blunt force injury to arms/ hands/ legs/ feet that could result from parked vehicles/ equipment moving unexpectedly.</p>	<p><b>1a.</b> Wear highly visible clothing such as orange reflective traffic vests or clothing.</p> <ul style="list-style-type: none"> <li>➤ Utilize cones/barricades/safety fence to establish the work zone – use minimum 4 cone/flag combination (min 70" tall) at 4 corners of work zone. Cone spacing = 5ft. install caution tape around cones on 3 sides of work area.</li> <li>➤ Establish access points to work zone to keep pedestrians and non-project related traffic out. Do not permit unauthorized individuals access to the work zone. Inform facility personnel of work (restricted) area.</li> </ul> <p><b>1b.</b> A spotter must be used when vehicles, including construction vehicles, are backing/ moving onsite to ensure a safe pathway.</p> <ul style="list-style-type: none"> <li>➤ Before vehicle movement, a discussion must be held with each designated spotter to inform them of their responsibilities/ hand signals to be used for directing equipment operators/ to ensure they are aware of any unique site conditions/ concerns.</li> <li>➤ Before moving any vehicle, close all racks/ doors/ toolboxes/ tailgates to prevent contact with objects/ personnel &amp; to prevent items from falling out during transport.</li> <li>➤ If there is no spotter, the driver must get out and walk around the vehicle prior to backing.</li> <li>➤ Spotters must look up ensuring there are no overhead wires/ structures that can be struck and ensure they can be cleared safely.</li> <li>➤ Look down to identify unusual depressions, holes, or debris that may interfere with backing.</li> <li>➤ Back slowly. Look into rear view mirrors frequently.</li> <li>➤ If backing vision is obscured, stop the vehicle every few feet/ dismount/ recheck the backing route.</li> <li>➤ Constantly watch for other vehicles/ pedestrians to appear unexpectedly in the path of travel alert while backing.</li> </ul> <p><b>Note:</b> Do not permit truck drivers to exit their vehicle cab. Drivers needing to exit vehicles must be escorted by GES or subcontractor staff/ taken to a designated (safe) area onsite and remain there until the truck is loaded and is able to leave the site.</p> <p><b>1c.</b> When parked and unhooked from a vehicle, trailers must have a wheel chock placed in front of and behind each rear wheel.</p> <ul style="list-style-type: none"> <li>➤ Wheel chocks must be used for large vehicles when parked/positioned on uneven surfaces; front &amp; back of each rear tire.</li> <li>➤ Wheel chocks must be used (front &amp; back of each rear tire) on all vehicles working at the site/ vehicles with manual transmission parked on sloping surfaces</li> </ul>
<p><b>2. Remove/load equipment from vehicle</b></p>	<p><b>2a.</b> Back/ waist strain that could result from lifting heavy loads.</p> <p><b>2b.</b> Blunt force injury that could result from falls while exiting vehicles.</p> <p><b>2c.</b> Scrapes/ crushing injuries to hands that could result from an unexpected shifting of a load.</p>	<p><b>2a.</b> When lifting: keep your back straight (when loading coolers and/or equipment back into truck); bend down at the knees and lift with your legs/ no bending and/or lifting with your back/ do not twist at the waist while lifting.</p> <ul style="list-style-type: none"> <li>➤ To avoid lifting heavy/awkward coolers, place cooler on tailgate to place samples/ ice into cooler.</li> <li>➤ Utilize material handling devices when possible to move equipment/ or for help when lifting objects weighing more than 50 lbs.</li> <li>➤ If necessary, utilize a ramp for loading and unloading wheeled devices. Ensuring ramp can support the load prior to use.</li> </ul> <p><b>2b.</b> Maintain three points-of-contact when exiting vehicle cab or when exiting truck beds.</p> <ul style="list-style-type: none"> <li>➤ Position cooler/equipment in a location nearest the door of vehicle to eliminate the need to carry items while exiting vehicle.</li> </ul> <p><b>2c.</b> Ensure all equipment is secured / stored during non- use and transportation.</p> <ul style="list-style-type: none"> <li>➤ Don leather work gloves when securing or removing equipment.</li> <li>➤ Do not place fingers between the load and nearby objects to minimize crushing type injuries caused by a shifting load.</li> </ul>

<p><b>3. Exposure to weather</b></p> <p>3.1. Fire/ explosion and personnel hazards relate to exposure to site contaminants.</p>	<p><b>3a.</b> Hypothermia/ dehydration that could result from working in cold weather.</p> <p><b>3b.</b> Heat rash/ stress/ exhaustion that could result from working in hot weather.</p> <p><b>3c.</b> Electrocutation/ blunt force injury to head/ arms/ legs/ torso that could result from inclement weather (i.e. lightning strike/ windblown debris/ hail).</p> <p><b>3.1</b> Fire/ explosion that could result from flammable vapors contacting an ignition source.</p>	<p><b>3a.</b> Staff should understand/ be able to recognize the signs and/or symptoms of cold weather related illnesses</p> <ul style="list-style-type: none"> <li>➤ Personnel should dress in accord (dry, layered clothing) with forecasted cool/ cold weather conditions.</li> <li>➤ Adjust work schedules to provide sufficient break periods in a heated area.</li> </ul> <p><b>3b.</b> Staff should understand/ be able to recognize the signs and/or symptoms of hot weather related illnesses</p> <ul style="list-style-type: none"> <li>➤ Adjust work schedules to provide time intervals for replenishing fluids that are free of contamination.</li> <li>➤ <b>Breaks</b> – (temperatures exceeding 90°F); 10-15 min break must be taken after every 45 min-to-1 hour of work in a cool area. Individuals must drink a minimum of 16-oz of water prior to start of work; 8-12 oz. water/ other hydration drinks (i.e. Gatorade) every 20-30 minutes.</li> <li>➤ No consuming caffeinated drinks at any time while on-site. Check coworker(s) periodically for signs of heat related illnesses.</li> </ul> <p><b>3c.</b> Perform SPSAs periodically to assess for developing inclement weather conditions (thunderstorms/ tornados)</p> <ul style="list-style-type: none"> <li>➤ Monitor severe weather alerts on wireless media (cell phones) to access for developing inclement weather.</li> <li>➤ Secure equipment/ materials in work area to minimize them becoming wind-blown projectiles during inclement weather.</li> <li>➤ Discontinue work/ take shelter immediately in a building/ vehicle upon seeing lightning/ hearing thunder/ during tornado watches/ hailstorms/ strong wind. Resume work 30min after seeing last lightning/ hearing thunder or inclement weather has passed.</li> </ul> <p><b>3.1.</b> Perform SPSAs to identify ignition sources if flammable vapors are present within 35-feet of work area.</p> <ul style="list-style-type: none"> <li>➤ Eliminate/ control ignition sources before commencing work.</li> <li>➤ Monitor worker breathing zone/ any enclosure to be entered for flammable vapor concentrations using a PID prior to entering.</li> <li>➤ Ensure Tyvek™ suits/ boot covers/ half-face or full face air purifying respirators with contaminant-specific filter cartridges are available for potential upgrade from Level D to Level C.</li> </ul> <p><b>Note:</b> <i>GES/ subs must wear fire retardant clothing/ protection when operating cutting tools generating sparks or generate conditions that act as ignition sources.</i></p> <p><b>Note:</b> <i>Indoor operation of equipment/ machinery fueled by hydrocarbon fuels requires emissions to be exhausted outside &amp; carbon monoxide (CO) levels to be monitored.CO levels over 35 ppm require operations to cease &amp; staff to evacuate the work area.</i></p>
<p><b>4. Biological hazards</b></p>	<p><b>1a.</b> Skin irritation that could result from contact with poisonous plants.</p> <p><b>1b.</b> Skin irritation/ infection/ anaphylactic shock that could result from bites by poisonous insects.</p> <p><b>1c.</b> Lacerations/ punctures/ rabies infections that could result from bite/ attack by wild animal.</p>	<p><b>1a.</b> Perform an SPSA to identify poisonous plants, such as poison ivy and poison oak.</p> <ul style="list-style-type: none"> <li>➤ Do not approach or traverse areas where poisonous plants have been identified.</li> <li>➤ Wear long pants with socks pulled over legs to prevent skin contact with plants.</li> <li>➤ Apply an over-the-counter barrier cream such as Ivy Block® to prevent poisonous plant oils contacting the skin.</li> <li>➤ Wash hands and arms immediately with soap and water if skin contacts with poisonous plants occur.</li> </ul> <p><b>1b.</b> Perform an SPSA to identify any wasp/hornet nests. Do not approach any wasp/ hornet nests identified in the SPSA.</p> <ul style="list-style-type: none"> <li>➤ Spray wasp/ hornet nests with insect repellent from a distance recommended by the manufacturer.</li> <li>➤ Wear long-sleeved shirts/ pants at all times to prevent contact with ticks. Using insect repellent with DEET is strongly recommended.</li> <li>➤ Do not spray your skin directly. If tick are found on the skin upgrade skin protection to a Tyvek™ suit.</li> <li>➤ Visually inspect and carefully open any outside enclosures that insects and small animals could potentially enter.</li> </ul> <p><b>1c.</b> Perform an SPSA to identify wild animals (i.e. raccoons/ skunks/ feral cats/ snakes) in the vicinity of the work area.</p> <ul style="list-style-type: none"> <li>➤ Do not approach/ antagonize wild animals identified as a result of the SPSA. Wear snake chaps to prevent snake bites to shins.</li> </ul>
<p><b>C. Traverse Site</b></p> <p><b>1. Slips/ trips/ fall on walking surfaces</b></p>	<p><b>1a.</b> Blunt force injury to arms/ legs/ torso that could result from slip/ trip/ falls related to site hazards.</p>	<p><b>1a.</b> Perform an SPSA prior to traversing the proposed path of travel to identify hazards. Avoid identified hazards.</p> <ul style="list-style-type: none"> <li>➤ Remove/ mark all hazards identified along the travel path; obstructions/ debris/ slip/ trip/ and fall hazards.</li> <li>➤ Store all equipment/ tools/ materials in designated areas when not in use and out of walking paths.</li> <li>➤ Look for changes in elevation and grade when walking on uneven terrain.</li> <li>➤ If ice/ slick conditions are present, use salt/ sand to add traction to prevent slips. Remove snow from walkways if a slip hazard.</li> <li>➤ Do not traverse through standing water/puddles.</li> <li>➤ Place temporary ramps over hoses or cords leading from water source or power source to designated work zone.</li> </ul>

**Core Safety Expectations**

1. Always follow Fall Protection standards when working at elevated heights.
2. Always follow Written Permit procedures.
3. Always follow Lock Out/Tag Out (LOTO) procedures.
4. Always follow Critical Devise Defeat procedures.
5. Always follow written PPE Requirements for the work being performed.

# Job Safety Analysis (JSA)

JSA Title: **Potable Well Sampling**

JSA revision #: **047**

<b>Date Developed:</b> 03/03/2006
<b>Latest Revised Date:</b> 11/24/2013
<b>Initiated/Changed by:</b> Tanner Stafford (Env Scientist)/ Alfonso Munoz (LHSO)
<b>Approved by:</b> Maurice W. Baron, Jr. Regional HSSE - SE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 4	<b>Work Location:</b>
<b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b>	

**REQUIRED PPE:** Gloves: nitrile, Kevlar (Level II), leather. Hard Hat, Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: Tyvek, Long sleeve, highly visible shirt and coveralls can include reflective safety vest. Safety Glasses. Safety Shoes: steel-toed (ASTM F-2413).

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Propane/ butane portable welding torch/ ABC-rated fire extinguisher

Activity/Sequence of Job Tasks	POTENTIAL HAZARDS	Risk Control Measures
<b>Please ensure that all necessary JSAs associated with your work scope have been identified and reviewed.</b>		
<b>A. Well Access – Exterior</b> 1. Access potable well sample point	<p><b>1a.</b> Blunt force injuries to hands/ torso/ arms legs that could result from assault by another person.</p> <p><b>1b.</b> Bites to hands/ arms/ legs/ torso that could result from being bitten by guard animals.</p> <p><b>1c.</b> Skin irritation, infection that could result from being bitten by bees/ wasps/ spiders/ scorpions/ wild animals or from contact with poisonous plants.</p> <p><b>1d.</b> Blunt force injury to arms/ legs / torso/ head that could result from slips/trips/falls caused by uneven/ slick ground/ objects along walking path or low overhead clearance.</p>	<p><b>1a.</b> Perform an SPSA prior to entering the sampling location. Do not enter the sampling location if there are hostile acting persons or persons issuing verbal threats.</p> <ul style="list-style-type: none"> <li>➤ Two people must be sent to complete potable well sampling until personnel feel that property owner/inhabitants or their animals do not pose a physical threat to them.</li> </ul> <p><b>1b.</b> Perform an SPSA prior to entering the sampling location. Do not enter the sampling location if unrestrained dogs appear to pose a physical threat to personnel.</p> <p><b>1c.</b> Perform an SPSA of area around the well sample point to assess for the presence of bees/ wasps/ spiders/ scorpions/ poisonous plants (poison oak/ poison ivy) or wild animals (skunks/ raccoons).</p> <ul style="list-style-type: none"> <li>➤ Use insecticide spray to neutralize bees/ wasps/ spiders. Avoid scorpions; use long stick to move scorpion from area of well sample point.</li> <li>➤ Do not enter well sample area until wild animals are no longer present. Wear long-sleeved shirts/ long pants/ safety glasses/ leather work gloves/ hard hat and anti-poison ivy/ oak ointment.</li> </ul> <p><b>1d.</b> Perform an SPSA to assess for the presence of uneven ground surfaces/ wet soil/ cords/ piping that pose slip/ trip/ fall hazards.</p> <ul style="list-style-type: none"> <li>➤ Remove/ avoid identified slip/ trip/ fall hazards that could provoke a fall.</li> <li>➤ If areas of low overhead clearance are identified; don a hard hat.</li> <li>➤ Use a flashlight if there is insufficient light to see the tap and collect a sample.</li> </ul>
<b>B. Well Sampling – Exterior Location</b> 1. Sterilize sample location (tap)/ collect water sample	<p><b>1a.</b> Burns to skin that could result from using a portable propane/ butane during/ after sterilization of spigot (sample point)</p> <p><b>1b.</b> Cuts to skin on hands/ fingers that could result from injurious contact with sharp metal edges/ burrs/ rust.</p> <p><b>1c.</b> Skin irritation that could result from contact with potentially contaminated water.</p> <p><b>1d.</b> Burns that could result</p>	<p><b>1a.</b> Perform an SPSA to identify flammable/ combustible materials within 5–feet of tap. Remove or cover any combustible/ flammable materials within 5-feet of the tap.</p> <ul style="list-style-type: none"> <li>➤ Avoid flame during sterilization of tap and hot tap surface after sterilization.</li> <li>➤ Have an ABC-rated fire extinguisher within 5 feet of tap being sterilized.</li> <li>➤ Wear safety glasses/ leather work gloves during sterilization.</li> </ul> <p><b>1b.</b> Avoid contact with observed sharp metallic edges/ burrs/ rust on or in area of the tap.</p> <ul style="list-style-type: none"> <li>➤ Wear Kevlar™ cut-resistance gloves under nitrile gloves when collecting a sample.</li> </ul> <p><b>1c.</b> Avoid skin contact with sample water while collecting sample.</p> <ul style="list-style-type: none"> <li>➤ Wear nitrile gloves to prevent skin contact by potentially contaminated water.</li> </ul> <p><b>1d.</b> Avoid contact with preservative solutions by filling sample containers slowly to prevent splashing of water = preservative material</p>

	<p>from corrosive sample preservative fluid coming in contact with skin/ eyes.  <b>1e.</b> Cuts to hands/ fingers that could result from sharp edges of shards from handling/ cleaning up broken sample containers that come in contact with skin.</p>	<p>onto skin/ eyes.                  &gt; Wear safety glasses with side shields. Wear nitrile gloves when filling sample containers.  <b>1e.</b> Avoid over tightening caps on glass sample container to minimize potential of glass breakage at cap/ container body area.                  &gt; Hold cap with three finger tips when tightening.                  &gt; Place hand on bottom part of container when tightening cap to keep hand away from the bottle neck area where breakage from over tightening usually occurs.                  &gt; Use a broom/ dust pan to clean up broken glassware. Do not pick up broken glass shards with hands unless absolutely necessary.                  &gt; Wear Kevlar™ cut resistant gloves under nitrile-surgical gloves when handling sampling containers that can break or when cleaning up/ handling broken glassware.</p>
<p><b>C. Well Sampling – Interior Location</b>                  1. Collect sample – interior of residence</p>	<p><b>1a.</b> Burns to skin that could result from using a portable propane/ butane during/ after sterilization of spigot (sample point)  <b>1b.</b> Cuts to skin on hands/ fingers that could result from injurious contact with sharp metal edges/ burrs/ rust.  <b>1c.</b> Skin irritation that could result from contact with potentially contaminated water.  <b>1d.</b> Burns that could result from corrosive sample preservative fluid coming in contact with skin/ eyes.  <b>1e.</b> Cuts to hands/ fingers that could result from sharp edges of shards from handling/ cleaning up broken sample containers that come in contact with skin.</p>	<p><b>1a.</b> Perform an SPSA to identify flammable/ combustible materials within 5–feet of tap. Remove or cover any combustible/ flammable materials within 5-feet of the tap.                  &gt; Avoid flame during sterilization of tap and hot tap surface after sterilization.                  &gt; Have an ABC-rated fire extinguisher within 5 feet of tap being sterilized.                  &gt; Wear safety glasses/ leather work gloves during sterilization.  <b>1b.</b> Avoid contact with observed sharp metallic edges/ burrs/ rust on or in area of the tap.                  &gt; Wear Kevlar™ cut-resistance gloves under nitrile gloves when collecting a sample.  <b>1c.</b> Avoid skin contact with sample water while collecting sample.                  &gt; Wear nitrile gloves to prevent skin contact by potentially contaminated water.  <b>1d.</b> Avoid contact with preservative solutions by filling sample containers slowly to prevent splashing of water = preservative material onto skin/ eyes.                  &gt; Wear safety glasses with side shields. Wear nitrile gloves when filling sample containers.  <b>1e.</b> Avoid over tightening caps on glass sample container to minimize potential of glass breakage at cap/ container body area.                  &gt; Hold cap with three finger tips when tightening.                  &gt; Place hand on bottom part of container when tightening cap to keep hand away from the bottle neck area where breakage from over tightening usually occurs.                  &gt; Use a broom/ dust pan to clean up broken glassware. Do not pick up broken glass shards with hands unless absolutely necessary.                  &gt; Wear Kevlar™ cut resistant gloves under nitrile-surgical gloves when handling sampling containers that can break or when cleaning up/ handling broken glassware.</p>
<p><b>On-site edits:</b></p>		

**Core Safety Expectations**

1. Always follow Fall Protection standards when working at elevated heights.
2. Always follow Written Permit procedures.
3. Always follow Lock Out/Tag Out (LOTO) procedures.
4. Always follow Critical Device Defeat procedures.
5. Always follow written PPE Requirements for the work being performed.

# Job Safety Analysis (JSA)

JSA Title: **Poet System Water Sampling**

JSA #: **046**

<b>Date Developed:</b> 2/9/05
<b>Latest Revised Date:</b> 7/17/12
<b>Initiated/Changed by:</b> Matt Depress (Field Scientist); Rich Brown (Tech manager)
<b>Approved by:</b> Julius Pachy, RHSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 8	<b>Work Location:</b>
This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.	

**REQUIRED PPE:** Gloves: nitrile, Kevlar, leather. Hard Hat: Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: highly visible clothing such as orange coveralls or reflective safety vest. Long sleeve shirts, Safety Glasses. Safety Shoes: steel-toed (ASTM F-2413).

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Hand tools, a cart or dolly

Activity/Sequence of Job Tasks	Potential Hazards	Eliminate – Control – Protect <b>Risk Control Measures</b>
<b>Please ensure that all necessary JSAs associated with your work scope have been identified and reviewed.</b>		
<b>A. Sampling of System Water</b> 1. Evaluate the area surrounding the POET system	<b>1a.</b> Skin punctures or bites from animals (Biological hazards) <b>1b.</b> Arm and hand injury from tripping and falling over equipment <b>1c.</b> Head injury from contacting low hanging pipes or other objects	<b>1a.</b> Stay away or don't go near animals, insects living in the areas surrounding the POET system including spiders, snakes, rodents, and birds. Use insect repellent for control.  <b>1b.</b> Be aware for uneven ground surfaces, cords, piping, etc.  <b>1c.</b> Be aware for areas of low overhead clearance and don a hard hat if these conditions are present. ➤ Evaluate the need for a flashlight if low light conditions are present
2. Collect sample	<b>2a.</b> Skin irritation from contact with system water Contact with corrosive preservatives <b>2b.</b> Cuts on hands from broken glassware <b>2c.</b> Skin irritation from contact with bleach from bacteria sampling	<b>2a.</b> Prevent contact with water to be sampled by using low flow to fill sample containers. Wear nitrile gloves over kevlar. ➤ Handle sample containers with the opening facing up so the preservative does not spill out. ➤ Preservatives can cause burns to the skin and eyes. Wear safety glasses and nitrile gloves over kevlar so that contact.  <b>2b.</b> Evaluate condition of glassware prior to handling. Wear cut resistant gloves (i.e., Kevlar under nitrile-surgical gloves) when sampling; especially when handling broken glassware  <b>2c.</b> Refer to the MSDS for more information. Bleach is an irritant to skin and eyes. Wear nitrile gloves over top of ➤ Kevlar gloves and safety glasses and prevent contact.
<b>B. O&amp;M Activities</b> 1. Lockout/tagout system components as needed	<b>1a.</b> Injury due to electrocution while work with / around energized equipment	<b>1a.</b> Implement LO/TO procedures and EM work permit requirements. ➤ Notify all affected personnel of the de-energized condition.
2. Unloading/loading carbon vessels from truck	<b>2a.</b> Back and muscle strain from handling or moving heavy object handling  <b>2b.</b> Cuts to skin while handling vessels	<b>2a.</b> Use power tailgate lift to lower or to lift carbon units onto and off of truck. Use material handling devices (i.e., a hand truck) to prevent personal injury while moving carbon vessels. Make sure to secure the carbon vessel onto the hand truck using locking straps. If equipment must be moved, lift with your legs-not your back. Never lift and twist at the same time, this increases the risk to injury greatly.  <b>2b.</b> Use mechanical lifting devices and enough force needed to complete the task and to prevent damage to tools or equipment. Wear Kevlar cut resistant gloves while using hand tools in addition to eye protection.

<p>3. Removing spent carbon units from residence and delivering replacement carbon units from residence</p> <p><i>Note: This is a two person task</i></p>	<p><b>3a.</b> Back injury or muscle strain from moving units (Heavy object handling)</p> <p><b>3b.</b> Whole body injury from being caught between or pinned by units</p> <p><b>3c.</b> Cuts to skin</p>	<p><b>3a.</b> Use material handling devices (i.e., a hand truck) to prevent personal injury while moving carbon vessels.</p> <ul style="list-style-type: none"> <li>➤ Make sure to secure the carbon vessel onto the hand truck using locking straps. If equipment must be moved, lift with your legs-not your back. Never lift and twist at the same time, this increases the risk to injury greatly.</li> </ul> <p><b>3b.</b> Use two people while maneuvering hand truck with secured carbon units up and down stairs with one person pulling the hand truck and the second positioned behind the hand truck for stability.</p> <p><b>3c.</b> Wear leather gloves while using hand tools in addition to eye protection.</p> <ul style="list-style-type: none"> <li>➤ Use enough force needed to complete the task and to prevent damage to tools or equipment.</li> </ul>
<p>4. Reconnect carbon units</p>	<p><b>4a.</b> Skin irritation from contact with system water</p>	<p><b>4a</b> Do not turn on water until the system is connected and all fittings are secure. Prevent hand contact with water by wearing nitrile gloves over Kevlar level 2 cut resistant gloves.</p> <p>Note: In cold environments, water released to the ground through leaks or splashing may freeze causing a dangerous slip hazard.</p> <ul style="list-style-type: none"> <li>➤ Minimize this condition by monitoring for released water and applying sand when ice develops</li> </ul>
<p><b>C. UV Bulb Maintenance replacement</b></p> <p>1 Replacing the UV bulb</p>	<p><b>1a.</b> electrical shock from energized electrical equipment</p> <p><b>1b.</b> Cuts to hands or skin from broken glass</p>	<p><b>1a.</b> Unplug the UV Unit from the power supply.</p> <ul style="list-style-type: none"> <li>➤ Be sure to keep the plug in your sight during the process to be sure that the unit has been de-energized.</li> <li>➤ Look for accumulated water on the floor and do not touch energized electrical equipment while standing in water.</li> </ul> <p><b>1b.</b> UV bulb is breakable. Wear cut resistant gloves (i.e., Kevlar under nitrile-surgical gloves); especially when handling broken glassware.</p> <p><i>Note: If more than one person is performing maintenance, be sure to LO/TO the power cord to prevent another person from restoring power while the bulb is replaced.</i></p>
<p>2. Clean the bulb sleeve</p>	<p><b>2a.</b> Acid burn to skin from the use of cleaning solution</p> <p><b>2b.</b> Respiratory irritation from cleaning solution</p> <p><b>2c.</b> Cuts to hand or skin due to broken glass</p>	<p><b>2a.</b> This process uses muriatic acid to clean the sleeve. Comply with MSDS requirements for handling and use.</p> <ul style="list-style-type: none"> <li>➤ Be sure to avoid contact with the skin and eyes by wearing safety glasses and Kevlar gloves under nitrile gloves while handling equipment.</li> </ul> <p><b>2b.</b> Work in a well-ventilated area (i.e., outdoors). Comply with MSDS requirements.</p> <p><i>Note: Keep water available while using acid. If contact is made with acid, flush the skin and eyes with large amounts of water and seek medical attention.</i></p> <p><b>2c.</b> Bulb sleeve is breakable. Two hands should be used at all times when handling this item. Wear cut resistant gloves (i.e., Kevlar under nitrile-surgical gloves); especially when handling broken glassware.</p>
<p><i>On-site edits:</i></p>		

**Core Safety Expectations**

1. Always follow Fall Protection standards when working at elevated heights.
2. Always follow Written Permit procedures.
3. Always follow Lock Out/Tag Out (LOTO) procedures.
4. Always follow Critical Device Defeat procedures.
5. Always follow written PPE Requirements for the work being performed.

# Job Safety Analysis (JSA)

JSA Title: **Private Utility Markout**

JSA Control #: **049**

<b>Date Developed:</b> 09/30/05
<b>Latest Revised Date:</b> 8/18/13
<b>Initiated/Changed by:</b> Scott Martin, Senior Case Manager / J. Pachy , RHSSE
<b>Approved by:</b> Tom Baylis, CIH, VP of HSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 3	<b>Work Location:</b>
This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.	

