



LANDMARK  
Environmental

Limited Phase II Environmental Investigation  
Vacant Property, Highway 280 and Kasota Avenue  
St. Paul, Minnesota

*Prepared for:*  
Venture Pass Partners, LLC  
Mason Holdings III, LLC

**June 2019**

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## 1.0 Introduction and Background

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### 1.1 Introduction

Landmark Environmental, LLC (Landmark) conducted a Limited Phase II Environmental Investigation (Investigation) at the property located northwest of Kasota Avenue and MN-280 in the City of St. Paul, Ramsey County, Minnesota (Property). Landmark conducted the Investigation on behalf of Venture Pass Partners, LLC and Mason Holdings III, LLC. The field work portion of the Investigation was conducted on May 30, 2019. The location of the Property is shown on **Figure 1**.

The Investigation was based on the information included in the *Phase I Environmental Site Assessment, Northwest of Kasota Avenue and MN-280, St. Paul, Minnesota* (Phase I ESA Report), which was prepared on behalf of Venture Pass Partners, LLC and Mason Holdings, LLC and dated April 2019, as well as the *Proposal for Limited Phase II Environmental Investigation, Vacant Property, Highway 280 and Kasota Avenue, St. Paul*, prepared by Landmark for Venture Pass Partners, LLC and dated January 8, 2019. The Investigation provides an evaluation of soil and fill material on the Property and takes into account the results of previous investigations. Landmark collected and field screen soil samples at eight (8) test trenches to investigate the findings from the Phase I ESA and provide overall spatial coverage across the Property.

**Figure 2** shows the Investigation locations and **Table 1** summarizes the Investigation location rationale and the corresponding analytical sampling summary. All Investigation activities were conducted in accordance with Landmark Standard Operating Procedures (SOPs), which are included in **Appendix A**, as well as applicable Minnesota Pollution Control Agency (MPCA) guidance documents.

### 1.2 Background and Phase I Summary

The Property is currently owned by Stan Koch and Sons Trucking, Inc. The Property consists of 1.668 acres of land that currently is zoned for light industrial use. The Property has never been developed. Historical aerial photographs from 1947 show surface water on the northern half and far-south sections of the Property. Surface water was no longer present by 1953, but visible again in 1966. This fluctuation may be the result of seasonal changes, precipitation or snowmelt. By 1974, the majority of the Property was occupied by surface water. By 1980, fill material appears to have been brought onto the Property because surface water is present on adjacent sites but is no longer present on the Property. The southwestern corner of the Property appears to support a stormwater pond/low-lying area between 1988 and present. The current Property owner, Stan Koch and Sons Trucking Inc., acquired the Property on February 25, 1992 and the Property has been vacant and unused since then.

Previous environmental investigations indicated that the Property supported a portion of the Elm Street Ash dump, which was used for disposal of incinerator ash containing heavy metals and

other wastes. Therefore, historic uses on the Property have likely involved the use, storage, and/or disposal of hazardous substances and petroleum products, and the documented presence of impacted fill soils at the Property, likely caused by historic dumping (Elm Street Ash Dump), was identified as a Recognized Environmental Conditions (REC) in the Phase I ESA Report.

Based on the identified REC, a Limited Phase II Environmental Investigation was recommended to further understand the potential for sub-surface impacts related to the planned redevelopment.

The following previous environmental assessments and investigations were conducted at the Property and were summarized in the Phase I ESA. Summaries of the scope and findings of these previous investigations are included below, and the analytical sample data listed in these summaries were compared to MPCA criteria at the time that these reports were published.

- *Exploratory Soil Borings for Phillips Klein, 280 & Kasota*, prepared by Advance Surveying & Engineering, Co. and dated March 14, 1986 (1986 Soil Borings Report);
- *MPCA Property File Evaluation Letter*, prepared by the MPCA and dated August 10, 1995 (1995 MPCA File Evaluation);
- *Phase I Environmental Site Assessment, Kasota Avenue and Highway 280, St. Paul, Minnesota*, prepared by GME and dated August 17, 1995 (1995 Phase I ESA);
- *A Geotechnical Evaluation Report for Stan Koch & Sons Trucking, Proposed Manufacturing/Warehouse Building Northwest of the Intersection of Kasota Avenue and the Southbound Minnesota Highway 280 Entrance Ramp in St. Paul, Minnesota*, prepared by Braun Intertec Corporation (Braun) and dated January 15, 1996 (1996 Geotechnical Report);
- *Environmental Profile, Kasota and Highway 280 Saint Paul, Ramsey County, MN*, prepared by EnPro Assessment Corp (EnPro) and dated May 21, 1996 (1996 Environmental Profile); and
- *Log of Boring Sheets and Monitoring Well Details for the Site Located in the Northwest Quadrant of Kasota Avenue and Highway 280 in St. Paul, Minnesota*, prepared by Braun and dated March 27, 1996 (1996 Borings Logs).

### **1986 Soil Borings Report**

As summarized in the 1986 Soil Borings Report, two borings were advanced at the Property on March 13, 1986, at opposite corners of the “buildable area”. One of the boring locations is shown on **Figure 3**. The second boring location could not be deciphered from the map included in the 1986 Soil Borings Report. Soils at the Property were reported to be sandy clay fill with concrete chunks and other debris down to a depth of approximately 22 feet below ground surface (bgs), where black, peaty clay was encountered. Peaty clay was underlain by firm brown sandy



clay from 23 to 29 feet, where borings were terminated. Water was observed in borings at approximately 22 feet bgs. Analytical samples were not collected.

### **1995 MPCA File Evaluation**

This document is a compilation of excerpts from regulatory files for regulatory-listed sites in the vicinity of the Property. Current regulatory-listed sites are described in Section 5.1 of the Phase I ESA.

### **1995 Phase I ESA**

Based upon historical and regulatory information reviewed, in-house files, and Property reconnaissance, the 1995 Phase I ESA identified multiple observations related to environmental conditions at the Property. Relevant observations include the following:

- The Property is covered with fill containing glass, plastic, slag, tires, wood, and metal. There is a sewer line extending along the south side of the Property.
- The land use surrounding the Property is industrial to the west and north with railyards to the south.
- According to previous investigations, subsurface soils are sandy clay fill with debris to a depth of 22 feet where water was encountered.
- Monitoring wells were observed on sites located approximately ¼ mile northwest and ¼ mile southeast of the Property.
- The Property and surrounding sites were used as an ash dump by Burlington Northern and the City of Minneapolis for years. Records indicate that some of the City of Minneapolis ash deposits exceed the recommended levels for heavy metals. Other wastes may have been dumped in the area.
- A wetland is present on the southwest corner of the Property.
- Multiple regulatory-listed sites are present in the Property vicinity, including multiple SPILL sites, Leak sites, hazardous waste generators. Three releases were also documented at the intersection of Highway 280 and Kasota Avenue.

### **1996 Geotechnical Report**

The 1996 Geotechnical Report summarizes a November 1995 geotechnical investigation which determined that conditions at the Property are unsuitable for spread footing foundations. The subsequent 1996 geotechnical investigation was conducted in order to evaluate deeper conditions.

During the November 1995 investigation, six borings were advanced at the Property to a maximum depth of 25 feet bgs. All borings encountered 16 to 22 feet of debris-laden, variably organic fill consisting of silty sand mixed with glass, sandy lean clay, concrete, gravel, wood, cinder, paper and peat. Fill was underlain by glacially-deposited sandy lean clay or silty sand. Fuel odors were detected at two borings locations (ST-1 and ST-4) at a depth of 2.5 feet bgs.

During the 1996 geotechnical investigation, two of the original sampling locations (ST-2 and ST-3) were re-sampled to a maximum depth of 70 to 80 feet bgs. Approximately 18 to 20 feet of variably organic fill was reported. Fill was underlain with glacially-deposited poorly graded sand, clayey sand and sandy lean clay to approximately 58 feet bgs. Below 58 feet, one boring location encountered shale bedrock to its termination depth of 80 feet bgs. Groundwater was observed at depths of approximately 16 to 21 feet bgs.

### **1996 Environmental Profile**

The 1996 Environmental Profile summarizes a soil and groundwater investigation conducted at the Property in 1996. This investigation was conducted as a follow up to a 1995 Phase II Investigation (report not available), during which EnPro monitored three of six geotechnical borings advanced by Braun (SB-3, SB-5, and SB-6). EnPro reported no visual or olfactory evidence of contamination, other than organic vapor readings of 0.1 to 11.2 parts per million (ppm) from 4 to 16 feet at one location (SB-5) and from 6 to 12 feet at a second location (SB-6). Braun reported strong petroleum odors from 2-4 feet at two of the geotechnical boring locations (SB-1 and SB-4).

Analytical data from the 1995 Phase II Investigation is not available, but the 1996 Environmental Profile indicated that several gasoline compounds were detected at one sampling location (SB-5) from 20 to 22 feet bgs and 1,2,4-trimethylbenzene was detected at a second location (SB-6) from 24 to 26 feet bgs. One semi-volatile (bis 2 ethyl-hexyl phthalate) and two pesticides (heptachlor and dieldrin) were detected in the same location (SB-6) from 24 to 26 feet (near the water table). Pesticide levels were reportedly low. Petroleum volatile organic compounds (VOCs) were detected in water table samples (SB-5 and SB-6) below MPCA action levels. Lead and cadmium were detected at one location (SB-6) from 8 to 10 feet bgs at levels that reportedly would warrant a leach test to determine if soil is hazardous. EnPro recommend additional sampling of soil and groundwater.

During the follow-up 1996 investigation, ten additional soil borings and three monitoring wells were advanced at the Property in the footprint of a proposed building and along the western Property boundary. Sampling locations are shown on **Figure 3**. Debris was reported at all borings, including glass, concrete, plastic, brick, cinders, paper, metal, and wood. Fuel odors were reported in multiple boring locations (MW-11, SB-14, SB-15, SB-16, SB-18, SB-19, SB-21). Organic vapor readings collected in the field were above background at nine of the borings and above 10 ppm at MW-11 (6 to 8 feet), SB-20 (0 to 4 feet), SB-14 (2 to 6 feet), SB-15 (2 to 6 feet), SB-16 (2 to 4 feet), and SB-18 (4 to 6 feet).

Laboratory analysis of soil samples indicated that petroleum, polychlorinated biphenyls (PCBs), lead, and pesticides are primary contaminants of concern. Petroleum contamination is said to consist of fuel oil, possibly mixed with gasoline and/or solvents, which is laterally widespread, but vertically confined to 2 to 6 feet bgs, with the exception of one boring location (SB-5), where field screening indicated that contamination extends to the water table. The continuous layer was said to suggest that petroleum-contaminated soil or ash was disposed of at the Property

during one or several specific events. Diesel range organics (DRO) was detected at or over 100 milligrams per kilogram (mg/kg), the current MPCA criteria for unregulated excess fill, at SB-18 from 2 to 4 feet (100 mg/kg) and SB-21 from 4 to 6 feet (500 mg/kg). Soil samples were also analyzed for benzene, toluene, ethylbenzene and xylene (BTEX). All reported BTEX concentrations were well below current MPCA screening criteria for an industrial setting.

PCB impacts to soil were detected from 2 to 4 feet in the vicinity of SB-20 and SB-21. PCBs were reported to be linked or possibly linked to petroleum contamination. Total PCBs were detected at 7.7 mg/kg in the sample collected at SB-20, and at 6.7 mg/kg in the sample collected at SB-21. Both of these concentrations are below the current MPCA criteria of 10 mg/kg for an industrial setting.

Lead impacts to soil exceeded 1996 screening criteria (MPCA Tanks and Emergency Response action limits for land farming of petroleum) at four locations, MW-11, SB-21, SB-6, and SB-23. Only one of these detections, 1,300 mg/kg at MW-11, exceeds current MPCA screening criteria for an industrial setting. Additional metals were detected in soil but all detections were also well below current MPCA screening criteria for an industrial setting.

Pesticides previously detected at SB-6 were not detected in other borings and were not determined to have impacted groundwater.

Monitoring wells were installed in three locations to depths of 22 to 23 feet bgs with a 10 foot screened interval. MW-11 was located on the upgradient side of the Property and MW-12 and MW-13 were located downgradient. Groundwater was reported at 10 to 19.5 feet bgs. Based on water level measurements collected in monitoring wells, groundwater at the Property was determined to be flowing to the west-northwest. Groundwater samples were analyzed for VOCs, pesticides, and metals. Multiple petroleum-based parameters as well as cadmium and silver were detected in groundwater. Concentrations of PCB 1254 and cadmium exceeded the Minnesota Department of Health (MDH) Health Risk Limit (1996 standard) in samples collected from each of the three wells, as well as the current MDH HRLs. No additional detections exceed current HRLs.

### **1996 Borings Logs**

As summarized in the 1996 Borings Logs, thirteen soil borings and three monitoring wells were advanced at the Property on March 5, 6, and 7, 1996. Soils were reported to be 15 to 22 feet of fill underlain by till, with the exception of MW-12, MW-13, and SB-20, where up to 4 feet of swamp and lake deposits were present above till. Outwash was encountered at depth in boring MW-13. Groundwater was encountered at 10 to 19.5 feet bgs.

## 2.0 Investigation Results

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### 2.1 Field Investigation Summary

The REC identified in the Phase I ESA Report was assessed as part of this Investigation. Landmark completed the field work portion of the Investigation on May 30, 2019, at the locations shown on **Figure 2**. The Investigation focused on assessing soil and characterizing fill material across the Property.

Prior to conducting the fieldwork, Landmark prepared a Site Safety Plan. Excavation services for the test trench portion of the Investigation for the collection of soil samples were provided by Frattalone Companies (Frattalone). In addition, Braun Intertec (Braun) was onsite to conduct a geotechnical evaluation for the proposed parking lot design and their associated report is included in **Appendix B**. A summary of the Investigation location rationale and analytical summary is listed in **Table 1** and a Photo Log documenting Investigation activities is included in **Appendix C**.

#### 2.1.1 Soil Sampling Summary

Eight test trenches, labeled Landmark Test Trench 1 (LTT-1) through LTT-8, were advanced and excavated to investigate the REC and to provide overall spatial coverage across the Property. The test trenches were excavated to an approximate depth of 5 feet bgs for the collection of soil samples. Soil samples submitted for laboratory analysis focused on characterizing near surface soil (approximately 0 to 5 feet bgs) across the Property for soil that may be disturbed during future redevelopment (construction of a semi-trailer parking lot), and to assess the potential for contamination.

Soil samples are labeled according to location and depth. For instance, sample LTT-5/2-4 was collected at location LTT-5 from 2 to 4 feet bgs. All soil samples were screened in the field for organic headspace values with a photoionization detector (PID) equipped with an 11.7 eV bulb as well as visual observation including screening for suspect regulated asbestos containing materials (RACM). A total of 16 soil samples (two samples at each test trench) were submitted to Pace Analytical Services, Inc. (Pace) for analysis; however, 8 of the 16 soil samples (one sample at each test trench) were held for analysis. Soil samples were analyzed for Resource Conservation and Recovery Act (RCRA) metals, VOCs, DRO, polynuclear aromatic hydrocarbons (PAHs) and PCBs, and these parameters were determined at each location based on field screening indications of contamination and to provide spatial coverage across the Property. Because suspect RACM were not observed, samples for RACM were not collected. Field screening results are listed on the test trench logs in **Appendix D** and the detected analytical parameters are listed in **Table 2**.

### 2.2 Field Investigation Results

**Figure 2** shows the Property layout with the Investigation locations and **Table 1** provides the Investigation Location Rationale and Sampling Summary. Fill material was observed across the

Property to depths of 5 feet bgs, as shown on the cross-sectional photos in the test trench logs in **Appendix D**. Fill material was comprised of silty sand with varying amounts of gravel and debris.

Field screening indications of contamination, including elevated PID readings [greater than 10 parts per million (ppm)], were observed in each test trench. A petroleum odor and elevated PID readings ranging from 12.9 to 254.2 ppm were observed at each test trench. Debris consisting of concrete, brick, clay tile, glass, plastic, wood, rubber, slag/coke, ash, metal and styrofoam were observed in each test trench.

## 2.3 Laboratory Analytical Results

Detected analytical parameters for soil samples are listed in **Tables 2** along with the MPCA Tier 1 Soil Leaching Values (SLVs), MPCA Residential Soil Reference Values (RSRVs) and the MPCA Industrial Soil Reference Values (ISRVs) for comparison purposes. The Pace laboratory reports are included in **Appendix E**.

The following items summarize the analytical results of soil samples listed in **Table 2**:

- Except for arsenic, chromium, lead and mercury, all detected RCRA metals were reported below the MPCA criteria. Arsenic was reported above the Tier 1 SLV of 5.8 milligrams per kilogram (mg/kg) in sample LTT-5/0-2' (10.3 mg/kg), LTT-6/0-2' (5.9 mg/kg) and LTT-7/2-4' (7.1 mg/kg). In addition, arsenic in sample LTT-5/0-2' was reported above the RSRV of 9 mg/kg, but below the ISRV of 20 mg/kg. Total chromium was reported from 43.3 to 75.1 mg/kg in samples LTT-1/1-2', LTT-2/2-3', LTT-5/0-2', LTT-6/0-2', LTT-7/2-4' and LTT-8/0-2'. The chromium detections are above the Tier 1 SLV of 36 mg/kg for Chromium VI, but below the RSRV of 87 mg/kg. However, because the samples were analyzed for total chromium at Pace, the concentrations of chromium are not discussed further. Lead was reported in samples LTT-1/1-2' and LTT-5/0-2' at 579 mg/kg and 1,430 mg/kg, respectively. These lead detections are above the RSRV of 300 mg/kg and the lead detection in sample LTT-5/0-2' is above the ISRV of 700 mg/kg. Mercury was reported above the RSRV of 0.5 mg/kg in sample LTT-5/0-2' (0.52 mg/kg), but well below the Tier 1 SLV of 3.3 mg/kg and ISRV of 1.5 mg/kg.

Because lead was detected in all 8 samples above 100 mg/kg, each sample was analyzed for lead using the Toxicity Characteristic Leaching Procedure (TCLP). However, lead was not detected above the laboratory's method detection limit (MDL) in any of the samples.

- Soil samples were collected for analysis of PCBs at each location. Total PCBs were detected in each sample and concentrations ranged from 0.37 to 5.5 mg/kg. These concentrations are above the Tier 1 SLV of 0.13 mg/kg. Total PCBs were detected above the RSRV of 1.2 mg/kg, but below the ISRV of 8 mg/kg in samples LTT-1/1-2' (4.0

mg/kg), LTT-2/2-3' (5.5 mg/kg), LTT-4/2-4' (3.3 mg/kg), LTT-5/0-2' (2.6 mg/kg) and LTT-7/2-4' (3.5 mg/kg). No PCBs were reported above the ISRV of 8 mg/kg.

- Three (3) soil samples were submitted to Pace for laboratory analysis of VOCs including LTT-4/2-4', LTT-6/0-2' and LTT-7/2-4'. Of the 14 VOCs detected, all of the detected VOCs were reported below the Tier 1 SLVs, RSRVs and ISRVs, except for benzene, ethylbenzene and trichloroethylene (TCE). Benzene was detected above the Tier 1 SLV of 0.017 mg/kg in sample LTT-7/2-4' (0.14 mg/kg), but below the RSRV of 6 mg/kg and ISRV of 10 mg/kg. Ethylbenzene was detected above the Tier 1 SLV of 1 mg/kg in sample LTT-7/2-4' (2.6 mg/kg), but well below the RSRV and ISRV of 200 mg/kg. TCE was detected at 0.099 mg/kg, 0.09 mg/kg and 0.10 mg/kg in samples LTT-4/2-4', LTT-6/0-2' and LTT-7/2-4', respectively. These TCE detections are above the Tier 1 SLV of 0.0023 mg/kg, but well below the RSRV of 29 mg/kg and ISRV of 46 mg/kg.
- DRO was detected in each sample and concentrations ranged from 89.2 mg/kg to 1,660 mg/kg. The reported DRO concentrations were "T6-flagged" in the Pace laboratory reports to indicate that "high boiling point hydrocarbons are present in the sample". In addition, the reported DRO concentrations at LTT-2 through LTT-8 were "T7-flagged" in the Pace laboratory report to indicate that "low boiling point hydrocarbons are present in the sample. The MPCA does not list risk-based criteria for DRO. Rather, the MPCA Petroleum Remediation Program lists a Best Management Practice (BMP) criteria for DRO of 100 mg/kg when defining unregulated fill for soil with no field screening indications of contamination. Seven of the 8 sampling locations exceeded 100 mg/kg for DRO, including LTT-1/1-2', LTT-2/2-3', LTT-3/0-2', LTT-4/2-4', LTT-5/0-2', LTT-6/0-2' and LTT-7/2-4'.
- PAHs were reported in each of the 8 soil samples submitted to Pace for analysis. PAH concentrations were calculated as the benzo(a)pyrene (BaP) equivalent for comparison with MPCA risk-based criteria. BaP equivalent concentrations ranged from 0.30 mg/kg to 1.3 mg/kg and all PAH concentrations were reported below the MPCA ISRV (3.0 mg/kg) the RSRV (2.0 mg/kg) and the Tier 1 SLV (1.4 mg/kg).