**REQUIRED PPE:** Safety Glasses, Gloves: nitrile, Kevlar (Level II), leather. Hard Hat, PPE Clothing: Long sleeve, highly visible shirt and coveralls can include reflective safety vest. Safety Shoes: steel-toed (ASTM F-2413)

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Traffic control devices, LOTO kit, Private Utility Marking devices, marking paint with wand

Activity/Sequence of Job Tasks	Potential Hazards	Risk Control Measures
<b>Please ensure that all necessary JSAs associated with your work scope have been identified and reviewed.</b>		
1. Site walk and evaluation of conditions/site features, locate points to be marked out	<p><b>1a.</b> Injury due to contact with 3<sup>rd</sup> party traffic while walking on site</p> <p><b>1b.</b> Adverse health effects due to inclement weather</p>	<p><b>1a.</b> Ensure walking path is in visible location of all 3<sup>rd</sup> party vehicles, do not walk in area where vehicles cannot see you (between vehicles, behind walls, bushes...)</p> <ul style="list-style-type: none"> <li>➤ Continually scan area for changes in traffic flow.</li> <li>➤ Don required PPE (Steel-toe, safety glasses, hard hat, leather gloves and long sleeve hi-visible clothing)</li> </ul> <p><b>1b.</b> Monitor for changes in weather and identify shelter if necessary, contact office should weather prevent work activities</p> <ul style="list-style-type: none"> <li>➤ Discuss and be aware of weather related illnesses (heat and cold related illness)</li> <li>➤ Schedule and take breaks base on GES work duration policy and comply with hydration guidelines.</li> <li>➤ Don clothing that reflects weather conditions (rain, snow, windy, sunny).</li> </ul>
2. Set up site control and control points	<p><b>2a.</b> Injury due to contact with 3<sup>rd</sup> party traffic while setting up control points</p> <p><b>2b.</b> Injury (sprains / strains to back) due to lifting / carrying equipment to work location</p> <p><b>2c.</b> Injury to hands due to contact with equipment while setting up traffic controls</p>	<p><b>2a.</b> Set up traffic control per GES traffic control policy, if traffic is heavy contact office to discuss options on traffic control upgrades or rescheduling of task in times that may allow for lighten traffic flow (mid-morning / afternoon to avoid commuter traffic).</p> <ul style="list-style-type: none"> <li>➤ Don required PPE (Steel-toe, safety glasses, hard hat, leather gloves and long sleeve hi-visible clothing)</li> </ul> <p><b>2b.</b> Utilize safe lifting techniques when loading and unloading vehicle.</p> <ul style="list-style-type: none"> <li>➤ Bend down at the knees and lift with your legs rather than bending and lifting with your back.</li> <li>➤ Don leather gloves and ensure hands are not in area between equipment where hand s/ fingers may get pinched / crushed.</li> <li>➤ <b>Note:</b> Do not twist while lifting. This can cause a severe back injury.</li> </ul> <p><b>2c.</b> Inspect and identify area equipment that may have share edges or area where body parts can be pinched, caught or cut.</p> <ul style="list-style-type: none"> <li>➤ Don leather gloves while handling traffic controls and ensure hands are not in area between equipment where hands/ fingers may get pinched / crushed.</li> <li>➤ Don required PPE (Steel-toe, safety glasses, hard hat, leather gloves and long sleeve hi-visible clothing)</li> </ul>
3. Open roadbox to connect to utilities by direct connect method or induction method using clamp; induction method using drop box technique	<p><b>3a.</b> Injury (cuts) due to contact while removing roadbox lids</p> <p><b>3b.</b> Injury (sprains) due to</p>	<p><b>3a.</b> Wear leather gloves to prevent a skin injury while handling tools and opening the roadbox.</p> <ul style="list-style-type: none"> <li>➤ Inspect lid for potential cut points (cracks, burrs...)</li> <li>➤ Use J-hook to remove lid.</li> <li>➤ Keep hands / fingers and body parts from area around lid and well that could cause an injury.</li> </ul> <p><b>3b.</b> Use body positioning when removing roadbox or manway covers.</p>

<p><b>NOTE:</b> The use of utility knives and pocket knives (e.g., Stanley knives, box cutters) are <b>STRICTLY PROHIBITED</b></p>	<p>opening/ removing roadbox or manway covers</p> <p><b>3c.</b> Injury due to electrocution, contact with energized lines</p> <p><b>3d.</b> Injury (cuts) due to contact with cutting tool while exposing wires</p>	<ul style="list-style-type: none"> <li>➤ Inspect area for presence of insects, spray insects or abandon job if necessary.</li> <li>➤ Do not lift manway covers; they can weigh over 50 lbs. Ask for assistance if needed.</li> <li>➤ Kneel down on knee pad for comfort, back straight, firm grip, and pull lid towards you.</li> <li>➤ Don leather gloves for this task, upgrade to nitrile over top of leather if a liquid hazard exist.</li> </ul> <p><b>3c.</b> Locate source of electricity of line being located and de-energize lines by using lockout/tagout procedures.</p> <ul style="list-style-type: none"> <li>➤ Complete LO/TO permit per GES and / or client requirements.</li> <li>➤ Ensure all electrical components / line are at “zero energy” state</li> </ul> <p><b>3d.</b> Utilize only approved cutting tool.</p> <ul style="list-style-type: none"> <li>➤ Sand paper or similar tool should be used.</li> <li>➤ Only self-retracting knives or blades protected by a guard are permitted for use.</li> <li>➤ Don required PPE (Steel-toe, safety glasses, hard hat, Kevlar (level II) gloves and long sleeve hi-visible clothing)</li> </ul>
<p>4. Marking lines on ground to indicate utilities</p>	<p><b>4a</b> Injury due to slip, trip, and fall when walking on site or moving through thick vegetation</p> <p><b>4b.</b> Injury due to contact with 3<sup>rd</sup> party traffic while conducting markout</p> <p><b>5c.</b> Adverse health effects due to exposure of paint and / or fumes</p>	<p><b>4a</b> Determine safest route to planned travel path, ensure to identify any potential ground hazards (holes, depressions, cracks, thick vegetation...).</p> <ul style="list-style-type: none"> <li>➤ Utilize a walking stick to probe thick vegetation for tripping hazards and debris.</li> <li>➤ Don required PPE (Steel-toe, safety glasses, hard hat, Kevlar (level II) gloves and long sleeve hi-visible clothing)</li> </ul> <p><b>4b.</b> Constantly scan for vehicles and changes in traffic patterns due to changes in commuter traffic (mornings, lunch times and after work hours).</p> <ul style="list-style-type: none"> <li>➤ Set up traffic control (e.g., cones, barricades) as required by GES traffic control policy.</li> <li>➤ Wear highly visible clothing, upgrade to traffic vest for additional visibility.</li> <li>➤ Limit time spent in areas where lines of sight for oncoming traffic are limited</li> <li>➤ Use a spotter in high traffic areas</li> </ul> <p><b>5c.</b> Don required PPE (Steel-toe, safety glasses, hard hat, nitrile gloves and long sleeve hi-visible clothing)</p> <ul style="list-style-type: none"> <li>➤ At no time should paint be sprayed toward body (face, eyes, mouth...)</li> <li>➤ While spraying utility locations, spray downwind to avoid paint fumes and over spray.</li> <li>➤ Use paint wand to apply paint.</li> </ul>
<p><b>On-site edits:</b></p>		

**Core Safety Expectations**

1. Always follow Fall Protection standards when working at elevated heights.
2. Always follow Written Permit procedures.
3. Always follow Lock Out/Tag Out (LOTO) procedures.
4. Always follow Critical Device Defeat procedures.
5. Always follow written PPE Requirements for the work being performed.

# Job Safety Analysis (JSA)

JSA Title: **Hand Auger Use (Soil Sampling)**

JSA Control #: **035**

<b>Date Developed:</b> 2/8/05
<b>Latest Revised Date:</b> 07/09/12
<b>Initiated/Changed by:</b> Brian Brittain, Sr. Environ. Tech / Kara Gioulis, LHSO
<b>Approved by:</b> Thomas Baylis, CIH - VP, HSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 4	<b>Work Location:</b>
<p><b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b></p>	

**REQUIRED PPE:** Gloves: nitrile, Kevlar (Level II), leather. Hard Hat, Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: Tyvek, Long sleeve, highly visible shirt and/or coveralls can include reflective safety vest. Safety Glasses. Safety Shoes: steel-toed (ASTM F-2413).

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Cones and flags; PID

Activity/Sequence of Job Tasks	Potential Hazard	Eliminate – Control – Protect Risk Control Measures
<p><b>A. Review Site Information Pertaining to Underground Improvements</b></p> <p>1. Working on underground improvements</p>	<p><b>1a.</b> Damage to underground improvements</p>	<p><b>1a.</b> Review any available site plans including as-built, public and private mark outs to determine if subsurface utilities are present.</p> <ul style="list-style-type: none"> <li>➤ Communicate with all interested parties who may have historical site knowledge on subsurface structures, recent site improvements, landscaped areas...</li> <li>➤ Ensure all hand clearing / protocols have been communicated and will be implemented (hand clearing, critical and non-critical zones, auger use etc...)</li> </ul>
<p><b>B. Prepping surface area before use of Hand Auger to Collect/Clear Soil</b></p> <p>1. Hand clear surface soil with spade shovel</p> <p><i><b>Warning:</b> If any evidence of <b>pea-stone or non-native material</b> is observed during hand clearing, drilling, excavation, or any subsurface activity, all subsurface work must stop and the project manager and/or the senior office manager must be contacted immediately.</i></p>	<p><b>1a.</b> Injury due to cuts to skin while handling spade shovel or touching subsurface material</p> <p><b>1b.</b> Injury to back (strain) due to overexertion when using the spade shovel.</p>	<p><b>1a.</b> Ensure leather gloves are donned as well as cut resistant gloves underneath to minimize cut from inadvertently contacting edges of spade shovel.</p> <ul style="list-style-type: none"> <li>➤ Don cut resistant gloves when cleaning spade shovel in the event subsurface material become stuck on shovel.</li> <li>➤ Don PPE (e.g., Hard hat, safety glasses, leather gloves, steel-toe shoes, highly visible clothing, shirt with long sleeves).</li> </ul> <p><b>1b.</b> When performing any type of physical labor, individuals need to be sure not to strain/stress your body. Place feet shoulder width apart and maintain good balance. Do not twist body</p> <ul style="list-style-type: none"> <li>➤ Bend knees and use with your legs rather than bending and lifting with your back; avoid twisting.</li> <li>➤ Take plenty of breaks to rest muscles and take in fluids.</li> <li>➤ Ensure work area is free of hazards or confined area that may not allow full range of motion to maintain body positioning and technique.</li> </ul>
<p>2. Use hand auger to collect soil samples</p> <p><i><b>Note:</b> This tool can cause damage to underground structures so it should never be advanced with excessive force!</i></p> <p><i>If you cannot turn the hand auger easily, stop and move to a new location.</i></p>	<p><b>2a.</b> Adverse health effects from contact with subsurface contaminants</p> <p><b>2b.</b> Injury to back (strain) due to overexertion when using the hand auger.</p> <p><b>2c.</b> Injury due to slip / trip / fall on open boreholes / associated soil stockpiles</p>	<p><b>2a.</b> Wear required PPE, (e.g., hard hat, safety glasses, nitrile gloves over cut resistant gloves, steel-toe shoes, highly visible clothing, with long sleeves) whenever handling contaminated soils. This includes nitrile sampling gloves to prevent contact with the skin.</p> <p><b>2b.</b> While operating the hand auger, be aware that it is easy to overexert yourself.</p> <p><i><b>Note:</b> Be sure not to twist your upper body at the waist while using the auger. This motion can cause injury to your back.</i></p> <ul style="list-style-type: none"> <li>➤ Use the strength in your upper arms to turn the hand auger.</li> <li>➤ Add handle extensions as needed so that your back can remain straight and there is no need to bend your waist.</li> <li>➤ Ensure handle extensions are at the height, for individual using auger, to prevent arms extending above shoulder height in order to prevent awkward body positioning and possible back strain.</li> <li>➤ Keep your feet shoulder width apart for stability.</li> <li>➤ Keep your face / head away from the handle of the auger. Should this tool break loose during use you will avoid injury.</li> <li>➤ Individuals who are not involved in the work activity should remain clear of the auger handle length plus 1 foot away from where the augering is occurring.</li> </ul> <p><b>2c.</b> Set up cones and flags to identify trip hazards associated with boreholes/stockpile inside the work zone.</p> <ul style="list-style-type: none"> <li>➤ Complete or backfill an open borehole ASAP.</li> </ul> <p><i><b>Note:</b> Prior to leaving the site, ensure all trip hazards associated with boreholes have been eliminated.</i></p>

<p>3. Sample and classify impacted soil</p>	<p><b>3a.</b> Adverse health effects from exposure to subsurface contaminated soils  <b>3b.</b> injury due to cut/puncture from fill material/soil  <b>3c.</b> Injury due to cut/puncture from broken glass</p>	<p><b>3a.</b> Scan soil samples with PID (NOT YOUR NOSE). Comply with action levels in HASP          &gt; Wear required PPE, (e.g., hard hat, safety glasses, nitrile gloves over cut resistant gloves, steel-toe shoes, highly visible clothing, with long sleeves) whenever handling contaminated soils. This includes nitrile sampling gloves to prevent contact with the skin.  <b>3b.</b> Wear cut-resistant gloves (e.g., nitrile coated knit cut resistant gloves or cut resistant under nitrile exam gloves) when sampling soil and/or handling sampling glassware.          &gt; Inspect soils by using a small shovel to loosen compacted soil containing sharp debris.  <b>3c.</b> Wear cut-resistant gloves (e.g., nitrile coated knit cut resistant gloves or cut resistant under nitrile exam gloves) when handling sampling glassware (especially OVA mason jars).</p>
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***Core Safety Expectations***

- 1. Always follow Fall Protection standards when working at elevated heights.***
- 2. Always follow Written Permit procedures.***
- 3. Always follow Lock Out/Tag Out (LOTO) procedures.***
- 4. Always follow Critical Device Defeat procedures.***
- 5. Always follow written PPE Requirements for the work being performed.***

# Job Safety Analysis (JSA)

JSA Title: **Drilling/Soil Boring/Monitoring Well Installation**

JSA Control #: **019**

<b>Date Developed:</b> 2/23/05
<b>Latest Revised Date:</b> 10/17/13
<b>Initiated/Changed by:</b> Bill Lovenberg, Driller/Paul LaWare, Project Engineer
<b>Approved by:</b> Thomas Baylis, CIH - VP, HSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 8	<b>Work Location:</b>
<b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b>	

**REQUIRED PPE:** Air Respirator: respirators may be required if conditions or work area air quality exceeds applicable HASP action levels; don a HEPA Dust Mask. Face Shield: if flying particles are generated. Gloves: nitrile, Kevlar (level II), leather. Hard Hat. Hearing Protection: if site activities raise the noise level to 85 dB. PPE Clothing: highly visible long sleeve shirt and/or coveralls can include reflective safety vest. Safety Glasses/ Safety Shoes: steel-toed, non-slip soles (ASTM F-2413)

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** PID, GCI/O2 or LEL meter; Sample bottles/jars; Lockout/tagout kit; Spill response kit/spill pad - used under hydraulic equipment when work activities occur on a permeable surface such as grass or gravel; Hotwork Permit; Driller's tools - inspect condition of; Sand and or salt for ice; PVC casing (6-10")

Activity/Sequence of Job Tasks	Potential Hazards	Eliminate – Control – Protect (Risk Control Measures)
1. Drill rig positioning at drilling location  <i>Note</i> If the mark out locations are not visible (i.e. covered by snow, debris, vehicles, washed away/faded, etc.) stop work and contact the project manager or senior office manager.	<b>1a.</b> Whole body injury to various body parts due to contact with rig supports/ levelers  <b>1b.</b> Burns or other injuries from electrocution or shock due to contact with underground energized electrical lines	<b>1a.</b> All non-essential personnel must remain at least 20 feet away from the rig. <i>Note:</i> If the rig is positioned on soft ground or there is any evidence of the levelers or jacks sinking into the soil or other surfaces, all activities must stop and all site staff alerted. The GES oversight person must call into the office, the client notified, and a near loss report must be completed regarding the issue. Prior to restarting activities, approved cribbing and other supports must be placed under each leveler (jack). If there is still evidence of sinking or if the rig appears to be unstable in any way, all work must stop, site staff alerted, and the local GES office and corporate HSSE notified. Work should not begin until all issues have been resolved. <b>1b.</b> Locate all sources of electricity to site features. <ul style="list-style-type: none"> <li>➤ To the extent possible, LO/TO all sources of electricity in the vicinity of the drilling location.</li> <li>➤ Notify all affected employees on-site of the de-energized condition.</li> <li>➤ Unless voltage is known, position boom a minimum of 20 feet from overhead power lines.</li> <li>➤ Have an observer watch the raising of mast.</li> </ul>
2. Drilling area containment construction	<b>2a.</b> Injury to back or muscle strain due to over exertion while lifting or moving containment material	<b>2a.</b> Bend down at the knees and lift with your legs rather than bending and lifting with your back when carrying and placing bails of straw or other material for containment. <i>Note:</i> Containment construction must comply with the guidance provided in Attachment 3 of GES' "Drilling Protocol".
<b>B. Drilling</b> 1. Begin drilling soil boring/ monitor well <i>Note:</i> When using an air rotary to drill the borehole ensure that the protective skirt is firmly secured to the drill rig in order to prevent sudden expulsions of potentially impacted groundwater/mud and soil (dust) from the open borehole.  <i>Note:</i> If utilizing a jackhammer to remove concrete/asphalt consult "Concrete/asphalt removal – Jackhammer Use" JSA	<b>1a.</b> Injury from contacting or caught by moving drill rig parts  <b>1b.</b> Back injury from lifting and moving augers (equipment)/ support equipment <b>1c.</b> Adverse health effects that result from contact / exposure to site contaminants <b>1d.</b> Hearing loss that could result from exposure to elevated noise levels from rig operation	<b>1a.</b> Ensure all Emergency Stop switches are discussed and checked for function. <ul style="list-style-type: none"> <li>➤ Personnel and their tools should stay at least 2 feet away from moving rotating parts (e.g., augers, drill drive shaft, etc.).</li> <li>➤ All non-essential personnel shell keep at least 10 feet away from borehole while drilling is in progress.</li> <li>➤ Confer with drillers to make sure you are in a good spot (i.e., safe distance and out of their work zone)</li> <li>➤ Do not wear excessively loose, baggy clothing, or jewelry.</li> </ul> <b>1b.</b> Handling of equipment and support supplies in strict compliance of 50 lb weight restrictions (e.g. augers, drums...) <ul style="list-style-type: none"> <li>➤ Bend down at the knees and lift with your legs rather than bending and lifting with your back.</li> <li>➤ Utilize buddy system or mechanical means to move items.</li> </ul> <i>Note:</i> If any drums are filled with soil or any material, the drum can only be filled a maximum of two-thirds (2/3) full. <b>1c.</b> Review HASP; Scan with PID. Monitor air in work area for elevated vapors during drilling activities. <ul style="list-style-type: none"> <li>➤ Comply with HASP action levels.</li> </ul> <b>1d.</b> Wear hearing protection (i.e., ear muffs or foam inserts).

<p>2. Collecting soil samples if necessary</p>	<p><b>2a.</b> skin irritation from exposure to site contaminants  <b>2b.</b> cuts or abrasions to the arms from contact with moving equipment  <b>2c.</b> Hand and arm injury due to slipping and tripping over material</p>	<p><b>2a.</b> Don PPE nitrile gloves when handling soil samples (e.g., safety glasses, hard hat, nitrile gloves, Level D clothing).                  Handle sample jars safely, if a jar is broken make sure cut resistance gloves are used during clean up.  <b>2b.</b> While logging soil samples, continuously observe all drilling activities and maintain a safe distance from the active drilling. .                  Utilize show me your hands approach  <b>2c.</b> Maintain work area, keep walk ways clean, pick up tools, and soil in drums.                  Watch for muddy conditions or ice formation while drilling in seasonal conditions.</p>
<p>3. Auger removal and clearing soil  <b>Note: NO J-hooks</b></p>	<p><b>3a.</b> Hand or bodily injury from contact/caught by equipment   <b>3b.</b> Cuts to hand when cleaning soil from auger due to auger burrs / debris in soil  <b>3c.</b> Back or muscle injury from lifting or moving augers</p>	<p><b>3a.</b> Leather work gloves must be used while handling winch cables.                  Shackles must be secured to auger flight should be used to lift augers; shackles must have manufacture certification.                  The augers should be lifted hydraulically with the drive cap bolted on the auger string; if permitted, the use of a cleavace or chain wrap device should be wrapped around the augers so that the augers can be lifted and placed in the location.  <b>3b.</b> Use a garden trowel, paint spatula or other tool to remove soil from the auger. Do not clear soil with your hands.  <b>3c.</b> Bend down at the knees and lift with your legs rather than bending and lifting with your back                  Utilize mechanical means to remove / move augers.                  Implement the buddy system. <i>No individual shall lift any augers in excess of 50 lbs.</i></p>
<p>4. Install well (riser, screen, sand pack, and bentonite)   <b>Note:</b> Do not use a die grinder tool or similar device to cut casing. An internal plastic pipe cutter, or a tool that could not result in a hand injury is acceptable</p>	<p><b>4a.</b> Back injury from lifting bags of bentonite or other material   <b>4b.</b> Hand and arm injuries from tripping and falling over equipment and material.  <b>4c.</b> Whole body injuries from falls when working at heights  <b>4d.</b> Respiratory irritation from dust  <b>4e.</b> Striking and laceration from saw or cutting device while cutting PVC well to finished length.</p>	<p><b>4a.</b> Bend down at the knees and lift with your legs rather than bending and lifting with your back while carrying bentonite and sand bags.                  See 1b for mitigation while lifting / moving items.  <b>4b.</b> Make sure work area is clean, pick up all tools, sweep up all soil, and maintain walk ways.   <b>4c.</b> Complete all required work permits and comply with safety expectations; Fall protection is required whenever individuals are working 6 feet or more above ground level.  <b>4d.</b> Monitor vapor levels in work area and wear nitrile gloves when cleaning up soil.                  Position yourself up wind from concrete dust generated while mixing.                  Don a HEPA dust mask for comfort if inhalation is unavoidable.  <b>4e.</b> A plastic pipe cutter or similar tool must be used. Wear cut resistant (Kevlar or similar) gloves during this activity.</p>
<p>5. Pressure grout the steel casing (if open rock well) or PVC riser in place using a tremie pipe</p>	<p><b>5a.</b> Back injury that can result lifting bags of material or piping  <b>5b.</b> Respiratory irritation from nuisance dust, inhalation hazard  <b>5c.</b> Eye or skin irritation or other injury from the contact with grout  <b>5d.</b> Skin irritation from the exposure to grout  <b>5e.</b> Hand and finger Injury from reaching into moving equipment  <b>5f.</b> Potential hearing loss from exposure to elevated noise levels.</p>	<p><b>5a.</b> Bend down at the knees and lift with your legs rather than bending and lifting with your back to add materials to the mixer and while installing or removing the tremie pipe;  <b>5b.</b> Avoid breathing dust generated when opening bags or mixing the grout.                  Stay upwind of the dust or wear a dust mask for comfort.                  Don a HEPA dust mask for comfort if inhalation is unavoidable.  <b>5c.</b> Mix and apply grout slowly to reduce airborne particulate. Keep material wet                  Wear eye protection, long pants, nitrile gloves or nitrile coated work gloves, shirt with sleeves, steel-toed boots).  <b>5d.</b> Avoid contact with grout; grout may cause skin irritation and burns.  <b>5e.</b> Do not reach into the mixer while operating.                  Make sure all guards are in place on the mixer prior to operating.  <b>5f.</b> Wear hearing protection (e.g., ear muffs or foam inserts) if noise levels exceed 85 dB.</p>

**Core Safety Expectations**

1. Always follow Fall Protection standards when working at elevated heights.
2. Always follow Written Permit procedures.
3. Always follow Lock Out/Tag Out (LOTO) procedures.
4. Always follow Critical Devise Defeat procedures.
5. Always follow written PPE Requirements for the work being performed.

JSA Title: **Excavation Activities**

JSA Control #: **024**

<b>Date Developed:</b> 2/23/05
<b>Latest Revised Date:</b> 03/19/13
<b>Initiated/Changed by:</b> Phil Tidd, Tech Services Super / Kara Gioulis, LHSO
<b>Approved by:</b> Thomas Baylis, CIH - VP, HSSE

<b>Please complete the below if this JSA is being modified for SITE-SPECIFIC reasons.</b>	
<b>Revision #:</b> 7	<b>Work Location:</b> various
<b>This JSA has been fully reviewed with all staff members and all activity job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on this JSA.</b>	

**REQUIRED PPE:** Gloves: nitrile, Kevlar, leather, anti-vibration (for jackhammer activities); Hard Hat; Hearing Protection: if site activities raise the noise level to 85 dB; PPE Clothing: highly visible clothing such as orange coveralls or reflective safety vest; Safety Glasses; Safety Shoes: steel-toed; OTHER - Respirator: may be required if conditions or work area air quality exceeds applicable HASP action levels

**REQUIRED AND/OR RECOMMENDED TOOLS AND EQUIPMENT:** Lockout/tagout kit, PID, LEL meter, Hotwork Permit, Small shovel, Sample jar/container, Spill response kit/spill pad - used under hydraulic equipment when work activities occur on a permeable surface such as grass or gravel

Activity/Sequence of Job Tasks	Potential Hazards	Risk Control Measures
<b>A. Mobilization</b> 1. Mobilize to trench/ excavation location, establish work zone for staff and equipment	<b>1a.</b> Contact, cuts, or a fall that could result from the contact with equipment  <b>1b.</b> Damage equipment that could from excavation equipment operating to close to the edge of the excavation	<b>1a.</b> Check excavation locations for underground and overhead utilities follow GES' <i>Excavation Protocol</i> or client-specific protocol. ➤ Observe equipment set up, ensuring no contact with overhead obstacles. ➤ The excavator must be positioned on level terrain prior to any excavation activities. ➤ Do not position outriggers on landscaping and verify that they are not directly above an underground utility if on grass. ➤ Excavator leveling is required. ➤ Remind everyone never to leave hand tools on/near equipment. <b>1b.</b> If excavator needs to work inside the opened excavation, insure that required side slope and access ramp are made. ➤ Excavator shall not be left unattended inside opened excavation. <b>Note:</b> <i>If the mark out locations are not visible (i.e. covered by snow, debris, vehicles, washed away/faded, etc.), stop work and contact the project manager or senior office manager.</i>
<b>B. Open Concrete/Asphalt</b> 1. Open/cut concrete/asphalt at trench/excavation location	<b>1a.</b> Hand cuts that could result from the contact with equipment.  <b>1b.</b> Fire, explosion that could result from the ignition of flammable vapors	<b>1a.</b> Make sure all kill switches, blade guards are functioning ➤ During cutting activities be aware of flying debris. ➤ Perform wet cuts when possible to reduce the amount of dust and sparks generated during the cut. ➤ Equipment must be turned off and allowed to cool prior to refueling. ➤ Always fuel in a clear area away from debris. ➤ If your fuel container has no spout, use a funnel. ➤ Wipe the saw clean of any spilled fuel after fueling. ➤ Never smoke while fueling. ➤ Wear PPE (e.g., safety glasses, ear muffs, work gloves, Level D clothing). <b>Note:</b> <i>Watch for the formation of ice during wet cuts in cold weather.</i> <b>1b.</b> Complete a Hotwork Permit when completing cuts within 35 feet of any vapor source. <b>Note:</b> <i>Air monitoring must take place throughout the cutting procedure if the possibility of flammable vapors exists.</i>
2. Breaking concrete or asphalt with a jackhammer	<b>2a.</b> Back injury from improper lifting of jackhammer <b>2b.</b> soft tissue injury that could result from vibration,  <b>2c.</b> Hearing loss from excessive noise,  <b>2d.</b> Eye injury from airborne particulate <b>2e.</b> If pneumatic jackhammer is in use, injury from loose hosing	<b>2a.</b> Use the following lifting techniques. When lifting bend at legs and keep your back straight. ➤ While using the jackhammer, stand with feet shoulder width apart and balanced. <b>DO NOT</b> muscle the jack hammer around; let it do the work. <b>2b.</b> Wear leather or vibration-absorbing gloves, ear plugs, eye protection (due to flying debris), and a hard hat. ➤ Use shovels to push debris out of way. Follow manufacturer's operating procedures for equipment. ➤ Have a stable stance; feet shoulder width apart, hold jackhammer lightly and balanced. ➤ Do not wear excessively loose, baggy clothing, or jewelry. ➤ Take breaks (a 10 minute break every hour of operation) during operation of equipment (e.g., jack hammer) to prevent vibration/repetitive motion injuries. ➤ If jackhammer use is anticipated to last greater than 1 cumulative hour in a day, establish an exclusion zone to keep unauthorized personnel/bystanders 20 feet away, to reduce their exposure to noise. <b>2c.</b> Wear hearing protection that reduces the noise exposure below 90 DBa <b>2d.</b> Use water to keep dust levels low and wear safety glasses <b>2e.</b> Make sure Chicago style fittings are secured with the safety pin and whip checks, and the air hose has no rips or tears; also secure the hose so there are no tripping hazards present. <b>Note:</b> <i>Electric and gas powered jack hammers are similar. For electric jackhammers, make sure the cord is secure and no cuts or tears are in the extension cord; it must be a GFCI extension cord.</i>