### 3.0 Conclusions and Recommendations

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The Phase I ESA Report indicated that historic activities on the Property have likely involved the use, storage, and/or disposal of hazardous substances and petroleum products, and the documented presence of impacted fill soils at the Property, likely caused by historic dumping (Elm Street Ash Dump), was identified as a REC in the Phase I ESA Report. This REC was addressed during the Investigation, which involved the excavation of 8 test trenches at the locations shown on **Figure 2**. Test trench logs included in **Appendix C** provide descriptions of the soil and fill material.

Eight soil samples (one from each test trench) were analyzed at Pace for RCRA metals, VOCs, DRO, PAHs and PCBs, as well as TCLP lead. Impacts to soil at the Property were observed and/or reported at the following locations:

- Fill material was observed across the Property to depths of 5 feet bgs, as shown on test trench logs in **Appendix D**. Fill material was comprised of silty sand with varying amounts of gravel and debris. Field screening indications of contamination, including elevated PID readings, were observed in each test trench. A petroleum odor, elevated PID readings that ranged from 12.9 ppm to 254.2 ppm, and debris consisting of concrete, brick, clay tile, glass, plastic, wood, rubber, slag/coke, ash, metal and styrofoam were observed in each of the test trenches.
- Arsenic was reported above the Tier 1 SLV in sample LTT-5/0-2', LTT-6/0-2' and LTT-7/2-4'. In addition, arsenic in sample LTT-5/0-2' was reported above the RSRV, but below the applicable MPCA ISRV criteria.
- Lead was reported in samples LTT-1/1-2' and LTT-5/0-2' above the RSRV and the lead detection in sample LTT-5/0-2' is above the applicable MPCA ISRV criteria. Because lead was detected in all 8 samples above 100 mg/kg, each sample was analyzed for TCLP lead. TCLP lead sample was not detected above the Pace MDL.
- Mercury was reported above the RSRV in sample LTT-5/0-2', but well below the Tier 1 SLV and the applicable MPCA ISRV criteria.
- Total PCBs were detected in the 8 soil samples above the Tier 1 SLV. In addition, total PCBs were detected above the RSRV in samples LTT-1/1-2', LTT-2/2-3', LTT-4/2-4', LTT-5/0-2' and LTT-7/2-4'. Total PCBs were not detected above the MPCA ISRV.
- Soil samples LTT-4/2-4', LTT-6/0-2' and LTT-7/2-4' were submitted to Pace for laboratory analysis of VOCs. Of the 14 VOCs detected, all of the detected VOCs were reported below the Tier 1 SLVs, RSRVs and the applicable MPCA ISRV criteria, except for benzene, ethylbenzene and TCE. Benzene was detected above the Tier 1 SLV in sample LTT-7/2-4', but below the RSRV and the ISRV. Ethylbenzene was detected

above the Tier 1 SLV in sample LTT-7/2-4', but well below the RSRV and the ISRV. TCE was detected in samples LTT-4/2-4', LTT-6/0-2' and LTT-7/2-4' above the Tier 1 SLV, but well below the RSRV and the ISRV.

- DRO was reported in each of the 8 samples. Except for the DRO sample at LTT-8, DRO was reported above the MPCA BMP criteria of 100 mg/kg in each of the samples
- PAHs were reported in each sample; however, concentrations were reported below the MPCA ISRV, RSRV and the Tier 1 SLV.

Based on the Investigation results, Landmark offers the following recommendations:

- The current Property owner should report the soil results listed in this Report to the Minnesota Department of Emergency Management Duty Officer.
- Landmark recommends that Venture Pass Partners, LLC and Mason Holdings III, LLC prepare an enrollment application to the MPCA Voluntary Brownfields Program. The application should request that the MPCA Voluntary Investigation and Cleanup (VIC) Program issue a No Association Determination for Venture Pass Partners, LLC, Mason Holdings III, LLC, and any lenders for the identified impacts to soil listed in this Investigation Report.
- Landmark recommends that a Voluntary Response Action Plan (VRAP) be prepared and submitted to the MPCA VIC and Petroleum Brownfields Programs for review and approval to address the management of impacted soil and fill material (and groundwater if necessary) associated with future construction activities to redevelop the Property as a surface parking lot for semi-trailer parking. Also, Landmark recommends that an Environmental Construction Contingency Plan (ECCP) be prepared and submitted to the MPCA VIC and Petroleum Brownfields Programs for review and approval to address any unknown conditions related to impacted soil and fill material and groundwater contamination that may be encountered during construction activities.



## Tables

**Table 1**  
Investigation Location Rationale and Sampling Summary  
Vacant Property, Highway 280 and Kasota Avenue  
St. Paul, Minnesota  
May 2019

<b>Location Name</b>	<b>Trench Depth (feet bgs)</b>	<b>Historical and/or Location Rationale</b>	<b>Sample Depth and Analytical Parameters</b>
LTT-1	5	Test trench located in the southeast corner of the Property and just southwest of monitoring well 11.	Soil sample LTT-1/1-2' collected from fill material for DRO, PAHs, RCRA metals, PCBs and TCLP lead analysis. (Hold VOCs) Soil sample LTT-1/4-5' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)
LTT-2	5.5	Test trench located just south of the trees on the southeastern portion of the Property.	Soil sample LTT-2/2-3' collected from fill material for DRO, PAHs, RCRA metals, PCBs and TCLP lead analysis. (Hold VOCs) Soil sample LTT-2/4-5' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)
LTT-3	5	Test trench located just north of monitoring well 12.	Soil sample LTT-3/0-2' collected from fill material for DRO, PAHs, RCRA metals, PCBs and TCLP lead analysis. (Hold VOCs) Soil sample LTT-3/2-4' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)
LTT-4	5	Test trench located in the proposed stormwater pond area.	Soil sample LTT-4/0-2' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs) Soil sample LTT-4/2-4' collected from fill material for DRO, PAHs, RCRA metals, PCBs, TCLP lead and VOCs analysis.
LTT-5	5	Test trench located just east of monitoring well 13.	Soil sample LTT-5/0-2' collected from fill material for DRO, PAHs, RCRA metals, PCBs and TCLP lead analysis. (Hold VOCs) Soil sample LTT-5/2-4' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)
LTT-6	5	Test trench located in the northwest corner of the Property.	Soil sample LTT-6/0-2' collected from fill material for DRO, PAHs, RCRA metals, PCBs, TCLP lead and VOCs analysis. Soil sample LTT-6/2-4' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)
LTT-7	5	Test trench located in the north-central portion of the Property at about 80 feet northeast of LTT-5 and about 80 feet southeast of LTT-6.	Soil sample LTT-7/0-2' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs) Soil sample LTT-7/2-4' collected from fill material for DRO, PAHs, RCRA metals, PCBs, TCLP lead and VOCs analysis.
LTT-8	5	Test trench located in the central portion of the Property at about 105 feet northeast of LTT-4 and about 80 feet northwest of LTT-3.	Soil sample LTT-8/0-2' collected from fill material for DRO, PAHs, RCRA metals, PCBs and TCLP lead analysis. (Hold VOCs) Soil sample LTT-8/2-4' collected from fill material. (Hold DRO, PAHs, RCRA metals, PCBs and VOCs)

Table 2  
Laboratory Soil Data - Detected Parameters  
Vacant Property, Highway 280 and Kasota Avenue, St. Paul, Minnesota  
(Results in mg/kg)

Sample Name	MPCA 2013	MPCA 2009	MPCA 2009	US EPA <sup>1</sup> Characteristic Waste for Toxicity for Landfill Disposal	LTT-1 1-2' Fill 5/30/2019	LTT-2 2-3' Fill 5/30/2019	LTT-3 0-2' Fill 5/30/2019	LTT-4 2-4' Fill 5/30/2019
Depth								
Soil Type	Tier 1 SLVs	Residential SRVs	Industrial SRVs					
Date Collected								
Petroluem								
PID Readings (ppm)	10	10	10	NS	0.0	1.2	0.0	3.8
DRO	100*	100*	100*	NS	151	171	128	159
PCBs								
	0.13	1.2	8	NS	4.0	5.5	0.37	3.3
RCRA Metals								
Arsenic	5.8	9	20	NS	4.5	4.6	3.8	4.5
	1,700	1,100	18,000	NS	119	123	62.7	110
Cadmium	8.8	25	200	NS	0.95	1.0	0.55	0.84
Chromium (III/VI)	1000000000/36	44000/87	100000/650	NS	43.9	43.3	30.5	23.5
Lead	2,700	300	700	NS	579	260	154	208
Selenium	2.6	160	1,300	NS	<1.1	<1.1	<1.1	<1.1
Silver	7.9	160	1,300	NS	0.62	0.58	0.59	<0.57
Mercury	3.3	0.5	1.5	NS	0.19	0.28	0.12	0.23
TCLP RCRA Metals (mg/L)								
Lead	NS	NS	NS	5.0	<0.10	<0.10	<0.10	<0.10
VOCs								
1,2,4-Trimethylbenzene	2.7	8	25	NS	NA	NA	NA	0.12
1,2-Dichlorobenzene	11	26	75	NS	NA	NA	NA	<0.063
1,3,5-Trimethylbenzene	2.7	3	10	NS	NA	NA	NA	<0.063
Benzene	0.017	6	10	NS	NA	NA	NA	<0.025
Ethylbenzene	1	200	200	NS	NA	NA	NA	0.64
Isopropylbenzene (Cumene)	9.5	30	87	NS	NA	NA	NA	<0.063
Naphthalene	4.5	10	28	NS	NA	NA	NA	<0.25
Toluene	2.5	107	305	NS	NA	NA	NA	0.19
Trichloroethene (TCE)	0.0023	29	46	NS	NA	NA	NA	0.099
Xylene (Total)	5.4	45	130	NS	NA	NA	NA	0.52
n-Butylbenzene	NS	30	92	NS	NA	NA	NA	<0.063
n-Propylbenzene	NS	30	93	NS	NA	NA	NA	<0.063
p-Isopropyltoluene	NS	NS	NS	NS	NA	NA	NA	<0.063
sec-Butylbenzene	NS	25	70	NS	NA	NA	NA	<0.063
PAHs								
Acenaphthene	81	1,200	5,260	NS	0.027	0.028	0.041	0.019
Acenaphthylene	NS	NS	NS	NS	0.018	0.022	0.014	<0.012
Anthracene	1,300	7,880	45,400	NS	0.078	0.076	0.070	0.052
Benzo(a)anthracene	BaP Eq	BaP Eq	BaP Eq	NS	0.33	0.24	0.41	0.19
Benzo(a)pyrene	BaP Eq	BaP Eq	BaP Eq	NS	0.39	0.31	0.65	0.20
Benzo(b)fluoranthene	BaP Eq	BaP Eq	BaP Eq	NS	0.63	0.46	0.90	0.30
Benzo(g,h,i)perylene	NS	NS	NS	NS	0.34	0.28	0.51	0.17
Benzo(k)fluoranthene	BaP Eq	BaP Eq	BaP Eq	NS	0.24	0.17	0.37	0.11
Chrysene	BaP Eq	BaP Eq	BaP Eq	NS	0.47	0.31	0.58	0.24
Dibenz(a,h)anthracene	BaP Eq	BaP Eq	BaP Eq	NS	0.097	0.075	0.12	0.051
Fluoranthene	670	1,080	6,800	NS	0.59	0.44	0.58	0.31
Fluorene	110	850	4,120	NS	0.026	0.032	0.039	0.029
Indeno(1,2,3-cd)pyrene	BaP Eq	BaP Eq	BaP Eq	NS	0.26	0.21	0.42	0.13
Naphthalene	4.5	10	28	NS	0.14	0.13	0.30	0.077
Phenanthrene	NS	NS	NS	NS	0.33	0.30	0.37	0.22
Pyrene	440	890	5,800	NS	0.57	0.39	0.59	0.28
Total BaP Equivalent	1.4	2	3	NS	0.59	0.47	0.94	0.30

Footnotes:

<sup>1</sup> As defined under 40 CFR 261 Subpart C. Analytical method is Toxicity Characteristics Leaching Procedure (TCLP) under US EPA SW-846 Method 1311

\* Meets MPCA Unregulated Fill Criteria for DRO

BaP Eq: benzo(a)pyrene equivalent

DRO: diesel range organics

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

MPCA: Minnesota Pollution Control Agency

NA: not analyzed

NS: no standard

PAHs: polynuclear aromatic hydrocarbons

PCBs: polychlorinated biphenyls

PID: photoionization detector

ppm: parts per million

RCRA: Resource Conservation Recovery Act

SLV: Soil Leaching Value

SRV: Soil Reference Value

VOCs: Volatile Organic Compounds

Table 2  
Laboratory Soil Data - Detected Parameters  
Vacant Property, Highway 280 and Kasota Avenue, St. Paul, Minnesota  
(Results in mg/kg)

Sample Name	MPCA 2013	MPCA 2009	MPCA 2009	US EPA <sup>1</sup> Characteristic Waste for Toxicity for Landfill Disposal	LTT-5 0-2' Fill 5/30/2019	LTT-6 0-2' Fill 5/30/2019	LTT-7 2-4' Fill 5/30/2019	LTT-8 0-2' Fill 5/30/2019
Depth	Tier 1	Residential	Industrial					
Soil Type	SLVs	SRVs	SRVs					
Date Collected								
Petroluem								
PID Readings (ppm)	10	10	10	NS	0.0	0.0	50.2	0.0
DRO	100*	100*	100*	NS	163	106	1,660	89.2
PCBs	0.13	1.2	8	NS	2.6	0.40	3.5	0.67
RCRA Metals								
Arsenic	5.8	9	20	NS	10.3	5.9	7.1	5.4
	1,700	1,100	18,000	NS	242	138	191	98.5
Cadmium	8.8	25	200	NS	6.8	5.4	2.1	1.1
Chromium (III/VI)	1000000000/36	44000/87	100000/650	NS	59.5	43.9	61.2	75.1
Lead	2,700	300	700	NS	1,430	261	268	173
Selenium	2.6	160	1,300	NS	<1.2	<1.2	<1.3	<1.3
Silver	7.9	160	1,300	NS	0.69	0.82	2.0	0.66
Mercury	3.3	0.5	1.5	NS	0.51	0.25	0.16	0.20
TCLP RCRA Metals (mg/L)								
Lead	NS	NS	NS	5.0	<0.10	<0.10	<0.10	<0.10
VOCs								
1,2,4-Trimethylbenzene	2.7	8	25	NS	NA	0.18	1.6	NA
1,2-Dichlorobenzene	11	26	75	NS	NA	<0.085	0.090	NA
1,3,5-Trimethylbenzene	2.7	3	10	NS	NA	0.085	0.36	NA
Benzene	0.017	6	10	NS	NA	<0.034	0.14	NA
Ethylbenzene	1	200	200	NS	NA	0.39	2.6	NA
Isopropylbenzene (Cumene)	9.5	30	87	NS	NA	<0.085	0.16	NA
Naphthalene	4.5	10	28	NS	NA	<0.34	0.61	NA
Toluene	2.5	107	305	NS	NA	0.59	0.73	NA
Trichloroethene (TCE)	0.0023	29	46	NS	NA	0.09	0.10	NA
Xylene (Total)	5.4	45	130	NS	NA	1.3	3.4	NA
n-Butylbenzene	NS	30	92	NS	NA	<0.085	0.43	NA
n-Propylbenzene	NS	30	93	NS	NA	<0.085	0.51	NA
p-Isopropyltoluene	NS	NS	NS	NS	NA	<0.085	0.17	NA
sec-Butylbenzene	NS	25	70	NS	NA	<0.085	0.29	NA
PAHs								
Acenaphthene	81	1,200	5,260	NS	0.040	<0.062	0.081	<0.027
Acenaphthylene	NS	NS	NS	NS	0.022	0.080	0.027	<0.027
Anthracene	1,300	7,880	45,400	NS	0.16	0.098	0.055	0.073
Benzo(a)anthracene	BaP Eq	BaP Eq	BaP Eq	NS	0.92	0.44	0.17	0.29
Benzo(a)pyrene	BaP Eq	BaP Eq	BaP Eq	NS	0.88	0.47	0.22	0.35
Benzo(b)fluoranthene	BaP Eq	BaP Eq	BaP Eq	NS	1.3	0.75	0.32	0.47
Benzo(g,h,i)perylene	NS	NS	NS	NS	0.63	0.43	0.21	0.30
Benzo(k)fluoranthene	BaP Eq	BaP Eq	BaP Eq	NS	0.48	0.26	0.11	0.20
Chrysene	BaP Eq	BaP Eq	BaP Eq	NS	0.94	0.51	0.26	0.35
Dibenz(a,h)anthracene	BaP Eq	BaP Eq	BaP Eq	NS	0.19	0.15	0.058	0.09
Fluoranthene	670	1,080	6,800	NS	1.3	0.70	0.29	0.43
Fluorene	110	850	4,120	NS	0.039	<0.062	0.11	<0.027
Indeno(1,2,3-cd)pyrene	BaP Eq	BaP Eq	BaP Eq	NS	0.52	0.34	0.16	0.23
Naphthalene	4.5	10	28	NS	0.18	0.14	0.44	0.14
Phenanthrene	NS	NS	NS	NS	0.63	0.39	0.38	0.36
Pyrene	440	890	5,800	NS	1.2	0.67	0.35	0.40
Total BaP Equivalent	1.4	2	3	NS	1.3	0.74	0.33	0.52

Footnotes:

<sup>1</sup> As defined under 40 CFR 261 Subpart C. Analytical method is Toxicity Characteristics Leaching Procedure (TCLP) under US EPA SW-846 Method 1311