<p>3. Hand clear known utility locations to assure no underground improvements</p>	<p><b>3a.</b> Muscle injury that could result from improper clearing technique</p>	<p><b>3a.</b> Hand clear slowly.</p> <ul style="list-style-type: none"> <li>➤ Do not force through; soil may contact/break underground lines (“soft dig” technologies are recommended).</li> <li>➤ Hand clear cautiously and use a balanced stance with feet shoulder width apart to avoid back, neck, and wrist strain.</li> </ul> <p><b>Note:</b> <i>If any evidence of <b>peastone or non-native material</b> is observed during handclearing, drilling, excavation, or any subsurface activity, all subsurface work must stop and the project manager and/or the senior office manager must be contacted immediately.</i></p>
<p><b>C. Begin Excavating Soil</b> 1. Excavating soil</p>	<p><b>1a.</b> Body injury from the contact with or caught by machinery <b>1b.</b> Exposure to site contaminants</p> <p><b>1c.</b> Fire or explosion from the ignition of a flammable atmosphere inside excavation <b>1d.</b> Trench collapse, flooding, damaged property/equipment</p> <p><b>1e.</b> Trip and fall from walking or working on uneven surfaces</p> <p><b>1f.</b> Falls from ladder use</p> <p><b>1g.</b> Body injury from trench collapse <b>1h.</b> Personal injury or property damage due to the improper positioning of site vehicles (i.e., excavation machinery and dump trucks)</p>	<p><b>1a.</b> Stay at least a 20 feet radius of center of moving equipment and at least 5 feet away from moving or rotating parts (e.g., excavator bucket, equipment tracks/wheels, vehicle drive shaft, etc.). <b>1b.</b> Monitor air in work area in the breathing zone of workers and third party nearby accessed areas for elevated vapors during digging activities as required by the H&amp;S plan.</p> <ul style="list-style-type: none"> <li>➤ Record any air monitoring data as required for the project’s H&amp;S Plan.</li> <li>➤ If visible airborne soil (particulate) results within the immediate work area, measures must be taken to limit or control emissions. The measures could include, but not be limited to wetting the area, using surfactant, etc.</li> <li>➤ In addition, if off-site migration results or is possible, a community air monitoring program may be necessary. <b>GES corporate HSSE must be contacted if a program is required.</b></li> </ul> <p><b>1c.</b> Monitor excavation with an LEL meter.</p> <ul style="list-style-type: none"> <li>➤ If combustible gas levels exceed meter levels of 20 % of the LEL, digging activities should be halted and excavation and vapor control measures implemented that would include but not be limited to foam, surfactant, or similar material application.</li> </ul> <p><b>1d.</b> Excavated soils should be stored on site as planned.</p> <ul style="list-style-type: none"> <li>➤ Typically soil is stored on poly and covered with poly.</li> <li>➤ Keep soils and equipment at least 2 feet back from the excavation/trench.</li> <li>➤ If excavator needs to work inside the opened excavation, insure that the required side slope and access ramp are made.</li> <li>➤ Excavator shall not be left unattended inside opened excavation.</li> <li>➤ Ensure that any structures that may be supported by soil being removed (e.g., curbing, buildings, etc.) are supported or braced.</li> </ul> <p><b>Note:</b> <i>If any drums are filled with soil or any material, the drum can only be filled a maximum of two-thirds (2/3) full.</i></p> <p><b>1e.</b> Access to the trench/excavation shall be restricted if deeper than 4 feet.</p> <ul style="list-style-type: none"> <li>➤ If work scope requires personnel to enter a trench/excavation greater than 4 feet, specific approval must be obtained from corporate H&amp;S prior to initiating field activities.</li> <li>➤ Under <b>NO</b> circumstances will a GES employee and/or sub-contractor be allowed to enter an excavation greater than 4 feet in depth without the prior corporate H&amp;S approval.</li> </ul> <p><b>1f.</b> Ladders shall be placed in the trench/excavation if the trench/excavation is 4 feet deep. These shall be arranged so that no point in the excavation is greater than 25 feet away from one ladder.</p> <ul style="list-style-type: none"> <li>➤ Ladders shall be pitched at a 4:1 ratio and secured at the top and bottom.</li> </ul> <p><b>1g.</b> No personnel shall be permitted to enter a trench/excavation with the presence of standing water/product at the bottom.</p> <ul style="list-style-type: none"> <li>➤ Constantly monitor for the signs of weakening sidewalls, evacuate the area if an unstable condition develops.</li> </ul> <p><b>1h.</b> Tri-axle vehicles (dump trucks) should be loaded from the side of the truck.</p> <ul style="list-style-type: none"> <li>➤ The excavator operator will be required to indicate where the truck should be positioned and to provide final approval to the truck’s spotter as to where the truck is positioned.</li> <li>➤ A spotter must be utilized when vehicles, including construction vehicles, are backing or moving onsite to ensure a safe pathway.</li> <li>➤ After a dump truck has completed dumping activities the dump body should be completely lowered and secured prior to moving forward.</li> </ul> <p><b>Note:</b> <i>The excavator operator should stop the work if he cannot safely see or reach the loading area.</i> <b>Note:</b> <i>Prior to any vehicle movement, a discussion must be held with each designated spotter so that they are aware of their responsibilities, hand signals that must be used for directing equipment operators, location in which to stand and ensure that they are aware of any unique site conditions or concerns. Spotters must look up to ensure that there are no overhead wires or structures such as canopies that can be struck and ensure that they can be safely cleared by the operating equipment. Look down to identify unusual depressions, holes, or debris that may interfere with backing. Observe fixed objects or parked, unoccupied vehicles.</i></p>
<p><b>D. Working in a Trench/Excavation</b> 1. Backfill trench/excavation</p>	<p><b>1a.</b> Body injury from contact with fill material <b>1b.</b> Injury from contact with machinery</p>	<p><b>1a.</b> Personnel are not permitted in trenches/excavations during the backfill process.</p> <ul style="list-style-type: none"> <li>➤ Remove all tools and equipment from the trench/excavation prior to replacing soils/pea gravel.</li> </ul> <p><b>1b.</b> Stay at least a 20 feet radius of center of moving equipment and at least 5 feet away from moving or rotating parts (e.g., excavator bucket, equipment tracks/wheels, vehicle drive shaft, etc.).</p>

ATTACHMENT E

PRE-ENTRY MEETING NOTES



ATTACHMENT F

SIGN OFF SHEET

SITE SAFETY AND HEALTH PLAN COMPLIANCE AGREEMENT

All project personnel, including visitors, must follow the requirements of this Site Safety Plan. In order to document individual agreement with this requirement, all personnel must complete this “Site Safety and Health Plan Compliance Agreement.” These agreements will be kept in this Site Safety Plan and will become part of the permanent project record upon completion of site activities.

By signing below, I have read the Site Health and Safety Plan (HASP), or I have been verbally advised of its contents. I understand, and I agree to comply with all of its provisions. I understand that I could be prohibited from working on the project, and I may be subject to disciplinary actions for violating any of the health and safety requirements specified in the HASP.

NAME	SIGNATURE	DATE	(TIME IN/OUT)
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
21. _____	_____	_____	_____
22. _____	_____	_____	_____

ATTACHMENT G

INCIDENT/INJURY CASE MANAGEMENT

**ALL accidents, injuries, property damages, or releases (Loss or Near Loss) shall be reported to GES' on-site supervisor ASAP but no later than the end of the shift.**

Injury Case Management is a collaborative process which:

- Helps ensure prompt, adequate, and appropriate medical care is provided
- Assesses, plans, implements, coordinates, monitors, and evaluates options
- Can minimize the impact of an impairment (resulting from potentially work-related injury or illness)
- Preserves as much as practicable the individual's functional capacity.

Medical injuries or emergencies within each field location will be managed by the following method:

- If an injury or medical condition occurs that cannot be treated by providing basic first aid to the individual, the GES PM and Site Operations Manager are notified by the GES Oversight person.
- Onsite, individuals who are certified in cardiopulmonary resuscitation (CPR)/First Aid will be requested to respond to the individual's location.
- Following this evaluation the GES VP, HSSE and client program manager, must be contacted regarding the individual's condition and injury management approach onsite and offsite.

Following an assessment of the individual's condition, if responding GES personnel feel that outside medical response personnel (emergency care) are necessary:

- The 911 emergency response system will be activated, if necessary.
- Provide the 911 emergency operator all of the information that is requested.
- The injured individual (GES or subcontractor employee) will be accompanied by other GES staff (i.e., PM, LHSO, Site Supervisor) so that desired injury management information will be communicated to the attending physician.

If an individual requires medical treatment *beyond basic first aid*, but the initial assessment determines that the individual does not require emergency care, then:

- The PM, Site Operations Manager, and CHSSE will be contacted PRIOR to leaving the site.
- The individual will be scheduled for an appointment at the occupational clinic near each office.
- If the injured individual is a subcontractor, then the individual will be directed to visit an occupational clinic established by the subcontracting company.
- If there is no clinic established, the individual will be scheduled at a GES clinic.

The individual will be accompanied to their examination by the GES LHSO or other GES or subcontractor management staff. Desired injury management information will be communicated to the attending physician that will include but not be limited to:

- Any required or alternative medication (over the counter medication)
- Any workplace restrictions versus lost time are discussed with the attending physician.
- The GES VP, HSSE will also contact the attending physician regarding the examination, diagnosis and the GES injury management approach.

ATTACHMENT H

SITE-SPECIFIC DECONTAMINATION PLAN

## DECONTAMINATION PLAN

### 1. Personnel Decontamination

Section 7 lists the specific levels of protection required. Consistent with the levels of protection required, step by step procedures for personnel decontamination for each Level of Protection are attached.

### 2. Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be:

Level B  Level C  Level D

Modifications include:

### 3. Disposition of Decontamination Wastes

(Provide a description of daily, weekly, and end of project waste disposition including identification of storage area, hauler, and final disposal site if applicable.)

### 4. Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

### 5. Sampling Equipment Decontamination

Sampling equipment will be decontaminated in accordance with the following procedure:

LEVEL C DECONTAMINATION PROCEDURES (if required)

[Check indicated Functions or add steps as necessary]:

STEP	FUNCTION	DESCRIPTION OF PROCESS, SOLUTION AND CONTAINER
<input type="checkbox"/>	Segregated equipment drop	_____
<input type="checkbox"/>	Boot cover and glove wash	_____
<input type="checkbox"/>	Boot cover and glove rinse	_____
<input type="checkbox"/>	Tape removal - outer glove/boot	_____
<input type="checkbox"/>	Boot cover removal	_____
<input type="checkbox"/>	Outer glove removal	_____
-----HOT-LINE-----		
<input type="checkbox"/>	Suit/safety boot wash	_____
<input type="checkbox"/>	Suit/boot/glove rinse	_____
<input type="checkbox"/>	Safety boot removal	_____
<input type="checkbox"/>	Suit Removal	_____
<input type="checkbox"/>	Inner glove wash	_____
<input type="checkbox"/>	Inner glove rinse	_____
<input type="checkbox"/>	Face piece removal	_____
<input type="checkbox"/>	Inner glove removal	_____
<input type="checkbox"/>	Inner clothing removal	_____
-----CRC/SAFE ZONE BOUNDARY-----		
<input type="checkbox"/>	Field wash	_____
<input type="checkbox"/>	Redress	_____



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**APPENDIX B**

**PaGWIS DATABASE RESULTS  
0.5-MILE RADIUS**

**SUNOCO LOGISTICS, LP  
BUTTERNUT ROAD RELEASE SITE  
GAMBLE TOWNSHIP, LYCOMING COUNTY, PENNSYLVANIA**

PAWellID	County	Municipality	QuadName	WellAddress	WellZipCode	DateDrilled	TypeOfActivity	LatitudeDD	LongitudeDD	Driller	OriginalOwner	WellUse	WaterUse	WellDepth(ft)
419659	LYCOMING					3/15/2006	NEW WELL	41.35694	-76.90806	HILL WELL DRILLING INC.	REYNOLDS	WITHDRAWAL	DOMESTIC	300

PaGWIS DATABASE RESULTS  
0.5-MILE RADIUS

SUNOCO LOGISTICS, LP  
BUTTERNUT ROAD RELEASE SITE  
GAMBLE TOWNSHIP, LYCOMING COUNTY, PENNSYLVANIA

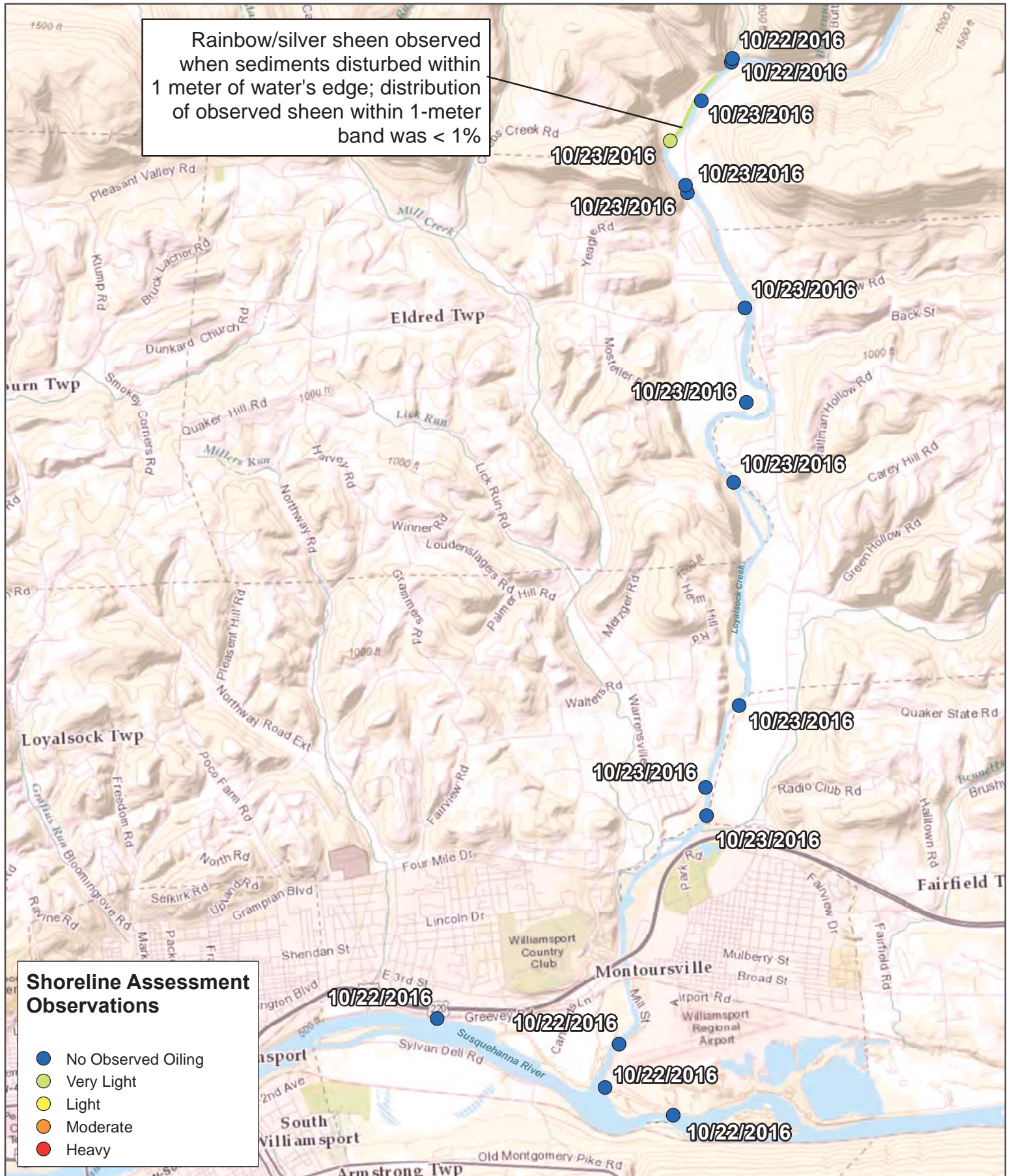
PAWellID	TopOfCasing(ft)	BottomOfCasing(ft)	CasingDiameter(in)	DepthToBedrock(ft)	BedrockNotReached	WellYield(gpm)	StaticWaterLevel(ft)	WaterLevelAfterYieldTest(ft)	LengthOfTest(min)	YieldMeasurementMethod	SaltwaterZone(ft)	FormationName	PaperImageLink	Remark
419659				0	False	10			30	VOLUMETRIC WATCH & BUCKET				



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**APPENDIX C**

Rainbow/silver sheen observed when sediments disturbed within 1 meter of water's edge; distribution of observed sheen within 1-meter band was < 1%



**Shoreline Assessment Observations**

- No Observed Oiling
- Very Light
- Light
- Moderate
- Heavy

**Shoreline Assessment Observations**  
**Butternut Road Release**  
**Lycoming County, Pennsylvania**



121 Continental Drive, Suite 308  
 New Castle, DE 19713 USA  
 Phone (+1) 302-395-1919 Fax (+1) 302-395-1920  
 www.cardno.com

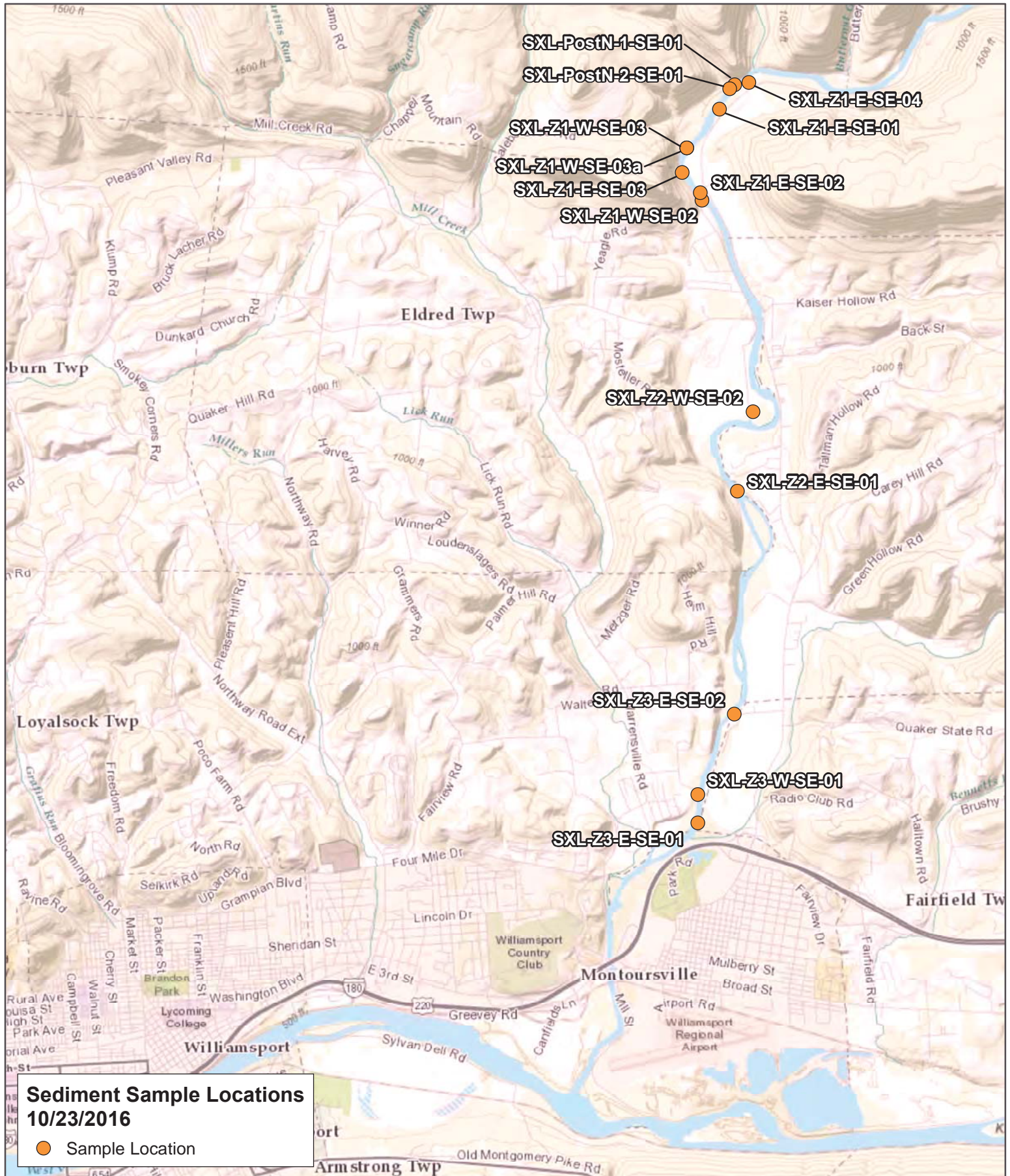


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**APPENDIX D**



**Sediment Sample Locations  
10/23/2016**

- Sample Location

**Sediment Sample Locations  
Butternut Road Release  
Lycoming County, Pennsylvania**



121 Continental Drive, Suite 308  
New Castle, DE 19713 USA  
Phone (+1) 302-395-1919 Fax (+1) 302-395-1920  
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**APPENDIX E**



# BORING LOG

ID NO. **SS-38**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **5.5 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: **Jason Crone**      Drilling Method: **Direct Push/Dual Tube**  
Dates Drilled: **11-15-2016**      Sampling Method: **Acetate Sleeve**  
Drilling Company: **Odyssey Environmental Services**      Soil Class. System: **Unified Soil Classification System (USCS)**  
Drill Rig Type: **Geoprobe 7720DT**      Field Screening: **PID 10.6 eV Lamp (ppm)**

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					GP: (0-5.5') Coarse gravelly sand, little silt, saturated	GP	This boring was located on a gravel bank deposited on the south bank of Wallis Run at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
	1.7 ppm (0-5')							
-5	5.5'						Geoprobe refusal at 5.5' bgs	
	1.7 ppm (5'-5.5')							

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

SS-38



# BORING LOG

ID NO. **SS-39**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **6 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: **Jason Crone**      Drilling Method: **Direct Push/ Dual Tube**  
Dates Drilled: **11-15-2016**      Sampling Method: **Acetate Sleeve**  
Drilling Company: **Odyssey Environmental Services**      Soil Class. System: **Unified Soil Classification System (USCS)**  
Drill Rig Type: **Geoprobe 7720DT**      Field Screening: **PID 10.6 eV Lamp (ppm)**

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					GP: (0-5') Brown gravelly coarse-grained sand, saturated	GP	This boring was located on a gravel bank deposited on the south bank of Wallis Run at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
	2.1 ppm (0-5')							
-5					SM: (5'-6') Brown silty coarse-grained sand, some coarse gravel, saturated	SM	Geoprobe refusal at 6' bgs	
	4.9 ppm (5'-6')							
6'								

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

SS-39



# BORING LOG

ID NO. **SS-40**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **6 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: <b>Jason Crone</b>	Drilling Method: <b>Direct Push/ Dual Tube</b>
Dates Drilled: <b>11-15-2016</b>	Sampling Method: <b>Acetate Sleeve</b>
Drilling Company: <b>Odyssey Environmental Services</b>	Soil Class. System: <b>Unified Soil Classification System (USCS)</b>
Drill Rig Type: <b>Geoprobe 7720DT</b>	Field Screening: <b>PID 10.6 eV Lamp (ppm)</b>

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					SM: (0-5') Coarse brown sand, some silt, few coarse gravel, saturated	<b>SM</b>	This boring was located on a gravel bar deposited at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
	0.3 ppm (0-5')							
-5					SM: (5'-6') Coarse brown silty sand, some coarse gravel, saturated			
	6'							
	0.5 ppm (5'-6')							

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

**SS-40**



# BORING LOG

ID NO. **SS-41**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **6 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: <b>Jason Crone</b>	Drilling Method: <b>Direct Push/ Dual Tube</b>
Dates Drilled: <b>11-15-2016</b>	Sampling Method: <b>Acetate Sleeve</b>
Drilling Company: <b>Odyssey Environmental Services</b>	Soil Class. System: <b>Unified Soil Classification System (USCS)</b>
Drill Rig Type: <b>Geoprobe 7720DT</b>	Field Screening: <b>PID 10.6 eV Lamp (ppm)</b>

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					GP: (0-5') Coarse gravel and coarse-grained sand, little brown silt, saturated	<b>GP</b>	This boring was located on a gravel bar deposited at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
	2.5 ppm (0-5')							
-5					SM: (5'-6') Brown silty sand, some coarse gravel, saturated	<b>SM</b>		
	6' 1.1 ppm (5'-6')							

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

SS-41



# BORING LOG

ID NO. **SS-42**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **12 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: **Jason Crone**      Drilling Method: **Direct Push/ Dual Tube**  
Dates Drilled: **11-15-2016**      Sampling Method: **Acetate Sleeve**  
Drilling Company: **Odyssey Environmental Services**      Soil Class. System: **Unified Soil Classification System (USCS)**  
Drill Rig Type: **Geoprobe 7720DT**      Field Screening: **PID 10.6 eV Lamp (ppm)**

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					ML: (0-10') Brown silty sand, little coarse gravel, moist, saturated at 5'-10'	ML	This boring was located on the north bank of Wallis Run at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
-5	0.0 ppm (0-5')							
-10	8'	0.0 ppm (5'-10')			GP: (10'-12') Brown gravel, some brown sand, saturated	GP		
	12'	0.0 ppm (10'-12')						

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

SS-42



# BORING LOG

ID NO. **SS-43**

Groundwater and Environmental Services, Inc.

Page 1 of 1

PROJECT: **Sunoco Logistics - Butternut Road Release**  
ADDRESS: **Butternut Rd. and Wallis Run Rd., Gamble Township, PA**  
JOB NO. **0204694-01-107**

TOTAL DEPTH: **12 feet**  
BOREHOLE DIA.: **4-inch**

Logged By: **Jason Crone**      Drilling Method: **Direct Push/ Dual Tube**  
Dates Drilled: **11-15-2016**      Sampling Method: **Acetate Sleeve**  
Drilling Company: **Odyssey Environmental Services**      Soil Class. System: **Unified Soil Classification System (USCS)**  
Drill Rig Type: **Geoprobe 7720DT**      Field Screening: **PID 10.6 eV Lamp (ppm)**

Elevation (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0					SM: (0-5') Brown sandy silt, some cobbles, slightly moist	<b>SM</b>	This boring was located on the north bank of Wallis Run at the confluence of Wallis Run and the Loyalsock Creek	Boring backfilled with soil cuttings
	0.0 ppm (0-5')							
-5	0.0 ppm (5'-8')			SM: (5'-10') Brown sand, little brown silt, very moist				
	8' 0.0 ppm (8'-10')							
-10	12' 0.3 ppm (10'-12')				SM: (10'-12') Cobbles with brown silty sand, saturated			

General Comments:

bgs = below ground surface  
ppm = parts per million

Symbol Key:

Lab Sample Location

**SS-43**



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**APPENDIX F**

October 28, 2016

## GES, Inc - Sunoco

Sample Delivery Group: L868560  
Samples Received: 10/27/2016  
Project Number: 0204694-01-107  
Description: SXL Butternut Road Release Site

Report To: Stephanie Grillo  
440 Creamery Way, Suite 500  
Exton, PA 19341

Entire Report Reviewed By:



Mark W. Beasley  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<b><sup>1</sup>Cp: Cover Page</b>	<b>1</b>
<b><sup>2</sup>Tc: Table of Contents</b>	<b>2</b>
<b><sup>3</sup>Ss: Sample Summary</b>	<b>3</b>
<b><sup>4</sup>Cn: Case Narrative</b>	<b>6</b>
<b><sup>5</sup>Sr: Sample Results</b>	<b>7</b>
SS-1 L868560-01	7
SS-2 L868560-02	8
SS-3 L868560-03	9
SS-4 L868560-04	10
SS-5 L868560-05	11
SS-6 L868560-06	12
SS-7 L868560-07	13
SS-8 L868560-08	14
SS-9 L868560-09	15
SS-10 L868560-10	16
SS-11 L868560-11	17
SS-12 L868560-12	18
SS-13 L868560-13	19
SS-14 L868560-14	20
SS-15 2 L868560-15	21
SS-16 L868560-16	22
SS-17 L868560-17	23
SS-28 L868560-18	24
<b><sup>6</sup>Qc: Quality Control Summary</b>	<b>25</b>
Total Solids by Method 2540 G-2011	25
Volatile Organic Compounds (GC/MS) by Method 8260B	27
<b><sup>7</sup>Gl: Glossary of Terms</b>	<b>29</b>
<b><sup>8</sup>Al: Accreditations &amp; Locations</b>	<b>30</b>
<b><sup>9</sup>Sc: Chain of Custody</b>	<b>31</b>



# SAMPLE SUMMARY



## SS-1 L868560-01 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:00      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:00	10/27/16 21:09	DWR

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

## SS-2 L868560-02 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:10      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:10	10/27/16 21:31	DWR

## SS-3 L868560-03 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:20      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:20	10/27/16 21:52	DWR

## SS-4 L868560-04 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:30      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:30	10/27/16 22:14	DWR

## SS-5 L868560-05 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:35      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:35	10/27/16 22:35	DWR

## SS-6 L868560-06 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:40      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:40	10/27/16 22:57	DWR

## SS-7 L868560-07 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 17:45      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:45	10/27/16 23:18	DWR

# SAMPLE SUMMARY



## SS-8 L868560-08 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921369	1	10/27/16 13:48	10/27/16 13:58	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 17:55	10/27/16 23:40	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 17:55	10/27/16 09:00

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

## SS-9 L868560-09 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:00	10/28/16 00:01	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:00	10/27/16 09:00

## SS-10 L868560-10 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:05	10/28/16 00:23	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:05	10/27/16 09:00

## SS-11 L868560-11 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:10	10/28/16 00:45	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:10	10/27/16 09:00

## SS-12 L868560-12 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:25	10/28/16 02:44	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:25	10/27/16 09:00

## SS-13 L868560-13 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:35	10/28/16 03:06	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:35	10/27/16 09:00

## SS-14 L868560-14 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:40	10/28/16 03:27	DWR

Collected by	Collected date/time	Received date/time
Craig Sherwood	10/26/16 18:40	10/27/16 09:00

# SAMPLE SUMMARY



## SS-15 2 L868560-15 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 18:45      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:45	10/28/16 03:48	DWR

1  
Cp

2  
Tc

3  
Ss

## SS-16 L868560-16 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 18:50      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 18:50	10/28/16 04:10	DWR

4  
Cn

5  
Sr

6  
Qc

## SS-17 L868560-17 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 19:00      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	1	10/26/16 19:00	10/28/16 04:31	DWR

7  
Gl

8  
Al

9  
Sc

## SS-28 L868560-18 Solid

Collected by  
Craig Sherwood      Collected date/time  
10/26/16 18:20      Received date/time  
10/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921371	1	10/27/16 13:37	10/27/16 13:46	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG921572	930	10/26/16 18:20	10/28/16 10:39	ACG



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley  
Technical Service Representative

- <sup>1</sup> Cp
- <sup>2</sup> Tc
- <sup>3</sup> Ss
- <sup>4</sup> Cn
- <sup>5</sup> Sr
- <sup>6</sup> Qc
- <sup>7</sup> Gl
- <sup>8</sup> Al
- <sup>9</sup> Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	89.0		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND	<a href="#">J3</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
Ethylbenzene	ND	<a href="#">J3 J6</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
Isopropylbenzene	ND	<a href="#">J3 J6</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND	<a href="#">J3</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
Naphthalene	ND	<a href="#">J3 J6</a>	0.00562	1	10/27/2016 21:09	<a href="#">WG921572</a>
Toluene	ND	<a href="#">J3</a>	0.00562	1	10/27/2016 21:09	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND	<a href="#">J3 J6</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND	<a href="#">J3 J6</a>	0.00112	1	10/27/2016 21:09	<a href="#">WG921572</a>
Xylenes, Total	ND	<a href="#">J3 J6</a>	0.00337	1	10/27/2016 21:09	<a href="#">WG921572</a>
(S) Toluene-d8	100		88.7-115		10/27/2016 21:09	<a href="#">WG921572</a>
(S) Dibromofluoromethane	108		76.3-123		10/27/2016 21:09	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	90.4		69.7-129		10/27/2016 21:09	<a href="#">WG921572</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	90.0		1	10/27/2016 13:58	<a href="#">WG921369</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
Naphthalene	ND		0.00555	1	10/27/2016 21:31	<a href="#">WG921572</a>
Toluene	ND		0.00555	1	10/27/2016 21:31	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00111	1	10/27/2016 21:31	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00333	1	10/27/2016 21:31	<a href="#">WG921572</a>
(S) Toluene-d8	99.4		88.7-115		10/27/2016 21:31	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/27/2016 21:31	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	92.7		69.7-129		10/27/2016 21:31	<a href="#">WG921572</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	88.9		1	10/27/2016 13:58	<a href="#">WG921369</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
Naphthalene	ND		0.00562	1	10/27/2016 21:52	<a href="#">WG921572</a>
Toluene	ND		0.00562	1	10/27/2016 21:52	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00112	1	10/27/2016 21:52	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00337	1	10/27/2016 21:52	<a href="#">WG921572</a>
(S) Toluene-d8	99.0		88.7-115		10/27/2016 21:52	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/27/2016 21:52	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	91.9		69.7-129		10/27/2016 21:52	<a href="#">WG921572</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	87.9		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
Naphthalene	ND		0.00569	1	10/27/2016 22:14	<a href="#">WG921572</a>
Toluene	ND		0.00569	1	10/27/2016 22:14	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00114	1	10/27/2016 22:14	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00341	1	10/27/2016 22:14	<a href="#">WG921572</a>
(S) Toluene-d8	100		88.7-115		10/27/2016 22:14	<a href="#">WG921572</a>
(S) Dibromofluoromethane	106		76.3-123		10/27/2016 22:14	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	94.8		69.7-129		10/27/2016 22:14	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.0		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
Naphthalene	ND		0.00550	1	10/27/2016 22:35	<a href="#">WG921572</a>
Toluene	ND		0.00550	1	10/27/2016 22:35	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00110	1	10/27/2016 22:35	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00330	1	10/27/2016 22:35	<a href="#">WG921572</a>
(S) Toluene-d8	99.0		88.7-115		10/27/2016 22:35	<a href="#">WG921572</a>
(S) Dibromofluoromethane	108		76.3-123		10/27/2016 22:35	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	92.6		69.7-129		10/27/2016 22:35	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	90.6		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
Naphthalene	ND		0.00552	1	10/27/2016 22:57	<a href="#">WG921572</a>
Toluene	ND		0.00552	1	10/27/2016 22:57	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00110	1	10/27/2016 22:57	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00331	1	10/27/2016 22:57	<a href="#">WG921572</a>
(S) Toluene-d8	98.9		88.7-115		10/27/2016 22:57	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/27/2016 22:57	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	90.8		69.7-129		10/27/2016 22:57	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	88.2		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
Naphthalene	ND		0.00567	1	10/27/2016 23:18	<a href="#">WG921572</a>
Toluene	ND		0.00567	1	10/27/2016 23:18	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00113	1	10/27/2016 23:18	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00340	1	10/27/2016 23:18	<a href="#">WG921572</a>
(S) Toluene-d8	99.9		88.7-115		10/27/2016 23:18	<a href="#">WG921572</a>
(S) Dibromofluoromethane	107		76.3-123		10/27/2016 23:18	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	91.4		69.7-129		10/27/2016 23:18	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	90.1		1	10/27/2016 13:58	<a href="#">WG921369</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
Naphthalene	ND		0.00555	1	10/27/2016 23:40	<a href="#">WG921572</a>
Toluene	ND		0.00555	1	10/27/2016 23:40	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00111	1	10/27/2016 23:40	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00333	1	10/27/2016 23:40	<a href="#">WG921572</a>
(S) Toluene-d8	99.4		88.7-115		10/27/2016 23:40	<a href="#">WG921572</a>
(S) Dibromofluoromethane	110		76.3-123		10/27/2016 23:40	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	93.1		69.7-129		10/27/2016 23:40	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	96.0		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
Naphthalene	ND		0.00521	1	10/28/2016 00:01	<a href="#">WG921572</a>
Toluene	ND		0.00521	1	10/28/2016 00:01	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00104	1	10/28/2016 00:01	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00312	1	10/28/2016 00:01	<a href="#">WG921572</a>
(S) Toluene-d8	100		88.7-115		10/28/2016 00:01	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/28/2016 00:01	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	92.2		69.7-129		10/28/2016 00:01	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	84.1		1	10/27/2016 13:46	<a href="#">WG921371</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
Naphthalene	ND		0.00594	1	10/28/2016 00:23	<a href="#">WG921572</a>
Toluene	ND		0.00594	1	10/28/2016 00:23	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00119	1	10/28/2016 00:23	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00357	1	10/28/2016 00:23	<a href="#">WG921572</a>
(S) Toluene-d8	99.4		88.7-115		10/28/2016 00:23	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/28/2016 00:23	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	92.0		69.7-129		10/28/2016 00:23	<a href="#">WG921572</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.5		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
Naphthalene	ND		0.00614	1	10/28/2016 00:45	<a href="#">WG921572</a>
Toluene	ND		0.00614	1	10/28/2016 00:45	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00123	1	10/28/2016 00:45	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00368	1	10/28/2016 00:45	<a href="#">WG921572</a>
(S) Toluene-d8	99.6		88.7-115		10/28/2016 00:45	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/28/2016 00:45	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	91.9		69.7-129		10/28/2016 00:45	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.3		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
Naphthalene	ND		0.00525	1	10/28/2016 02:44	<a href="#">WG921572</a>
Toluene	ND		0.00525	1	10/28/2016 02:44	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00105	1	10/28/2016 02:44	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00315	1	10/28/2016 02:44	<a href="#">WG921572</a>
(S) Toluene-d8	101		88.7-115		10/28/2016 02:44	<a href="#">WG921572</a>
(S) Dibromofluoromethane	109		76.3-123		10/28/2016 02:44	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	91.1		69.7-129		10/28/2016 02:44	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.1		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
Naphthalene	ND		0.00537	1	10/28/2016 03:06	<a href="#">WG921572</a>
Toluene	ND		0.00537	1	10/28/2016 03:06	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00107	1	10/28/2016 03:06	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00322	1	10/28/2016 03:06	<a href="#">WG921572</a>
(S) Toluene-d8	99.9		88.7-115		10/28/2016 03:06	<a href="#">WG921572</a>
(S) Dibromofluoromethane	108		76.3-123		10/28/2016 03:06	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	93.1		69.7-129		10/28/2016 03:06	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	80.4		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
Naphthalene	ND		0.00622	1	10/28/2016 03:27	<a href="#">WG921572</a>
Toluene	ND		0.00622	1	10/28/2016 03:27	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00124	1	10/28/2016 03:27	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00373	1	10/28/2016 03:27	<a href="#">WG921572</a>
(S) Toluene-d8	99.7		88.7-115		10/28/2016 03:27	<a href="#">WG921572</a>
(S) Dibromofluoromethane	108		76.3-123		10/28/2016 03:27	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	92.2		69.7-129		10/28/2016 03:27	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	87.6		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
Naphthalene	ND		0.00571	1	10/28/2016 03:48	<a href="#">WG921572</a>
Toluene	ND		0.00571	1	10/28/2016 03:48	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00114	1	10/28/2016 03:48	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00342	1	10/28/2016 03:48	<a href="#">WG921572</a>
(S) Toluene-d8	100		88.7-115		10/28/2016 03:48	<a href="#">WG921572</a>
(S) Dibromofluoromethane	111		76.3-123		10/28/2016 03:48	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	90.9		69.7-129		10/28/2016 03:48	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.7		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
Naphthalene	ND		0.00534	1	10/28/2016 04:10	<a href="#">WG921572</a>
Toluene	ND		0.00534	1	10/28/2016 04:10	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00107	1	10/28/2016 04:10	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00320	1	10/28/2016 04:10	<a href="#">WG921572</a>
(S) Toluene-d8	100		88.7-115		10/28/2016 04:10	<a href="#">WG921572</a>
(S) Dibromofluoromethane	107		76.3-123		10/28/2016 04:10	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	93.4		69.7-129		10/28/2016 04:10	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.9		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
Ethylbenzene	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
Isopropylbenzene	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
Naphthalene	ND		0.00533	1	10/28/2016 04:31	<a href="#">WG921572</a>
Toluene	ND		0.00533	1	10/28/2016 04:31	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	ND		0.00107	1	10/28/2016 04:31	<a href="#">WG921572</a>
Xylenes, Total	ND		0.00320	1	10/28/2016 04:31	<a href="#">WG921572</a>
(S) Toluene-d8	99.7		88.7-115		10/28/2016 04:31	<a href="#">WG921572</a>
(S) Dibromofluoromethane	108		76.3-123		10/28/2016 04:31	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	94.8		69.7-129		10/28/2016 04:31	<a href="#">WG921572</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.0		1	10/27/2016 13:46	<a href="#">WG921371</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
Ethylbenzene	13.5		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
Isopropylbenzene	2.69		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
Methyl tert-butyl ether	ND		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
Naphthalene	5.34		4.89	930	10/28/2016 10:39	<a href="#">WG921572</a>
Toluene	ND		4.89	930	10/28/2016 10:39	<a href="#">WG921572</a>
1,2,4-Trimethylbenzene	71.3		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
1,3,5-Trimethylbenzene	22.9		0.979	930	10/28/2016 10:39	<a href="#">WG921572</a>
Xylenes, Total	86.1		2.94	930	10/28/2016 10:39	<a href="#">WG921572</a>
(S) Toluene-d8	103		88.7-115		10/28/2016 10:39	<a href="#">WG921572</a>
(S) Dibromofluoromethane	94.6		76.3-123		10/28/2016 10:39	<a href="#">WG921572</a>
(S) 4-Bromofluorobenzene	108		69.7-129		10/28/2016 10:39	<a href="#">WG921572</a>

Sample Narrative:

8260B L868560-18 WG921572: Non-target compounds too high to run at a lower dilution.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3174035-1 10/27/16 13:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000900			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

L868300-06 Original Sample (OS) • Duplicate (DUP)

(OS) L868300-06 10/27/16 13:58 • (DUP) R3174035-3 10/27/16 13:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	78.1	81.7	1	4.49		5

<sup>7</sup> Gl

<sup>8</sup> Al

Laboratory Control Sample (LCS)

(LCS) R3174035-2 10/27/16 13:58

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3174033-1 10/27/16 13:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000900			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L868560-13 Original Sample (OS) • Duplicate (DUP)

(OS) L868560-13 10/27/16 13:46 • (DUP) R3174033-3 10/27/16 13:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	93.1	92.9	1	0.163		5

Laboratory Control Sample (LCS)

(LCS) R3174033-2 10/27/16 13:46

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	



Method Blank (MB)

(MB) R3174053-3 10/27/16 19:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000270	0.00100
Ethylbenzene	U		0.000297	0.00100
Isopropylbenzene	U		0.000243	0.00100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000434	0.00500
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Xylenes, Total	U		0.000698	0.00300
<i>(S) Toluene-d8</i>	98.2			88.7-115
<i>(S) Dibromofluoromethane</i>	100			76.3-123
<i>(S) 4-Bromofluorobenzene</i>	98.2			69.7-129

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3174053-1 10/27/16 17:38 • (LCSD) R3174053-2 10/27/16 17:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0238	0.0246	95.3	98.4	72.6-120			3.18	20
Ethylbenzene	0.0250	0.0240	0.0255	95.9	102	78.6-124			5.97	20
Isopropylbenzene	0.0250	0.0230	0.0246	92.1	98.3	79.4-126			6.49	20
Methyl tert-butyl ether	0.0250	0.0245	0.0258	98.1	103	70.2-122			5.21	20
Naphthalene	0.0250	0.0224	0.0243	89.4	97.3	69.9-132			8.40	20
Toluene	0.0250	0.0223	0.0235	89.0	94.2	76.7-116			5.63	20
1,2,4-Trimethylbenzene	0.0250	0.0239	0.0251	95.6	100	77.1-124			4.80	20
1,3,5-Trimethylbenzene	0.0250	0.0242	0.0254	96.7	101	79.0-125			4.86	20
Xylenes, Total	0.0750	0.0717	0.0752	95.6	100	78.1-123			4.85	20
<i>(S) Toluene-d8</i>				97.2	97.2	88.7-115				
<i>(S) Dibromofluoromethane</i>				101	102	76.3-123				
<i>(S) 4-Bromofluorobenzene</i>				92.1	91.4	69.7-129				

L868560-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868560-01 10/27/16 21:09 • (MS) R3174053-4 10/27/16 20:05 • (MSD) R3174053-5 10/27/16 20:26

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0281	ND	0.0224	0.0171	79.9	61.0	1	47.8-131		J3	26.8	22.8
Ethylbenzene	0.0281	ND	0.0192	0.0118	68.5	42.0	1	44.8-135		J3 J6	48.0	26.9



L868560-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868560-01 10/27/16 21:09 • (MS) R3174053-4 10/27/16 20:05 • (MSD) R3174053-5 10/27/16 20:26

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Isopropylbenzene	0.0281	ND	0.0183	0.0111	65.1	39.4	1	41.9-139		J3 J6	49.2	29.3
Methyl tert-butyl ether	0.0281	ND	0.0258	0.0162	91.8	57.6	1	50.4-131		J3	45.7	24.8
Naphthalene	0.0281	ND	0.0100	0.00362	35.8	12.9	1	18.4-145		J3 J6	94.1	34
Toluene	0.0281	ND	0.0199	0.0136	70.7	48.3	1	47.8-127		J3	37.6	24.3
1,2,4-Trimethylbenzene	0.0281	ND	0.0161	0.00771	57.2	27.5	1	32.9-139		J3 J6	70.3	30.6
1,3,5-Trimethylbenzene	0.0281	ND	0.0170	0.00894	60.6	31.8	1	37.1-138		J3 J6	62.2	30.6
Xylenes, Total	0.0842	ND	0.0550	0.0321	65.3	38.1	1	42.7-135		J3 J6	52.6	26.6
(S) Toluene-d8					99.0	96.9		88.7-115				
(S) Dibromofluoromethane					107	109		76.3-123				
(S) 4-Bromofluorobenzene					82.5	84.8		69.7-129				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

- <sup>1</sup> Cp
- <sup>2</sup> Tc
- <sup>3</sup> Ss
- <sup>4</sup> Cn
- <sup>5</sup> Sr
- <sup>6</sup> Qc
- <sup>7</sup> Gl
- <sup>8</sup> Al
- <sup>9</sup> Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.



## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

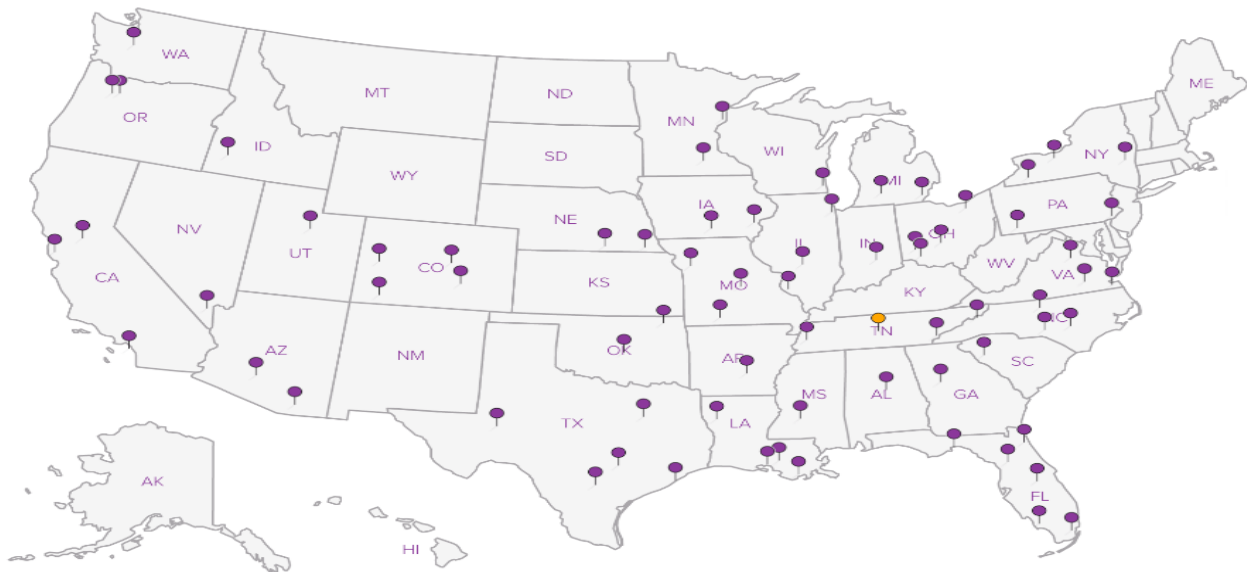
## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



**GES, Inc - Sunoco**

440 Creamery Way, Suite 500  
Exton, PA 19341

Billing Information & Quote Number:  
ges-invoices@gesonline.com  
Accounts Payable  
1691 Georgetown Rd - 440 Creamery Way  
Hudson, OH 44236 Exton, PA

Analysis / Container / Preservative

Chain of Custody Page \_\_\_ of \_\_\_



YOUR LAB OF CHOICE

32065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



Report to:  
**Stephanie Grillo**

Email To: sgrillo@gesonline.com

Project Description: **SXL Butternut Road Release Site**

City/State Collected:

Phone: **610-458-1077**  
Fax:

Client Project #  
**0204694-01-107**

Lab Project #  
**SUNGES-SXL**

Collected by (print):  
*Craig Sherwood*

Site/Facility ID #  
*ACS 1402*

P.O. #

Collected by (signature):  
*Craig Sherwood*  
Immediately Packed on Ice N \_\_\_ Y

**Rush?** (Lab MUST Be Notified)  
Same Day .....200%  
 Next Day .....100%  
Two Day .....50%  
Three Day .....25%

Date Results Needed

Email? \_\_\_ No  Yes  
FAX? \_\_\_ No \_\_\_ Yes

No. of Cntrs

TS 4ozClr-NoPres

V8260UGPA 40ml/NaHSO4/Syr/MeOH

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs															
SS-1	Grab	SS		10/26/16	1700	4	X	X													
SS-2	Grab	SS		10/26/16	1710	4	X	X													01
SS-3	Grab	SS		10/26/16	1720	4	X	X													02
SS-4	Grab	SS		10/26/16	1730	4	X	X													03
SS-5	Grab	SS		10/26/16	1735	4	X	X													04
SS-6	Grab	SS		10/26/16	1740	4	X	X													05
SS-7	Grab	SS		10/26/16	1745	4	X	X													06
SS-8	Grab	SS		10/26/16	1755	4	X	X													07
SS-9	Grab	SS		10/26/16	1800	4	X	X													08
SS-10	Grab	SS		10/26/16	1805	4	X	X													09

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

**Remarks:**

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Hold # \_\_\_\_\_  
Condition: (lab use only) *CSW 7*  
COC Seal Intact: \_\_\_ Y \_\_\_ N  NA  
pH Checked: \_\_\_\_\_ NCF: \_\_\_\_\_

Relinquished by: (Signature) <i>Craig Sherwood</i>	Date: 10/26/16	Time: 19:30	Received by: (Signature) <i>Fedex Courier</i>	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: _____ °C Bottles Received: <i>70</i>
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: <i>10-27-16</i> Time: <i>9:00</i>

**GES, Inc - Sunoco**

440 Creamery Way, Suite 500  
Exton, PA 19341

Billing Information & Quote Number:

Accounts Payable 440 Creamery Way  
1691 Georgetown Rd Exton, PA  
Hudson, OH 44236  
ges-invoices@gesonline.com

Report to:  
**Stephanie Grillo**

Email To: sgrillo@gesonline.com

Project Description: **SXL Butternut Road Release Site**

City/State Collected:

Phone: 610-458-1077  
Fax:

Client Project #  
**0204694-01-107**

Lab Project #  
**SUNGES-SXL**

Collected by (print):  
**Craig Sherwood**

Site/Facility ID #

P.O. #

Collected by (signature):  
**Craig Sherwood**

**Rush?** (Lab MUST Be Notified)  
Same Day .....200%  
 Next Day .....100%  
Two Day .....50%  
Three Day .....25%

Date Results Needed

Email?  No  Yes

FAX?  No  Yes

No. of Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative		Chain of Custody Page ___ of ___		
SS-11	Grab	SS		10/26/16	1810	4	X	X	ESC L.A.B S.C.I.E.N.C.E.S. YOUR LAB OF CHOICE 12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859  L# 86390 Table # Acctnum: SUNGES Template: T117141 Prelogin: P573688 TSR: 134 - Mark W. Beasley PB: Shipped Via: Rem./Contaminant Sample # (lab only)		
SS-12	Grab	SS		10/26/16	1825	4	X	X			11
SS-13	Grab	SS		10/26/16	1835	4	X	X			12
SS-14	Grab	SS		10/26/16	1840	4	X	X			13
SS-15 @ 2'	Grab	SS		10/26/16	1845	4	X	X			14
SS-16	Grab	SS		10/26/16	1850	4	X	X			15
SS-17	Grab	SS		10/26/16	1900	4	X	X			16
<del>SS-18</del>	<del>Grab</del>	<del>SS</del>		<del>10/26/16</del>	<del>(WCS)</del>	4	X	X			17
<del>SS-19</del>	<del>Grab</del>	<del>SS</del>		<del>10/26/16</del>	<del>(WCS)</del>	4	X	X			18
SS-20	Grab	SS		10/26/16	(WCS)	4	X	X			19

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Samples returned via:  UPS

Hold #

Condition: (lab use only)

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

FedEx  Courier  \_\_\_\_\_

Temp: \_\_\_\_\_ °C Bottles Received: \_\_\_\_\_

COC Seal Intact:  Y  N  NA

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

Date: \_\_\_\_\_ Time: \_\_\_\_\_

pH Checked:

NCF:

**GES, Inc - Sunoco**

440 Creamery Way, Suite 500  
Exton, PA 19341

Billing Information & Quote Number:

Accounts Payable  
1691 Georgetown Rd  
Hudson, OH 44236  
440 Creamery Way  
Exton, PA 19341  
ges-invoices@gesonline.com

Email To: sgrillo@gesonline.com

Report to:  
**Stephanie Grillo**

Project Description: **SXL Butternut Road Release Site**

City/State Collected:

Phone: **610-458-1077**

Client Project #  
**0204694-01-107**

Lab Project #  
**SUNGES-SXL**

Fax:

*03 1402*

Collected by (print):

*Craig Sherwood*

Site/Facility ID #

P.O. #

Collected by (signature):

*Craig Sherwood*  
(immediately)  
Packed on ice N \_\_\_ Y **X**

**Rush?** (Lab MUST Be Notified)

Same Day .....200%  
 Next Day .....100%  
Two Day .....50%  
Three Day .....25%

Date Results Needed

Email? \_\_\_ No  Yes

FAX? \_\_\_ No \_\_\_ Yes

No. of Entrs

Analysis / Container / Preservative

TS 4ozClr-NoPres  
V8260UGPA 40ml/NaHSO4/Syr/MeOH

Chain of Custody Page \_\_\_ of \_\_\_



YOUR LAB OF CHOICE

12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# *26820*

Table #

Acctnum: **SUNGES**

Template: **T117141**

Prelogin: **P573688**

TSR: **134 - Mark W. Beasley**

PB:

Shipped Via:

Rem./Contaminant Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Entrs	TS 4ozClr-NoPres	V8260UGPA 40ml/NaHSO4/Syr/MeOH											
<del>SS-21</del>	<del>Grab</del>	<del>SS</del>		<del>10/26/16</del>	<del>(WCS)</del>	4	X	X											
<del>SS-22</del>	<del>Grab</del>	<del>SS</del>		<del>10/26/16</del>	<del>(WCS)</del>	4	X	X											
<del>SS-23</del>	<del>Grab</del>	<del>SS</del>		<del>10/26/16</del>	<del>(WCS)</del>	4	X	X											
SS-20	Grab	SS		10/26/16	1820	4	X	X											18
		SS				4	X	X											
		SS				4	X	X											
		SS				4	X	X											
		SS				4	X	X											
		SS				4	X	X											

\* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other

Remarks:

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Hold # \_\_\_\_\_

Condition: (lab use only) *~ JW7*

COC Seal Intact: \_\_\_ Y \_\_\_ N  NA

pH Checked: \_\_\_\_\_ NCF: \_\_\_\_\_

Relinquished by: (Signature) <i>Craig Sherwood</i>	Date: 10/26/16	Time: 19:30	Received by: (Signature) <i>FedEx Courier</i>	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C 2.6 Bottles Received: 22
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>Stephanie Grillo</i>	Date: 10-27-16 Time: 9:00



YOUR LAB OF CHOICE

### Cooler Receipt Form

Client:	<i>SAGES</i>	SDG#	<i>868568</i>		
Cooler Received/Opened On:	<i>10/27/16</i>	Temperature Upon Receipt:	<i>2.6 °C</i>		
Received By: <b>Rickey Mosley</b>					
Signature: <i>Rickey Mosley</i>					
Receipt Check List			Yes	No	N/A
Were custody seals on outside of cooler and intact?					✓
Were custody papers properly filled out?			✓		
Did all bottles arrive in good condition?			✓		
Were correct bottles used for the analyses requested?			✓		
Was sufficient amount of sample sent in each bottle?			✓		
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)					✓
If applicable, was an observable VOA headspace present?					✓
Non Conformance Generated. (If yes see attached NCF)					

## GES, Inc - Sunoco

Sample Delivery Group: L868946  
Samples Received: 10/28/2016  
Project Number: 0204694-01-107  
Description: SXL Butternut Road Release Site

Report To: Stephanie Grillo  
440 Creamery Way, Suite 500  
Exton, PA 19341

Entire Report Reviewed By:



Jason Romer  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<sup>1</sup> Cp: Cover Page	1
<sup>2</sup> Tc: Table of Contents	2
<sup>3</sup> Ss: Sample Summary	3
<sup>4</sup> Cn: Case Narrative	6
<sup>5</sup> Sr: Sample Results	7
SS-18 L868946-01	7
SS-19 L868946-02	8
SS-20 L868946-03	9
SS-21 L868946-04	10
SS-22 L868946-05	11
SS-23 L868946-06	12
SS-24 L868946-07	13
SS-25 L868946-08	14
SS-26 L868946-09	15
SS-27 L868946-10	16
SS-29 L868946-11	17
SS-30 L868946-12	18
SS-31 L868946-13	19
SS-32 L868946-14	20
SS-33 L868946-15	21
SS-34 L868946-16	22
SS-35 L868946-17	23
SS-36 L868946-18	24
SS-37 L868946-19	25
<sup>6</sup> Qc: Quality Control Summary	26
Total Solids by Method 2540 G-2011	26
Volatile Organic Compounds (GC/MS) by Method 8260B	29
<sup>7</sup> Gl: Glossary of Terms	31
<sup>8</sup> Al: Accreditations & Locations	32
<sup>9</sup> Sc: Chain of Custody	33



# SAMPLE SUMMARY



## SS-18 L868946-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 17:18	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 15:50  
 Received date/time 10/28/16 09:00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## SS-19 L868946-02 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 17:38	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 16:00  
 Received date/time 10/28/16 09:00

## SS-20 L868946-03 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 17:58	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 16:10  
 Received date/time 10/28/16 09:00

## SS-21 L868946-04 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 18:19	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 16:20  
 Received date/time 10/28/16 09:00

## SS-22 L868946-05 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 18:39	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 16:25  
 Received date/time 10/28/16 09:00

## SS-23 L868946-06 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921805	1	10/28/16 13:45	10/28/16 13:54	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 18:59	JAH

Collected by Jason Crone  
 Collected date/time 10/24/16 16:35  
 Received date/time 10/28/16 09:00

## SS-24 L868946-07 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 19:19	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 16:45  
 Received date/time 10/28/16 09:00

# SAMPLE SUMMARY



## SS-25 L868946-08 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 19:39	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 16:55  
 Received date/time 10/28/16 09:00