\* Meets MPCA Unregulated Fill Criteria for DRO

BaP Eq: benzo(a)pyrene equivalent

DRO: diesel range organics

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

MPCA: Minnesota Pollution Control Agency

NA: not analyzed

NS: no standard

PAHs: polynuclear aromatic hydrocarbons

PCBs: polychlorinated biphenyls

PID: photoionization detector

ppm: parts per million

RCRA: Resource Conservation Recovery Act

SLV: Soil Leaching Value

SRV: Soil Reference Value

VOCs: Volatile Organic Compounds

## Figures



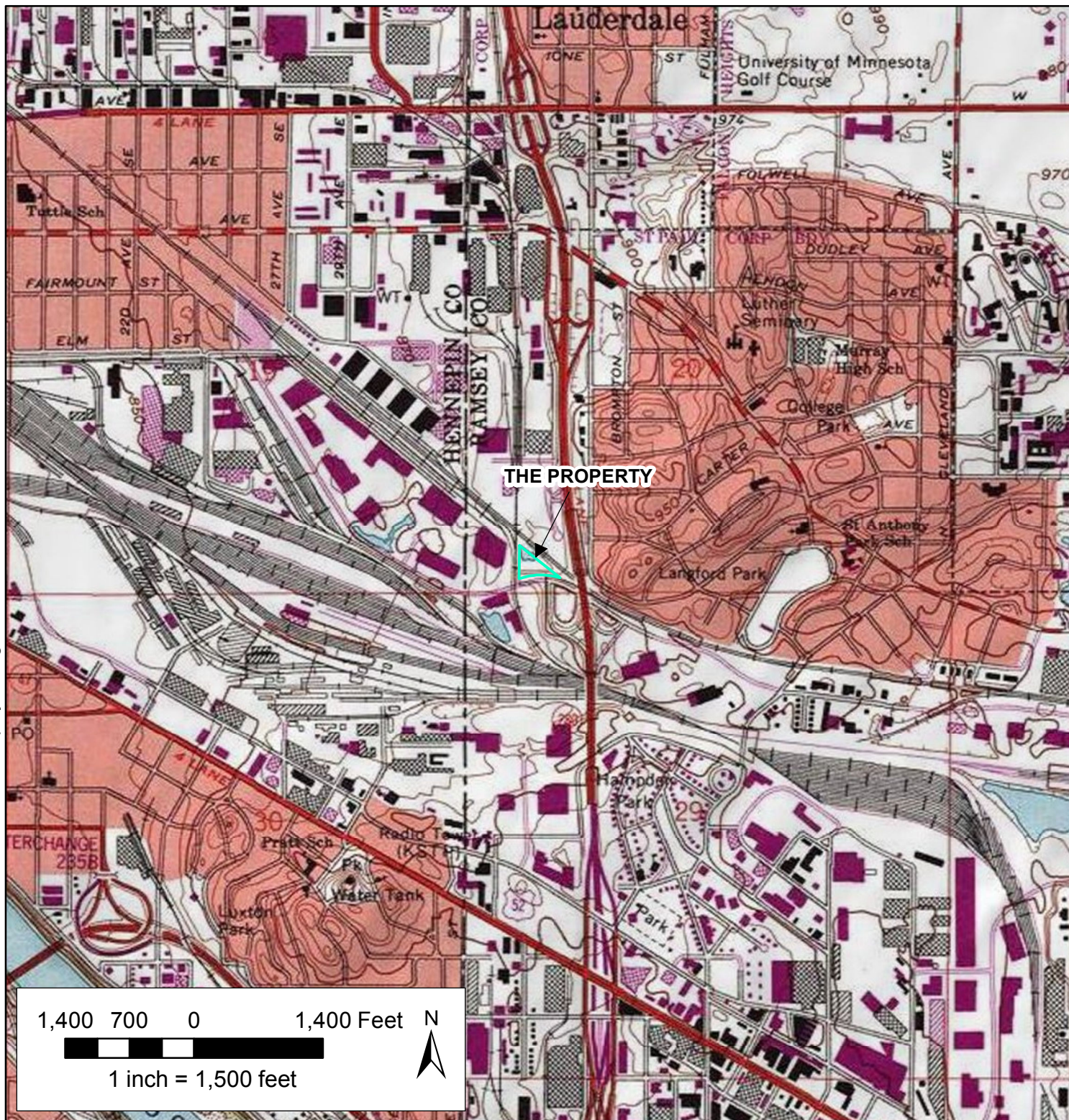
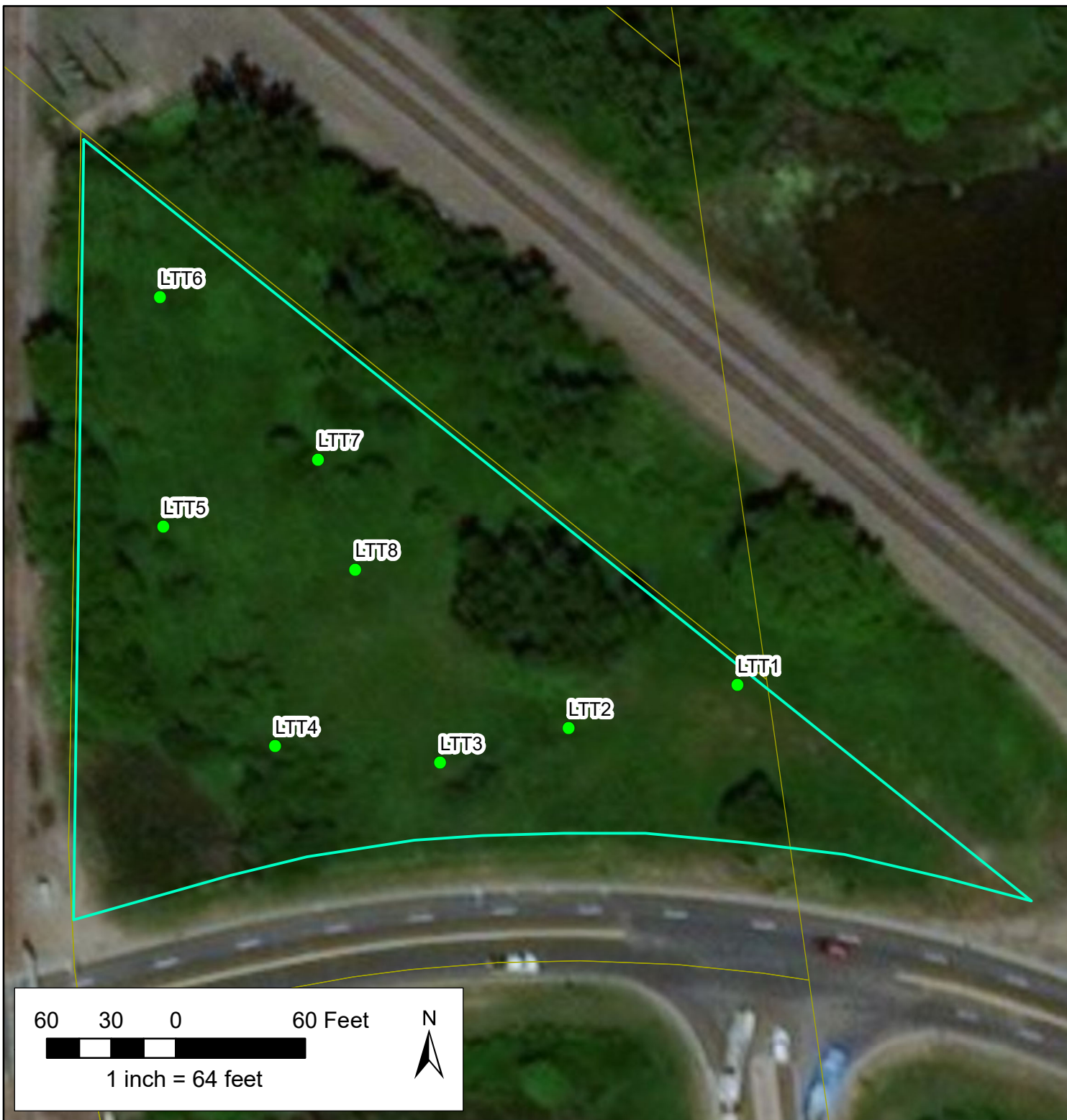


Figure 1

**PROPERTY LOCATION MAP  
NW of Kasota Ave and MN-280  
St. Paul, Minnesota**

**LANDMARK ENVIRONMENTAL, LLC**





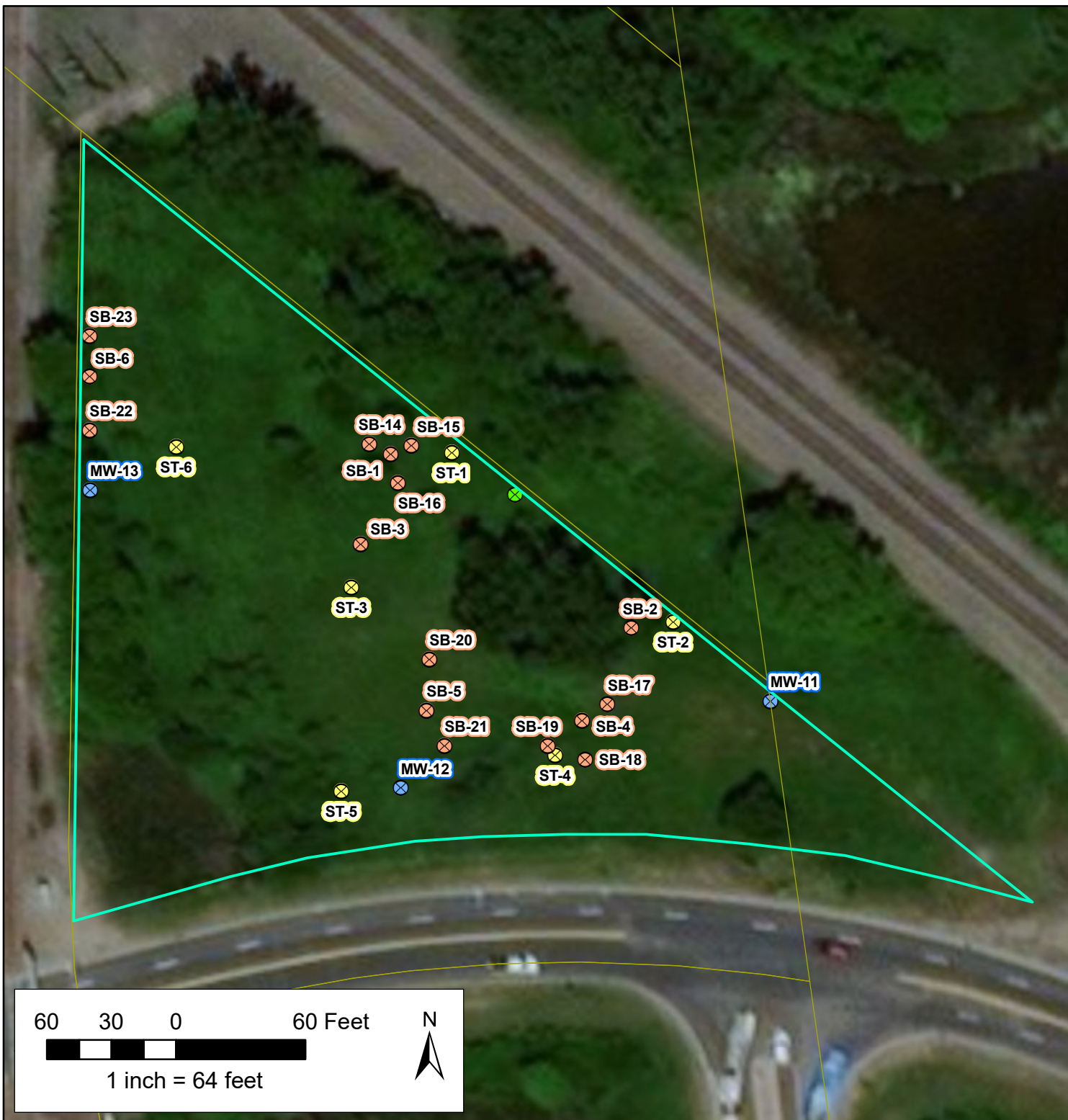
## Legend

-  Property Boundary
-  Tax Parcels
-  Test Trench Locations

Figure 2

**PROPERTY LAYOUT MAP WITH  
INVESTIGATION LOCATIONS  
NW of Kasota Ave and MN-280  
St. Paul, Minnesota**

**LANDMARK ENVIRONMENTAL, LLC**



## Legend

Property Boundary

Tax Parcels

### Previous Investigation Locations

- 1986 Advance Surveying Geotechnical Boring
- 1996 Braun Geotechnical Boring
- 1996 EnPro Boring
- 1996 EnPro Monitoring Well

Figure 3

**PROPERTY LAYOUT MAP WITH  
PREVIOUS INVESTIGATION LOCATIONS  
NW of Kasota Ave and MN-280  
St. Paul, Minnesota**

**LANDMARK ENVIRONMENTAL, LLC**



## Appendices

## Appendix A

# **Standard Operating Procedures for the Bag Headspace Procedure Soil Sample Collection and Analysis**

**May 29, 2018**

## **Introduction**

This document describes technical standard operating procedures (SOPs) prepared by Landmark Environmental, LLC (Landmark). The SOPs, which are being submitted to the U.S. Environmental Protection Agency (EPA) and the Minnesota Pollution Control Agency (MPCA) for review, are based on the MPCA's Risk Based Site Characterization and Sampling Guidance, Working Draft, September 16, 1998 and Soil Sample Collection and Analysis Fact Sheet #3.22, July 1996 and has been prepared in accordance with Guidance for Preparing Standard Operating Procedures (QA/G-6), EPA/600/B-07/001, April 2007.

While it is understood that different practitioners will employ various methods based on their experience and equipment, due care will be taken to ensure integrity of the samples and data quality. The procedures recommended in the SOPs may be varied or changed, with MPCA or EPA approval, depending on site-specific conditions or emerging technologies and methodologies. In all cases, the methodologies used in the field must be thoroughly described and documented in the final report accompanying the sampling results. Field work will be completed using the same methods and procedures at all sampling locations throughout the project. Equipment required to collect headspace readings includes, nitrile gloves, self-sealing quart-size bags, a photoionization detector (PID), and the appropriate personal protective equipment necessary for collection and handling of soil samples as described in the Site Safety Plan (SSP).

## **Field Screening Procedure**

The MPCA recommends the polyethylene bag headspace method described below as the field procedure for characterization of soil contamination:

Use a PID with 11.7 or greater eV. Perform PID instrument calibration of site and at the start, end of the day and at least once mid-day to yield "total organic vapors" in volume parts per million (ppmv) of PCE equivalent. Follow the manufacturer's instructions for operation, maintenance, and calibration of the instrument. Daily calibration records will be kept. MPCA staff reserve the right to request these records.

Use a self-sealing quart-size polyethylene freezer bag. Half-fill the bag with the sample to be screened so the volume ratio of soil to air is equal. The bag should then be immediately sealed. If necessary, manually break up the soil clumps within the bag. *Note:* Soil collected from a split spoon should be transferred to the bag immediately after opening the split spoon; soil collected from an excavation or soil pile should be collected from freshly exposed surfaces.

Allow headspace development for at least 10 minutes. Vigorously shake bags for 15 seconds both at the beginning and end of the headspace development period. Headspace development decreases with temperature. When temperatures are below the operating range of the instrument perform headspace development and analysis within a heated vehicle or building. Record the ambient temperature during headspace screening. *Complete headspace analysis within approximately 20 minutes of sample collection.*

Following headspace development introduce the instrument sampling probe through a small opening in the bag to a point about one-half of the headspace depth. Keep the probe free of water droplets and soil particles.

Record the highest meter response in the appropriate field documentation (Drilling Log, Environmental Sampling Log, Excavation Sidewall Stratigraphic Log or the Field Information Data Sheet. Maximum response usually occurs within about two seconds. Erratic meter response may occur at high organic vapor concentrations or if moisture is present. Note any erratic headspace data.

This SOP was prepared by:

Name: Eric Gabrielson



Signature:

Title: Field Manager

This SOP was reviewed by:

Name: Jason Skramstad



Signature:

Title: Project Manager

This SOP was approved by:

Name: Ken Haberman



Signature:

Title: Quality Assurance Manager

# Standard Operating Procedure for Classification of Soils for Engineering Purposes

May 29, 2018

## Introduction

This document describes technical standard operating procedures (SOPs) prepared by Landmark Environmental, LLC (Landmark). This SOP, which has been submitted to the U.S. Environmental Protection Agency (EPA) for review, is based on the Minnesota Pollution Control Agency (MPCA) and has been prepared in accordance with *Guidance for [Preparing Standard Operating Procedures \(QA/G-6\)](#)*, EPA, EPA/240/B-01/004, March 2001. This SOP provides procedures for field methods and procedures for the collection of soil samples that will be submitted for laboratory analysis for a variety of hazardous substances. This SOP also provides procedures for the classification of soils for Engineering purposes specifically following ASTM D 2487-06 method.

Soil classification is used to systematically group soils with similar physical characteristics in the same classification category. The use of a soil classification system produces a consistent description of soil samples that can be readily understood by engineers, geologists, drillers and other members of the project team. Soil classification systems group soils based upon physical characteristics (e.g. grain size, gradation, plasticity, etc.). General engineering and hydrologic properties of soils can be estimated from these physical characteristics allowing rapid preliminary assessment of site conditions during a field investigation program when little time is available for laboratory analyses. A systematic grouping of similar soil types based upon physical characteristics aids in the identification and correlation of subsurface stratigraphy. Accurate identification of subsurface structures of heterogeneities can have a significant impact on rates and directions of contaminant movement.

## Procedure

Qualified individual will ensure that samples to be classified are representative of the soil strata from which they were obtained. Soil will be identified on the field data sheets to where it was collected. In addition, field personnel will write an extensive description of the soil encountered. Equipment necessary in the field for soil identification include; a knife or similar steel tools, a hand lens, a soil chart, a Munsell color chart, and a USCS Soil Classification Chart.

The following criteria are to be recorded in the field:

- Color
- Moisture
- Density
- Shape
- Size
- Plasticity
- Odor
- Noted if contaminated

The soil will be given one or more of the following designations:

- GW –well graded gravels
- GP –poorly graded gravels with little or no fines
- GM –silty gravels

- SW –well graded sands
- SP –poorly graded sands
- SM –silty sands
- SC –clayey sands
- ML –inorganic silts
- CL –inorganic clays
- OL –organic silts
- MH –inorganic silts
- CH –inorganic clay (fat clays)
- OH –organic clays
- PT –organic based soils

## Fill and Debris Soils

Fill and debris soils are common to encounter during the initial depths of any soil boring. Fill and or debris represent any material that has been placed un- naturally typically occurring at the ground surface. These types of soils include soils that do not appear natural, concrete, brick, glass, plastic and organic materials. When fill/debris soils are encountered, they will be noted on the field data sheet.

## Documentation

Documentation will be noted on the field data sheets or the soil boring logs.

## Reference

ASTM D2487-11 Standard Practice for Classification of Soils for Engineering Purposes (ASTM D 2487).

This SOP was prepared by:

Name: Eric Gabrielson



Signature:

Title: Field Manager

This SOP was reviewed by:

Name: Jason Skramstad



Signature:

Title: Project Manager

This SOP was approved by:

Name: Ken Haberman

A handwritten signature in blue ink that reads "Ken Boehman". The signature is written in a cursive style with a large, stylized 'K' and 'B'.

Signature:

Title: Quality Assurance Manager

# **Standard Operating Procedure for General Soil Sample Collection**

## **May 29, 2018**

### **Introduction**

This document describes technical standard operating procedures (SOPs) prepared by Landmark Environmental, LLC (Landmark). This SOP, which has been submitted to the U.S. Environmental Protection Agency (EPA) for review, is based on the Minnesota Pollution Control Agency (MPCA) and has been prepared in accordance with *Guidance for Preparing Standard Operating Procedures (QA/G-6)*, EPA, EPA/240/B-01/004, March 2001. This SOP provides procedures for field methods and procedures for the collection of soil samples that will be submitted for laboratory analysis for a variety of hazardous substances. This SOP also provides procedures for integrated and grab sample collection, as well as quality assurance/quality control (QA/QC) procedures for field sample collection and laboratory analysis. This SOP also provides procedures for grab and composite sample collection, as well as quality assurance/quality control (QA/QC) procedures for field sample collection and laboratory analysis.

A variety of samplers (Geoprobe, backhoe, split-barrel, auger, shovel, and hand sampling methods) may be used to retrieve soil from sampling locations. Immediately after collection, the soil sample will be transferred to laboratory-supplied containers. Equipment required to transfer soil from the sampler to the laboratory-supplied sample containers includes single use disposable nitrile gloves, stainless steel spoons or scoops, and the appropriate personal protective equipment necessary for collection and handling of soil samples as described in the Site Safety Plan (SSP).

To prevent sample cross-contamination, all soil sampling equipment will be new and or cleaned prior to sampling. All sampling tools, including split-barrels and stainless steel spoons and scoops, will be cleaned before use and between samples by washing with a soap free of phosphate and 1,4-dioxane/clean-water solution (such as Seventh Generation Free ®) and rinsed with potable water, using a brush if necessary, and rinsing with potable water. Gloves will be discarded between sampling locations.

### **Metals, PAHs, VOC, and other General Analytical Samples**

Soil samples collected with a sampler:

1. Open the sampler.
2. For VOCs analysis collect sample directly from the sampler using either a subcoring device, such as an Encore sampler™ or a modified syringe. Obtain the soil sample and either cap the subcoring device immediately or extrude the sample into a sample jar that contains methanol from the laboratory and immediately screw on the lid.
3. If a composite sample is required, place the remaining soil into a stainless steel or other inert container for mixing. Mix thoroughly to obtain a homogenous sample that is representative of the entire sample. Mixing soil for homogenous sample is applicable for Metals, PAH and other General Analytical Samples. Mix thoroughly with either a gloved hand or clean inert mixing apparatus. This will ensure a sample that represents a mixed



aliquot of the soil. Place soil into each appropriate container and wipe the jar lip and screw threads to remove soil and provide a good sealing surface, immediately screw on the lid. If the sample was homogenized, complete notes on the field homogenization sheet. Laboratory performed incremental sub-sampling techniques procedures are presented in the Appendix C (Laboratory Certifications) of the QAPP.

4. These and all samples will be documented with in a chain-of custody (COC), one per cooler and cooled to approximately 4°C. Ice used for cooling will be made from potable water. When the MPCA provides a COC, it will be adopted. The samples will either be hand delivered to the laboratory or direct courier. A Pace provided COC is provided as Attachment 1.
5. For MS/MSD samples two extra jars of soil will be collected for of VOC analysis but not TAL metals, PCGs and PAH. The extra volumes for VOC samples will be collected as stated below with a Encore Sampler™ or a modified syringe.