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

## SS-26 L868946-09 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 19:59	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 17:05  
 Received date/time 10/28/16 09:00

## SS-27 L868946-10 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 20:19	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 17:15  
 Received date/time 10/28/16 09:00

## SS-29 L868946-11 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 20:40	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 17:45  
 Received date/time 10/28/16 09:00

## SS-30 L868946-12 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 21:00	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 17:50  
 Received date/time 10/28/16 09:00

## SS-31 L868946-13 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/26/16 18:05	10/30/16 21:20	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 18:05  
 Received date/time 10/28/16 09:00

## SS-32 L868946-14 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 21:40	JAH

Collected by Jason Crone  
 Collected date/time 10/26/16 18:15  
 Received date/time 10/28/16 09:00

# SAMPLE SUMMARY



## SS-33 L868946-15 Solid

			Collected by Jason Crone	Collected date/time 10/26/16 18:00	Received date/time 10/28/16 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 22:00	JAH

1 Cp

2 Tc

3 Ss

## SS-34 L868946-16 Solid

			Collected by Jason Crone	Collected date/time 10/26/16 16:15	Received date/time 10/28/16 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921806	1	10/28/16 13:35	10/28/16 13:44	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 22:20	JAH

4 Cn

5 Sr

6 Qc

## SS-35 L868946-17 Solid

			Collected by Jason Crone	Collected date/time 10/26/16 16:05	Received date/time 10/28/16 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921858	1	10/29/16 09:34	10/29/16 09:50	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 22:40	JAH

7 Gl

8 Al

9 Sc

## SS-36 L868946-18 Solid

			Collected by Jason Crone	Collected date/time 10/26/16 17:55	Received date/time 10/28/16 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921858	1	10/29/16 09:34	10/29/16 09:50	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 23:00	JAH

## SS-37 L868946-19 Solid

			Collected by Jason Crone	Collected date/time 10/26/16 17:40	Received date/time 10/28/16 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG921858	1	10/29/16 09:34	10/29/16 09:50	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922046	1	10/29/16 21:41	10/30/16 23:21	JAH



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer  
Technical Service Representative

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.6		1	10/28/2016 13:54	<a href="#">WG921805</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
Ethylbenzene	0.00507		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
Naphthalene	ND		0.00534	1	10/30/2016 17:18	<a href="#">WG922046</a>
Toluene	ND		0.00534	1	10/30/2016 17:18	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.0118		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00381		0.00107	1	10/30/2016 17:18	<a href="#">WG922046</a>
Xylenes, Total	0.0319		0.00321	1	10/30/2016 17:18	<a href="#">WG922046</a>
(S) Toluene-d8	102		88.7-115		10/30/2016 17:18	<a href="#">WG922046</a>
(S) Dibromofluoromethane	113		76.3-123		10/30/2016 17:18	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.3		69.7-129		10/30/2016 17:18	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.9		1	10/28/2016 13:54	<a href="#">WG921805</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
Ethylbenzene	0.0110		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
Isopropylbenzene	0.00112		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
Naphthalene	ND		0.00544	1	10/30/2016 17:38	<a href="#">WG922046</a>
Toluene	0.00600		0.00544	1	10/30/2016 17:38	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.0212		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00656		0.00109	1	10/30/2016 17:38	<a href="#">WG922046</a>
Xylenes, Total	0.0682		0.00326	1	10/30/2016 17:38	<a href="#">WG922046</a>
(S) Toluene-d8	112		88.7-115		10/30/2016 17:38	<a href="#">WG922046</a>
(S) Dibromofluoromethane	117		76.3-123		10/30/2016 17:38	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	88.2		69.7-129		10/30/2016 17:38	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	87.8		1	10/28/2016 13:54	<a href="#">WG921805</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
Ethylbenzene	0.00358		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
Naphthalene	ND		0.00569	1	10/30/2016 17:58	<a href="#">WG922046</a>
Toluene	ND		0.00569	1	10/30/2016 17:58	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00126		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00114	1	10/30/2016 17:58	<a href="#">WG922046</a>
Xylenes, Total	0.0176		0.00342	1	10/30/2016 17:58	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 17:58	<a href="#">WG922046</a>
(S) Dibromofluoromethane	112		76.3-123		10/30/2016 17:58	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	88.5		69.7-129		10/30/2016 17:58	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.6		1	10/28/2016 13:54	<a href="#">WG921805</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
Ethylbenzene	0.00365		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
Naphthalene	ND		0.00546	1	10/30/2016 18:19	<a href="#">WG922046</a>
Toluene	ND		0.00546	1	10/30/2016 18:19	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00369		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00124		0.00109	1	10/30/2016 18:19	<a href="#">WG922046</a>
Xylenes, Total	0.0189		0.00327	1	10/30/2016 18:19	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 18:19	<a href="#">WG922046</a>
(S) Dibromofluoromethane	114		76.3-123		10/30/2016 18:19	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.5		69.7-129		10/30/2016 18:19	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	96.7		1	10/28/2016 13:54	<a href="#">WG921805</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
Naphthalene	ND		0.00517	1	10/30/2016 18:39	<a href="#">WG922046</a>
Toluene	ND		0.00517	1	10/30/2016 18:39	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00103	1	10/30/2016 18:39	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00310	1	10/30/2016 18:39	<a href="#">WG922046</a>
(S) Toluene-d8	102		88.7-115		10/30/2016 18:39	<a href="#">WG922046</a>
(S) Dibromofluoromethane	117		76.3-123		10/30/2016 18:39	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	87.2		69.7-129		10/30/2016 18:39	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.3		1	10/28/2016 13:54	<a href="#">WG921805</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
Ethylbenzene	0.00121		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
Naphthalene	ND		0.00525	1	10/30/2016 18:59	<a href="#">WG922046</a>
Toluene	ND		0.00525	1	10/30/2016 18:59	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00105	1	10/30/2016 18:59	<a href="#">WG922046</a>
Xylenes, Total	0.00647		0.00315	1	10/30/2016 18:59	<a href="#">WG922046</a>
<i>(S) Toluene-d8</i>	101		88.7-115		10/30/2016 18:59	<a href="#">WG922046</a>
<i>(S) Dibromofluoromethane</i>	115		76.3-123		10/30/2016 18:59	<a href="#">WG922046</a>
<i>(S) 4-Bromofluorobenzene</i>	87.5		69.7-129		10/30/2016 18:59	<a href="#">WG922046</a>



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	84.9		1	10/28/2016 13:44	<a href="#">WG921806</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
Ethylbenzene	0.00359		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
Naphthalene	ND		0.00589	1	10/30/2016 19:19	<a href="#">WG922046</a>
Toluene	ND		0.00589	1	10/30/2016 19:19	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00646		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00239		0.00118	1	10/30/2016 19:19	<a href="#">WG922046</a>
Xylenes, Total	0.0213		0.00353	1	10/30/2016 19:19	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 19:19	<a href="#">WG922046</a>
(S) Dibromofluoromethane	112		76.3-123		10/30/2016 19:19	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.2		69.7-129		10/30/2016 19:19	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.6		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
Ethylbenzene	0.00153		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
Naphthalene	ND		0.00523	1	10/30/2016 19:39	<a href="#">WG922046</a>
Toluene	ND		0.00523	1	10/30/2016 19:39	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00201		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00105	1	10/30/2016 19:39	<a href="#">WG922046</a>
Xylenes, Total	0.00953		0.00314	1	10/30/2016 19:39	<a href="#">WG922046</a>
(S) Toluene-d8	102		88.7-115		10/30/2016 19:39	<a href="#">WG922046</a>
(S) Dibromofluoromethane	118		76.3-123		10/30/2016 19:39	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	90.1		69.7-129		10/30/2016 19:39	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.8		1	10/28/2016 13:44	<a href="#">WG921806</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
Ethylbenzene	0.00295		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
Naphthalene	ND		0.00533	1	10/30/2016 19:59	<a href="#">WG922046</a>
Toluene	ND		0.00533	1	10/30/2016 19:59	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00670		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00259		0.00107	1	10/30/2016 19:59	<a href="#">WG922046</a>
Xylenes, Total	0.0192		0.00320	1	10/30/2016 19:59	<a href="#">WG922046</a>
(S) Toluene-d8	102		88.7-115		10/30/2016 19:59	<a href="#">WG922046</a>
(S) Dibromofluoromethane	116		76.3-123		10/30/2016 19:59	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	87.3		69.7-129		10/30/2016 19:59	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.6		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
Naphthalene	ND		0.00523	1	10/30/2016 20:19	<a href="#">WG922046</a>
Toluene	ND		0.00523	1	10/30/2016 20:19	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00105	1	10/30/2016 20:19	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00314	1	10/30/2016 20:19	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 20:19	<a href="#">WG922046</a>
(S) Dibromofluoromethane	116		76.3-123		10/30/2016 20:19	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.6		69.7-129		10/30/2016 20:19	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	84.2		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
Ethylbenzene	0.00304		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
Naphthalene	ND		0.00594	1	10/30/2016 20:40	<a href="#">WG922046</a>
Toluene	ND		0.00594	1	10/30/2016 20:40	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00119	1	10/30/2016 20:40	<a href="#">WG922046</a>
Xylenes, Total	0.0148		0.00356	1	10/30/2016 20:40	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 20:40	<a href="#">WG922046</a>
(S) Dibromofluoromethane	111		76.3-123		10/30/2016 20:40	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	85.3		69.7-129		10/30/2016 20:40	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.1		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
Ethylbenzene	0.00787		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
Naphthalene	ND		0.00648	1	10/30/2016 21:00	<a href="#">WG922046</a>
Toluene	0.00739		0.00648	1	10/30/2016 21:00	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00378		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00185		0.00130	1	10/30/2016 21:00	<a href="#">WG922046</a>
Xylenes, Total	0.0399		0.00389	1	10/30/2016 21:00	<a href="#">WG922046</a>
(S) Toluene-d8	103		88.7-115		10/30/2016 21:00	<a href="#">WG922046</a>
(S) Dibromofluoromethane	111		76.3-123		10/30/2016 21:00	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	85.8		69.7-129		10/30/2016 21:00	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	83.2		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
Ethylbenzene	0.00487	<a href="#">J3 J6</a>	0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
Isopropylbenzene	ND	<a href="#">J3 J6</a>	0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
Naphthalene	ND	<a href="#">J3 J6</a>	0.00601	1	10/30/2016 21:20	<a href="#">WG922046</a>
Toluene	ND	<a href="#">J3 J6</a>	0.00601	1	10/30/2016 21:20	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00180	<a href="#">J3 J6</a>	0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND	<a href="#">J3 J6</a>	0.00120	1	10/30/2016 21:20	<a href="#">WG922046</a>
Xylenes, Total	0.0240	<a href="#">J3 J6</a>	0.00361	1	10/30/2016 21:20	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 21:20	<a href="#">WG922046</a>
(S) Dibromofluoromethane	113		76.3-123		10/30/2016 21:20	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.9		69.7-129		10/30/2016 21:20	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	62.3		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
Ethylbenzene	0.00241		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
Naphthalene	ND		0.00803	1	10/30/2016 21:40	<a href="#">WG922046</a>
Toluene	ND		0.00803	1	10/30/2016 21:40	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00387		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00161	1	10/30/2016 21:40	<a href="#">WG922046</a>
Xylenes, Total	0.0137		0.00482	1	10/30/2016 21:40	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 21:40	<a href="#">WG922046</a>
(S) Dibromofluoromethane	113		76.3-123		10/30/2016 21:40	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	87.9		69.7-129		10/30/2016 21:40	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.3		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
Ethylbenzene	0.00492		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
Naphthalene	ND		0.00615	1	10/30/2016 22:00	<a href="#">WG922046</a>
Toluene	ND		0.00615	1	10/30/2016 22:00	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	0.00496		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	0.00188		0.00123	1	10/30/2016 22:00	<a href="#">WG922046</a>
Xylenes, Total	0.0272		0.00369	1	10/30/2016 22:00	<a href="#">WG922046</a>
(S) Toluene-d8	113		88.7-115		10/30/2016 22:00	<a href="#">WG922046</a>
(S) Dibromofluoromethane	110		76.3-123		10/30/2016 22:00	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	84.9		69.7-129		10/30/2016 22:00	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.9		1	10/28/2016 13:44	<a href="#">WG921806</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
Naphthalene	ND		0.00521	1	10/30/2016 22:20	<a href="#">WG922046</a>
Toluene	ND		0.00521	1	10/30/2016 22:20	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00104	1	10/30/2016 22:20	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00313	1	10/30/2016 22:20	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 22:20	<a href="#">WG922046</a>
(S) Dibromofluoromethane	120		76.3-123		10/30/2016 22:20	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	88.6		69.7-129		10/30/2016 22:20	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	89.8		1	10/29/2016 09:50	<a href="#">WG921858</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
Naphthalene	ND		0.00557	1	10/30/2016 22:40	<a href="#">WG922046</a>
Toluene	ND		0.00557	1	10/30/2016 22:40	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00111	1	10/30/2016 22:40	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00334	1	10/30/2016 22:40	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 22:40	<a href="#">WG922046</a>
(S) Dibromofluoromethane	115		76.3-123		10/30/2016 22:40	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	87.3		69.7-129		10/30/2016 22:40	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	97.1		1	10/29/2016 09:50	<a href="#">WG921858</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
Naphthalene	ND		0.00515	1	10/30/2016 23:00	<a href="#">WG922046</a>
Toluene	ND		0.00515	1	10/30/2016 23:00	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00103	1	10/30/2016 23:00	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00309	1	10/30/2016 23:00	<a href="#">WG922046</a>
(S) Toluene-d8	101		88.7-115		10/30/2016 23:00	<a href="#">WG922046</a>
(S) Dibromofluoromethane	118		76.3-123		10/30/2016 23:00	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	86.4		69.7-129		10/30/2016 23:00	<a href="#">WG922046</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	93.0		1	10/29/2016 09:50	<a href="#">WG921858</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
Ethylbenzene	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
Isopropylbenzene	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
Methyl tert-butyl ether	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
Naphthalene	ND		0.00538	1	10/30/2016 23:21	<a href="#">WG922046</a>
Toluene	ND		0.00538	1	10/30/2016 23:21	<a href="#">WG922046</a>
1,2,4-Trimethylbenzene	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
1,3,5-Trimethylbenzene	ND		0.00108	1	10/30/2016 23:21	<a href="#">WG922046</a>
Xylenes, Total	ND		0.00323	1	10/30/2016 23:21	<a href="#">WG922046</a>
(S) Toluene-d8	102		88.7-115		10/30/2016 23:21	<a href="#">WG922046</a>
(S) Dibromofluoromethane	114		76.3-123		10/30/2016 23:21	<a href="#">WG922046</a>
(S) 4-Bromofluorobenzene	83.3		69.7-129		10/30/2016 23:21	<a href="#">WG922046</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3174590-1 10/28/16 13:54

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.00120			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

L868944-03 Original Sample (OS) • Duplicate (DUP)

(OS) L868944-03 10/28/16 13:54 • (DUP) R3174590-3 10/28/16 13:54

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	84.8	84.9	1	0.124		5

<sup>6</sup> Qc

Laboratory Control Sample (LCS)

(LCS) R3174590-2 10/28/16 13:54

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3174576-1 10/28/16 13:44

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000400			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

L868946-16 Original Sample (OS) • Duplicate (DUP)

(OS) L868946-16 10/28/16 13:44 • (DUP) R3174576-3 10/28/16 13:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	95.9	95.0	1	0.992		5

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3174576-2 10/28/16 13:44

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	



Method Blank (MB)

(MB) R3174532-1 10/29/16 09:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000100			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

L868802-01 Original Sample (OS) • Duplicate (DUP)

(OS) L868802-01 10/29/16 09:50 • (DUP) R3174532-3 10/29/16 09:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	89.1	86.3	1	3.15		5

<sup>6</sup> Qc

Laboratory Control Sample (LCS)

(LCS) R3174532-2 10/29/16 09:50

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3174577-2 10/30/16 14:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000270	0.00100
Ethylbenzene	U		0.000297	0.00100
Isopropylbenzene	U		0.000243	0.00100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000434	0.00500
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	101			88.7-115
(S) Dibromofluoromethane	109			76.3-123
(S) 4-Bromofluorobenzene	90.8			69.7-129

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3174577-3 10/30/16 15:22 • (LCSD) R3174577-4 10/30/16 15:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0278	0.0263	111	105	72.6-120			5.65	20
Ethylbenzene	0.0250	0.0226	0.0214	90.5	85.5	78.6-124			5.63	20
Isopropylbenzene	0.0250	0.0222	0.0221	88.9	88.2	79.4-126			0.800	20
Methyl tert-butyl ether	0.0250	0.0250	0.0283	100	113	70.2-122			12.3	20
Naphthalene	0.0250	0.0268	0.0258	107	103	69.9-132			3.65	20
Toluene	0.0250	0.0262	0.0244	105	97.8	76.7-116			6.80	20
1,2,4-Trimethylbenzene	0.0250	0.0224	0.0230	89.6	91.9	77.1-124			2.54	20
1,3,5-Trimethylbenzene	0.0250	0.0224	0.0229	89.5	91.6	79.0-125			2.32	20
Xylenes, Total	0.0750	0.0670	0.0652	89.3	86.9	78.1-123			2.67	20
(S) Toluene-d8				102	103	88.7-115				
(S) Dibromofluoromethane				106	111	76.3-123				
(S) 4-Bromofluorobenzene				88.8	95.4	69.7-129				

L868946-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868946-13 10/30/16 21:20 • (MS) R3174577-5 10/30/16 16:18 • (MSD) R3174577-6 10/30/16 16:38

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0301	ND	0.0221	0.0176	73.4	58.7	1	47.8-131			22.2	22.8
Ethylbenzene	0.0301	0.00487	0.0131	0.00827	27.3	11.3	1	44.8-135	J6	J3 J6	45.1	26.9



L868946-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868946-13 10/30/16 21:20 • (MS) R3174577-5 10/30/16 16:18 • (MSD) R3174577-6 10/30/16 16:38

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Isopropylbenzene	0.0301	ND	0.0109	0.00594	35.2	18.6	1	41.9-139	<u>J6</u>	<u>J3 J6</u>	59.1	29.3
Methyl tert-butyl ether	0.0301	ND	0.0256	0.0228	85.3	75.8	1	50.4-131			11.8	24.8
Naphthalene	0.0301	ND	0.00767	0.00367	25.5	12.2	1	18.4-145		<u>J3 J6</u>	70.4	34
Toluene	0.0301	ND	0.0178	0.0131	42.4	26.7	1	47.8-127	<u>J6</u>	<u>J3 J6</u>	30.4	24.3
1,2,4-Trimethylbenzene	0.0301	0.00180	0.0106	0.00561	29.2	12.7	1	32.9-139	<u>J6</u>	<u>J3 J6</u>	61.3	30.6
1,3,5-Trimethylbenzene	0.0301	ND	0.0101	0.00501	30.7	13.8	1	37.1-138	<u>J6</u>	<u>J3 J6</u>	67.3	30.6
Xylenes, Total	0.0902	0.0240	0.0401	0.0257	17.9	1.84	1	42.7-135	<u>J6</u>	<u>J3 J6</u>	43.9	26.6
(S) Toluene-d8					100	101		88.7-115				
(S) Dibromofluoromethane					114	112		76.3-123				
(S) 4-Bromofluorobenzene					83.3	86.6		69.7-129				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

- <sup>1</sup> Cp
- <sup>2</sup> Tc
- <sup>3</sup> Ss
- <sup>4</sup> Cn
- <sup>5</sup> Sr
- <sup>6</sup> Qc
- <sup>7</sup> Gl
- <sup>8</sup> Al
- <sup>9</sup> Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.



## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

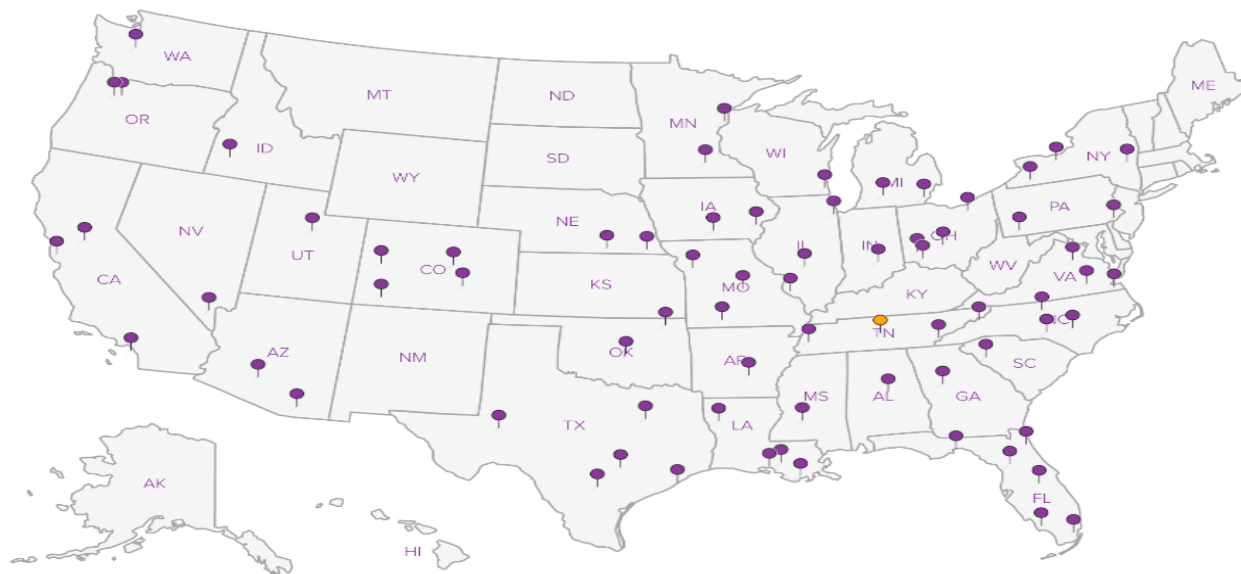
## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**





Company Name/Address:  
**GES, Inc - Sunoco**  
 440 Creamery Way, Suite 500  
 Exton, PA 19341

Billing Information:  
**Accounts Payable**  
 440 Creamery Way, Suite 500  
 Exton, PA 19341  
 ges-invoices@gesonline.com

Report to:  
**Stephanie Grillo**

Email To:  
 sgrillo@gesonline.com, labreports@gesonline.com

Project Description:  
**SXL Butternut Road Release Site**

City/State Collected:  
**Montoursville, PA**

Phone: **610-458-1077**  
 Fax:

Client Project #  
**0204694-01-107, org 1402**

Lab Project #  
**SUNGES-GRILLO**

Collected by (print):  
*Jason Crane*

Site/Facility ID #

P.O. #

Collected by (signature):  
*Jason Crane*  
 Immediately Packed on Ice N \_\_\_ Y

**Rush?** (Lab MUST Be Notified)  
 Same Day .....200%  
 Next Day .....100%  
 Two Day .....50%  
 Three Day .....25%

Date Results Needed  
 Email? \_\_\_ No  Yes  
 FAX?  No \_\_\_ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
SS-29	Grab	SS		10/26/16	1745	4
SS-30	Grab	SS		10/26/16	1750	4
SS-31	Grab	SS		10/26/16	1805	4
SS-32	Grab	SS		10/26/16	1815	4
SS-33	Grab	SS		10/26/16	1800	4
SS-34	Grab	SS		10/27/16	1615	4
SS-35	Grab	SS		10/27/16	1605	4
SS-36	Grab	SS		10/27/16	1755	34
SS-37	Grab	SS		10/27/16	1740	4
	Grab	SS				4

Analysis / Container / Preservative										
8260B - BTEX < MTBE, cumene, naphthalene, 1,2,4-TMB										
MOISTURE										

Chain of Custody Page \_\_\_ of \_\_\_



YOUR LAB OF CHOICE

12065 Lebanon Rd  
 Mount Juliet, TN 37122  
 Phone: 615-758-5858  
 Phone: 800-787-5859  
 Fax: 615-758-5859



L# **2868946**

Table #

Acctnum **SUNGES**  
 Template: **T114657**  
 Prelogin: **P564159**  
 TSR: **Mark Beasley**  
 Cooler:

Shipped Via:

Rem./Contaminant	Sample # (lab only)
	11
	12
	13
	14
	15
	16
	17
	18
	19
	20 JW

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other \_\_\_\_\_

Remarks:

Relinquished by: (Signature) *Jason Crane* Date: **10-27-16** Time: **1915**

Relinquished by: (Signature) Date: Time: Received by: (Signature) *FedEx Courier*

Relinquished by: (Signature) Date: Time: Received for lab by: (Signature) *MW*

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Hold #

Samples returned via:  UPS  FedEx  Courier  \_\_\_\_\_

Temp: \_\_\_\_\_ °C Bottles Received: **75**

2.6

Date: **10-28-16** Time: **9:00**

Condition: (lab use only) **JW**

COC Seal Intact:  Y \_\_\_ N \_\_\_ NA

pH Checked: NCF:



L · A · B   S · C · I · E · N · C · E · S

YOUR LAB OF CHOICE

### Cooler Receipt Form

Client:	SUNGES	SDG#	L868946
Cooler Received/Opened On:	10/28/16	Temperature Upon Receipt:	2.6 °C
Received By: Michael Witherspoon			
Signature: <i>Mwit</i>			

Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were custody papers properly filled out?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did all bottles arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct bottles used for the analyses requested?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was sufficient amount of sample sent in each bottle?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If applicable, was an observable VOA headspace present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Non Conformance Generated. (If yes see attached NCF)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Matt Shacklock**

**ESC Lab Sciences**  
**Non-Conformance Form**

<b>Login #: L868946</b>	<b>Client: SUNGES</b>	<b>Date: 10/28/16</b>	<b>Evaluated by: Micheal</b>
-------------------------	-----------------------	-----------------------	------------------------------

**Non-Conformance (check applicable items)**

<b>Sample Integrity</b>	<b>Chain of Custody Clarification</b>	<b>If Broken Container:</b>
Parameter(s) past holding time	Login Clarification Needed	Insufficient packing material around container
Improper temperature	Chain of custody is incomplete	Insufficient packing material inside cooler
Improper container type	Please specify Metals requested.	Improper handling by carrier (FedEx / UPS / Courier)
Improper preservation	Please specify TCLP requested.	Sample was frozen
Insufficient sample volume.	Received additional samples not listed on coc.	Container lid not intact
Sample is biphasic.	Sample ids on containers do not match ids on coc	<b>If no Chain of Custody:</b>
Vials received with headspace.	Trip Blank not received.	Received by:
Broken container	Client did not "X" analysis.	Date/Time:
Broken container:	Chain of Custody is missing	Temp./Cont. Rec./pH:
Sufficient sample remains		Carrier:
		Tracking#

**Login Comments:**

- 1. Received 1-40ml Vial broken for SS-36**
- 2. Received ss-27 @ 1715 instead of SS-25 @ 1715. Logged per COC**
- 3. Received SS-33 @ 1815 instead of SS-32 @ 1815. Logged per COC**

<b>Client informed by:</b>	<b>Call</b>	<b>Email</b>	<b>Voice Mail</b>	<b>Date: 10/28/16</b>	<b>Time: 11:40</b>
<b>TSR Initials: MB</b>	<b>Client Contact: Stephanie Grillo</b>				

**Login Instructions:**

- 1) Client notified
- 2) Log per COC
- 3) Log per COC

This E-mail and any attached files are confidential, and may be copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. If you have received this message in error, please contact the sender immediately and delete/destroy all information received.

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Report Date: October 31, 2016

**Project: SXL - Loyalsock**

Submittal Date: 10/26/2016

Group Number: 1725036

SDG: SXL03

PO Number: LOYALSOCK

State of Sample Origin: PA

### Client Sample Description

SXL-Z1-E-SW-04 Grab Surface Water  
SXL-Z1-E-SE-04 Grab Sediment  
SXL-Z1-E-SE-03 Grab Sediment  
SXL-Z1-E-SW-03 Grab Surface Water

Lancaster Labs

(LL) #

8662063

8662064

8662065

8662066

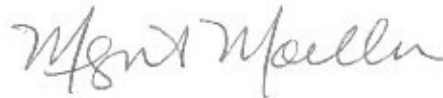
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Cardno, Inc.  
Electronic Copy To Cardno Entrix

Attn: Chris Pfeifer  
Attn: Kimberly Sechrist

Respectfully Submitted,



Megan A. Moeller  
Senior Specialist

(717) 556-7261

Sample Description: **SXL-Z1-E-SW-04 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8662063**  
LL Group # **1725036**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/24/2016 17:41 by SH

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/26/2016 08:05

Reported: 10/31/2016 12:25

Z1EW4 SDG#: SXL03-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	Z163002AA	10/26/2016 12:58	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z163002AA	10/26/2016 12:58	Anita M Dale	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299A94A	10/26/2016 13:47	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299A94A	10/26/2016 13:47	Brett W Kenyon	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SE-04 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8662064**  
LL Group # **1725036**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/24/2016 17:41 by SH

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/26/2016 08:05  
Reported: 10/31/2016 12:25

Z1EE4 SDG#: SXL03-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 7	7	0.7	1
10237	Ethylbenzene	100-41-4	< 7	7	1	1
10237	Isopropylbenzene	98-82-8	< 7	7	1	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 7	7	0.7	1
10237	Naphthalene	91-20-3	< 7	7	1	1
10237	Toluene	108-88-3	< 7	7	1	1
10237	1,2,4-Trimethylbenzene	95-63-6	< 7 Q8	7	1	1
10237	1,3,5-Trimethylbenzene	108-67-8	< 7 Q8	7	1	1
10237	Xylene (Total)	1330-20-7	< 7 Q8	7	1	1
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.3	1.3	0.3	24.98
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 436 Q8	436	145	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	25.0	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B163001AA	10/26/2016 15:20	Angela D Sneeringer	1
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 12:05	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201630043142	10/26/2016 12:05	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 11:42	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16301A16A	10/27/2016 13:27	Marie D Beamenderfer	24.98
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 11:42	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731B	10/26/2016 20:21	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16300912201A	10/26/2016 09:37	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SE-03 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8662065**  
LL Group # **1725036**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/24/2016 18:12 by SH

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/26/2016 08:05

Reported: 10/31/2016 12:25

Z1EW3 SDG#: SXL03-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 6	6	0.6	0.97
10237	Ethylbenzene	100-41-4	< 6	6	1	0.97
10237	Isopropylbenzene	98-82-8	< 6	6	1	0.97
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 6	6	0.6	0.97
10237	Naphthalene	91-20-3	< 6	6	1	0.97
10237	Toluene	108-88-3	< 6	6	1	0.97
10237	1,2,4-Trimethylbenzene	95-63-6	< 6 Q8	6	1	0.97
10237	1,3,5-Trimethylbenzene	108-67-8	< 6 Q8	6	1	0.97
10237	Xylene (Total)	1330-20-7	< 6 Q8	6	1	0.97
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.2	1.2	0.2	24.3
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	883 Q8	383	128	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	18.6	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B163001AA	10/26/2016 15:42	Angela D Sneeringer	0.97
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 12:05	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201630043142	10/26/2016 12:05	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 11:44	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16301A16A	10/27/2016 14:05	Marie D Beamenderfer	24.3
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201630043142	10/26/2016 11:43	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731B	10/26/2016 20:29	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16300912201A	10/26/2016 10:02	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SW-03 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8662066**  
LL Group # **1725036**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/24/2016 18:12 by SH

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/26/2016 08:05

Reported: 10/31/2016 12:25

Z1EE3 SDG#: SXL03-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	Z163002AA	10/26/2016 13:22	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	Z163002AA	10/26/2016 13:22	Anita M Dale	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299A94A	10/26/2016 13:22	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299A94A	10/26/2016 13:22	Brett W Kenyon	1

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 12:25

Group Number: 1725036

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: B163001AA	Sample number(s): 8662064-8662065		
Benzene	< 5	5	0.5
Ethylbenzene	< 5	5	1
Isopropylbenzene	< 5	5	1
Methyl Tertiary Butyl Ether	< 5	5	0.5
Naphthalene	< 5	5	1
Toluene	< 5	5	1
1,2,4-Trimethylbenzene	< 5	5	1
1,3,5-Trimethylbenzene	< 5	5	1
Xylene (Total)	< 5	5	1
	ug/l	ug/l	ug/l
Batch number: Z163002AA	Sample number(s): 8662063,8662066		
Benzene	< 1	1	0.5
Ethylbenzene	< 1	1	0.5
Isopropylbenzene	< 2	2	0.5
Methyl Tertiary Butyl Ether	< 1	1	0.5
Naphthalene	< 4	4	1
Toluene	< 1	1	0.5
1,2,4-Trimethylbenzene	< 2	2	0.5
1,3,5-Trimethylbenzene	< 2	2	0.5
Xylene (Total)	< 1	1	0.5
	mg/kg	mg/kg	mg/kg
Batch number: 16301A16A	Sample number(s): 8662064-8662065		
TPH-GRO soil C6-C10	< 1.0	1.0	0.2
	ug/l	ug/l	ug/l
Batch number: 16299A94A	Sample number(s): 8662063,8662066		
TPH-GRO water C6-C10	< 50	50	20
	mg/kg	mg/kg	mg/kg
Batch number: 16300121731B	Sample number(s): 8662064-8662065		
TOC by Lloyd Kahn	< 300	300	100

### LCS/LCSD

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 12:25

Group Number: 1725036

### LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: B163001AA	Sample number(s): 8662064-8662065								
Benzene	20	17.8	20	17.39	89	87	80-120	2	30
Ethylbenzene	20	18.43	20	17.98	92	90	80-120	2	30
Isopropylbenzene	20	18.82	20	18.57	94	93	76-120	1	30
Methyl Tertiary Butyl Ether	20	18.79	20	18.45	94	92	72-120	2	30
Naphthalene	20	19.23	20	19.11	96	96	53-120	1	30
Toluene	20	18.83	20	18.44	94	92	80-120	2	30
1,2,4-Trimethylbenzene	20	18.38	20	17.91	92	90	74-120	3	30
1,3,5-Trimethylbenzene	20	18.32	20	18.12	92	91	73-120	1	30
Xylene (Total)	60	56	60	54.74	93	91	80-120	2	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: Z163002AA	Sample number(s): 8662063,8662066								
Benzene	20	18.8			94		78-120		
Ethylbenzene	20	19.38			97		78-120		
Isopropylbenzene	20	19.76			99		80-120		
Methyl Tertiary Butyl Ether	20	19.91			100		75-120		
Naphthalene	20	17.36			87		59-120		
Toluene	20	19.28			96		80-120		
1,2,4-Trimethylbenzene	20	19.09			95		75-120		
1,3,5-Trimethylbenzene	20	18.83			94		75-120		
Xylene (Total)	60	59.15			99		80-120		
	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>					
Batch number: 16301A16A	Sample number(s): 8662064-8662065								
TPH-GRO soil C6-C10	11	9.05	11	8.95	82	81	54-120	1	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 16299A94A	Sample number(s): 8662063,8662066								
TPH-GRO water C6-C10	1100	1025.15	1100	1051.76	93	96	80-120	3	30
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>					
Batch number: 16300912201A	Sample number(s): 8662064-8662065								
Moisture	100	100			100		98-101		
	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>					
Batch number: 16300121731B	Sample number(s): 8662064-8662065								
TOC by Lloyd Kahn	5830	4134.53			71		50-150		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 12:25

Group Number: 1725036

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Z163002AA	Sample number(s): 8662063,8662066 UNSPK: P655766									
Benzene	< 1	20	18.49	20	19.5	92	98	78-120	5	30
Ethylbenzene	< 1	20	18.93	20	19.77	95	99	78-120	4	30
Isopropylbenzene	< 2	20	19.35	20	20.44	97	102	80-120	6	30
Methyl Tertiary Butyl Ether	5.84	20	24	20	24.56	91	94	75-120	2	30
Naphthalene	< 4	20	15.43	20	17.34	77	87	59-120	12	30
Toluene	< 1	20	18.71	20	19.83	94	99	80-120	6	30
1,2,4-Trimethylbenzene	< 2	20	18.57	20	19.68	93	98	75-120	6	30
1,3,5-Trimethylbenzene	< 2	20	18.31	20	19.35	92	97	75-120	6	30
Xylene (Total)	< 1	60	57.61	60	60.73	96	101	80-120	5	30
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16300121731B	Sample number(s): 8662064-8662065 UNSPK: 8662065									
TOC by Lloyd Kahn	718.76	37590	27243.11			71		47-143		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/kg	DUP Conc ug/kg	DUP RPD	DUP RPD Max
Batch number: B163001AA	Sample number(s): 8662064-8662065 BKG: P644491			
Benzene	< 5	< 5	0 (1)	30
Ethylbenzene	< 5	< 5	0 (1)	30
Isopropylbenzene	< 5	< 5	0 (1)	30
Methyl Tertiary Butyl Ether	< 5	< 5	0 (1)	30
Naphthalene	< 5	< 5	0 (1)	30
Toluene	< 5	< 5	0 (1)	30
1,2,4-Trimethylbenzene	13.05	2.49	136* (1)	30
1,3,5-Trimethylbenzene	82.91	14.16	142* (1)	30
Xylene (Total)	4.96	< 5	200* (1)	30
	%	%		
Batch number: 16300912201A	Sample number(s): 8662064-8662065 BKG: P661238			
Moisture	74.76	74.72	0	3
	mg/kg	mg/kg		
Batch number: 16300121731B	Sample number(s): 8662064-8662065 BKG: 8662065			
TOC by Lloyd Kahn	718.76	649.82	10* (1)	7

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 12:25

Group Number: 1725036

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: UST Unleaded 8260+TMBs (Soil)  
Batch number: B163001AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8662064	97	99	102	94
8662065	98	100	101	93
Blank	102	108	97	97
DUP	99	108	99	97
LCS	100	105	102	97
LCSD	100	101	102	98
Limits:	50-141	54-135	52-141	50-131

Analysis Name: UST Unleaded + TMBs 8260B  
Batch number: Z163002AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8662063	103	100	96	95
8662066	104	99	97	93
Blank	104	100	97	94
LCS	101	101	97	100
MS	101	100	97	100
MSD	100	100	96	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: TPH-GRO water C6-C10  
Batch number: 16299A94A

	Trifluorotoluene-F
8662063	80
8662066	76
Blank	80
LCS	95
LCSD	97
Limits:	63-135

Analysis Name: TPH-GRO soil C6-C10  
Batch number: 16301A16A

	Trifluorotoluene-F
8662064	93
8662065	104
Blank	114
LCS	105
LCSD	105
Limits:	50-142

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

**Quality Control Summary**Client Name: Cardno Entrix  
Reported: 10/31/2016 12:25Group Number: 1725036

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\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Client: Cardno

**Delivery and Receipt Information**

Delivery Method: UPS                      Arrival Timestamp: 10/26/2016 8:05  
 Number of Packages: 1                      Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Timothy Cubberley (6520) at 08:17 on 10/26/2016*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)*    All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.8	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	none detected
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

## Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value  $\geq$  the Method Detection Limit (MDL or DL) and  $<$  the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column  $>40\%$ . The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column  $>100\%$ . The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

## Additional Data Qualifiers

<b>Qualifier</b>	<b>Definition</b>
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Report Date: October 31, 2016

**Project: SXL - Loyalsock**

Submittal Date: 10/25/2016

Group Number: 1724533

SDG: SXL02

PO Number: LOYALSOCK

State of Sample Origin: PA

Lancaster Labs

Client Sample Description

	<u>(LL) #</u>
SXL-SU-DS-SW-01 Grab Surface Water	8659826
SXL-SU-MX-SW-01 Grab Surface Water	8659827
SXL-LS-SW-04 Grab Surface Water	8659828
SXL-SU-UP-SW-01 Grab Surface Water	8659829
SXL-BN-SW-01 Grab Surface Water	8659830
SXL-LS-SW-05 Grab Surface Water	8659831
SXL-Z3-E-SW-01 Grab Surface Water	8659832
SXL-Z3-E-SE-01 Grab Sediment	8659833
SXL-Z3-E-SW-02 Grab Surface Water	8659834
SXL-Z3-E-SE-02 Grab Sediment	8659835
SXL-Z2-E-SW-01 Grab Surface Water	8659836
SXL-Z2-E-SE-01 Grab Sediment	8659837
SXL-PostN-1-SW-01 Grab Surface Water	8659838
SXL-PostN-1-SW-02 Grab Surface Water	8659839
SXL-PostN-1-SE-01 Grab Sediment	8659840
SXL-PostN-2-SW-01 Grab Surface Water	8659841
SXL-PostN-2-SE-01 Grab Sediment	8659842
TRIB Grab Surface Water	8659843
SXL-Z1-E-SW-01 Grab Surface Water	8659844
SXL-Z1-E-SE-01 Grab Sediment	8659845
SXL-Z3-W-SW-01 Grab Surface Water	8659846
SXL-Z3-W-SE-01 Grab Sediment	8659847
SXL-Z2-W-SW-02 Grab Surface Water	8659848
SXL-Z2-W-SE-02 Grab Sediment	8659849
SXL-Z1-W-SW-01 Grab Surface Water	8659850
SXL-Z1-W-SW-02 Grab Surface Water	8659851
SXL-Z1-W-SE-02 Grab Sediment	8659852
SXL-Z1-W-SW-03 Grab Surface Water	8659853
SXL-Z1-W-SE-03 Grab Sediment	8659854
SXL-Z1-W-SE-03a Grab Sediment	8659855

SXL-Z1-E-SW-02 Grab Surface Water  
SXL-Z1-E-SE-02 Grab Sediment

8659856  
8659857


The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Cardno, Inc.  
Electronic Copy To Cardno Entrix

Attn: Chris Pfeifer  
Attn: Kimberly Sechrist

Respectfully Submitted,



Megan A. Moeller  
Senior Specialist

(717) 556-7261

Sample Description: SXL-SU-DS-SW-01 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659826  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/22/2016 10:45 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

SUDSW SDG#: SXL02-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	2	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 15:23	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 15:23	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 12:57	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 12:57	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-SU-MX-SW-01 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659827  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/22/2016 11:30 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

SUMXW SDG#: SXL02-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	2	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 15:45	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 15:45	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 13:24	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 13:24	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-LS-SW-04 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659828  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/22/2016 11:56 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

LSSW4 SDG#: SXL02-03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	2	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 16:07	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 16:07	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 13:51	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 13:51	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-SU-UP-SW-01 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659829  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/22/2016 12:15 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

SUUPW SDG#: SXL02-04

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 16:29	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 16:29	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 14:18	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 14:18	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-BN-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659830**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/22/2016 16:55 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

BNSW1 SDG#: SXL02-05

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 16:50	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 16:50	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 14:46	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 14:46	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-LS-SW-05 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659831  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/22/2016 17:10 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

LSSW1 SDG#: SXL02-06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	2	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 17:12	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 17:12	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 15:13	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 15:13	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-Z3-E-SW-01 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659832  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 11:10 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z3E01 SDG#: SXL02-07

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	3	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	3	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 17:34	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 17:34	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 15:40	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 15:40	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z3-E-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659833**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 11:12 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z3E02 SDG#: SXL02-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 7	7	0.7	1.03
10237	Ethylbenzene	100-41-4	< 7	7	1	1.03
10237	Isopropylbenzene	98-82-8	< 7	7	1	1.03
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 7	7	0.7	1.03
10237	Naphthalene	91-20-3	< 7	7	1	1.03
10237	Toluene	108-88-3	< 7	7	1	1.03
10237	1,2,4-Trimethylbenzene	95-63-6	< 7	7	1	1.03
10237	1,3,5-Trimethylbenzene	108-67-8	< 7	7	1	1.03
10237	Xylene (Total)	1330-20-7	< 7	7	1	1.03
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.4	1.4	0.3	26.29
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 427 Q8	427	142	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	23.5	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 17:33	Patrick T Herres	1.03
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:44	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16298A31A	10/25/2016 15:51	Marie D Beamenderfer	26.29
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:00	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 18:25	Drew M Gerhart	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 11:42	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z3-E-SW-02 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659834**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 11:45 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z3ES2 SDG#: SXL02-09

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	4	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	3	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 17:56	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 17:56	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 16:08	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 16:08	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z3-E-SE-02 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659835**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 11:50 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

SZESE SDG#: SXL02-10

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 7	7	0.7	0.98
10237	Ethylbenzene	100-41-4	< 7	7	1	0.98
10237	Isopropylbenzene	98-82-8	< 7	7	1	0.98
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 7	7	0.7	0.98
10237	Naphthalene	91-20-3	< 7	7	1	0.98
10237	Toluene	108-88-3	< 7	7	1	0.98
10237	1,2,4-Trimethylbenzene	95-63-6	< 7	7	1	0.98
10237	1,3,5-Trimethylbenzene	108-67-8	< 7	7	1	0.98
10237	Xylene (Total)	1330-20-7	7	7	1	0.98
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.4	1.4	0.3	25.56
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	1,350 Q8	425	142	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	29.4	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 17:55	Patrick T Herres	0.98
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:36	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16298A31A	10/25/2016 16:27	Marie D Beamenderfer	25.56
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:04	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 18:33	Drew M Gerhart	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 11:53	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z2-E-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659836**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 12:45 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z2ESW SDG#: SXL02-11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>			<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	2	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	5	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	5	1	0.5	1
<b>GC Volatiles SW-846 8015B</b>			<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 18:18	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 18:18	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 16:35	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 16:35	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z2-E-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659837**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 12:50 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z2ESE SDG#: SXL02-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 6	6	0.6	1.02
10237	Ethylbenzene	100-41-4	< 6	6	1	1.02
10237	Isopropylbenzene	98-82-8	< 6	6	1	1.02
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 6	6	0.6	1.02
10237	Naphthalene	91-20-3	< 6	6	1	1.02
10237	Toluene	108-88-3	< 6	6	1	1.02
10237	1,2,4-Trimethylbenzene	95-63-6	< 6	6	1	1.02
10237	1,3,5-Trimethylbenzene	108-67-8	< 6	6	1	1.02
10237	Xylene (Total)	1330-20-7	< 6	6	1	1.02
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.3	1.3	0.3	26.23
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 378 Q8	378	126	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	19.1	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 18:18	Patrick T Herres	1.02
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:20	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16298A31A	10/25/2016 17:03	Marie D Beamenderfer	26.23
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:03	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:09	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 12:06	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-PostN-1-SW-01 Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659838  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 13:30 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

PN1W1 SDG#: SXL02-13

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	4	1	0.5	1
10945	Ethylbenzene	100-41-4	5	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	14	4	1	1
10945	Toluene	108-88-3	26	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	17	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	4	2	0.5	1
10945	Xylene (Total)	1330-20-7	34	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	270	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 18:39	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 18:39	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299C20A	10/25/2016 17:02	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299C20A	10/25/2016 17:02	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-PostN-1-SW-02 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659839**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:00 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

PN1W2 SDG#: SXL02-14

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	3	1	0.5	1
10945	Ethylbenzene	100-41-4	2	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	18	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	4	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	16	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	150	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 19:01	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 19:01	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 13:10	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 13:10	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-PostN-1-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659840**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:08 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

PN1S1 SDG#: SXL02-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 6	6	0.6	1
10237	Ethylbenzene	100-41-4	< 6	6	1	1
10237	Isopropylbenzene	98-82-8	< 6	6	1	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 6	6	0.6	1
10237	Naphthalene	91-20-3	< 6	6	1	1
10237	Toluene	108-88-3	< 6	6	1	1
10237	1,2,4-Trimethylbenzene	95-63-6	< 6	6	1	1
10237	1,3,5-Trimethylbenzene	108-67-8	< 6	6	1	1
10237	Xylene (Total)	1330-20-7	< 6	6	1	1
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.3	1.3	0.3	25.99
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 369 Q8	369	123	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	17.0	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 18:41	Patrick T Herres	1
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:46	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:41	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16298A31A	10/25/2016 17:39	Marie D Beamenderfer	25.99
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:42	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:19	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 12:16	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-PostN-2-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659841**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:30 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

PN2W1 SDG#: SXL02-16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	2	1	0.5	1
10945	Ethylbenzene	100-41-4	2	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	13	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	10	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	110	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 19:23	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 19:23	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 13:37	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 13:37	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-PostN-2-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659842**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:35 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

PN2S1 SDG#: SXL02-17

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 7	7	0.7	1.03
10237	Ethylbenzene	100-41-4	< 7	7	1	1.03
10237	Isopropylbenzene	98-82-8	< 7	7	1	1.03
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 7	7	0.7	1.03
10237	Naphthalene	91-20-3	< 7	7	1	1.03
10237	Toluene	108-88-3	< 7	7	1	1.03
10237	1,2,4-Trimethylbenzene	95-63-6	< 7	7	1	1.03
10237	1,3,5-Trimethylbenzene	108-67-8	< 7	7	1	1.03
10237	Xylene (Total)	1330-20-7	< 7	7	1	1.03
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.3	1.3	0.3	24.9
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 411 Q8	411	137	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	21.2	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 19:04	Patrick T Herres	1.03
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:46	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:46	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16298A31A	10/25/2016 18:15	Marie D Beamenderfer	24.9
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:47	Katelyn C Shober	n.a.
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 11:48	Katelyn C Shober	n.a.

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-PostN-2-SE-01 Grab Sediment  
SXL - Loyalsock

LL Sample # SW 8659842  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 14:35 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

PN2S1 SDG#: SXL02-17

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:27	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 12:29	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: TRIB Grab Surface Water  
SXL - Loyalsock

LL Sample # WW 8659843  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 14:47 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

TRIB- SDG#: SXL02-18

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 19:45	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 19:45	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 14:05	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 14:05	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659844**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 17:38 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1ES1 SDG#: SXL02-19

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10945	Benzene	71-43-2	< 1	ug/1	ug/1	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	< 1	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	< 1	1	0.5	1
<b>GC Volatiles SW-846 8015B</b>						
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 20:06	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 20:06	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 14:32	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 14:32	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659845**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 17:38 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

S1ES1 SDG#: SXL02-20

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 7	7	0.7	1.04
10237	Ethylbenzene	100-41-4	< 7	7	1	1.04
10237	Isopropylbenzene	98-82-8	< 7	7	1	1.04
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 7	7	0.7	1.04
10237	Naphthalene	91-20-3	< 7	7	1	1.04
10237	Toluene	108-88-3	< 7	7	1	1.04
10237	1,2,4-Trimethylbenzene	95-63-6	< 7	7	1	1.04
10237	1,3,5-Trimethylbenzene	108-67-8	< 7	7	1	1.04
10237	Xylene (Total)	1330-20-7	< 7	7	1	1.04
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.4	1.4	0.3	26.46
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 409 Q8	409	136	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	25.9	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 19:26	Patrick T Herres	1.04
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:44	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 15:06	Marie D Beamenderfer	26.46
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:45	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:35	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 12:49	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z3-W-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659846**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 10:30 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z3WW1 SDG#: SXL02-21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	3	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 20:28	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 20:28	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 14:59	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 14:59	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z3-W-SE-01 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659847**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 10:30 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z3WS1 SDG#: SXL02-22

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 8	8	0.8	0.98
10237	Ethylbenzene	100-41-4	< 8	8	2	0.98
10237	Isopropylbenzene	98-82-8	< 8	8	2	0.98
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 8	8	0.8	0.98
10237	Naphthalene	91-20-3	< 8	8	2	0.98
10237	Toluene	108-88-3	< 8	8	2	0.98
10237	1,2,4-Trimethylbenzene	95-63-6	< 8	8	2	0.98
10237	1,3,5-Trimethylbenzene	108-67-8	< 8	8	2	0.98
10237	Xylene (Total)	1330-20-7	< 8	8	2	0.98
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.5	1.5	0.3	23.92
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	3,600 Q8	489	163	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	38.1	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 19:49	Patrick T Herres	0.98
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:28	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 15:47	Marie D Beamenderfer	23.92
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:06	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:43	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 13:09	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z2-W-SW-02 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659848**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 11:50 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z2WW2 SDG#: SXL02-23

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	3	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 20:50	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 20:50	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 15:27	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 15:27	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z2-W-SE-02 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659849**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 11:50 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z2WS2 SDG#: SXL02-24

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles</b>			<b>SW-846 8260B</b>	<b>ug/kg</b>	<b>ug/kg</b>	<b>ug/kg</b>
10237	Benzene	71-43-2	< 5	5	0.5	0.95
10237	Ethylbenzene	100-41-4	< 5	5	1	0.95
10237	Isopropylbenzene	98-82-8	< 5	5	1	0.95
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 5	5	0.5	0.95
10237	Naphthalene	91-20-3	< 5	5	1	0.95
10237	Toluene	108-88-3	< 5	5	1	0.95
10237	1,2,4-Trimethylbenzene	95-63-6	< 5	5	1	0.95
10237	1,3,5-Trimethylbenzene	108-67-8	< 5	5	1	0.95
10237	Xylene (Total)	1330-20-7	< 5	5	1	0.95
<b>GC Volatiles</b>			<b>SW-846 8015B</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>
01637	TPH-GRO soil C6-C10	n.a.	< 1.1	1.1	0.2	24.18
<b>Wet Chemistry</b>			<b>Lloyd Kahn modified</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>
00383	TOC by Lloyd Kahn	n.a.	< 420 Q8	420	140	1
Due to the nature of this sample matrix, the sample cup was filled to capacity with less than 1000 mg of sample being used. The lowered sample weight has resulted in a raised reporting limit.						
			<b>SM 2540 G-1997</b>	<b>%</b>	<b>%</b>	<b>%</b>
02111	Moisture	n.a.	11.5	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 20:11	Patrick T Herres	0.95
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:25	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 17:11	Marie D Beamenderfer	24.18
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:08	Katelyn C Shober	n.a.

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-Z2-W-SE-02 Grab Sediment  
SXL - Loyalsock

LL Sample # SW 8659849  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 11:50 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z2WS2 SDG#: SXL02-24

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731B	10/26/2016 21:35	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 13:15	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SW-01 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659850**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:00 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1WW1 SDG#: SXL02-25

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	4	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	3	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 21:12	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 21:12	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 15:54	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 15:54	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SW-02 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659851**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1WW2 SDG#: SXL02-26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	1	1	0.5	1
10945	Ethylbenzene	100-41-4	1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	8	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	4	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	10	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	110	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 21:34	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 21:34	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 16:21	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 16:21	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SE-02 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659852**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 14:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z1WS2 SDG#: SXL02-27

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B ug/kg</b>						
10237	Benzene	71-43-2	< 12	12	1	0.99
10237	Ethylbenzene	100-41-4	24	12	2	0.99
10237	Isopropylbenzene	98-82-8	< 12	12	2	0.99
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 12	12	1	0.99
10237	Naphthalene	91-20-3	< 12	12	2	0.99
10237	Toluene	108-88-3	60	12	2	0.99
10237	1,2,4-Trimethylbenzene	95-63-6	48	12	2	0.99
10237	1,3,5-Trimethylbenzene	108-67-8	24	12	2	0.99
10237	Xylene (Total)	1330-20-7	160	12	2	0.99
<b>GC Volatiles SW-846 8015B mg/kg</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 2.3	2.3	0.5	23.52
<b>Wet Chemistry Lloyd Kahn modified mg/kg</b>						
00383	TOC by Lloyd Kahn	n.a.	53,900 Q8	2,750	916	1
<b>SM 2540 G-1997 %</b>						
02111	Moisture	n.a.	58.3	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 20:34	Patrick T Herres	0.99
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:52	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 16:28	Marie D Beamenderfer	23.52
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:53	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 15:53	Chelsea Thomas	1
02111	Moisture	SM 2540 G-1997	1	16299912201A	10/25/2016 13:40	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SW-03 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659853**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 15:20 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1WW3 SDG#: SXL02-28

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	6	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	5	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	57	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 21:56	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 21:56	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 16:49	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 16:49	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SE-03 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659854**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 15:20 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z1WS3 SDG#: SXL02-29

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles SW-846 8260B</b>						
10237	Benzene	71-43-2	< 6	6	0.6	0.95
10237	Ethylbenzene	100-41-4	< 6	6	1	0.95
10237	Isopropylbenzene	98-82-8	< 6	6	1	0.95
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 6	6	0.6	0.95
10237	Naphthalene	91-20-3	< 6	6	1	0.95
10237	Toluene	108-88-3	12	6	1	0.95
10237	1,2,4-Trimethylbenzene	95-63-6	< 6	6	1	0.95
10237	1,3,5-Trimethylbenzene	108-67-8	< 6	6	1	0.95
10237	Xylene (Total)	1330-20-7	21	6	1	0.95
<b>GC Volatiles SW-846 8015B</b>						
01637	TPH-GRO soil C6-C10	n.a.	< 1.3	1.3	0.3	24.58
<b>Wet Chemistry Lloyd Kahn modified</b>						
00383	TOC by Lloyd Kahn	n.a.	< 413 Q8	413	138	1
<b>SM 2540 G-1997</b>						
02111	Moisture	n.a.	24.5 Q8	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 20:57	Patrick T Herres	0.95
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:43	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 14:24	Marie D Beamenderfer	24.58
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 11:55	Katelyn C Shober	n.a.
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 11:59	Katelyn C Shober	n.a.