Soil samples collected by hand:

1. Dig to the desired sampling interval, exposing a fresh soil surface to sample.
2. Collect a large sample on a shovel or auger and bring it to the surface, or collect the sample directly from the fresh soil surface.
3. For VOCs analysis collect sample directly from the sampler using either a subcoring device, such as an Encore sampler™ or a modified syringe. Obtain the soil sample and either cap the subcoring device immediately or extrude the sample into a sample jar that contains methanol from the laboratory and immediately screw on the lid.
4. .
5. If a composite sample is required, place the remaining soil into a stainless steel or other inert container for mixing. Mix thoroughly to obtain a homogenous sample representative of the entire sample. Mixing soil for homogenous sample is applicable for Metals, PAH and other General Analytical Samples place the remainder of the sample into a clean stainless steel or other homogenization container and mix thoroughly with either a gloved hand or inert clean mixing apparatus. If the sample was homogenized, complete notes on the field homogenization sheet. This will ensure a sample that represents a mixed aliquot of the soil. Wipe the jar lip and screw threads to remove soil and provide a good sealing surface, and immediately screw on the lid. Laboratory performed incremental sub-sampling techniques procedures are presented in the Appendix C (Laboratory Certifications) of the QAPP.
6. These and all samples will be documented with in a chain-of custody (COC), one per cooler and cooled to approximately 4°C. Ice used for cooling will be made from potable water. (See example COC at end of SOP.)

## **Volatile Organic Samples**

Soil samples collected either by sampler or by hand:

1. Expose fresh soil surface in sampler.
2. Using a subcoring device, such as an Encore sampler™ or a modified syringe obtain a soil sample and either cap the subcoring device immediately or extrude the sample into a sample jar that contains methanol from the laboratory.

3. Wipe the jar lip and screw threads to remove soil and provide a good sealing surface, and immediately screw on the lid.
4. These and all samples will be documented with in a chain-of custody (COC), one per cooler and cooled to approximately 4°C. Ice used for cooling will be made from potable water.

## **Sample Storage**

Field personnel will maintain custody of the samples until transferred to the shipper or laboratory.

## **Documentation on a Chain-of-Custody**

The Chain-of-Custody (see Attachment 1) shows traceable possession of samples from the time they are obtained until they are introduced as evidence in legal proceedings (when the MPCA provides a chain of custody form it will be adopted for use).

1. Complete the Chain-of-Custody prior to leaving the sampling location.
2. Complete one Chain-of-Custody or more as needed for each cooler of samples.
3. Provide the following information on the Chain-of-Custody form:
  - Project number
  - Sample identification
  - Date and time of sample collection
  - Container type and number
  - Whether the sample is a grab, composite, or blank sample
  - Project manager
  - Project contact
  - Laboratory
  - Analyses required
  - Signature of sampler(s)
  - Signature of transferee
  - Date and time of transfer
  - Method of transport and any shipping numbers

This SOP was prepared by:

Name: Eric Gabrielson



Signature:

Title: Field Manager

This SOP was reviewed by:

Name: Jason Skramstad

  
Signature:  
Title: Project Manager

This SOP was approved by:

Name: Ken Haberman

  
Signature:  
Title: Quality Assurance Manager

## Appendix B

# Geotechnical Evaluation Report

Proposed Pavements  
280 Trailer Storage  
Kasota Avenue and Hwy 280 South Entrance Ramp  
St. Paul, Minnesota

*Prepared for*

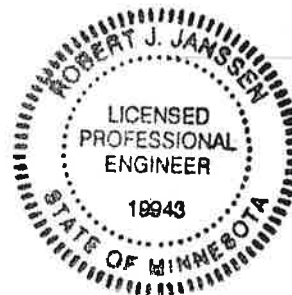
**Venture Pass Partners, LLC or assigns  
and Mason Holdings III, LLC or assigns**

## Professional Certification:

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



Robert J. Janssen, PE  
President - Principal Engineer  
License Number: 19943  
June 21, 2019



June 21, 2019

Project B1905336

Mr. Randy Rauwerdink  
Venture Pass Partners, LLC or assigns  
and Mason Holdings III, LLC or assigns  
19620 Waterford Court  
Shorewood, MN 55331

Re: Geotechnical Evaluation  
Proposed Pavements  
280 Trailer Storage  
Kasota Avenue and Hwy 280 South Entrance Ramp  
St. Paul, Minnesota

Dear Mr. Rauwerdink:

We are pleased to present this Geotechnical Evaluation Report for the proposed parking lot at in the northwest quadrant of Kasota Avenue and Highway 280 in St. Paul, Minnesota.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Belick Pha at 612.750.2148 (bpha@braunintertec.com) or Bob Janssen at 612.865.8786 (bjanssen@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION



Belick Pha, EIT  
Staff Engineer



Robert J. Janssen, PE  
President - Principal Engineer

c: Mr. Jerry Mullin, Landmark Environmental  
Mr. Chad Ayers, Sambatek

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### Appendix

Soil Boring Location Sketch

Log of Test Pit Sheets TP-1 to TP-8

Log of Previous Borings ST-1 to ST-6 (Project No. BAAX-95-846, dated January 15, 1996)

Descriptive Terminology of Soil



## A. Introduction

### A.1. Project Description

This Geotechnical Evaluation Report addresses the proposed design and construction of a new trailer parking lot located at the junction of MN 280 and Kasota Avenue in Saint Paul, Minnesota. The project will include the construction of a bituminous paved parking lot for semi-truck trailers. Table 1 provides project details.

**Table 1. Site Aspects and Grading Description**

Aspect	Description
Pavement type(s)	Bituminous or concrete with concrete dolly pads
Assumed pavement loads	Heavy-duty: 150,000 ESALs*
Grade changes	2 (provided)

\*Equivalent 43,000-lb multi-axle loads based on 15 semitrailers per day for a 20-year design life.

The figure below shows an illustration of the proposed site layout.

**Figure 1. Site Layout**



Figure provided by Google Earth® dated June 2019. Approximate property line denoted in solid red lines.

## **A.2. Site Conditions and History**

Currently, the site exists as undeveloped property. The surface is generally populated with vegetation including grass and trees with no structures currently existing on site. Generally, the site is flat, increasing in elevation from the southwest to northeast.

Correspondences with Venture Pass Partners, LLC indicated the site had previously been used as a landfill. No further documents were provided about the site's use history, except for those mentioned in section A.4.

### **A.3. Purpose**

The purpose of our evaluation was to characterize subsurface geologic conditions at selected exploration locations, evaluate their impact and provide recommendations for use in the design and construction of the proposed parking lot.

### **A.4. Background Information and Reference Documents**

We reviewed the following information:

- Topographic map and Concept Plan 4 prepared by Sambatek, Inc.
- Previous geotechnical report prepared by Braun Intertec (Project No. BAAX-95-849) and dated January 15, 1996. As part of that evaluation, 6 soil borings were performed on this site. The approximate locations of those borings are shown on the sketch and those boring logs are included with this report.
- Communications with Venture Pass Partners, LLC regarding test pit locations and scheduling.
- Discussions with you, along with the Civil Engineers with Sambatek and the Environmental consultants with Landmark to discuss design details.

In addition to the provided sources, we have used several publicly available sources of information.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

### **A.5. Scope of Services**

We performed our scope of services for the project in accordance with our Proposal to Venture Park Pass, LLC, dated May 17, 2019. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Landmark Environmental (Landmark) selected the new test pit locations. We acquired the surface elevations and locations with Landmark GPS technology using the Universal Transverse Mercator (UTM) coordinate system NAD83/UTM 15T. The attached Sketch shows the approximate locations of the test pits, along with the locations of the previously performed soil borings.
- Performing 8 test pits, denoted as TP-1 to TP-8, to nominal depths of 5 feet below grade across the site.
- Preparing this report containing a test pit location sketch, logs of test pits, a summary of the soils encountered, and recommendations for pavement subgrade preparation and the design and pavements.

Our scope of services did not include environmental services or testing. Environmental testing and services were provided by Landmark Environmental (Landmark). When the test pits were excavated, an environmental scientist was present from Landmark.

## **B. Results**

### **B.1. Geologic Overview**

We based the geologic origins used in this report on the soil types and available common knowledge of the geological history of the site.

### **B.2. Test Pit and Previous Boring Results**

We performed 6 soil borings at this site in 1995. Borings ST-1 to ST-6 are in the area of the proposed parking lot footprint. The borings were extended to nominal depths of 25 1/2 to 80 feet. Logs of the previous borings are included in the Appendix.

Table 2 provides a summary of the test pits and previous soil boring results, in the general order we encountered the strata. Please refer to the Log of Test Pits and Boring sheets in the Appendix for additional details. The Descriptive Terminology sheet in the Appendix includes definitions of abbreviations used in Table 2.

**Table 2. Subsurface Profile Summary\***

Strata	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil Fill	SM		<ul style="list-style-type: none"> <li>Predominantly SM.</li> <li>Generally black.</li> <li>Topsoil fill not present at all borings and was measured to be less than 1 foot when observed.</li> <li>Moisture condition generally moist.</li> </ul>
Fill	SM, CL, OL, PT	Weight of hammer to 39 blows per foot (BPF)	<ul style="list-style-type: none"> <li>General penetration resistance of 4 to 15 BPF.</li> <li>Intermixed layers of dark brown, dark gray, and black.</li> <li>Moisture condition generally moist to wet.</li> <li>Thicknesses at soil boring locations varied from 16 to 22 feet.</li> <li>Highly variable, soils intermixed; layers of organic clay and peat observed in Boring ST-1.</li> <li>Existing fill contained variable amounts of gravel and debris, including glass, bricks, metal, concrete and bituminous.</li> <li>Possible cobbles and boulders.</li> </ul>
Swamp deposits	OL	1 to 4 BPF	<ul style="list-style-type: none"> <li>A 3-foot layer was observed in Boring ST-5.</li> <li>Generally black.</li> <li>Moisture condition generally wet.</li> <li>Swamp deposits not observed in test pits.</li> </ul>
Alluvial	CL	4 BPF	<ul style="list-style-type: none"> <li>Moisture condition generally wet.</li> <li>Only observed beneath the fill in Borings ST-3/ST-3A and ST-6.</li> <li>Alluvial soils not observed in test pits.</li> </ul>
Glacial deposits	SP, SP-SM, SM	2 to 58 BPF	<ul style="list-style-type: none"> <li>Intermixed layers of glacial outwash and till.</li> <li>Variable amounts of gravel; may contain cobbles.</li> <li>Moisture condition generally wet.</li> <li>Glacial deposits not observed in test pits.</li> </ul>
	SC, CL, ML	4 to 20 BPF	
Bedrock	Shale	17 to 44 BPF	<ul style="list-style-type: none"> <li>Top of bedrock observed at depth of 80 feet.</li> <li>Generally bluish gray.</li> <li>Bedrock not observed in test pits.</li> </ul>

\*Abbreviations defined in the attached Descriptive Terminology sheet.

### B.3. Groundwater

While excavating the test pits, water was observed seeping into 3 of the test pits. Table 3 summarizes the depths where we observed groundwater while excavating test pits. Table 3 also summarizes groundwater observed while advancing previous soil borings. The attached Log of Test Pits and Log of Borings in the Appendix also include this information and additional details.

**Table 3. Groundwater Summary**

<b>Location</b>	<b>Measured or Estimated Depth to Groundwater (ft)</b>
TP-1	Not observed in test pit to 5 feet
TP-2	Not observed in test pit to 5 1/2 feet
TP-3	Not observed in test pit to 5 feet
TP-4	2
TP-5	Not observed in test pit to 5 feet
TP-6	Not observed in test pit to 5 feet
TP-7	1.1/2
TP-8	1 1/2
ST-1	Not observed in boring to 25.5 feet
ST-2/ST-2A	19 1/2
ST-3/ST-3A	Not observed in boring to 80 feet
ST-4	16
ST-5	18
ST-6	21.2

Groundwater observed in test pits were relatively shallow and likely due to perched water conditions. Precipitation or seasonal changes, such as thawing, will increase perched water conditions in sand seams in the fill.

Based on the available data, it appears that at the time those borings were performed, the hydrostatic water level will be below excavations for the proposed parking lot.

## **C. Recommendations**

### **C.1. Site Grading and Subgrade Preparation**

#### **C.1.a. Existing Fill**

As indicated by the soil borings and test pit data, the on-site soils consist of significant amounts of fill materials consisting of variable soils types which are intermixed with miscellaneous debris and organic soils, and the penetration resistances recorded in the soil borings indicate that some of the fill is very soft or loose. Ideally, and to reduce risks of long-term differential settlement, all or a significant portion of the existing fill would have to be removed from beneath the proposed pavements. However, because of the environmental concerns associated with the removal of the existing fill and considering that some risk of long-term settlements associated with pavements can typically be tolerated, the significant costs associated with the removal of significant amounts of the existing fill can likely not be tolerated. As such, the recommendations we are providing in this report assumes that the risk of long-term differential settlement to the pavements can be tolerated. Within this report, we will provide design and earthwork recommendations to reduce risks associated with adverse amounts of long-term settlement.

As discussed in more detail in the following sections, our recommendations include the removal of the surficial topsoil, scarifying and compacting the in place soils prior to placement of fill or pavement areas, removing any exposed large-sized or compressible debris, and placement of geogrid beneath the recommended pavement designs.

#### **C.1.b. Reuse of On-Site Soils**

With the exception of the topsoil and unsuitable debris, assuming that the soils are acceptable per the Response Action Plan (RAP) that is being prepared by Landmark, it is our opinion that much of the excavated soils on site will be suitable to be reused for subgrade fill material. Any on-site soils with an organic content greater than 3 percent, or debris or boulders larger than 4 inches in diameter should be considered unsuitable for use as pavement fill material. Those materials should be placed in a green area or hauled off site. Furthermore, much of the soils on this site are moisture sensitive, and it is likely that some moisture conditioning (wetting or drying) will be necessary to reuse the on-site soils as compacted backfill.

#### **C.1.c. Excavated Slopes**

Based on the borings, we anticipate on-site soils in excavations will consist of silty sands intermixed with clay. These soils are typically considered Type B Soil under OSHA (Occupational Safety and Health

Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type B soils should have a gradient no steeper than 1H:1V. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches." This document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

#### **C.1.d. Excavation Dewatering**

We recommend removing groundwater from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays. If it is necessary to pump water from excavations, that work should be done in accordance with the RAP.

#### **C.1.e. Pavement and Exterior Slab Subgrade Preparation**

We recommend the following steps for pavement and exterior slab subgrade preparation, understanding the site will have a grade change of 2 feet or less. Note that project planning may need to require additional subcuts to limit frost heave.

1. Strip unsuitable soils consisting of surficial vegetation and soils with an organic content greater than 3 percent any existing structures and pavements that exists within 2 feet of the surface of the proposed pavement subgrade. At depths greater than 2 feet, assuming the surficial organic materials are removed and the underlying soils can be stabilized as addressed below, the existing soils can remain in place.
2. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary.
3. Prior to placement of fill or the pavement materials, Scarify the exposed soils to a depth of 10 inches, moisture condition the soils to near optimum moisture content and then compact the soils to the relative densities indicated in Table 5.
4. Place pavement engineered fill to grade and compact in accordance with Section C.1.g. to bottom of pavement.
5. Proofroll the pavement or exterior slab subgrade as described in Section C.1.f.



Along with the earthwork correction recommendations previously provided and because much of the existing fill that will be left in place beneath the pavement areas are very soft/loose and contain organic soils and debris, to improve long-term pavement performance of the pavement, we recommend incorporating biaxial geogrid at the interface of the prepared subgrade and aggregate base layer.

#### **C.1.f. Pavement Subgrade Proofroll**

After preparing the subgrade as described above and prior to the placement of the geogrid and aggregate base, we recommend proofrolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization and/or geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous or concrete pavement.

#### **C.1.g. Engineered Fill Materials and Compaction**

The engineered fill materials placed in proposed pavement areas should consist of on-site soils as addressed previously in Section C.1.b or imported soils consisting of soils classified as sands or clays with an organic content less than 3 percent containing a plastic index less than 25 percent. We recommend placing an aggregate base below the pavement to provide a suitable subgrade for pavement, reduce faulting and help dissipate loads.

Table 4 provides recommended subgrade relative compaction of fill based on depth and location.

**Table 4. Compaction Recommendations Summary**

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, ML, SM)
Within 3 feet of pavement subgrade	100	±2	-1 to +2
More than 3 feet below pavement subgrade	95	±3	±3
Below landscaped surfaces	90	±5	±4

\*Increase compaction requirement to meet compaction required for structure supported by this engineered fill.

The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material. Frost should not penetrate under foundations during construction.

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

## **C.2. Pavements and Exterior Slabs**

### **C.2.a. Design Sections**

Based on the previous year's average load and estimated average daily traffic, provided by Venture Pass Partners, LLC., and test pit observations, we recommend pavement design assume an R-value of 12. We based the concrete pavement designs on a modulus of subgrade reaction (k) of 75 pci.

Note the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value.

Table 5 provides recommended pavement sections, based on the soils support and traffic loads.

**Table 5. Recommended Bituminous and Concrete Pavement Sections**

Material Component	Component Thicknesses (inches)	
	Heavy-duty	
	Bituminous <sup>a</sup>	Concrete
Bituminous Wear	2	—
Bituminous Non-wear	2	—
Bituminous Non-wear	2	—
Concrete	—	6
Aggregate Base	8	6
Geotextile Grid	Yes (see Section C.2.e)	No

### **C.2.b. Aggregate Base Materials**

We recommend specifying crushed aggregate base meeting the requirements of Minnesota Department of Transportation (MnDOT) Specification 3138 for Class 5.

Table 6 shows recommended Minnesota Department of Transportation (MnDOT) Class 5 and Class 6 base aggregate gradations. Gradation recommendations assume base aggregate will contain less than 25 percent, by weight, recycled aggregate.

**Table 6. MnDOT Class 5 and 6 Aggregate\***

Base Aggregate**	% passing 1 1/2" Sieve	% passing 3/4" Sieve	% passing 3/8" Sieve	% passing #4 Sieve	% passing #10 Sieve	% passing #40 Sieve	% passing #200 Sieve
Class 5	100	70 - 100	45 - 90	35 - 80	20 - 65	10 - 35	3.0 - 10.0
Class 6	100	70 - 100	45 - 85	35 - 70	20 - 55	10 - 30	3.0 - 7.0

\*Gradations based on Minnesota Department of Transportation (MnDOT) 2018 Standard Specification for Construction section 3138.

\*\*Percent passing value should be total percent passing by weight.

We recommend that the aggregate base be compacted to a minimum of 100 percent of its maximum standard Proctor dry density at a moisture content within 1 percentage point of its optimum moisture content.

### **C.2.c. Bituminous Pavement Materials**

We recommend that the bituminous wear and base courses meet the requirements of Minnesota Department of Transportation Specification 2360, Type SP. We recommend the aggregate gradations for the asphalt mixes meet Gradation B for the non-wear and wear courses. We recommend that the light- and heavy-duty bituminous mixes incorporate Traffic Level 3. With that, we recommend using the following mix designations for heavy- duty pavements:

- Heavy-duty Non-Wear: SPNWB330E; Asphalt Binder Grade PG 58H-28 (PG 64-28)
- Heavy-duty Wear: SPWEB340E; Asphalt Binder Grade PG 58H-28 (PG 64-28)

We recommend that the bituminous pavement be compacted to an average density of at least 92 percent (per the core method) of the maximum theoretical Rice density, with no core test result being less than 90 percent and no core test result being greater than 97 percent.

#### **C.2.d. Concrete Pavement Materials**

We assumed the concrete pavement sections in Table 5 will have edge support. We recommend placing an aggregate base below the pavement to provide a suitable subgrade for concrete placement, reduce faulting and help dissipate loads. Appropriate mix designs, panel sizing, jointing, doweling, and edge reinforcement are critical to performance of rigid pavements.

We recommend specifying concrete for pavements that has a minimum 28-day compressive strength of 4,000 psi, and a modulus of rupture ( $M_r$ ) of at least 600 psi. We also recommend Type I cement meeting the requirements of ASTM C 150. We recommend specifying 5 to 7 percent entrained air for exposed concrete to provide resistance to freeze-thaw deterioration. We also recommend using a water/cement ratio of 0.45 or less for concrete exposed to deicers.