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-Z1-W-SE-03 Grab Sediment  
SXL - Loyalsock

LL Sample # SW 8659854  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 15:20 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1WS3 SDG#: SXL02-29

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 19:57	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201B	10/25/2016 13:59	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-W-SE-03a Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659855**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 15:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z1WFD SDG#: SXL02-30FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS Volatiles</b>			<b>SW-846 8260B</b>	<b>ug/kg</b>	<b>ug/kg</b>	
10237	Benzene	71-43-2	< 5	5	0.5	1
10237	Ethylbenzene	100-41-4	< 5	5	1	1
10237	Isopropylbenzene	98-82-8	< 5	5	1	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 5	5	0.5	1
10237	Naphthalene	91-20-3	< 5	5	1	1
10237	Toluene	108-88-3	< 5	5	1	1
10237	1,2,4-Trimethylbenzene	95-63-6	< 5	5	1	1
10237	1,3,5-Trimethylbenzene	108-67-8	< 5	5	1	1
10237	Xylene (Total)	1330-20-7	< 5	5	1	1
<b>GC Volatiles</b>			<b>SW-846 8015B</b>	<b>mg/kg</b>	<b>mg/kg</b>	
01637	TPH-GRO soil C6-C10	n.a.	< 1.0	1.0	0.2	24.25
<b>Wet Chemistry</b>			<b>Lloyd Kahn modified</b>	<b>mg/kg</b>	<b>mg/kg</b>	
00383	TOC by Lloyd Kahn	n.a.	< 426 Q8	426	142	1
Due to the nature of this sample matrix, the sample cup was filled to capacity with less than 1000 mg of sample being used. The lowered sample weight has resulted in a raised reporting limit.						
			<b>SM 2540 G-1997</b>	<b>%</b>	<b>%</b>	
02111	Moisture	n.a.	4.3 Q8	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 21:20	Patrick T Herres	1
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:40	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 17:53	Marie D Beamenderfer	24.25
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:01	Katelyn C Shober	n.a.

\*=This limit was used in the evaluation of the final result

Sample Description: SXL-Z1-W-SE-03a Grab Sediment  
SXL - Loyalsock

LL Sample # SW 8659855  
LL Group # 1724533  
Account # 11623

Project Name: SXL - Loyalsock

Collected: 10/23/2016 15:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1WFD SDG#: SXL02-30FD

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731A	10/26/2016 20:06	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201B	10/25/2016 14:34	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SW-02 Grab Surface Water**  
**SXL - Loyalsock**

LL Sample # **WW 8659856**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 17:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15

Reported: 10/31/2016 10:32

Z1EW2 SDG#: SXL02-31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
10945	Benzene	71-43-2	< 1	1	0.5	1
10945	Ethylbenzene	100-41-4	< 1	1	0.5	1
10945	Isopropylbenzene	98-82-8	< 2	2	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	< 1	1	0.5	1
10945	Naphthalene	91-20-3	< 4	4	1	1
10945	Toluene	108-88-3	3	1	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	< 2	2	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	< 2	2	0.5	1
10945	Xylene (Total)	1330-20-7	2	1	0.5	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
01635	TPH-GRO water C6-C10	n.a.	< 50	50	20	1

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	UST Unleaded + TMBs	SW-846 8260B	1	F162991AA	10/25/2016 22:18	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F162991AA	10/25/2016 22:18	Brett W Kenyon	1
01635	TPH-GRO water C6-C10	SW-846 8015B	1	16299D20A	10/25/2016 17:16	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16299D20A	10/25/2016 17:16	Marie D Beamenderfer	1

\*=This limit was used in the evaluation of the final result

Sample Description: **SXL-Z1-E-SE-02 Grab Sediment**  
**SXL - Loyalsock**

LL Sample # **SW 8659857**  
LL Group # **1724533**  
Account # **11623**

Project Name: **SXL - Loyalsock**

Collected: 10/23/2016 17:40 by SB

Cardno Entrix  
121 Continental Drive  
Suite 308  
Newark DE 19713

Submitted: 10/25/2016 08:15  
Reported: 10/31/2016 10:32

Z1ES2 SDG#: SXL02-32

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Limit of Quantitation*	Dry Method Detection Limit	Dilution Factor
<b>GC/MS</b>	<b>Volatiles</b>	<b>SW-846 8260B</b>	<b>ug/kg</b>	<b>ug/kg</b>	<b>ug/kg</b>	
10237	Benzene	71-43-2	< 8	8	0.8	1
10237	Ethylbenzene	100-41-4	< 8	8	2	1
10237	Isopropylbenzene	98-82-8	< 8	8	2	1
10237	Methyl Tertiary Butyl Ether	1634-04-4	< 8	8	0.8	1
10237	Naphthalene	91-20-3	< 8	8	2	1
10237	Toluene	108-88-3	< 8	8	2	1
10237	1,2,4-Trimethylbenzene	95-63-6	< 8	8	2	1
10237	1,3,5-Trimethylbenzene	108-67-8	< 8	8	2	1
10237	Xylene (Total)	1330-20-7	10	8	2	1
<b>GC</b>	<b>Volatiles</b>	<b>SW-846 8015B</b>	<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	
01637	TPH-GRO soil C6-C10	n.a.	< 1.5	1.5	0.3	23.99
<b>Wet Chemistry</b>	<b>Lloyd Kahn modified</b>		<b>mg/kg</b>	<b>mg/kg</b>	<b>mg/kg</b>	
00383	TOC by Lloyd Kahn	n.a.	< 467 Q8	467	156	1
	<b>SM 2540 G-1997</b>		<b>%</b>	<b>%</b>	<b>%</b>	
02111	Moisture	n.a.	35.1 Q8	1.0	1.0	1
"Moisture" represents the loss in weight of the sample after drying with an infrared lamp at 150 degrees Celsius.						

### Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	UST Unleaded 8260+TMBs (Soil)	SW-846 8260B	1	B162992AA	10/25/2016 21:42	Patrick T Herres	1
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
11966	GC/MS - Bulk Soil Prep	SW-846 5035A Modified	2	201629943113	10/25/2016 12:47	Katelyn C Shober	n.a.
06646	GC/MS HL Bulk Sample Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:37	Katelyn C Shober	n.a.
01637	TPH-GRO soil C6-C10	SW-846 8015B	1	16299A34A	10/25/2016 18:36	Marie D Beamenderfer	23.99
11968	GC - Bulk Soil Prep	SW-846 5035A Modified	1	201629943113	10/25/2016 12:02	Katelyn C Shober	n.a.
00383	TOC by Lloyd Kahn	Lloyd Kahn modified	1	16300121731B	10/26/2016 20:14	Samuel J Weaver	1
02111	Moisture	SM 2540 G-1997	1	16299912201B	10/25/2016 14:55	Nancy J Shoop	1

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result	LOQ**	MDL
	ug/kg	ug/kg	ug/kg
Batch number: B162992AA	Sample number(s): 8659833, 8659835, 8659837, 8659840, 8659842, 8659845, 8659847, 8659849, 8659852, 8659854-8659855, 8659857		
Benzene	< 5	5	0.5
Ethylbenzene	< 5	5	1
Isopropylbenzene	< 5	5	1
Methyl Tertiary Butyl Ether	< 5	5	0.5
Naphthalene	< 5	5	1
Toluene	< 5	5	1
1,2,4-Trimethylbenzene	< 5	5	1
1,3,5-Trimethylbenzene	< 5	5	1
Xylene (Total)	< 5	5	1
	ug/l	ug/l	ug/l
Batch number: F162991AA	Sample number(s): 8659826-8659832, 8659834, 8659836, 8659838-8659839, 8659841, 8659843-8659844, 8659846, 8659848, 8659850-8659851, 8659853, 8659856		
Benzene	< 1	1	0.5
Ethylbenzene	< 1	1	0.5
Isopropylbenzene	< 2	2	0.5
Methyl Tertiary Butyl Ether	< 1	1	0.5
Naphthalene	< 4	4	1
Toluene	< 1	1	0.5
1,2,4-Trimethylbenzene	< 2	2	0.5
1,3,5-Trimethylbenzene	< 2	2	0.5
Xylene (Total)	< 1	1	0.5
	mg/kg	mg/kg	mg/kg
Batch number: 16298A31A	Sample number(s): 8659833, 8659835, 8659837, 8659840, 8659842		
TPH-GRO soil C6-C10	< 1.0	1.0	0.2
Batch number: 16299A34A	Sample number(s): 8659845, 8659847, 8659849, 8659852, 8659854-8659855, 8659857		
TPH-GRO soil C6-C10	< 1.0	1.0	0.2
	ug/l	ug/l	ug/l
Batch number: 16299C20A	Sample number(s): 8659826-8659832, 8659834, 8659836, 8659838		
TPH-GRO water C6-C10	< 50	50	20
Batch number: 16299D20A	Sample number(s): 8659839, 8659841, 8659843-8659844, 8659846, 8659848, 8659850-8659851, 8659853, 8659856		
TPH-GRO water C6-C10	< 50	50	20
	mg/kg	mg/kg	mg/kg

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

### Method Blank (continued)

Analysis Name	Result mg/kg	LOQ** mg/kg	MDL mg/kg
Batch number: 16300121731A	Sample number(s): 8659833, 8659835, 8659837, 8659840, 8659842, 8659845, 8659847, 8659852, 8659854-8659855		
TOC by Lloyd Kahn	< 300	300	100
Batch number: 16300121731B	Sample number(s): 8659849, 8659857		
TOC by Lloyd Kahn	< 300	300	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: B162992AA	Sample number(s): 8659833, 8659835, 8659837, 8659840, 8659842, 8659845, 8659847, 8659849, 8659852, 8659854-8659855, 8659857								
Benzene	20	18.51	20	17.33	93	87	80-120	7	30
Ethylbenzene	20	17.79	20	16.7	89	83	80-120	6	30
Isopropylbenzene	20	18.13	20	17.05	91	85	76-120	6	30
Methyl Tertiary Butyl Ether	20	20.05	20	18.75	100	94	72-120	7	30
Naphthalene	20	19.18	20	17.22	96	86	53-120	11	30
Toluene	20	18.16	20	17.12	91	86	80-120	6	30
1,2,4-Trimethylbenzene	20	17.27	20	16.19	86	81	74-120	6	30
1,3,5-Trimethylbenzene	20	17.53	20	16.11	88	81	73-120	8	30
Xylene (Total)	60	54.07	60	50.7	90	85	80-120	6	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: F162991AA	Sample number(s): 8659826-8659832, 8659834, 8659836, 8659838-8659839, 8659841, 8659843-8659844, 8659846, 8659848, 8659850-8659851, 8659853, 8659856								
Benzene	20	18.76	20	18.91	94	95	78-120	1	30
Ethylbenzene	20	16.88	20	16.95	84	85	78-120	0	30
Isopropylbenzene	20	17.34	20	17.32	87	87	80-120	0	30
Methyl Tertiary Butyl Ether	20	16	20	16.43	80	82	75-120	3	30
Naphthalene	20	16.03	20	15.79	80	79	59-120	2	30
Toluene	20	17.98	20	18.1	90	90	80-120	1	30
1,2,4-Trimethylbenzene	20	16.19	20	16.17	81	81	75-120	0	30
1,3,5-Trimethylbenzene	20	16.24	20	16.47	81	82	75-120	1	30
Xylene (Total)	60	52.34	60	52.1	87	87	80-120	0	30
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16298A31A	Sample number(s): 8659833, 8659835, 8659837, 8659840, 8659842								
TPH-GRO soil C6-C10	11	10.9	11	11.19	99	102	54-120	3	30
Batch number: 16299A34A	Sample number(s): 8659845, 8659847, 8659849, 8659852, 8659854-8659855, 8659857								
TPH-GRO soil C6-C10	11	10.22	11	9.67	93	88	54-120	6	30

\*- Outside of specification

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16299C20A TPH-GRO water C6-C10	1100	990	1100	963.95	90	88	80-120	3	30
Batch number: 16299D20A TPH-GRO water C6-C10	1100	1020.33	1100	1012.56	93	92	80-120	1	30
Batch number: 16299912201A Moisture	100	99.44			99		98-101		
Batch number: 16299912201B Moisture	100	99.44			99		98-101		
Batch number: 16300121731A TOC by Lloyd Kahn	5830	4134.53			71		50-150		
Batch number: 16300121731B TOC by Lloyd Kahn	5830	4134.53			71		50-150		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16300121731A TOC by Lloyd Kahn	22487.6	73890	73201.97			69		47-143		
Batch number: 16300121731B TOC by Lloyd Kahn	718.76	37590	27243.11			71		47-143		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc %	DUP Conc %	DUP RPD	DUP RPD Max
Batch number: 16299912201A	Sample number(s): 8659833,8659835,8659837,8659840,8659842,8659845,8659847,8659849,8659852 BKG: P658667			
Moisture	45.9	47.02	2	3
Batch number: 16299912201B	Sample number(s): 8659854-8659855,8659857 BKG: 8659857			
Moisture	35.12	29.81	16*	3
	mg/kg	mg/kg		
Batch number: 16300121731A	Sample number(s): 8659833,8659835,8659837,8659840,8659842,8659845,8659847,8659852,8659854-8659855 BKG: 8659852			
TOC by Lloyd Kahn	22487.6	20538.64	9*	7
Batch number: 16300121731B	Sample number(s): 8659849,8659857 BKG: P662065			
TOC by Lloyd Kahn	718.76	649.82	10* (1)	7

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: UST Unleaded 8260+TMBs (Soil)  
Batch number: B162992AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8659833	102	99	98	95
8659835	102	102	97	95
8659837	102	101	97	95
8659840	102	101	97	95
8659842	104	101	98	95
8659845	102	99	97	93
8659847	103	98	98	95
8659849	103	102	96	94
8659852	101	94	106	88
8659854	102	100	99	96
8659855	104	102	97	94
8659857	102	98	98	94
Blank	104	105	96	96
LCS	103	107	99	100
LCSD	103	106	99	100
Limits:	50-141	54-135	52-141	50-131

Analysis Name: UST Unleaded + TMBs 8260B  
Batch number: F162991AA

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8659826	96	99	98	96
8659827	96	97	99	95
8659828	96	101	98	95
8659829	98	98	99	96
8659830	96	99	99	94
8659831	97	101	99	94
8659832	97	103	99	96
8659834	96	99	99	96
8659836	96	98	100	94
8659838	99	100	99	98
8659839	96	101	99	97
8659841	97	101	99	96
8659843	96	100	99	93
8659844	96	100	98	95
8659846	95	101	98	92
8659848	96	101	100	95
8659850	96	100	100	93
8659851	96	99	99	95
8659853	95	102	99	93
8659856	96	100	100	93
Blank	95	101	98	94
LCS	96	99	101	97
LCSD	96	101	100	98
Limits:	80-116	77-113	80-113	78-113

Analysis Name: TPH-GRO soil C6-C10  
Batch number: 16298A31A

	Trifluorotoluene-F
8659833	100
8659835	97
8659837	109
8659840	100
8659842	93
Blank	108
LCS	104
LCSD	113
Limits:	50-142

Analysis Name: TPH-GRO soil C6-C10  
Batch number: 16299A34A

	Trifluorotoluene-F
8659845	91
8659847	76
8659849	94
8659852	71

\*- Outside of specification

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32

Group Number: 1724533

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Trifluorotoluene-F	
8659854	90
8659855	96
8659857	83
Blank	88
LCS	98
LCSD	103

Limits: 50-142

Analysis Name: TPH-GRO water C6-C10  
Batch number: 16299C20A

Trifluorotoluene-F	
8659826	90
8659827	85
8659828	85
8659829	87
8659830	86
8659831	89
8659832	86
8659834	85
8659836	89
8659838	85
Blank	88
LCS	97
LCSD	95

Limits: 63-135

Analysis Name: TPH-GRO water C6-C10  
Batch number: 16299D20A

Trifluorotoluene-F	
8659839	87
8659841	84
8659843	74
8659844	86
8659846	83
8659848	84
8659850	85
8659851	86
8659853	75
8659856	76
Blank	84
LCS	94
LCSD	96

Limits: 63-135

\*- Outside of specification

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

**Quality Control Summary**Client Name: Cardno Entrix  
Reported: 10/31/2016 10:32Group Number: 1724533

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\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

11623 1724533 8659826-57



### Chain-of-Custody Record

Client Contact Information		Project Manager: Chris Pfeifer				Site Contact: Stephanie Briggs				Shipping Airbill No: IZA3030T1515456431, IZA3030T1582122120, IZA3030T1582116306				COC No: 20161024-SB-2			
Cardno, Inc. Address: 121 Continental Dr, Suite 308 Newark, DE 19713 Phone: 302-395-1919 Fax: Project Name: SXL - Loyalsock Project No.: E114011902 Other:		Sampler Information (print name): Stephanie Briggs / Ryan Rupperecht / Sara Holmes Phone: 484-678-9480 Email: stephanie.briggs@cardno.com				Lab Name: Lancaster Laboratories				Page 1 of 3 Job No. SDG No.							
		Turnaround Time (TAT) Requested: Normal <input type="checkbox"/> Priority <input type="checkbox"/> RUSH <input checked="" type="checkbox"/>				Preservative				For Laboratory Use Only							
						Analysis											
						Filtered Sample? (Y/N)											
						BTEX											
						MTBE											
						Naphthalene											
						Cumene											
						TMB 8260											
						TPH GRO											
						TOC per HS.											
						LOW 10/24/16											
Sample Identification		Sample Date	Sample Time	Sample Type (G,C)	Matrix	Total # of Cont.	Filtered Sample? (Y/N)	BTEX	MTBE	Naphthalene	Cumene	TMB 8260	TPH GRO	TOC per HS.	LOW 10/24/16	Sample-Specific Notes:	
SXL-SU-DS-SW-01		10/22/2016	1045	G	SW	3	N	X	X	X	X	X	X				
SXL-SU-MX-SW-01		10/22/2016	1130	G	SW	3	N	X	X	X	X	X	X				
SXL-LS-SW-04		10/22/2016	1156	G	SW	3	N	X	X	X	X	X	X				
SXL-SU-UP-SW-01		10/22/2016	1215	G	SW	3	N	X	X	X	X	X	X				
SXL-BN-SW-01		10/22/2016	1655	G	SW	3	N	X	X	X	X	X	X				
SXL-LS-SW-05		10/22/2016	1710	G	SW	3	N	X	X	X	X	X	X				
SXL-Z3-E-SW-01		10/23/2016	1110	G	SW	3	N	X	X	X	X	X	X				
SXL-Z3-E-SE-01		10/23/2016	1112	G	SE	2	N	X	X	X	X	X	X	X			
SXL-Z3-E-SW-02		10/23/2016	1145	G	SW	3	N	X	X	X	X	X	X				
SXL-Z3-E-SE-02		10/23/2016	1150	G	SE	2	N	X	X	X	X	X	X	X			
SXL-Z2-E-SW-01		10/23/2016	1245	G	SW	3	N	X	X	X	X	X	X				
SXL-Z2-E-SE-01		10/23/2016	1250	G	SE	2	N	X	X	X	X	X	X	X			
Possible Hazard Identification					Sample Type: C=Composite, G=Grab												
Non-Hazard      Flammable      Skin Irritant      Poison B					Matrix Codes: SW=Surface Water, AQ=Water other than Surface Water, TA=Tissue, TP=Plant Tissue, SE=Sediment, FM=Filter Media, OR=Other												
Comments:																	
Relinquished by Sampler (Print/Sign): Stephanie Briggs		Company: Cardno		Date/Time: 10/24/16 2145				Received by (Print/Sign):				Company:		Date/Time:			
Relinquished by (Print/Sign):		Company:		Date/Time:				Received by (Print/Sign):				Company:		Date/Time:			
Relinquished by (Print/Sign):		Company:		Date/Time:				Received by (Print/Sign):				Company:		Date/Time:			
DATE SAMPLES WERE SHIPPED: 10/24/16							Received by (Print/Sign):				Company: ELLE		Date/Time: 10-25-16 8:15				

11623 1724533 8659826-57



### Chain-of-Custody Record

Client Contact Information		Project Manager: Chris Pfeifer				Site Contact: Stephanie Briggs				Shipping Airbill No: 1ZA3030T1515456431, 1ZA3030T1582122120, 1ZA3030T1582116306				COC No: 20161024-SB-2			
Cardno, Inc. Address: 121 Continental Dr, Suite 308 Newark, DE 19713 Phone: 302-395-1919 Fax:		Sampler Information (print name): Stephanie Briggs / Ryan Rupprecht / Sara Holmes Phone: 484-678-9480 Email: stephanie.briggs@cardno.com				Lab Name: Lancaster Laboratories				Page 2 of 3				Job No.			
Project Name: SXL - Loyalsock Project No.: E114011902 Other:		Turnaround Time (TAT) Requested: Normal <input type="checkbox"/> Priority <input type="checkbox"/> RUSH <input checked="" type="checkbox"/>				Filtered Sample? (Y/N)				For Laboratory Use Only				SDG No.			
Sample Identification		Sample Date	Sample Time	Sample Type (G,C)	Matrix	Total # of Cont.										Sample-Specific Notes:	
SXL-PostN-1-SW-01		10/23/2016	1330	G	SW	3	N										
SXL-PostN-1-SW-02		10/23/2016	1400	G	SW	3	N										
SXL-PostN-1-SE-01		10/23/2016	1408	G	SE	1	N										
SXL-PostN-2-SW-01		10/23/2016	1430	G	SW	3	N										
SXL-PostN-2-SE-01		10/23/2016	1435	G	SE	1	N										
TRIB		10/23/2016	1447	G	SW	3	N										
SXL-Z1-E-SW-01		10/23/2016	1738	G	SW	3	N										
SXL-Z1-E-SE-01		10/23/2016	1738	G	SE	2	N										
SXL-Z3-W-SW-01		10/23/2016	1030	G	SW	3	N										
SXL-Z3-W-SE-01		10/23/2016	1030	G	SE	2	N										
SXL-Z2-W-SW-02		10/23/2016	1150	G	SW	3	N										
SXL-Z2-W-SE-02		10/23/2016	1150	G	SE	2	N										
Possible Hazard Identification Non-Hazard      Flammable      Skin Irritant      Poison B						Sample Type: C=Composite, G=Grab Matrix Codes: SW=Surface Water, AQ=Water other than Surface Water, TA=Tissue, TP=Plant Tissue, SE=Sediment, FM=Filter Media, OR=Other											
Comments:																	
Relinquished by Sampler (Print/Sign): Stephanie Briggs		Company: Cardno		Date/Time: 10/24/16 2145		Received by (Print/Sign):		Company:		Date/Time:							
Relinquished by (Print/Sign):		Company:		Date/Time:		Received by (Print/Sign):		Company:		Date/Time:							
Relinquished by (Print/Sign):		Company:		Date/Time:		Received by (Print/Sign):		Company:		Date/Time:							
DATE SAMPLES WERE SHIPPED: 10/24/16						Received by (Print/Sign): <i>[Signature]</i>		Company: ELCE		Date/Time: 10-25-16		815					

11623 1724533 8659826-57



Chain-of-Custody Record

Client Contact Information		Project Manager: Chris Pfeifer				Site Contact: Stephanie Briggs				Shipping Airbill No: IZA3030T1515456431, IZA3030T1582122120, IZA3030T1582116306				COC No: 20161024-SB-2	
Cardno, Inc. Address: 121 Continental Dr, Suite 308 Newark, DE 19713 Phone: 302-395-1919 Fax: Project Name: SXL - Loyalsock Project No.: E114011902 Other:		Sampler Information (print name): Stephanie Briggs / Ryan Rupperecht / Sara Holmes Phone: 484-678-9480 Email: stephanie.briggs@cardno.com Turnaround Time (TAT) Requested: Normal <input type="checkbox"/> Priority <input type="checkbox"/> RUSH <input checked="" type="checkbox"/>				Lab Name: Lancaster Laboratories				Page 3 of 3 Job No. SDG No.					
Sample Identification		Sample Date	Sample Time	Sample Type (G,C)	Matrix	Total # of Cont.	Filtered Sample? (Y/N)	Preservative	Analysis	For Laboratory Use Only				Sample-Specific Notes:	
SXL-Z1-W-SW-01		10/23/2016	1400	G	SW	3	N		BTEX						
SXL-Z1-W-SW-02		10/23/2016	1440	G	SW	3	N		MTBE						
SXL-Z1-W-SE-02		10/23/2016	1440	G	SE	2	N		Naphthalene						
SXL-Z1-W-SW-03		10/23/2016	1520	G	SW	3	N		Cumene						
SXL-Z1-W-SE-03		10/23/2016	1520	G	SE	2	N		TMB 8260						
SXL-Z1-W-SE-03a		10/23/2016	1540	G	SE	2	N		TPH GRO						
SXL-Z1-E-SW-02		10/23/2016	1740	G	SW	3	N		TOL, PEA, KS LMM, 10/26/16						
SXL-Z1-E-SE-02		10/23/2016	1740	G	SE	2	N								
Possible Hazard Identification		Sample Type: C=Composite, G=Grab				Matrix Codes: SW=Surface Water, AQ=Water other than Surface Water, TA=Tissue, TP=Plant Tissue, SE=Sediment, FM=Filter Media, OR=Other									
Non-Hazard		Flammable		Skin Irritant		Poison B									
Comments:															
Relinquished by Sampler (Print/Sign): Stephanie Briggs		Company: Cardno		Date/Time: 10/24/16 2145		Received by (Print/Sign):		Company:		Date/Time:					
Relinquished by (Print/Sign):		Company:		Date/Time:		Received by (Print/Sign):		Company:		Date/Time:					
Relinquished by (Print/Sign):		Company:		Date/Time:		Received by (Print/Sign):		Company:		Date/Time:					
DATE SAMPLES WERE SHIPPED: 10/24/16						Received by (Print/Sign): Stephanie Briggs		Company: ECLL		Date/Time: 10-25-16		815			

Client: Cardno

**Delivery and Receipt Information**

Delivery Method: UPS                      Arrival Timestamp: 10/25/2016 8:15  
 Number of Packages: 3                      Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

*Unpacked by Timothy Cubberley (6520) at 09:02 on 10/25/2016*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.9	DT	Wet	Y	Bagged	N
2	DT131	0.8	DT	Wet	Y	Bagged	N
3	DT131	1.4	DT	Wet	Y	Bagged	N

**Container Quantity Discrepancy Details**

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
SLX-Z2E-SW-01	4	3	

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	none detected
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

## Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value  $\geq$  the Method Detection Limit (MDL or DL) and  $<$  the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column  $>40\%$ . The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column  $>100\%$ . The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

## Additional Data Qualifiers

<b>Qualifier</b>	<b>Definition</b>
B	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD

## GES, Inc - Sunoco

Sample Delivery Group: L869562  
Samples Received: 11/01/2016  
Project Number: 0204694-01-107  
Description: SXL Butternut Road Release Site

Report To: Stephanie Grillo  
440 Creamery Way, Suite 500  
Exton, PA 19341

Entire Report Reviewed By:



Mark W. Beasley  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<b><sup>1</sup>Cp: Cover Page</b>	<b>1</b>	
<b><sup>2</sup>Tc: Table of Contents</b>	<b>2</b>	
<b><sup>3</sup>Ss: Sample Summary</b>	<b>3</b>	
<b><sup>4</sup>Cn: Case Narrative</b>	<b>4</b>	
<b><sup>5</sup>Sr: Sample Results</b>	<b>5</b>	
SS-34 L869562-01	5	
SS-35 L869562-02	6	
SS-36 L869562-03	7	
SS-37 L869562-04	8	
<b><sup>6</sup>Qc: Quality Control Summary</b>	<b>9</b>	
Total Solids by Method 2540 G-2011	9	
Volatile Organic Compounds (GC/MS) by Method 8260B	10	
<b><sup>7</sup>Gl: Glossary of Terms</b>	<b>12</b>	
<b><sup>8</sup>Al: Accreditations &amp; Locations</b>	<b>13</b>	
<b><sup>9</sup>Sc: Chain of Custody</b>	<b>14</b>	

# SAMPLE SUMMARY



## SS-34 L869562-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG922645	1	11/01/16 13:15	11/01/16 13:24	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922691	1	10/28/16 19:30	11/01/16 17:05	ACG

Collected by Tom Niemann  
 Collected date/time 10/28/16 19:30  
 Received date/time 11/01/16 09:00

1 Cp

2 Tc

3 Ss

## SS-35 L869562-02 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG922645	1	11/01/16 13:15	11/01/16 13:24	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922691	1	10/28/16 20:00	11/01/16 17:25	ACG

Collected by Tom Niemann  
 Collected date/time 10/28/16 20:00  
 Received date/time 11/01/16 09:00

4 Cn

5 Sr

6 Qc

## SS-36 L869562-03 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG922645	1	11/01/16 13:15	11/01/16 13:24	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922691	1	10/29/16 10:22	11/01/16 17:45	ACG

Collected by Tom Niemann  
 Collected date/time 10/29/16 10:22  
 Received date/time 11/01/16 09:00

7 Gl

8 Al

9 Sc

## SS-37 L869562-04 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG922645	1	11/01/16 13:15	11/01/16 13:24	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG922691	1	10/29/16 01:24	11/01/16 18:05	ACG

Collected by Tom Niemann  
 Collected date/time 10/29/16 10:24  
 Received date/time 11/01/16 09:00



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley  
Technical Service Representative

- <sup>1</sup> Cp
- <sup>2</sup> Tc
- <sup>3</sup> Ss
- <sup>4</sup> Cn
- <sup>5</sup> Sr
- <sup>6</sup> Qc
- <sup>7</sup> Gl
- <sup>8</sup> Al
- <sup>9</sup> Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.2		1	11/01/2016 13:24	<a href="#">WG922645</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
Ethylbenzene	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
Isopropylbenzene	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
Methyl tert-butyl ether	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
Naphthalene	ND		0.00525	1	11/01/2016 17:05	<a href="#">WG922691</a>
Toluene	ND		0.00525	1	11/01/2016 17:05	<a href="#">WG922691</a>
1,2,4-Trimethylbenzene	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
1,3,5-Trimethylbenzene	ND		0.00105	1	11/01/2016 17:05	<a href="#">WG922691</a>
Xylenes, Total	ND		0.00315	1	11/01/2016 17:05	<a href="#">WG922691</a>
(S) Toluene-d8	102		88.7-115		11/01/2016 17:05	<a href="#">WG922691</a>
(S) Dibromofluoromethane	116		76.3-123		11/01/2016 17:05	<a href="#">WG922691</a>
(S) 4-Bromofluorobenzene	95.8		69.7-129		11/01/2016 17:05	<a href="#">WG922691</a>