#### **C.2.e. Geotextile Grid**

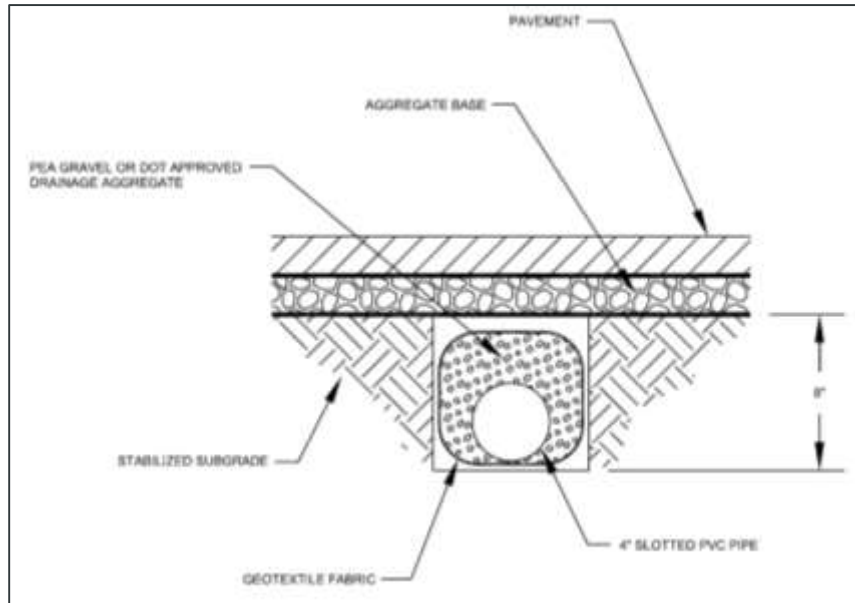
We recommend placing Tensar® Biaxial Geogrid BX1200 or equivalent directly below the aggregate base layer.

#### **C.2.f. Subgrade Drainage**

We recommend installing plastic perforated drainpipes throughout pavement areas at low points and about catch basins. The drainpipes should be placed in small trenches extended at least 8 inches below the aggregate base material. A cross-section illustration of a drainage trench is shown below in Figure 2. We recommend installing the drain tile at a pitch of no less than 1/4 percent. We recommend routing the drain tile to nearby storm sewer or other suitable outlet.

We suggest that we work with the civil engineer to determine the spacing of drainpipes.

**Figure 2. Draintile Illustration**



### **C.2.g. Performance and Maintenance**

We based the above pavement designs on a 20-year performance life for bituminous and a 20-year life for concrete. This is the amount of time before we anticipate the pavement will require reconstruction. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions and maintenance.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regard to bituminous pavements in particular, it is common to have thermal cracking develop within the first one to two years of placement, and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

### **C.3. Utilities**

#### **C.3.a. Subgrade Stabilization**

For exterior utilities, we anticipate the soils at typical invert elevations will generally be suitable for utility support. However, if construction encounters unfavorable conditions such as soft clay, organic soils, perched water or large debris within 2 feet of invert grades, the unsuitable soils should be removed and replaced with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations.

#### **C.3.b. Corrosion Potential**

Based on our experience, the soils encountered by the borings are moderately corrosive to metallic conduits, but only marginally corrosive to concrete. We recommend specifying non-corrosive materials or providing corrosion protection, unless project planning chooses to perform additional tests to demonstrate the soils are not corrosive.

### **D. Procedures**

#### **D.1. Exploratory Test Pits**

Frattalone excavated the test pits with a Bobcat E85 backhoe, under the direction and observation of our staff, Landmark, and Venture Pass Partners, Inc. We prepared Test Pit Logs by visually examining the sidewalls of the test pits and classifying the materials brought to the surface by the backhoe bucket. We measured strata boundary depths with a steel tape and generally rounded to the nearest 1/2-foot.

#### **D.2. Exploration Logs**

##### **D.2.a. Log of Test Pit and Previous Boring Sheets**

The Appendix includes Log of Test Pit sheets as well as Logs of Borings from previous projects. The logs classify and describe the geologic materials exposed in the sidewalls and bottoms of the pits, present the results of laboratory tests performed on bulk samples obtained from them, and depict groundwater measurements.

#### **D.2.b. Geologic Origins**

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance and other in-situ testing performed for the project, and (4) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

### **D.3. Material Classification and Testing**

#### **D.3.a. Visual and Manual Classification**

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

#### **D.3.b. Laboratory Testing**

The exploration logs in the Appendix note the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM or AASHTO procedures.

### **D.4. Groundwater Measurements**

While excavating the test pits and at the termination depths, our field personnel observed the sides and bottoms of the excavation for evidence of groundwater seepage and/or accumulation.

## **E. Qualifications**

### **E.1. Variations in Subsurface Conditions**

#### **E.1.a. Material Strata**

We developed our evaluation, analyses and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and

thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work, or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

### **E.1.b. Groundwater Levels**

We made groundwater measurements under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

## **E.2. Continuity of Professional Responsibility**

### **E.2.a. Plan Review**

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

### **E.2.b. Construction Observations and Testing**

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.



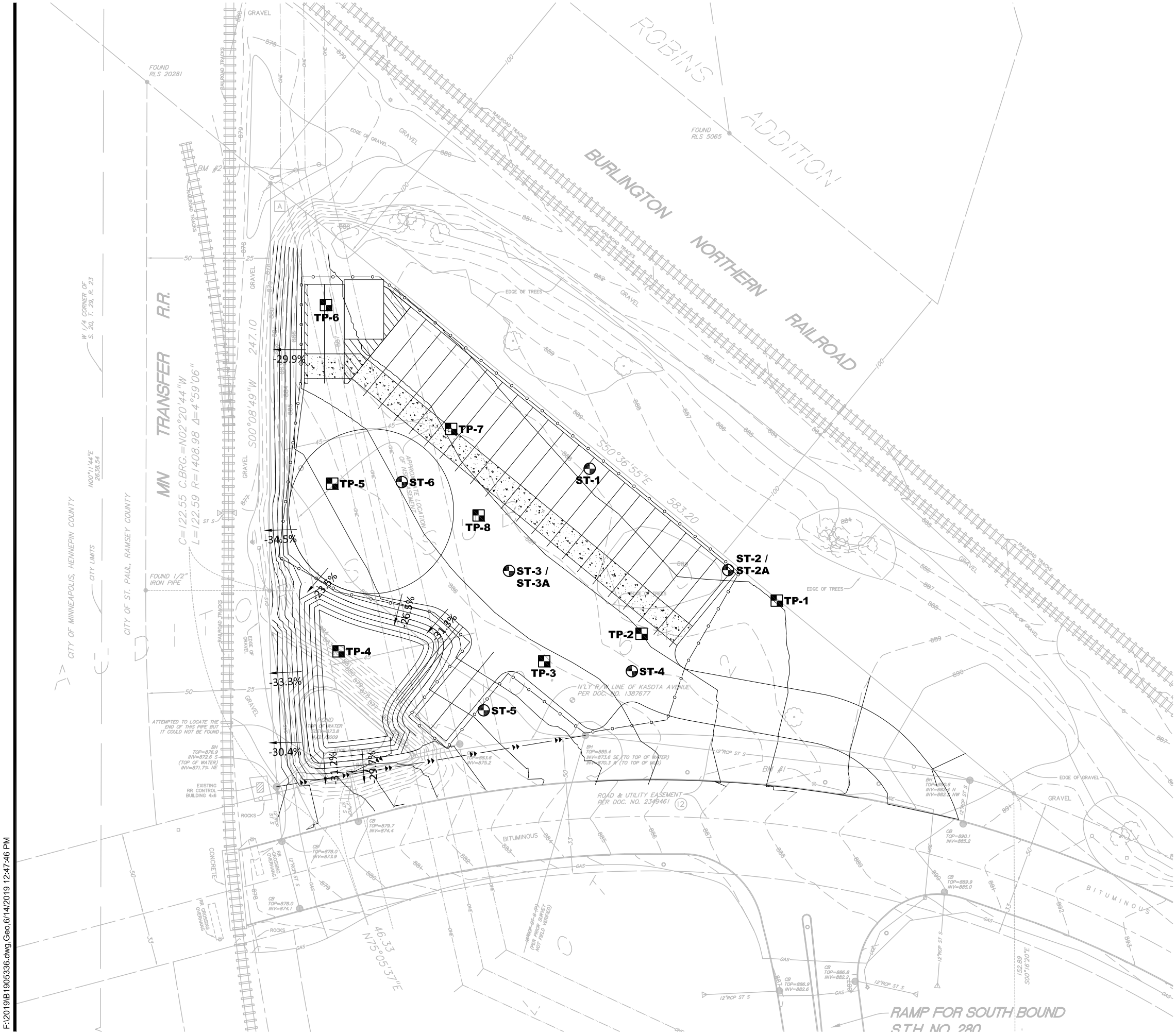
### **E.3. Use of Report**

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

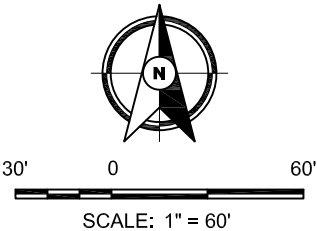
### **E.4. Standard of Care**

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

## Appendix



- DENOTES APPROXIMATE LOCATION OF TEST PIT
- DENOTES APPROXIMATE LOCATION OF PREVIOUSLY COMPLETED SOIL BORING



The Science You Build On.

11001 Hampshire Avenue S  
Minneapolis, MN 55438  
952.995.2000  
braunintertec.com

Base Drawing Provided By

Drawing Information

Project No:  
B1905336

Drawing No:  
B1905336

Drawn By: BJB

Date Drawn: 6/14/19

Checked By: BP

Last Modified: 6/14/19

Project Information

280 Trailer Storage

Kasota Avenue, west of Highway 280

Saint Paul, Minnesota

Test Pit and Soil Boring Location Sketch

<b>Project Number B1905336</b> <b>Geotechnical Evaluation</b> <b>280 Trailer Storage</b> <b>Kasota Avenue and Hwy 280 South Entrance Ramp</b> <b>Saint Paul, Minnesota</b>					TEST PIT: <b>TP-1</b>		
					LOCATION: Coordinate datum uses NAD83/UTM Zone 15N. Elevations estimated from Concept 4 plans, CP-4, prepared by Sambatek. See attached sketch.		
					NORTHING: 4980523	EASTING: 483893.0	
EXCAVATOR: Frattalone		LOGGED BY: B. Pha		START DATE: 05/30/19	END DATE: 05/30/19		
SURFACE ELEVATION: 889.0 ft		RIG: Excavator	METHOD:	SURFACING: Grass	WEATHER: Cloudy		
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Sample Blows Recovery	q <sub>p</sub> tsf	MC %	Tests or Remarks
888.2		SILTY SAND (SM), fine to medium sand, trace Gravel, black, moist (TOPSOIL)					Soil consisted of approximately 5 to 10 percent debris
0.8		FILL: SILTY SAND (SM), fine to medium sand, with Gravel, and debris, dark brown to dark gray, moist, debris includes glass, brick, plastic, wooden beams, and wood chips  <i>Soil dark gray and contained odor below 2 1/2 feet</i>					
884.0		END OF TEST PIT	5				Water not observed with 5.0 feet of tooling in the ground while drilling.
5.0		Test pit then backfilled with spoils					

<b>Project Number B1905336</b> <b>Geotechnical Evaluation</b> <b>280 Trailer Storage</b> <b>Kasota Avenue and Hwy 280 South Entrance Ramp</b> <b>Saint Paul, Minnesota</b>					TEST PIT: <b>TP-2</b>		
					LOCATION: Coordinate datum uses NAD83/UTM Zone 15N. Elevations estimated from Concept 4 plans, CP-4, prepared by Sambatek. See attached sketch.		
					NORTHING: 4980517	EASTING: 483868.0	
EXCAVATOR: Frattalone		LOGGED BY: B. Pha		START DATE: 05/30/19	END DATE: 05/30/19		
SURFACE ELEVATION: 887.0 ft		RIG: Excavator	METHOD:	SURFACING: Grass	WEATHER: Cloudy		
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Sample Blows Recovery	q <sub>p</sub> tsf	MC %	Tests or Remarks
886.6 0.4		SILTY SAND (SM), fine to medium sand, with Gravel, and roots, black, moist (TOPSOIL) FILL: SILTY SAND (SM), fine to medium sand, with Gravel, and debris, dark brown to dark gray, moist, debris includes glass, brick, plastic, rubber, wood chips, wooden beams, and cinders  Soil dark gray and contained odor below 4 feet					Soil consisted of approximately 5 to 10 percent debris
881.5 5.5		END OF TEST PIT  Test pit then backfilled with spoils					Water not observed with 5.5 feet of tooling in the ground while drilling.

B1905336 Braun Intertec Corporation TP-3 page 1 of 1

B1905336 Braun Intertec Corporation TP-4 page 1 of 1

B1905336 Braun Intertec Corporation TP-5 page 1 of 1



B1905336 Braun Intertec Corporation TP-6 page 1 of 1



B1905336 Braun Intertec Corporation TP-7 page 1 of 1

B1905336 Braun Intertec Corporation TP-8 page 1 of 1

# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					<b>BORING: ST-1</b>  <b>LOCATION:</b> See attached sketch.	
<b>DRILLER: M. Rowland</b>		<b>METHOD: 3 1/4" HSA</b>		<b>DATE: 10/31/95</b>	<b>SCALE: 1" = 4'</b>	
Elev. 98.2	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
		FILL	FILL: Silty Sand mixed with glass, concrete, Gravel, brick, wood, cinders, paper and peat, black and dark brown, moist to wet.	4		Strong fuel odor.
				8		
				10		
				3		
				5		
84.2	14.0	FILL	FILL: Organic Clay mixed with glass, black and gray, wet.	2		
82.2	16.0	FILL	FILL: Peat mixed with Organic Clay and Silt with a trace of glass, black and gray, wet.	5		
				7		
76.2	22.0	CL	SANDY LEAN CLAY, with a trace of Gravel, brow, wet, medium to rather stiff. (Glacial Till)	7		
				9		
72.7	25.5		END OF BORING.			Elevation Reference: Top of catch basin on north side of Kasota Avenue east of the southbound highway 280 entrance ramp. Elevation assumed to be 100.0.
			Water not observed with 24' of hollow-stem auger in the ground.			
			Boring grouted to the surface.			

## LOG OF BORING

PROJECT: BABX-95-849 PRELIMINARY GEOTECHNICAL EVALUATION Proposed Manufacturing Building Northwest of Kasota Avenue & Minnesota Highway 280 St. Paul, Minnesota					BORING: ST-2	
					LOCATION: See attached sketch.	
DRILLER: M. Niesen		METHOD: 3 1/4" HSA		DATE: 10/30/95		SCALE: 1" = 4'
Elev. 98.2	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes
		FILL	FILL: Silty Sand mixed with brick rubble, wood, metal, Organic Clay and glass, black and dark brown, moist to 10' then wet.	9 14 6 10 13 19 10 10 4 5 2 4 1 5		
80.2	18.0	CL	SANDY LEAN CLAY, with a trace of Gravel and seams and layers of Sand, brown, wet, rather soft to very stiff. (Glacial Till)	4 6 5 17 12 17	 	
72.2	26.0		END OF BORING.  Water down 22 1/2' with 24' of hollow-stem auger in the ground.  Water down 19 1/2' with cave-in at 21 1/2'.  Boring then grouted to surface.			

# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> Proposed Manufacturing Building Northwest of Kasota Avenue & Minnesota Highway 280 St. Paul, Minnesota					<b>BORING: ST-2A</b> <b>LOCATION:</b> Same as Boring ST-2 - redrilled.		
<b>DRILLER:</b> M. Niesen		<b>METHOD:</b> 3 1/4" HSA		<b>DATE:</b> 12/21/95		<b>SCALE:</b> 1" = 4'	
Elev. 98.2	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
		FILL	FILL: Silty Sand mixed with brick rubble, wood, metal, Organic Clay and glass, black and dark brown, moist to 10' then wet.				
80.2	18.0	CL	SANDY LEAN CLAY, with a trace of Gravel and seams and layers of Sand, brown, wet, rather soft to very stiff. (Glacial Till)				
72.2	26.0	SC	CLAYEY SAND, with a trace of Gravel, brown, wet, very stiff. (Glacial Till)	20			
70.2	28.0	SC	CLAYEY SAND, with a trace of Gravel, grayish brown, wet, medium. (Glacial Till)	8			
66.2	32.0						

# LOG OF BORING

PROJECT: <b>BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					BORING: <b>ST-2A (cont.)</b> LOCATION: Same as Boring ST-2 - redrilled.				
DRILLER: M. Niesen			METHOD: 3 1/4" HSA		DATE: 12/21/95		SCALE: 1" = 4'		
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes			
		SP	POORLY GRADED SAND, mostly medium-grained, brown, waterbearing, very loose. (Glacial Outwash)						
60.2	38.0	SP	POORLY GRADED SAND, fine- to coarse-grained, with fine to coarse Gravel, brown, waterbearing, medium dense. (Glacial Outwash)	3					
		SP		20					
		SP		24					
50.2	48.0	SP	POORLY GRADED SAND, mostly fine- to medium-grained, with a trace of fine to coarse Gravel, brown, waterbearing, medium dense. (Glacial Outwash)	12					
		SP		14					
39.2	59.0	SC	CLAYEY SAND, with a trace of fine to coarse Gravel, brown, wet, hard. (Glacial Till)	32					
34.2	64.0		(Continued on next page)						



# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>						<b>BORING: ST-2A (cont.)</b>							
<b>DRILLER: M. Niesen</b>						<b>METHOD: 3 1/4" HSA</b>		<b>DATE: 12/21/95</b>		<b>SCALE: 1" = 4'</b>			
<b>Elev.</b>		<b>Depth</b>		<b>ASTM Symbol</b>		<b>Description of Materials</b>		<b>BPF</b>		<b>WL</b>		<b>Tests or Notes</b>	
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# LOG OF BORING

PROJECT: <b>BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					BORING: <b>ST-3</b>		
LOCATION: See attached sketch.							
DRILLER: M. Rowland		METHOD: 3 1/4" HSA		DATE: 10/31/95		SCALE: 1" = 4'	
Elev. 97.2	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
		FILL	FILL: Sandy Lean Clay mixed with Peat, Gravel, glass, concrete and brick debris, black, moist to wet.	2 8 6 3 4 3 39		OC = 9% MC = 40%	
77.2	20.0	CL	LEAN CLAY, gray, wet, rather soft. (Alluvium)	4			
75.2	22.0	CL	SANDY LEAN CLAY, with seams and layers of Sand and a trace of Gravel, brown, wet, stiff. (Glacial Till)	14			
71.7	25.5		END OF BORING.  Water not observed with 24' of hollow-stem auger in the ground.  Boring grouted to surface.				

# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					<b>BORING: ST-3A</b>		
<b>LOCATION:</b> Same as Boring ST-3 - redrilled.							
<b>DRILLER: M. Niesen</b>		<b>METHOD: 3 1/4" HSA</b>		<b>DATE: 12/21/95</b>		<b>SCALE: 1" = 4'</b>	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
97.2	0.0	FILL	FILL: Sandy Lean Clay mixed with Peat, Gravel, glass, concrete and brick debris, black, moist to wet. (Redrilled, augered to 25-foot depth.)				
77.2	20.0	CL	LEAN CLAY, gray, wet, rather soft. (Alluvium)				
75.2	22.0	CL	SANDY LEAN CLAY, with seams and layers of Sand and a trace of Gravel, brown, wet, stiff. (Glacial Till)				
72.2	25.0	CL	SANDY LEAN CLAY, with a trace of Gravel and layers of Sand, brown, wet, rather stiff. (Glacial Till)	9			
69.2	28.0	SC	CLAYEY SAND, with a trace of fine to medium Gravel, brown, wet, stiff. (Glacial Till)	16			
65.2	32.0		(Continued on next page)				

# LOG OF BORING

PROJECT: <b>BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					BORING: <b>ST-3A (cont.)</b> LOCATION: Same as Boring ST-3 - redrilled.		
DRILLER: M. Niesen		METHOD: 3 1/4" HSA		DATE: 12/21/95		SCALE: 1" = 4'	
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
64.2	33.0	SC CL	(Continued from previous page) CLAYEY SAND, with a trace of fine to medium Gravel, brown, wet, stiff. (Glacial Till) SANDY LEAN CLAY, with a trace of fine to medium Gravel, brown, wet, medium to stiff. (Glacial Till)	8			
53.2	44.0	SP	POORLY GRADED SAND, mostly fine- to medium-grained, brown, waterbearing, very loose to medium dense. (Glacial Outwash)	2			
44.2	53.0	SP	POORLY GRADED SAND, mostly fine- to medium-grained, with a trace of Gravel and layers of Clayey Sand, brown, waterbearing, medium dense. (Glacial Outwash)	25			
39.2	58.0	CL	LEAN CLAY, Shale, bluish gray, moist, very stiff to hard. (Bedrock)	17			
33.2	64.0		(Continued on next page)				

# LOG OF BORING

PROJECT: <b>BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					BORING: <b>ST-3A (cont.)</b> LOCATION: Same as Boring ST-3 - redrilled.				
DRILLER: M. Niesen			METHOD: 3 1/4" HSA		DATE: 12/21/95		SCALE: 1" = 4'		
Elev.	Depth	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes			
		CL	(Continued from previous page) LEAN CLAY, Shale, bluish gray, moist, very stiff to hard. (Bedrock)	40					
				30					
				42					
17.2	80.0			44					
			END OF BORING. Boring immediately grouted to surface.						

# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					<b>BORING: ST-4</b>		
<b>LOCATION:</b> Drilled 5' north of staked location. See attached sketch.							
<b>DRILLER: M. Niesen</b>		<b>METHOD: 3 1/4" HSA</b>		<b>DATE: 10/30/95</b>		<b>SCALE: 1" = 4'</b>	
Elev. 97.4	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
		FILL	FILL: Silty Sand mixed with Gravel, wood, paper, glass and metal debris, black and dark brown, moist to 14' then wet.	15		Strong fuel odor.	
				5			
				2	▼		
80.4	17.0	CL	SANDY LEAN CLAY, with a trace of Gravel, brown, wet, rather soft to rather stiff. (Glacial Till)	4			
				6			
71.9	25.5			12			
			<b>END OF BORING.</b>  Water not observed with 24' of hollow-stem auger in the ground.  Water down 16' with cave-in at 23'.  Boring then grouted to the surface.				

# LOG OF BORING

PROJECT: <b>BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> Proposed Manufacturing Building Northwest of Kasota Avenue & Minnesota Highway 280 St. Paul, Minnesota					BORING: <b>ST-5</b> LOCATION: See attached sketch.		
DRILLER: M. Niesen		METHOD: 3 1/4" HSA		DATE: 10/30/95		SCALE: 1" = 4'	
Elev. 96.5	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
			FILL: Silty Sand mixed with Organic Clay, glass, concrete, Gravel, brick, wood, paper and a trace of coal, black and dark brown, moist to wet.	5			
				8			
				6			
				7			
				9			
				16			
				27			
				30			
				11			
				7			
				5			
				5			
				1			
				2			
				80.5			
2							
1							
77.5	19.0	CL	SANDY LEAN CLAY, with a trace of Gravel, and seams and layers of Sand, wet, rather soft to very stiff. (Glacial Till)	5			
4							
7							
14							
29							
70.5	26.0		END OF BORING.  Water down 16 1/2' with 24' of hollow-stem auger in the ground.  Water down 18' immediately after withdrawal of auger with cave-in at 23'.*				

Boring then grouted to the surface.

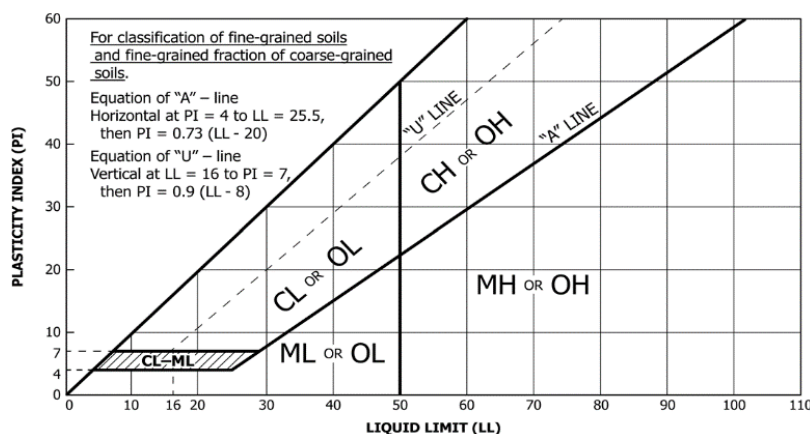


# LOG OF BORING

<b>PROJECT: BABX-95-849</b> <b>PRELIMINARY GEOTECHNICAL EVALUATION</b> <b>Proposed Manufacturing Building</b> <b>Northwest of Kasota Avenue &amp; Minnesota Highway 280</b> <b>St. Paul, Minnesota</b>					<b>BORING: ST-6</b>  <b>LOCATION:</b> See attached sketch.		
DRILLER: M. Rowland		METHOD: 3 1/4" HSA		DATE: 10/31/95		SCALE: 1" = 4'	
Elev. 96.2	Depth 0.0	ASTM Symbol	Description of Materials	BPF	WL	Tests or Notes	
		FILL	FILL: Mixed Silty Sand, Clayey Sand, Organic Clay, Peat, glass, concrete, Gravel, wood, metal and brick rubble, black, moist to wet.	5			
				4			
				9			
				8			
				3			
				3			
				5			
				13			
				11			
				12			
				16			
				15			
				10			
				8			
				5			
			4				
			5				
			7				
			3				
			2				
			4				
74.2	22.0			4	▽		
		ML	SILT, with a trace of shells, gray, wet, very loose. (Alluvium)	4			
72.2	24.0			4			
		SM	SILTY SAND, mostly fine-grained, with a trace of Gravel, gray, waterbearing, medium dense. (Glacial Till)	14			
70.2	26.0			16			
			END OF BORING.				
			Water down 21.2' with 24' of hollow-stem auger in the ground.				
			Boring grouted to the surface.				

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup>				Soil Classification	
				Group Symbol	Group Name <sup>B</sup>
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines <sup>C</sup> )	$C_u \geq 4$ and $1 \leq C_c \leq 3^D$	GW	Well-graded gravel <sup>E</sup>
			$C_u < 4$ and/or ( $C_c < 1$ or $C_c > 3$ ) <sup>D</sup>	GP	Poorly graded gravel <sup>E</sup>
		Gravels with Fines (More than 12% fines <sup>C</sup> )	Fines classify as ML or MH	GM	Silty gravel <sup>EFG</sup>
			Fines Classify as CL or CH	GC	Clayey gravel <sup>EFG</sup>
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines <sup>H</sup> )	$C_u \geq 6$ and $1 \leq C_c \leq 3^D$	SW	Well-graded sand <sup>I</sup>
			$C_u < 6$ and/or ( $C_c < 1$ or $C_c > 3$ ) <sup>D</sup>	SP	Poorly graded sand <sup>I</sup>
		Sands with Fines (More than 12% fines <sup>H</sup> )	Fines classify as ML or MH	SM	Silty sand <sup>FGI</sup>
			Fines classify as CL or CH	SC	Clayey sand <sup>FGI</sup>
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line <sup>J</sup>	CL	Lean clay <sup>KLM</sup>
			PI < 4 or plots below "A" line <sup>J</sup>	ML	Silt <sup>KLM</sup>
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OL	Organic clay <sup>KLMN</sup> Organic silt <sup>KLMQ</sup>
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay <sup>KLM</sup>
			PI plots below "A" line	MH	Elastic silt <sup>KLM</sup>
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OH	Organic clay <sup>KLMP</sup> Organic silt <sup>KLMQ</sup>
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

- Based on the material passing the 3-inch (75-mm) sieve.
- If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
- Gravels with 5 to 12% fines require dual symbols:  
GW-GM well-graded gravel with silt  
GW-GC well-graded gravel with clay  
GP-GM poorly graded gravel with silt  
GP-GC poorly graded gravel with clay
- $C_u = D_{60} / D_{10}$        $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
- If soil contains  $\geq 15\%$  sand, add "with sand" to group name.
- If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
- If fines are organic, add "with organic fines" to group name.
- Sands with 5 to 12% fines require dual symbols:  
SW-SM well-graded sand with silt  
SW-SC well-graded sand with clay  
SP-SM poorly graded sand with silt  
SP-SC poorly graded sand with clay
- If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.
- If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
- If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
- If soil contains  $\geq 30\%$  plus No. 200, predominantly sand, add "sandy" to group name.
- If soil contains  $\geq 30\%$  plus No. 200 predominantly gravel, add "gravelly" to group name.
- PI  $\geq 4$  and plots on or above "A" line.
- PI plots on or above "A" line.
- PI plots below "A" line.



**DD** Dry density, pcf  
**WD** Wet density, pcf  
**P200** % Passing #200 sieve

**Laboratory Tests**  
**OC** Organic content, %  
**q<sub>p</sub>** Pocket penetrometer strength, tsf  
**MC** Moisture content, %  
**q<sub>u</sub>** Unconfined compression test, tsf

**LL** Liquid limit  
**PL** Plastic limit  
**PI** Plasticity index

## Particle Size Identification

Boulders..... over 12"  
Cobbles..... 3" to 12"  
Gravel  
Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)  
Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)  
Sand  
Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)  
Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)  
Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)  
Silt..... No. 200 (0.075 mm) to .005 mm  
Clay..... < .005 mm

## Relative Proportions<sup>L, M</sup>

trace..... 0 to 5%  
little..... 6 to 14%  
with.....  $\geq 15\%$

## Inclusion Thicknesses

lens..... 0 to 1/8"  
seam..... 1/8" to 1"  
layer..... over 1"

## Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF  
Loose ..... 5 to 10 BPF  
Medium dense..... 11 to 30 BPF  
Dense..... 31 to 50 BPF  
Very dense..... over 50 BPF

## Consistency of Cohesive Soils      Blows Per Foot      Approximate Unconfined Compressive Strength

Very soft..... 0 to 1 BPF..... < 0.25 tsf  
Soft..... 2 to 4 BPF..... 0.25 to 0.5 tsf  
Medium..... 5 to 8 BPF ..... 0.5 to 1 tsf  
Stiff..... 9 to 15 BPF..... 1 to 2 tsf  
Very Stiff..... 16 to 30 BPF..... 2 to 4 tsf  
Hard..... over 30 BPF..... > 4 tsf

## Moisture Content:

**Dry:** Absence of moisture, dusty, dry to the touch.  
**Moist:** Damp but no visible water.  
**Wet:** Visible free water, usually soil is below water table.

## Drilling Notes:




**Blows/N-value:** Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

**Partial Penetration:** If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

**Recovery:** Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

**WOH:** Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

**WOR:** Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

**Water Level:** Indicates the water level measured by the drillers either while drilling (  ), at the end of drilling (  ), or at some time after drilling (  ).

## Appendix C



Photo Log  
Vacant Property, Highway 280 and Kasota Avenue  
St. Paul, Minnesota  
May 30, 2019



View facing east looking down at test trench location LTT-1.



View facing east looking down at test trench location LTT-2.



View facing west/northwest looking down at the side wall of test trench location LTT-3.



View facing southwest looking down at the side wall of test trench location LTT-4.



View facing west looking down at the side wall of test trench location LTT-5.



View facing south looking down at the side wall of test trench location LTT-6.



Photo Log  
Vacant Property, Highway 280 and Kasota Avenue  
St. Paul, Minnesota  
May 30, 2019



View facing northeast looking down at the side wall of test trench location LTT-7.



View facing southwest looking down at the side wall of test trench location LTT-8.

## Appendix D

# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-1

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483893/N4980522

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of south sidewall

0-1' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

1-2' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick/clay tile, glass, plastic, wood**

2-5' – fill – black to dark gray silty sand, fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick/clay tile, glass, plastic, wood**

### PID

1-2' 0.0 ppm

4-5' 50.0 ppm

### Soil Samples

LTT-1/1-2' @ 8:15 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, HOLD-VOCs

LTT-1/4-5' @ 8:30 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-2

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483869/N4980516

Length: 15'

Width: 5'

Depth: 5.5'

## Excavation Sidewall Sketch



View of north sidewall

0-0.5' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

0.5-4' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber**

4-5.5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, slag/coke**

### PID

1-2' 0.0 ppm

2-3' 1.2 ppm

4-5' 103.4 ppm

### Soil Samples

LTT-2/2-3' @ 8:45 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, HOLD-VOCs

LTT-2/4-5' @ 9:00 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-3

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483851/N4980511

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of east/southeast sidewall

0-0.5' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

0.5-3.5' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **large chunk of concrete, pieces of concrete, brick, glass, plastic, wood, rubber**

3.5-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, ash**

### PID

0-2' 0.0 ppm

2-4' 12.9 ppm

4-5' 254.2 ppm

### Soil Samples

LTT-3/0-2' @ 9:15 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, HOLD-VOCs

LTT-3/2-4' @ 9:30 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-4

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483828/N4980513

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of northeast sidewall

0-1' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

1-3.5' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal**

PID

3' – water seeping in

0-2'	0.0 ppm
2-4'	3.8 ppm
4-5'	56.4 ppm

3.5-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, slag/coke, metal**

### Soil Samples

LTT-4/0-2' @ 9:45 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs

LTT-4/2-4' @ 10:00 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-5

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483812/N4980544

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of east sidewall

0-0.5' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

0.5-3' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal, slag/coke**

3-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, slag/coke**

3.5' – water seeping in

PID

0-2' 0.0 ppm

2-4' 55.1 ppm

4-5' 58.1 ppm

### Soil Samples

LTT-5/0-2' @ 10:15 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, HOLD-VOCs

LTT-5/2-4' @ 10:30 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs

# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-6

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483811/N4980577

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of south sidewall

0-0.5' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

0.5-3.5' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal, styrofoam**

3.5-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, slag/coke**

### PID

0-2' 0.0 ppm

2-4' 19.6 ppm

4-5' 54.6 ppm

### Soil Samples

LTT-6/0-2' @ 10:45 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, VOCs

LTT-6/2-4' @ 11:00 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-7

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483834/N4980554

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of southwest sidewall

0-0.5' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

0.5-3.5' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal**

2' – water seeping in

3.5-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal**

### PID

0-2' 0.0 ppm

2-4' 50.2 ppm

4-5' 27.4 ppm

### Soil Samples

LTT-7/0-2' @ 11:15 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs

LTT-7/2-4' @ 11:30 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, VOCs



# Test Trench Sampling Log

Landmark Environmental, LLC

Project Name:  
Address:

**VPP-Kasota Ave**  
**0 Kasota Avenue, St. Paul, MN**

Excavation # LTT-8

Date: 5/30/2019

Contractor: Frattalone

Excavation Method: Backhoe

Coordinates: NAD83 UTM 15T E483839/N4980538

Length: 15'

Width: 5'

Depth: 5'

## Excavation Sidewall Sketch



View of northeast sidewall

### PID

0-2' 0.0 ppm  
2-4' 38.5 ppm  
4-5' 43.1 ppm

0-1' – topsoil – brown to dark brown silty sand, fine to medium grained, some organics/roots

1-3' – fill – brown to dark brown silty sand, fine to medium grained, with debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal**

1.5' – water seeping in

3-5' – fill – black to dark gray silty sand fine to medium grained, with petroleum odor and debris:

- **pieces of concrete, brick, glass, plastic, wood, rubber, metal**

### Soil Samples

LTT-8/0-2' @ 11:45 – DRO, PAHs, RCRA Metals, PCBs, TCLP Lead, HOLD-VOCs

LTT-8/2-4' @ 12:00 – HOLD- DRO, PAHs, RCRA Metals, PCBs, VOCs

## Appendix E

June 18, 2019

Shannon Russell  
Landmark Environmental  
2042 West 98th Street  
Minneapolis, MN 55431

RE: Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

Dear Shannon Russell:

Enclosed are the analytical results for sample(s) received by the laboratory on May 30, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on June 18, 2019 to include results for TCLP lead on Pace samples 10477057 001 – 008.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Annika Asp  
annika.asp@pacelabs.com  
(612)607-1700  
Project Manager

Enclosures

cc: Mr. Jerry Mullin, Landmark Environmental



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

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### Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10477057001	LTT-1/1-2	Solid	05/30/19 08:15	05/30/19 12:35
10477057002	LTT-2/2-3	Solid	05/30/19 08:45	05/30/19 12:35
10477057003	LTT-3/0-2	Solid	05/30/19 09:15	05/30/19 12:35
10477057004	LTT-4/2-4	Solid	05/30/19 10:00	05/30/19 12:35
10477057005	LTT-5/0-2	Solid	05/30/19 10:15	05/30/19 12:35
10477057006	LTT-6/0-2	Solid	05/30/19 10:45	05/30/19 12:35
10477057007	LTT-7/2-4	Solid	05/30/19 11:30	05/30/19 12:35
10477057008	LTT-8/0-2	Solid	05/30/19 11:45	05/30/19 12:35
10477057009	LTT-1/4-5	Solid	05/30/19 08:30	05/30/19 12:35
10477057010	LTT-2/4-5	Solid	05/30/19 09:00	05/30/19 12:35
10477057011	LTT-3/2-4	Solid	05/30/19 09:30	05/30/19 12:35
10477057012	LTT-4/0-2	Solid	05/30/19 09:45	05/30/19 12:35
10477057013	LTT-5/2-4	Solid	05/30/19 10:30	05/30/19 12:35
10477057014	LTT-6/2-4	Solid	05/30/19 11:00	05/30/19 12:35
10477057015	LTT-7/0-2	Solid	05/30/19 11:15	05/30/19 12:35
10477057016	LTT-8/2-4	Solid	05/30/19 12:00	05/30/19 12:35

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10477057001	LTT-1/1-2	EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057002	LTT-2/2-3	EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057003	LTT-3/0-2	EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057004	LTT-4/2-4	EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057005	LTT-5/0-2	EPA 8260B	CD2	70	PASI-M
		EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057006	LTT-6/0-2	EPA 8082A	RAG	11	PASI-M

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10477057007	LTT-7/2-4	WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10477057008	LTT-8/0-2	EPA 8260B	CD2	70	PASI-M
		EPA 8082A	RAG	11	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		EPA 6010D	IP	1	PASI-M
		EPA 6010D	IP	7	PASI-M
		EPA 7471B	BTS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

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**Date:** June 18, 2019

On the evening of Thursday, May 30, 2019 around 10:30 pm Pace Analytical Services, Minneapolis experienced a power outage. On Friday, May 31, 2019 around 8:30 am the continuous temperature monitoring system went into alarm; lab staff followed our Standard Operating Procedure and took a representative reading of samples in the unit (C-16) and documented it in the system. The samples in the cooler were in temp at this time, there was no additional follow up.

The power outage created an unknown mechanical error with the unit and it never regained proper functionality. A manual temperature reading was taken June 3, 2019 at 7:40 am, which was out of compliance around 13 degrees Celsius which prompted all samples to be moved to a functioning unit.

For samples to be in compliance with requirements, they need to be maintained between 0 – 6°C.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

---

**Method:** EPA 8082A  
**Description:** 8082A GCS PCB  
**Client:** Landmark Environmental  
**Date:** June 18, 2019

### General Information:

8 samples were analyzed for EPA 8082A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3550 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 609973

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- BLANK (Lab ID: 3296468)
  - Decachlorobiphenyl (S)
- LCS (Lab ID: 3296469)
  - Decachlorobiphenyl (S)
- MS (Lab ID: 3296646)
  - Decachlorobiphenyl (S)
- MSD (Lab ID: 3296647)
  - Decachlorobiphenyl (S)

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

QC Batch: 609401

S0: Surrogate recovery outside laboratory control limits.

- MS (Lab ID: 3293237)
  - Decachlorobiphenyl (S)
  - Tetrachloro-m-xylene (S)
- MSD (Lab ID: 3293238)
  - Tetrachloro-m-xylene (S)

QC Batch: 609973

S0: Surrogate recovery outside laboratory control limits.

- LTT-1/1-2 (Lab ID: 10477057001)
  - Decachlorobiphenyl (S)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

---

**Method:** EPA 8082A

**Description:** 8082A GCS PCB

**Client:** Landmark Environmental

**Date:** June 18, 2019

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 609401

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10475343014

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 3293237)
- PCB-1016 (Aroclor 1016)

### Additional Comments:

Analyte Comments:

QC Batch: 609973

D4: Sample was diluted due to the presence of high levels of target analytes.