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	96.2		1	11/01/2016 13:24	<a href="#">WG922645</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
Ethylbenzene	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
Isopropylbenzene	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
Methyl tert-butyl ether	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
Naphthalene	ND		0.00520	1	11/01/2016 17:25	<a href="#">WG922691</a>
Toluene	ND		0.00520	1	11/01/2016 17:25	<a href="#">WG922691</a>
1,2,4-Trimethylbenzene	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
1,3,5-Trimethylbenzene	ND		0.00104	1	11/01/2016 17:25	<a href="#">WG922691</a>
Xylenes, Total	ND		0.00312	1	11/01/2016 17:25	<a href="#">WG922691</a>
(S) Toluene-d8	101		88.7-115		11/01/2016 17:25	<a href="#">WG922691</a>
(S) Dibromofluoromethane	119		76.3-123		11/01/2016 17:25	<a href="#">WG922691</a>
(S) 4-Bromofluorobenzene	87.2		69.7-129		11/01/2016 17:25	<a href="#">WG922691</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	94.6		1	11/01/2016 13:24	<a href="#">WG922645</a>

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
Ethylbenzene	ND		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
Isopropylbenzene	ND		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
Methyl tert-butyl ether	ND		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
Naphthalene	ND		0.00528	1	11/01/2016 17:45	<a href="#">WG922691</a>
Toluene	ND		0.00528	1	11/01/2016 17:45	<a href="#">WG922691</a>
1,2,4-Trimethylbenzene	0.00174		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
1,3,5-Trimethylbenzene	ND		0.00106	1	11/01/2016 17:45	<a href="#">WG922691</a>
Xylenes, Total	ND		0.00317	1	11/01/2016 17:45	<a href="#">WG922691</a>
(S) Toluene-d8	101		88.7-115		11/01/2016 17:45	<a href="#">WG922691</a>
(S) Dibromofluoromethane	115		76.3-123		11/01/2016 17:45	<a href="#">WG922691</a>
(S) 4-Bromofluorobenzene	89.8		69.7-129		11/01/2016 17:45	<a href="#">WG922691</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.3		1	11/01/2016 13:24	<a href="#">WG922645</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
Ethylbenzene	0.00109		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
Isopropylbenzene	ND		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
Methyl tert-butyl ether	ND		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
Naphthalene	0.0176		0.00525	1	11/01/2016 18:05	<a href="#">WG922691</a>
Toluene	ND		0.00525	1	11/01/2016 18:05	<a href="#">WG922691</a>
1,2,4-Trimethylbenzene	0.0209		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
1,3,5-Trimethylbenzene	0.00731		0.00105	1	11/01/2016 18:05	<a href="#">WG922691</a>
Xylenes, Total	0.00869		0.00315	1	11/01/2016 18:05	<a href="#">WG922691</a>
(S) Toluene-d8	102		88.7-115		11/01/2016 18:05	<a href="#">WG922691</a>
(S) Dibromofluoromethane	113		76.3-123		11/01/2016 18:05	<a href="#">WG922691</a>
(S) 4-Bromofluorobenzene	89.9		69.7-129		11/01/2016 18:05	<a href="#">WG922691</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3175179-1 11/01/16 13:24

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000400			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

L869566-02 Original Sample (OS) • Duplicate (DUP)

(OS) L869566-02 11/01/16 13:24 • (DUP) R3175179-3 11/01/16 13:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	83.3	83.5	1	0.202		5

<sup>7</sup> Gl

<sup>8</sup> Al

Laboratory Control Sample (LCS)

(LCS) R3175179-2 11/01/16 13:24

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	49.7	99.3	85.0-115	

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3175241-4 11/01/16 14:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000270	0.00100
Ethylbenzene	U		0.000297	0.00100
Isopropylbenzene	U		0.000243	0.00100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000434	0.00500
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	101			88.7-115
(S) Dibromofluoromethane	106			76.3-123
(S) 4-Bromofluorobenzene	88.8			69.7-129

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3175241-1 11/01/16 13:52 • (LCSD) R3175241-2 11/01/16 14:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0265	0.0264	106	106	72.6-120			0.100	20
Ethylbenzene	0.0250	0.0224	0.0222	89.5	88.9	78.6-124			0.690	20
Isopropylbenzene	0.0250	0.0223	0.0216	89.3	86.3	79.4-126			3.45	20
Methyl tert-butyl ether	0.0250	0.0275	0.0263	110	105	70.2-122			4.57	20
Naphthalene	0.0250	0.0262	0.0270	105	108	69.9-132			2.91	20
Toluene	0.0250	0.0249	0.0253	99.7	101	76.7-116			1.43	20
1,2,4-Trimethylbenzene	0.0250	0.0232	0.0221	92.7	88.2	77.1-124			4.95	20
1,3,5-Trimethylbenzene	0.0250	0.0230	0.0222	91.8	88.7	79.0-125			3.51	20
Xylenes, Total	0.0750	0.0675	0.0660	90.0	88.1	78.1-123			2.20	20
(S) Toluene-d8				102	102	88.7-115				
(S) Dibromofluoromethane				107	104	76.3-123				
(S) 4-Bromofluorobenzene				92.7	89.8	69.7-129				

L868809-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868809-08 11/01/16 19:45 • (MS) R3175241-5 11/01/16 20:05 • (MSD) R3175241-6 11/01/16 20:25

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0325	ND	0.0249	0.0237	76.7	73.1	1	47.8-131			4.75	22.8
Ethylbenzene	0.0325	ND	0.0189	0.0184	58.1	56.7	1	44.8-135			2.30	26.9



L868809-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L868809-08 11/01/16 19:45 • (MS) R3175241-5 11/01/16 20:05 • (MSD) R3175241-6 11/01/16 20:25

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Isopropylbenzene	0.0325	ND	0.0179	0.0174	55.0	53.7	1	41.9-139			2.44	29.3
Methyl tert-butyl ether	0.0325	ND	0.0290	0.0271	89.4	83.4	1	50.4-131			6.98	24.8
Naphthalene	0.0325	ND	0.0220	0.0217	67.7	66.8	1	18.4-145			1.34	34
Toluene	0.0325	ND	0.0232	0.0221	64.4	61.2	1	47.8-127			4.64	24.3
1,2,4-Trimethylbenzene	0.0325	ND	0.0171	0.0167	52.7	51.5	1	32.9-139			2.21	30.6
1,3,5-Trimethylbenzene	0.0325	ND	0.0175	0.0171	53.9	52.7	1	37.1-138			2.32	30.6
Xylenes, Total	0.0974	ND	0.0560	0.0539	57.5	55.3	1	42.7-135			3.87	26.6
<i>(S) Toluene-d8</i>					101	101		88.7-115				
<i>(S) Dibromofluoromethane</i>					111	111		76.3-123				
<i>(S) 4-Bromofluorobenzene</i>					90.2	90.5		69.7-129				

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
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The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

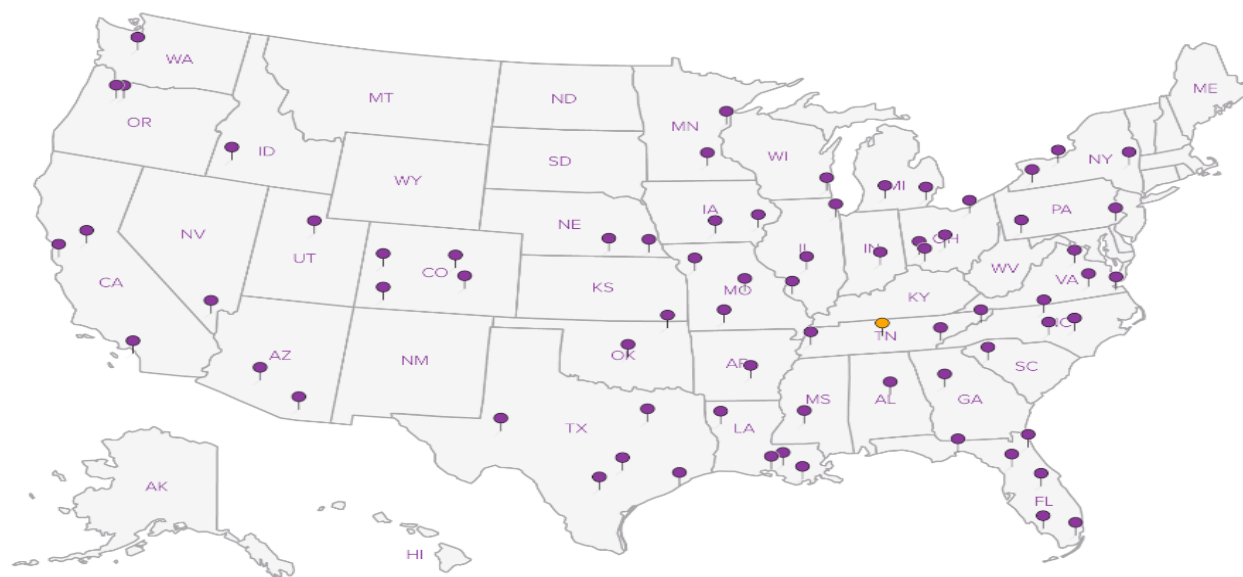
## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc





Cooler Receipt Form			
Client:	<i>Sonbes</i>	SDG#	<i>86952</i>
Cooler Received/Opened On:	11/1/16	Temperature Upon Receipt:	<i>3.2</i> °C
Received By: <b>Richard Hughes</b>			
Signature: <i>[Signature]</i>			
Receipt Check List			
	Yes	No	N/A
Were custody seals on outside of cooler and intact?			/
Were custody papers properly filled out?	/		
Did all bottles arrive in good condition?	/		
Were correct bottles used for the analyses requested?	/		
Was sufficient amount of sample sent in each bottle?			/
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)			/
If applicable, was an observable VOA headspace present?			/
Non Conformance Generated. (If yes see attached NCF)			

November 17, 2016

## GES, Inc - Sunoco

Sample Delivery Group: L872937  
Samples Received: 11/16/2016  
Project Number: 0204694-01-107  
Description: SXL Butternut Road Release Site  
Site: SXL-BUTTERNUT RD RELEASE  
Report To: Stephanie Grillo  
440 Creamery Way, Suite 500  
Exton, PA 19341

Entire Report Reviewed By:



Mark W. Beasley  
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<b><sup>1</sup>Cp: Cover Page</b>	<b>1</b>	
<b><sup>2</sup>Tc: Table of Contents</b>	<b>2</b>	
<b><sup>3</sup>Ss: Sample Summary</b>	<b>3</b>	
<b><sup>4</sup>Cn: Case Narrative</b>	<b>5</b>	
<b><sup>5</sup>Sr: Sample Results</b>	<b>6</b>	
SS-38 5.5 L872937-01	6	
SS-39 6 L872937-02	7	
SS-40 6 L872937-03	8	
SS-41 6 L872937-04	9	
SS-42 8 L872937-05	10	
SS-42 12 L872937-06	11	
SS-43 8 L872937-07	12	
SS-43 12 L872937-08	13	
<b><sup>6</sup>Qc: Quality Control Summary</b>	<b>14</b>	
Total Solids by Method 2540 G-2011	14	
Volatile Organic Compounds (GC/MS) by Method 8260B	16	
<b><sup>7</sup>Gl: Glossary of Terms</b>	<b>18</b>	
<b><sup>8</sup>Al: Accreditations &amp; Locations</b>	<b>19</b>	
<b><sup>9</sup>Sc: Chain of Custody</b>	<b>20</b>	

# SAMPLE SUMMARY



## SS-38 5.5 L872937-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927095	1	11/16/16 13:10	11/16/16 13:29	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1	11/15/16 14:05	11/17/16 00:49	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:05  
 Received date/time 11/16/16 09:00

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## SS-39 6 L872937-02 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927095	1	11/16/16 13:10	11/16/16 13:29	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1.01	11/15/16 14:10	11/17/16 02:08	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:10  
 Received date/time 11/16/16 09:00

## SS-40 6 L872937-03 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927095	1	11/16/16 13:10	11/16/16 13:29	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1	11/15/16 14:15	11/17/16 02:30	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:15  
 Received date/time 11/16/16 09:00

## SS-41 6 L872937-04 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927095	1	11/16/16 13:10	11/16/16 13:29	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1	11/15/16 14:25	11/17/16 02:52	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:25  
 Received date/time 11/16/16 09:00

## SS-42 8 L872937-05 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927096	1	11/16/16 13:32	11/16/16 13:42	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1	11/15/16 14:40	11/17/16 03:14	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:40  
 Received date/time 11/16/16 09:00

## SS-42 12 L872937-06 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927096	1	11/16/16 13:32	11/16/16 13:42	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1.02	11/15/16 14:45	11/17/16 03:42	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 14:45  
 Received date/time 11/16/16 09:00

## SS-43 8 L872937-07 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927096	1	11/16/16 13:32	11/16/16 13:42	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1.01	11/15/16 10:20	11/17/16 04:03	JAH

Collected by Jason Crone  
 Collected date/time 11/15/16 10:20  
 Received date/time 11/16/16 09:00

# SAMPLE SUMMARY



SS-43 12 L872937-08 Solid

Collected by  
Jason Crone

Collected date/time  
11/15/16 14:55

Received date/time  
11/16/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG927096	1	11/16/16 13:32	11/16/16 13:42	KDW
Volatile Organic Compounds (GC/MS) by Method 8260B	WG927363	1	11/15/16 14:55	11/17/16 04:24	JAH

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley  
Technical Service Representative

- <sup>1</sup> Cp
- <sup>2</sup> Tc
- <sup>3</sup> Ss
- <sup>4</sup> Cn
- <sup>5</sup> Sr
- <sup>6</sup> Qc
- <sup>7</sup> Gl
- <sup>8</sup> Al
- <sup>9</sup> Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.7		1	11/16/2016 13:29	<a href="#">WG927095</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
Naphthalene	ND		0.00545	1	11/17/2016 00:49	<a href="#">WG927363</a>
Toluene	ND		0.00545	1	11/17/2016 00:49	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00109	1	11/17/2016 00:49	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00327	1	11/17/2016 00:49	<a href="#">WG927363</a>
(S) Toluene-d8	96.4		88.7-115		11/17/2016 00:49	<a href="#">WG927363</a>
(S) Dibromofluoromethane	105		76.3-123		11/17/2016 00:49	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	92.2		69.7-129		11/17/2016 00:49	<a href="#">WG927363</a>



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	92.8		1	11/16/2016 13:29	<a href="#">WG927095</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Naphthalene	ND		0.00544	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Toluene	ND		0.00544	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00109	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00326	1.01	11/17/2016 02:08	<a href="#">WG927363</a>
(S) Toluene-d8	97.1		88.7-115		11/17/2016 02:08	<a href="#">WG927363</a>
(S) Dibromofluoromethane	102		76.3-123		11/17/2016 02:08	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	93.8		69.7-129		11/17/2016 02:08	<a href="#">WG927363</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.9		1	11/16/2016 13:29	<a href="#">WG927095</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
Naphthalene	0.0225		0.00544	1	11/17/2016 02:30	<a href="#">WG927363</a>
Toluene	ND		0.00544	1	11/17/2016 02:30	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00109	1	11/17/2016 02:30	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00326	1	11/17/2016 02:30	<a href="#">WG927363</a>
(S) Toluene-d8	98.4		88.7-115		11/17/2016 02:30	<a href="#">WG927363</a>
(S) Dibromofluoromethane	101		76.3-123		11/17/2016 02:30	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	95.3		69.7-129		11/17/2016 02:30	<a href="#">WG927363</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	90.9		1	11/16/2016 13:29	<a href="#">WG927095</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
Naphthalene	ND		0.00550	1	11/17/2016 02:52	<a href="#">WG927363</a>
Toluene	ND		0.00550	1	11/17/2016 02:52	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00110	1	11/17/2016 02:52	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00330	1	11/17/2016 02:52	<a href="#">WG927363</a>
(S) Toluene-d8	96.4		88.7-115		11/17/2016 02:52	<a href="#">WG927363</a>
(S) Dibromofluoromethane	106		76.3-123		11/17/2016 02:52	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	94.5		69.7-129		11/17/2016 02:52	<a href="#">WG927363</a>



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.9		1	11/16/2016 13:42	<a href="#">WG927096</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
Naphthalene	ND		0.00544	1	11/17/2016 03:14	<a href="#">WG927363</a>
Toluene	ND		0.00544	1	11/17/2016 03:14	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00109	1	11/17/2016 03:14	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00326	1	11/17/2016 03:14	<a href="#">WG927363</a>
(S) Toluene-d8	96.5		88.7-115		11/17/2016 03:14	<a href="#">WG927363</a>
(S) Dibromofluoromethane	103		76.3-123		11/17/2016 03:14	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	92.9		69.7-129		11/17/2016 03:14	<a href="#">WG927363</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	89.0		1	11/16/2016 13:42	<a href="#">WG927096</a>

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Naphthalene	ND		0.00573	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Toluene	ND		0.00573	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00115	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00344	1.02	11/17/2016 03:42	<a href="#">WG927363</a>
(S) Toluene-d8	96.3		88.7-115		11/17/2016 03:42	<a href="#">WG927363</a>
(S) Dibromofluoromethane	105		76.3-123		11/17/2016 03:42	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	92.1		69.7-129		11/17/2016 03:42	<a href="#">WG927363</a>



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	81.1		1	11/16/2016 13:42	<a href="#">WG927096</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Naphthalene	ND		0.00623	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Toluene	ND		0.00623	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00125	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00374	1.01	11/17/2016 04:03	<a href="#">WG927363</a>
(S) Toluene-d8	98.8		88.7-115		11/17/2016 04:03	<a href="#">WG927363</a>
(S) Dibromofluoromethane	102		76.3-123		11/17/2016 04:03	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	89.8		69.7-129		11/17/2016 04:03	<a href="#">WG927363</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	88.1		1	11/16/2016 13:42	<a href="#">WG927096</a>

1 Cp

2 Tc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
Ethylbenzene	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
Isopropylbenzene	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
Methyl tert-butyl ether	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
Naphthalene	ND		0.00567	1	11/17/2016 04:24	<a href="#">WG927363</a>
Toluene	ND		0.00567	1	11/17/2016 04:24	<a href="#">WG927363</a>
1,2,4-Trimethylbenzene	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
1,3,5-Trimethylbenzene	ND		0.00113	1	11/17/2016 04:24	<a href="#">WG927363</a>
Xylenes, Total	ND		0.00340	1	11/17/2016 04:24	<a href="#">WG927363</a>
(S) Toluene-d8	97.9		88.7-115		11/17/2016 04:24	<a href="#">WG927363</a>
(S) Dibromofluoromethane	103		76.3-123		11/17/2016 04:24	<a href="#">WG927363</a>
(S) 4-Bromofluorobenzene	94.2		69.7-129		11/17/2016 04:24	<a href="#">WG927363</a>

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3178661-1 11/16/16 13:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000700			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L872914-05 Original Sample (OS) • Duplicate (DUP)

(OS) L872914-05 11/16/16 13:29 • (DUP) R3178661-3 11/16/16 13:29

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	87.0	85.5	1	1.72		5

Laboratory Control Sample (LCS)

(LCS) R3178661-2 11/16/16 13:29

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	



Method Blank (MB)

(MB) R3178665-1 11/16/16 13:42

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000400			

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L872934-03 Original Sample (OS) • Duplicate (DUP)

(OS) L872934-03 11/16/16 13:42 • (DUP) R3178665-3 11/16/16 13:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	76.7	76.5	1	0.276		5

Laboratory Control Sample (LCS)

(LCS) R3178665-2 11/16/16 13:42

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	



Method Blank (MB)

(MB) R3178784-4 11/16/16 21:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000270	0.00100
Ethylbenzene	U		0.000297	0.00100
Isopropylbenzene	U		0.000243	0.00100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
Toluene	U		0.000434	0.00500
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	95.5			88.7-115
(S) Dibromofluoromethane	101			76.3-123
(S) 4-Bromofluorobenzene	93.8			69.7-129

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3178784-1 11/16/16 19:19 • (LCSD) R3178784-2 11/16/16 19:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0258	0.0250	103	100	72.6-120			3.22	20
Ethylbenzene	0.0250	0.0258	0.0243	103	97.1	78.6-124			6.20	20
Isopropylbenzene	0.0250	0.0249	0.0233	99.6	93.3	79.4-126			6.54	20
Methyl tert-butyl ether	0.0250	0.0275	0.0265	110	106	70.2-122			3.66	20
Naphthalene	0.0250	0.0246	0.0237	98.2	94.9	69.9-132			3.44	20
Toluene	0.0250	0.0238	0.0233	95.1	93.2	76.7-116			2.06	20
1,2,4-Trimethylbenzene	0.0250	0.0258	0.0241	103	96.3	77.1-124			7.03	20
1,3,5-Trimethylbenzene	0.0250	0.0254	0.0238	102	95.3	79.0-125			6.36	20
Xylenes, Total	0.0750	0.0773	0.0729	103	97.2	78.1-123			5.83	20
(S) Toluene-d8				96.0	97.0	88.7-115				
(S) Dibromofluoromethane				98.2	98.3	76.3-123				
(S) 4-Bromofluorobenzene				93.0	89.6	69.7-129				

L872884-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L872884-01 11/16/16 22:55 • (MS) R3178784-5 11/16/16 21:50 • (MSD) R3178784-6 11/16/16 22:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	ND	0.659	0.628	101	96.6	26	47.8-131			4.83	22.8
Ethylbenzene	0.0250	ND	0.633	0.602	97.3	92.5	26	44.8-135			5.06	26.9
Isopropylbenzene	0.0250	ND	0.624	0.603	96.0	92.7	26	41.9-139			3.49	29.3



L872884-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L872884-01 11/16/16 22:55 • (MS) R3178784-5 11/16/16 21:50 • (MSD) R3178784-6 11/16/16 22:12

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Methyl tert-butyl ether	0.0250	ND	0.750	0.705	115	109	26	50.4-131			6.06	24.8
Naphthalene	0.0250	ND	0.692	0.690	93.7	93.5	26	18.4-145			0.200	34
Toluene	0.0250	ND	0.599	0.573	92.2	88.1	26	47.8-127			4.50	24.3
1,2,4-Trimethylbenzene	0.0250	ND	0.641	0.620	95.2	92.1	26	32.9-139			3.26	30.6
1,3,5-Trimethylbenzene	0.0250	ND	0.641	0.619	98.6	95.3	26	37.1-138			3.41	30.6
Xylenes, Total	0.0750	ND	1.88	1.80	96.3	92.1	26	42.7-135			4.45	26.6
(S) Toluene-d8					96.4	97.0		88.7-115				
(S) Dibromofluoromethane					99.1	98.3		76.3-123				
(S) 4-Bromofluorobenzene					92.7	91.4		69.7-129				

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
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The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.



## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

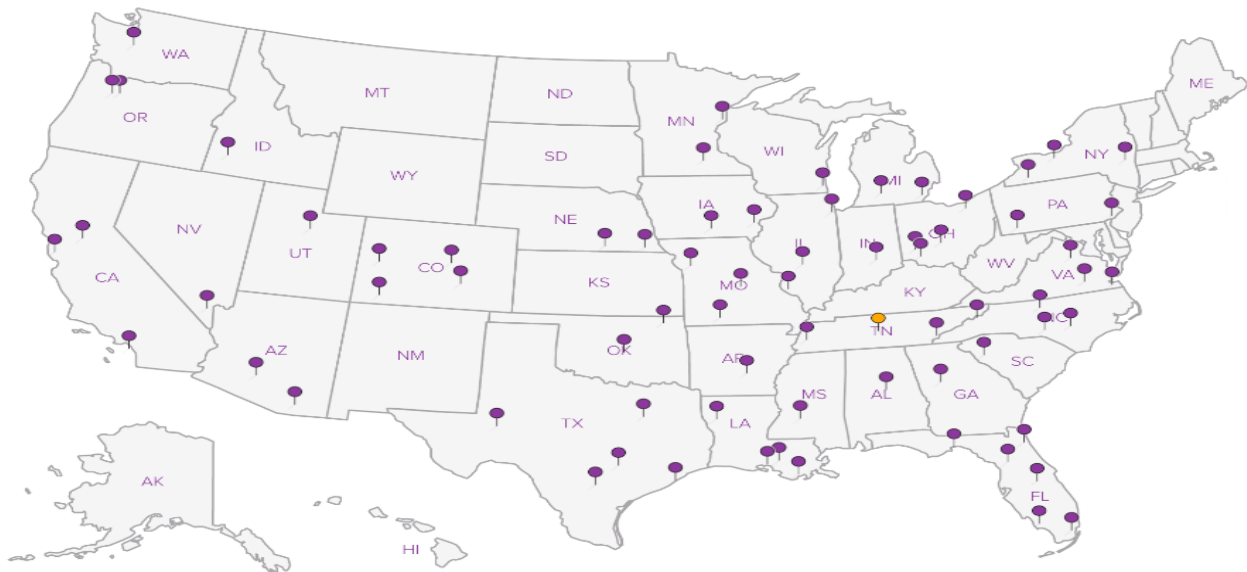
## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



**GES, Inc - Sunoco**

440 Creamery Way, Suite 500  
Exton, PA 19341

Billing Information & Quote Number:

Accounts Payable  
440 Creamery Way, Suite 500  
Exton, PA 19341  
ges-invoices@gesonline.com

Report to:  
**Stephanie Grillo**

Email To: sgrillo@gesonline.com,  
hsmoker@gesonline.com

Project  
Description: **SXL Butternut Road Release Site**

City/State: **Montoursville PA**  
Collected: **PA**

Phone: **610-458-1077**  
Fax:

Client Project #  
**0204694-01-107**  
**Org 1402**

Lab Project #  
**SUNGES-SXL**  
**SUNGES-GRILLO**

Collected by (print):  
**Jason Crowe**

Site/Facility ID #  
**Sx-Butternut Rd Release**

P.O. #

Collected by (signature):  
*Jason Crowe*

Rush? (Lab MUST Be Notified)  
Same Day .....200%  
 Next Day **NEXT DAY** .....100%  
 Two Day .....50%  
 Three Day .....25%

Date Results Needed

Immediately  
Packed on Ice N  Y

Email?  No  Yes  
FAX?  No  Yes

No. of Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TS 4ozClr-NoPres	V8260UGPA 40ml/NaHSO4/Syr/MeOH	Analysis / Container / Preservative							Chain of Custody Page <u>    </u> of <u>    </u>	
SS-38 @ 5.5'	Grab	SS	5.5'	11-15-16	1405	4	X	X									
SS-39 @ 6'	Grab	SS	6'	11-15-16	1410	4	X	X									
SS-40 @ 6'	Grab	SS	6'	11-15-16	1415	4	X	X									
SS-41 @ 6'	Grab	SS	6'	11-15-16	1425	4	X	X									
SS-42 @ 8'	Grab	SS	8'	11-15-16	1440	4	X	X									
SS-42 @ 12'	Grab	SS	12'	11-15-16	1445	4	X	X									
SS-43 @ 8'	Grab	SS	8'	11-15-16	1020	4	X	X									
SS-43 @ 12'	Grab	SS	12'	11-15-16	1455	4	X	X									
		SS				4	X	X									
		SS				4	X	X									

Chain of Custody Page      of     



YOUR LAB OF CHOICE

12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# **872937**  
**J204**

Acctnum: **SUNGES**  
Template: **T117141**  
Prelogin: **P576152**  
TSR: **134 - Mark W. Beasley**  
PB:

Shipped Via:

Rem./Contaminant	Sample # (lab only)
	01
	02
	03
	04
	05
	06
	07
	08

\* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH \_\_\_\_\_ Temp \_\_\_\_\_ 7066 8115 1880  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Relinquished by: (Signature) <i>Jason Crowe</i>	Date: 11-15-16	Time: 1600	Received by: (Signature) <i>Fed Ex Courier</i>	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>	Hold #
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 3.1 32	Condition: (lab use only) <i>LG</i>
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>M/V</i>	Date: 11-16-16 Time: 9W	COC Seal Intact: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA pH Checked: NCF:



L · A · B   S · C · I · E · N · C · E · S

YOUR LAB OF CHOICE

### Cooler Receipt Form

Client: <i>Sunbets</i>	SDG#	<i>872437</i>
Cooler Received/Opened On: <i>11/16/16</i>	Temperature Upon Receipt:	<i>3.1 °c</i>

Received By: **Richard Hughes**

Signature: *[Signature]*

Receipt Check List			
	Yes	No	N/A
Were custody seals on outside of cooler and intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were custody papers properly filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did all bottles arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct bottles used for the analyses requested?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was sufficient amount of sample sent in each bottle?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If applicable, was an observable VOA headspace present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Non Conformance Generated. (If yes see attached NCF)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>