- LTT-1/1-2 (Lab ID: 10477057001)
  - Tetrachloro-m-xylene (S)
- LTT-2/2-3 (Lab ID: 10477057002)
  - Tetrachloro-m-xylene (S)
- LTT-5/0-2 (Lab ID: 10477057005)
  - Tetrachloro-m-xylene (S)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

---

**Method:** WI MOD DRO  
**Description:** WIDRO GCS Silica Gel  
**Client:** Landmark Environmental  
**Date:** June 18, 2019

### General Information:

8 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

QC Batch: 609985

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- LTT-1/1-2 (Lab ID: 10477057001)
  - n-Triacontane (S)
- LTT-5/0-2 (Lab ID: 10477057005)
  - n-Triacontane (S)
- LTT-7/2-4 (Lab ID: 10477057007)
  - n-Triacontane (S)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Method:** WI MOD DRO

**Description:** WIDRO GCS Silica Gel

**Client:** Landmark Environmental

**Date:** June 18, 2019

Analyte Comments:

QC Batch: 609985

1M: Samples requiring thermal preservation exceeded method recommended temperature limits after receipt but before extraction or digestion was conducted. Results are estimated

- LTT-1/1-2 (Lab ID: 10477057001)
  - n-Triacontane (S)
- LTT-2/2-3 (Lab ID: 10477057002)
  - n-Triacontane (S)
- LTT-3/0-2 (Lab ID: 10477057003)
  - n-Triacontane (S)
- LTT-4/2-4 (Lab ID: 10477057004)
  - n-Triacontane (S)
- LTT-5/0-2 (Lab ID: 10477057005)
  - n-Triacontane (S)
- LTT-6/0-2 (Lab ID: 10477057006)
  - n-Triacontane (S)
- LTT-7/2-4 (Lab ID: 10477057007)
  - n-Triacontane (S)

2M: Samples requiring thermal preservation exceeded method recommended temperature limits after receipt but before extraction or digestion was conducted. Results are estimated.

- LTT-8/0-2 (Lab ID: 10477057008)
  - n-Triacontane (S)

T6: High boiling point hydrocarbons are present in the sample.

- LTT-1/1-2 (Lab ID: 10477057001)
  - WDRO C10-C28
- LTT-2/2-3 (Lab ID: 10477057002)
  - WDRO C10-C28
- LTT-3/0-2 (Lab ID: 10477057003)
  - WDRO C10-C28
- LTT-4/2-4 (Lab ID: 10477057004)
  - WDRO C10-C28
- LTT-5/0-2 (Lab ID: 10477057005)
  - WDRO C10-C28
- LTT-6/0-2 (Lab ID: 10477057006)
  - WDRO C10-C28
- LTT-7/2-4 (Lab ID: 10477057007)
  - WDRO C10-C28
- LTT-8/0-2 (Lab ID: 10477057008)
  - WDRO C10-C28

T7: Low boiling point hydrocarbons are present in the sample.

- LTT-2/2-3 (Lab ID: 10477057002)
  - WDRO C10-C28
- LTT-3/0-2 (Lab ID: 10477057003)
  - WDRO C10-C28

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

---

**Method:** WI MOD DRO

**Description:** WIDRO GCS Silica Gel

**Client:** Landmark Environmental

**Date:** June 18, 2019

Analyte Comments:

QC Batch: 609985

T7: Low boiling point hydrocarbons are present in the sample.

- LTT-4/2-4 (Lab ID: 10477057004)
  - WDRO C10-C28
- LTT-5/0-2 (Lab ID: 10477057005)
  - WDRO C10-C28
- LTT-6/0-2 (Lab ID: 10477057006)
  - WDRO C10-C28
- LTT-7/2-4 (Lab ID: 10477057007)
  - WDRO C10-C28
- LTT-8/0-2 (Lab ID: 10477057008)
  - WDRO C10-C28

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

---

**Method:** EPA 6010D

**Description:** 6010D MET ICP, TCLP

**Client:** Landmark Environmental

**Date:** June 18, 2019

**General Information:**

8 samples were analyzed for EPA 6010D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

---

**Method:** EPA 6010D

**Description:** 6010D MET ICP

**Client:** Landmark Environmental

**Date:** June 18, 2019

### General Information:

8 samples were analyzed for EPA 6010D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 609891

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10476849001

R1: RPD value was outside control limits.

- MSD (Lab ID: 3296195)
- Lead

### Additional Comments:

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

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**Method:** EPA 7471B

**Description:** 7471B Mercury

**Client:** Landmark Environmental

**Date:** June 18, 2019

**General Information:**

8 samples were analyzed for EPA 7471B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

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**Method:** EPA 8270D by SIM  
**Description:** 8270D MSSV PAH by SIM  
**Client:** Landmark Environmental  
**Date:** June 18, 2019

### General Information:

8 samples were analyzed for EPA 8270D by SIM. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3550 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 609600

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10476509005

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 3294380)
  - Fluoranthene
  - Phenanthrene
  - Pyrene
- MSD (Lab ID: 3294381)
  - Chrysene
  - Pyrene

### Additional Comments:

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

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**Method:** EPA 8270D by SIM

**Description:** 8270D MSSV PAH by SIM

**Client:** Landmark Environmental

**Date:** June 18, 2019

Analyte Comments:

QC Batch: 609600

D4: Sample was diluted due to the presence of high levels of target analytes.

- LTT-6/0-2 (Lab ID: 10477057006)
  - 2-Fluorobiphenyl (S)
- LTT-8/0-2 (Lab ID: 10477057008)
  - 2-Fluorobiphenyl (S)

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

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**Method:** EPA 8260B  
**Description:** 8260B MSV 5030 Med Level  
**Client:** Landmark Environmental  
**Date:** June 18, 2019

### General Information:

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

QC Batch: 610910

SS: This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

- LCS (Lab ID: 3300778)
- Trichlorofluoromethane

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

---

**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** Landmark Environmental

**Date:** June 18, 2019

Analyte Comments:

QC Batch: 610910

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- BLANK (Lab ID: 3300777)
  - Dichlorofluoromethane
- LCS (Lab ID: 3300778)
  - Dichlorofluoromethane
- LTT-4/2-4 (Lab ID: 10477057004)
  - Dichlorofluoromethane
- LTT-6/0-2 (Lab ID: 10477057006)
  - Dichlorofluoromethane
- LTT-7/2-4 (Lab ID: 10477057007)
  - Dichlorofluoromethane
- MS (Lab ID: 3300779)
  - Dichlorofluoromethane
- MSD (Lab ID: 3300780)
  - Dichlorofluoromethane

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-1/1-2 **Lab ID:** 10477057001 **Collected:** 05/30/19 08:15 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.19	mg/kg	0.19	0.054	5	06/03/19 14:00	06/06/19 09:58	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.19	mg/kg	0.19	0.068	5	06/03/19 14:00	06/06/19 09:58	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.19	mg/kg	0.19	0.077	5	06/03/19 14:00	06/06/19 09:58	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.19	mg/kg	0.19	0.065	5	06/03/19 14:00	06/06/19 09:58	53469-21-9	
PCB-1248 (Aroclor 1248)	<0.19	mg/kg	0.19	0.058	5	06/03/19 14:00	06/06/19 09:58	12672-29-6	
PCB-1254 (Aroclor 1254)	4.0	mg/kg	0.19	0.057	5	06/03/19 14:00	06/06/19 09:58	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.19	mg/kg	0.19	0.046	5	06/03/19 14:00	06/06/19 09:58	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.19	mg/kg	0.19	0.067	5	06/03/19 14:00	06/06/19 09:58	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.19	mg/kg	0.19	0.063	5	06/03/19 14:00	06/06/19 09:58	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	104	%	57-125		5	06/03/19 14:00	06/06/19 09:58	877-09-8	D4
Decachlorobiphenyl (S)	127	%	49-125		5	06/03/19 14:00	06/06/19 09:58	2051-24-3	S0
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	151	mg/kg	66.9	25.9	10	06/03/19 09:17	06/04/19 20:41		T6
<b>Surrogates</b>									
n-Triacontane (S)	0	%	44-143		10	06/03/19 09:17	06/04/19 20:41	638-68-6	1M,S4
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.08; Final pH: 1.74									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 11:44	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	4.5	mg/kg	1.1	0.22	1	06/04/19 07:04	06/04/19 14:45	7440-38-2	
Barium	119	mg/kg	0.54	0.085	1	06/04/19 07:04	06/04/19 14:45	7440-39-3	
Cadmium	0.95	mg/kg	0.16	0.032	1	06/04/19 07:04	06/04/19 14:45	7440-43-9	
Chromium	43.9	mg/kg	0.54	0.11	1	06/04/19 07:04	06/04/19 14:45	7440-47-3	
Lead	579	mg/kg	0.54	0.12	1	06/04/19 07:04	06/04/19 14:45	7439-92-1	
Selenium	<1.1	mg/kg	1.1	0.35	1	06/04/19 07:04	06/04/19 14:45	7782-49-2	
Silver	0.62	mg/kg	0.54	0.039	1	06/04/19 07:04	06/05/19 11:08	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.19	mg/kg	0.021	0.0093	1	06/04/19 07:27	06/04/19 15:10	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	14.7	%	0.10	0.10	1		06/05/19 17:35		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.027	mg/kg	0.012	0.00048	1	05/31/19 09:40	06/06/19 02:51	83-32-9	
Acenaphthylene	0.018	mg/kg	0.012	0.00058	1	05/31/19 09:40	06/06/19 02:51	208-96-8	
Anthracene	0.078	mg/kg	0.012	0.00055	1	05/31/19 09:40	06/06/19 02:51	120-12-7	
Benzo(a)anthracene	0.33	mg/kg	0.012	0.0013	1	05/31/19 09:40	06/06/19 02:51	56-55-3	
Benzo(a)pyrene	0.39	mg/kg	0.012	0.00080	1	05/31/19 09:40	06/06/19 02:51	50-32-8	
Benzo(b)fluoranthene	0.63	mg/kg	0.058	0.0022	5	05/31/19 09:40	06/06/19 11:54	205-99-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-1/1-2 **Lab ID:** 10477057001 **Collected:** 05/30/19 08:15 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	<b>0.34</b>	mg/kg	0.012	0.00074	1	05/31/19 09:40	06/06/19 02:51	191-24-2	
Benzo(k)fluoranthene	<b>0.24</b>	mg/kg	0.012	0.00099	1	05/31/19 09:40	06/06/19 02:51	207-08-9	
Chrysene	<b>0.47</b>	mg/kg	0.058	0.0080	5	05/31/19 09:40	06/06/19 11:54	218-01-9	
Dibenz(a,h)anthracene	<b>0.097</b>	mg/kg	0.012	0.00054	1	05/31/19 09:40	06/06/19 02:51	53-70-3	
Fluoranthene	<b>0.59</b>	mg/kg	0.058	0.0025	5	05/31/19 09:40	06/06/19 11:54	206-44-0	
Fluorene	<b>0.026</b>	mg/kg	0.012	0.00037	1	05/31/19 09:40	06/06/19 02:51	86-73-7	
Indeno(1,2,3-cd)pyrene	<b>0.26</b>	mg/kg	0.012	0.00078	1	05/31/19 09:40	06/06/19 02:51	193-39-5	
Naphthalene	<b>0.14</b>	mg/kg	0.012	0.00090	1	05/31/19 09:40	06/06/19 02:51	91-20-3	
Phenanthrene	<b>0.33</b>	mg/kg	0.012	0.0022	1	05/31/19 09:40	06/06/19 02:51	85-01-8	
Pyrene	<b>0.57</b>	mg/kg	0.058	0.0089	5	05/31/19 09:40	06/06/19 11:54	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	<b>0.59</b>	mg/kg	0.058	0.058	5	05/31/19 09:40	06/06/19 11:54		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	72	%.	30-125		1	05/31/19 09:40	06/06/19 02:51	321-60-8	
p-Terphenyl-d14 (S)	74	%.	30-125		1	05/31/19 09:40	06/06/19 02:51	1718-51-0	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-2/2-3 **Lab ID:** 10477057002 **Collected:** 05/30/19 08:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.20	mg/kg	0.20	0.055	5	06/03/19 14:00	06/06/19 10:14	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.20	mg/kg	0.20	0.069	5	06/03/19 14:00	06/06/19 10:14	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.20	mg/kg	0.20	0.078	5	06/03/19 14:00	06/06/19 10:14	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.20	mg/kg	0.20	0.067	5	06/03/19 14:00	06/06/19 10:14	53469-21-9	
PCB-1248 (Aroclor 1248)	<0.20	mg/kg	0.20	0.059	5	06/03/19 14:00	06/06/19 10:14	12672-29-6	
PCB-1254 (Aroclor 1254)	5.5	mg/kg	0.20	0.058	5	06/03/19 14:00	06/06/19 10:14	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.20	mg/kg	0.20	0.047	5	06/03/19 14:00	06/06/19 10:14	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.20	mg/kg	0.20	0.068	5	06/03/19 14:00	06/06/19 10:14	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.20	mg/kg	0.20	0.064	5	06/03/19 14:00	06/06/19 10:14	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	101	%	57-125		5	06/03/19 14:00	06/06/19 10:14	877-09-8	D4
Decachlorobiphenyl (S)	120	%	49-125		5	06/03/19 14:00	06/06/19 10:14	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	171	mg/kg	28.8	11.2	5	06/03/19 09:17	06/04/19 20:48		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	80	%	44-143		5	06/03/19 09:17	06/04/19 20:48	638-68-6	1M
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.56; Final pH: 1.81									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 11:58	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	4.6	mg/kg	1.1	0.23	1	06/04/19 07:04	06/04/19 14:48	7440-38-2	
Barium	123	mg/kg	0.56	0.089	1	06/04/19 07:04	06/04/19 14:48	7440-39-3	
Cadmium	1.0	mg/kg	0.17	0.034	1	06/04/19 07:04	06/04/19 14:48	7440-43-9	
Chromium	43.3	mg/kg	0.56	0.11	1	06/04/19 07:04	06/04/19 14:48	7440-47-3	
Lead	260	mg/kg	0.56	0.13	1	06/04/19 07:04	06/04/19 14:48	7439-92-1	
Selenium	<1.1	mg/kg	1.1	0.37	1	06/04/19 07:04	06/04/19 14:48	7782-49-2	
Silver	0.58	mg/kg	0.56	0.041	1	06/04/19 07:04	06/05/19 11:11	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.28	mg/kg	0.023	0.010	1	06/04/19 07:27	06/04/19 15:12	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	16.1	%	0.10	0.10	1		06/05/19 17:35		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.028	mg/kg	0.012	0.00049	1	05/31/19 09:40	06/06/19 03:12	83-32-9	
Acenaphthylene	0.022	mg/kg	0.012	0.00059	1	05/31/19 09:40	06/06/19 03:12	208-96-8	
Anthracene	0.076	mg/kg	0.012	0.00056	1	05/31/19 09:40	06/06/19 03:12	120-12-7	
Benzo(a)anthracene	0.24	mg/kg	0.012	0.0013	1	05/31/19 09:40	06/06/19 03:12	56-55-3	
Benzo(a)pyrene	0.31	mg/kg	0.012	0.00082	1	05/31/19 09:40	06/06/19 03:12	50-32-8	
Benzo(b)fluoranthene	0.46	mg/kg	0.060	0.0022	5	05/31/19 09:40	06/06/19 12:15	205-99-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-2/2-3 **Lab ID:** 10477057002 **Collected:** 05/30/19 08:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	<b>0.28</b>	mg/kg	0.012	0.00075	1	05/31/19 09:40	06/06/19 03:12	191-24-2	
Benzo(k)fluoranthene	<b>0.17</b>	mg/kg	0.012	0.0010	1	05/31/19 09:40	06/06/19 03:12	207-08-9	
Chrysene	<b>0.31</b>	mg/kg	0.012	0.0016	1	05/31/19 09:40	06/06/19 03:12	218-01-9	
Dibenz(a,h)anthracene	<b>0.075</b>	mg/kg	0.012	0.00055	1	05/31/19 09:40	06/06/19 03:12	53-70-3	
Fluoranthene	<b>0.44</b>	mg/kg	0.060	0.0025	5	05/31/19 09:40	06/06/19 12:15	206-44-0	
Fluorene	<b>0.032</b>	mg/kg	0.012	0.00037	1	05/31/19 09:40	06/06/19 03:12	86-73-7	
Indeno(1,2,3-cd)pyrene	<b>0.21</b>	mg/kg	0.012	0.00080	1	05/31/19 09:40	06/06/19 03:12	193-39-5	
Naphthalene	<b>0.13</b>	mg/kg	0.012	0.00092	1	05/31/19 09:40	06/06/19 03:12	91-20-3	
Phenanthrene	<b>0.30</b>	mg/kg	0.012	0.0023	1	05/31/19 09:40	06/06/19 03:12	85-01-8	
Pyrene	<b>0.39</b>	mg/kg	0.012	0.0018	1	05/31/19 09:40	06/06/19 03:12	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	<b>0.47</b>	mg/kg	0.060	0.060	5	05/31/19 09:40	06/06/19 12:15		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	78	%.	30-125		1	05/31/19 09:40	06/06/19 03:12	321-60-8	
p-Terphenyl-d14 (S)	77	%.	30-125		1	05/31/19 09:40	06/06/19 03:12	1718-51-0	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-3/0-2 **Lab ID:** 10477057003 **Collected:** 05/30/19 09:15 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.039	mg/kg	0.039	0.011	1	05/30/19 18:52	06/01/19 04:53	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.039	mg/kg	0.039	0.014	1	05/30/19 18:52	06/01/19 04:53	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.039	mg/kg	0.039	0.016	1	05/30/19 18:52	06/01/19 04:53	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.039	mg/kg	0.039	0.013	1	05/30/19 18:52	06/01/19 04:53	53469-21-9	
PCB-1248 (Aroclor 1248)	0.21	mg/kg	0.039	0.012	1	05/30/19 18:52	06/01/19 04:53	12672-29-6	
PCB-1254 (Aroclor 1254)	0.16	mg/kg	0.039	0.011	1	05/30/19 18:52	06/01/19 04:53	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.039	mg/kg	0.039	0.0093	1	05/30/19 18:52	06/01/19 04:53	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.039	mg/kg	0.039	0.013	1	05/30/19 18:52	06/01/19 04:53	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.039	mg/kg	0.039	0.013	1	05/30/19 18:52	06/01/19 04:53	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	69	%	57-125		1	05/30/19 18:52	06/01/19 04:53	877-09-8	
Decachlorobiphenyl (S)	60	%	49-125		1	05/30/19 18:52	06/01/19 04:53	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	128	mg/kg	30.7	11.9	5	06/03/19 09:17	06/04/19 20:55		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	57	%	44-143		5	06/03/19 09:17	06/04/19 20:55	638-68-6	1M
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 9; Final pH: 1.68									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:01	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	3.8	mg/kg	1.1	0.23	1	06/04/19 07:04	06/04/19 14:51	7440-38-2	
Barium	62.7	mg/kg	0.55	0.088	1	06/04/19 07:04	06/04/19 14:51	7440-39-3	
Cadmium	0.55	mg/kg	0.17	0.033	1	06/04/19 07:04	06/04/19 14:51	7440-43-9	
Chromium	30.5	mg/kg	0.55	0.11	1	06/04/19 07:04	06/04/19 14:51	7440-47-3	
Lead	154	mg/kg	0.55	0.12	1	06/04/19 07:04	06/04/19 14:51	7439-92-1	
Selenium	<1.1	mg/kg	1.1	0.36	1	06/04/19 07:04	06/04/19 14:51	7782-49-2	
Silver	0.59	mg/kg	0.55	0.040	1	06/04/19 07:04	06/05/19 11:14	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.12	mg/kg	0.022	0.0097	1	06/04/19 07:27	06/04/19 15:19	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	15.5	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.041	mg/kg	0.012	0.00048	1	05/31/19 09:40	06/06/19 03:33	83-32-9	
Acenaphthylene	0.014	mg/kg	0.012	0.00058	1	05/31/19 09:40	06/06/19 03:33	208-96-8	
Anthracene	0.070	mg/kg	0.012	0.00055	1	05/31/19 09:40	06/06/19 03:33	120-12-7	
Benzo(a)anthracene	0.41	mg/kg	0.059	0.0064	5	05/31/19 09:40	06/06/19 12:36	56-55-3	
Benzo(a)pyrene	0.65	mg/kg	0.059	0.0041	5	05/31/19 09:40	06/06/19 12:36	50-32-8	
Benzo(b)fluoranthene	0.90	mg/kg	0.059	0.0022	5	05/31/19 09:40	06/06/19 12:36	205-99-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-3/0-2 **Lab ID:** 10477057003 **Collected:** 05/30/19 09:15 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	<b>0.51</b>	mg/kg	0.059	0.0037	5	05/31/19 09:40	06/06/19 12:36	191-24-2	
Benzo(k)fluoranthene	<b>0.37</b>	mg/kg	0.012	0.0010	1	05/31/19 09:40	06/06/19 03:33	207-08-9	
Chrysene	<b>0.58</b>	mg/kg	0.059	0.0080	5	05/31/19 09:40	06/06/19 12:36	218-01-9	
Dibenz(a,h)anthracene	<b>0.12</b>	mg/kg	0.012	0.00054	1	05/31/19 09:40	06/06/19 03:33	53-70-3	
Fluoranthene	<b>0.58</b>	mg/kg	0.059	0.0025	5	05/31/19 09:40	06/06/19 12:36	206-44-0	
Fluorene	<b>0.039</b>	mg/kg	0.012	0.00037	1	05/31/19 09:40	06/06/19 03:33	86-73-7	
Indeno(1,2,3-cd)pyrene	<b>0.42</b>	mg/kg	0.059	0.0040	5	05/31/19 09:40	06/06/19 12:36	193-39-5	
Naphthalene	<b>0.30</b>	mg/kg	0.012	0.00091	1	05/31/19 09:40	06/06/19 03:33	91-20-3	
Phenanthrene	<b>0.37</b>	mg/kg	0.012	0.0023	1	05/31/19 09:40	06/06/19 03:33	85-01-8	
Pyrene	<b>0.59</b>	mg/kg	0.059	0.0090	5	05/31/19 09:40	06/06/19 12:36	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	<b>0.94</b>	mg/kg	0.059	0.059	5	05/31/19 09:40	06/06/19 12:36		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	76	%.	30-125		1	05/31/19 09:40	06/06/19 03:33	321-60-8	
p-Terphenyl-d14 (S)	78	%.	30-125		1	05/31/19 09:40	06/06/19 03:33	1718-51-0	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-4/2-4 **Lab ID:** 10477057004 **Collected:** 05/30/19 10:00 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.040	mg/kg	0.040	0.011	1	05/30/19 18:52	06/01/19 05:08	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.040	mg/kg	0.040	0.014	1	05/30/19 18:52	06/01/19 05:08	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.040	mg/kg	0.040	0.016	1	05/30/19 18:52	06/01/19 05:08	11141-16-5	
PCB-1242 (Aroclor 1242)	2.9	mg/kg	0.20	0.068	5	05/30/19 18:52	06/03/19 12:33	53469-21-9	
PCB-1248 (Aroclor 1248)	<0.040	mg/kg	0.040	0.012	1	05/30/19 18:52	06/01/19 05:08	12672-29-6	
PCB-1254 (Aroclor 1254)	0.40	mg/kg	0.040	0.012	1	05/30/19 18:52	06/01/19 05:08	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.040	mg/kg	0.040	0.0096	1	05/30/19 18:52	06/01/19 05:08	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.040	mg/kg	0.040	0.014	1	05/30/19 18:52	06/01/19 05:08	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.040	mg/kg	0.040	0.013	1	05/30/19 18:52	06/01/19 05:08	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	68	%	57-125		1	05/30/19 18:52	06/01/19 05:08	877-09-8	
Decachlorobiphenyl (S)	57	%	49-125		1	05/30/19 18:52	06/01/19 05:08	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	159	mg/kg	10.7	4.2	2	06/03/19 09:17	06/04/19 21:01		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	90	%	44-143		2	06/03/19 09:17	06/04/19 21:01	638-68-6	1M
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.51; Final pH: 1.87									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:04	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	4.5	mg/kg	1.1	0.23	1	06/04/19 07:04	06/04/19 14:54	7440-38-2	
Barium	110	mg/kg	0.57	0.091	1	06/04/19 07:04	06/04/19 14:54	7440-39-3	
Cadmium	0.84	mg/kg	0.17	0.034	1	06/04/19 07:04	06/04/19 14:54	7440-43-9	
Chromium	23.5	mg/kg	0.57	0.11	1	06/04/19 07:04	06/04/19 14:54	7440-47-3	
Lead	208	mg/kg	0.57	0.13	1	06/04/19 07:04	06/04/19 14:54	7439-92-1	
Selenium	<1.1	mg/kg	1.1	0.38	1	06/04/19 07:04	06/04/19 14:54	7782-49-2	
Silver	<0.57	mg/kg	0.57	0.042	1	06/04/19 07:04	06/05/19 11:18	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.23	mg/kg	0.022	0.0099	1	06/04/19 07:27	06/04/19 15:21	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	17.6	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.019	mg/kg	0.012	0.00050	1	05/31/19 09:40	06/06/19 03:54	83-32-9	
Acenaphthylene	<0.012	mg/kg	0.012	0.00060	1	05/31/19 09:40	06/06/19 03:54	208-96-8	
Anthracene	0.052	mg/kg	0.012	0.00057	1	05/31/19 09:40	06/06/19 03:54	120-12-7	
Benzo(a)anthracene	0.19	mg/kg	0.012	0.0013	1	05/31/19 09:40	06/06/19 03:54	56-55-3	
Benzo(a)pyrene	0.20	mg/kg	0.012	0.00083	1	05/31/19 09:40	06/06/19 03:54	50-32-8	
Benzo(b)fluoranthene	0.30	mg/kg	0.012	0.00045	1	05/31/19 09:40	06/06/19 03:54	205-99-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Sample: LTT-4/2-4 Lab ID: 10477057004 Collected: 05/30/19 10:00 Received: 05/30/19 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	0.17	mg/kg	0.012	0.00077	1	05/31/19 09:40	06/06/19 03:54	191-24-2	
Benzo(k)fluoranthene	0.11	mg/kg	0.012	0.0010	1	05/31/19 09:40	06/06/19 03:54	207-08-9	
Chrysene	0.24	mg/kg	0.012	0.0016	1	05/31/19 09:40	06/06/19 03:54	218-01-9	
Dibenz(a,h)anthracene	0.051	mg/kg	0.012	0.00056	1	05/31/19 09:40	06/06/19 03:54	53-70-3	
Fluoranthene	0.31	mg/kg	0.012	0.00052	1	05/31/19 09:40	06/06/19 03:54	206-44-0	
Fluorene	0.029	mg/kg	0.012	0.00038	1	05/31/19 09:40	06/06/19 03:54	86-73-7	
Indeno(1,2,3-cd)pyrene	0.13	mg/kg	0.012	0.00081	1	05/31/19 09:40	06/06/19 03:54	193-39-5	
Naphthalene	0.077	mg/kg	0.012	0.00093	1	05/31/19 09:40	06/06/19 03:54	91-20-3	
Phenanthrene	0.22	mg/kg	0.012	0.0023	1	05/31/19 09:40	06/06/19 03:54	85-01-8	
Pyrene	0.28	mg/kg	0.012	0.0019	1	05/31/19 09:40	06/06/19 03:54	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	0.30	mg/kg	0.012	0.012	1	05/31/19 09:40	06/06/19 03:54		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	76	%.	30-125		1	05/31/19 09:40	06/06/19 03:54	321-60-8	
p-Terphenyl-d14 (S)	78	%.	30-125		1	05/31/19 09:40	06/06/19 03:54	1718-51-0	

### 8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<1.3	mg/kg	1.3	0.39	1	06/06/19 10:16	06/06/19 14:33	67-64-1	
Allyl chloride	<0.25	mg/kg	0.25	0.053	1	06/06/19 10:16	06/06/19 14:33	107-05-1	
Benzene	<0.025	mg/kg	0.025	0.0035	1	06/06/19 10:16	06/06/19 14:33	71-43-2	
Bromobenzene	<0.063	mg/kg	0.063	0.0039	1	06/06/19 10:16	06/06/19 14:33	108-86-1	
Bromochloromethane	<0.063	mg/kg	0.063	0.022	1	06/06/19 10:16	06/06/19 14:33	74-97-5	
Bromodichloromethane	<0.063	mg/kg	0.063	0.022	1	06/06/19 10:16	06/06/19 14:33	75-27-4	
Bromoform	<0.25	mg/kg	0.25	0.095	1	06/06/19 10:16	06/06/19 14:33	75-25-2	
Bromomethane	<0.63	mg/kg	0.63	0.074	1	06/06/19 10:16	06/06/19 14:33	74-83-9	
2-Butanone (MEK)	<0.31	mg/kg	0.31	0.033	1	06/06/19 10:16	06/06/19 14:33	78-93-3	
n-Butylbenzene	<0.063	mg/kg	0.063	0.030	1	06/06/19 10:16	06/06/19 14:33	104-51-8	
sec-Butylbenzene	<0.063	mg/kg	0.063	0.012	1	06/06/19 10:16	06/06/19 14:33	135-98-8	
tert-Butylbenzene	<0.063	mg/kg	0.063	0.012	1	06/06/19 10:16	06/06/19 14:33	98-06-6	
Carbon tetrachloride	<0.063	mg/kg	0.063	0.030	1	06/06/19 10:16	06/06/19 14:33	56-23-5	
Chlorobenzene	<0.063	mg/kg	0.063	0.0035	1	06/06/19 10:16	06/06/19 14:33	108-90-7	
Chloroethane	<0.63	mg/kg	0.63	0.033	1	06/06/19 10:16	06/06/19 14:33	75-00-3	
Chloroform	<0.063	mg/kg	0.063	0.031	1	06/06/19 10:16	06/06/19 14:33	67-66-3	
Chloromethane	<0.25	mg/kg	0.25	0.015	1	06/06/19 10:16	06/06/19 14:33	74-87-3	
2-Chlorotoluene	<0.063	mg/kg	0.063	0.0031	1	06/06/19 10:16	06/06/19 14:33	95-49-8	
4-Chlorotoluene	<0.063	mg/kg	0.063	0.0032	1	06/06/19 10:16	06/06/19 14:33	106-43-4	
1,2-Dibromo-3-chloropropane	<0.63	mg/kg	0.63	0.22	1	06/06/19 10:16	06/06/19 14:33	96-12-8	
Dibromochloromethane	<0.25	mg/kg	0.25	0.0073	1	06/06/19 10:16	06/06/19 14:33	124-48-1	
1,2-Dibromoethane (EDB)	<0.063	mg/kg	0.063	0.0066	1	06/06/19 10:16	06/06/19 14:33	106-93-4	
Dibromomethane	<0.063	mg/kg	0.063	0.012	1	06/06/19 10:16	06/06/19 14:33	74-95-3	
1,2-Dichlorobenzene	<0.063	mg/kg	0.063	0.0025	1	06/06/19 10:16	06/06/19 14:33	95-50-1	
1,3-Dichlorobenzene	<0.063	mg/kg	0.063	0.0023	1	06/06/19 10:16	06/06/19 14:33	541-73-1	
1,4-Dichlorobenzene	<0.063	mg/kg	0.063	0.0039	1	06/06/19 10:16	06/06/19 14:33	106-46-7	
Dichlorodifluoromethane	<0.25	mg/kg	0.25	0.020	1	06/06/19 10:16	06/06/19 14:33	75-71-8	
1,1-Dichloroethane	<0.063	mg/kg	0.063	0.0071	1	06/06/19 10:16	06/06/19 14:33	75-34-3	
1,2-Dichloroethane	<0.063	mg/kg	0.063	0.0069	1	06/06/19 10:16	06/06/19 14:33	107-06-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-4/2-4 **Lab ID:** 10477057004 **Collected:** 05/30/19 10:00 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1-Dichloroethene	<0.063	mg/kg	0.063	0.019	1	06/06/19 10:16	06/06/19 14:33	75-35-4	
cis-1,2-Dichloroethene	<0.063	mg/kg	0.063	0.010	1	06/06/19 10:16	06/06/19 14:33	156-59-2	
trans-1,2-Dichloroethene	<0.063	mg/kg	0.063	0.029	1	06/06/19 10:16	06/06/19 14:33	156-60-5	
Dichlorofluoromethane	<0.63	mg/kg	0.63	0.087	1	06/06/19 10:16	06/06/19 14:33	75-43-4	N2
1,2-Dichloropropane	<0.063	mg/kg	0.063	0.011	1	06/06/19 10:16	06/06/19 14:33	78-87-5	
1,3-Dichloropropane	<0.063	mg/kg	0.063	0.0087	1	06/06/19 10:16	06/06/19 14:33	142-28-9	
2,2-Dichloropropane	<0.25	mg/kg	0.25	0.0078	1	06/06/19 10:16	06/06/19 14:33	594-20-7	
1,1-Dichloropropene	<0.063	mg/kg	0.063	0.029	1	06/06/19 10:16	06/06/19 14:33	563-58-6	
cis-1,3-Dichloropropene	<0.063	mg/kg	0.063	0.0090	1	06/06/19 10:16	06/06/19 14:33	10061-01-5	
trans-1,3-Dichloropropene	<0.063	mg/kg	0.063	0.0087	1	06/06/19 10:16	06/06/19 14:33	10061-02-6	
Diethyl ether (Ethyl ether)	<0.25	mg/kg	0.25	0.038	1	06/06/19 10:16	06/06/19 14:33	60-29-7	
Ethylbenzene	0.64	mg/kg	0.063	0.0034	1	06/06/19 10:16	06/06/19 14:33	100-41-4	
Hexachloro-1,3-butadiene	<0.31	mg/kg	0.31	0.015	1	06/06/19 10:16	06/06/19 14:33	87-68-3	
Isopropylbenzene (Cumene)	<0.063	mg/kg	0.063	0.0028	1	06/06/19 10:16	06/06/19 14:33	98-82-8	
p-Isopropyltoluene	<0.063	mg/kg	0.063	0.019	1	06/06/19 10:16	06/06/19 14:33	99-87-6	
Methylene Chloride	<0.25	mg/kg	0.25	0.12	1	06/06/19 10:16	06/06/19 14:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	<0.31	mg/kg	0.31	0.013	1	06/06/19 10:16	06/06/19 14:33	108-10-1	
Methyl-tert-butyl ether	<0.063	mg/kg	0.063	0.0075	1	06/06/19 10:16	06/06/19 14:33	1634-04-4	
Naphthalene	<0.25	mg/kg	0.25	0.059	1	06/06/19 10:16	06/06/19 14:33	91-20-3	
n-Propylbenzene	<0.063	mg/kg	0.063	0.0034	1	06/06/19 10:16	06/06/19 14:33	103-65-1	
Styrene	<0.063	mg/kg	0.063	0.0029	1	06/06/19 10:16	06/06/19 14:33	100-42-5	
1,1,1,2-Tetrachloroethane	<0.063	mg/kg	0.063	0.020	1	06/06/19 10:16	06/06/19 14:33	630-20-6	
1,1,2,2-Tetrachloroethane	<0.063	mg/kg	0.063	0.011	1	06/06/19 10:16	06/06/19 14:33	79-34-5	
Tetrachloroethene	<0.063	mg/kg	0.063	0.022	1	06/06/19 10:16	06/06/19 14:33	127-18-4	
Tetrahydrofuran	<2.5	mg/kg	2.5	0.091	1	06/06/19 10:16	06/06/19 14:33	109-99-9	
Toluene	0.19	mg/kg	0.063	0.015	1	06/06/19 10:16	06/06/19 14:33	108-88-3	
1,2,3-Trichlorobenzene	<0.063	mg/kg	0.063	0.010	1	06/06/19 10:16	06/06/19 14:33	87-61-6	
1,2,4-Trichlorobenzene	<0.063	mg/kg	0.063	0.014	1	06/06/19 10:16	06/06/19 14:33	120-82-1	
1,1,1-Trichloroethane	<0.063	mg/kg	0.063	0.029	1	06/06/19 10:16	06/06/19 14:33	71-55-6	
1,1,2-Trichloroethane	<0.063	mg/kg	0.063	0.0075	1	06/06/19 10:16	06/06/19 14:33	79-00-5	
Trichloroethene	0.099	mg/kg	0.063	0.0097	1	06/06/19 10:16	06/06/19 14:33	79-01-6	
Trichlorofluoromethane	<0.25	mg/kg	0.25	0.11	1	06/06/19 10:16	06/06/19 14:33	75-69-4	
1,2,3-Trichloropropane	<0.25	mg/kg	0.25	0.016	1	06/06/19 10:16	06/06/19 14:33	96-18-4	
1,1,2-Trichlorotrifluoroethane	<0.25	mg/kg	0.25	0.073	1	06/06/19 10:16	06/06/19 14:33	76-13-1	
1,2,4-Trimethylbenzene	0.12	mg/kg	0.063	0.013	1	06/06/19 10:16	06/06/19 14:33	95-63-6	
1,3,5-Trimethylbenzene	<0.063	mg/kg	0.063	0.010	1	06/06/19 10:16	06/06/19 14:33	108-67-8	
Vinyl chloride	<0.025	mg/kg	0.025	0.012	1	06/06/19 10:16	06/06/19 14:33	75-01-4	
Xylene (Total)	0.52	mg/kg	0.19	0.015	1	06/06/19 10:16	06/06/19 14:33	1330-20-7	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-125		1	06/06/19 10:16	06/06/19 14:33	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1	06/06/19 10:16	06/06/19 14:33	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1	06/06/19 10:16	06/06/19 14:33	460-00-4	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-5/0-2 **Lab ID:** 10477057005 **Collected:** 05/30/19 10:15 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.083	mg/kg	0.083	0.023	2	06/03/19 14:00	06/06/19 10:30	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.083	mg/kg	0.083	0.029	2	06/03/19 14:00	06/06/19 10:30	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.083	mg/kg	0.083	0.033	2	06/03/19 14:00	06/06/19 10:30	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.083	mg/kg	0.083	0.028	2	06/03/19 14:00	06/06/19 10:30	53469-21-9	
PCB-1248 (Aroclor 1248)	<0.083	mg/kg	0.083	0.025	2	06/03/19 14:00	06/06/19 10:30	12672-29-6	
PCB-1254 (Aroclor 1254)	2.6	mg/kg	0.083	0.024	2	06/03/19 14:00	06/06/19 10:30	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.083	mg/kg	0.083	0.020	2	06/03/19 14:00	06/06/19 10:30	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.083	mg/kg	0.083	0.029	2	06/03/19 14:00	06/06/19 10:30	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.083	mg/kg	0.083	0.027	2	06/03/19 14:00	06/06/19 10:30	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	89	%	57-125		2	06/03/19 14:00	06/06/19 10:30	877-09-8	D4
Decachlorobiphenyl (S)	104	%	49-125		2	06/03/19 14:00	06/06/19 10:30	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	163	mg/kg	76.7	29.8	10	06/03/19 09:17	06/04/19 21:08		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	0	%	44-143		10	06/03/19 09:17	06/04/19 21:08	638-68-6	1M,S4
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.75; Final pH: 1.81									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:07	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	10.3	mg/kg	1.2	0.24	1	06/04/19 07:04	06/04/19 14:57	7440-38-2	
Barium	242	mg/kg	0.58	0.092	1	06/04/19 07:04	06/04/19 14:57	7440-39-3	
Cadmium	6.8	mg/kg	0.17	0.035	1	06/04/19 07:04	06/04/19 14:57	7440-43-9	
Chromium	59.5	mg/kg	0.58	0.12	1	06/04/19 07:04	06/04/19 14:57	7440-47-3	
Lead	1430	mg/kg	2.9	0.65	5	06/04/19 07:04	06/05/19 12:23	7439-92-1	
Selenium	<1.2	mg/kg	1.2	0.38	1	06/04/19 07:04	06/04/19 14:57	7782-49-2	
Silver	0.69	mg/kg	0.58	0.042	1	06/04/19 07:04	06/05/19 11:21	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.51	mg/kg	0.024	0.011	1	06/04/19 07:27	06/04/19 15:23	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	20.8	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.040	mg/kg	0.013	0.00051	1	05/31/19 09:40	06/06/19 04:15	83-32-9	
Acenaphthylene	0.022	mg/kg	0.013	0.00062	1	05/31/19 09:40	06/06/19 04:15	208-96-8	
Anthracene	0.16	mg/kg	0.013	0.00059	1	05/31/19 09:40	06/06/19 04:15	120-12-7	
Benzo(a)anthracene	0.92	mg/kg	0.063	0.0068	5	05/31/19 09:40	06/06/19 12:58	56-55-3	
Benzo(a)pyrene	0.88	mg/kg	0.063	0.0043	5	05/31/19 09:40	06/06/19 12:58	50-32-8	
Benzo(b)fluoranthene	1.3	mg/kg	0.063	0.0023	5	05/31/19 09:40	06/06/19 12:58	205-99-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-5/0-2 **Lab ID:** 10477057005 Collected: 05/30/19 10:15 Received: 05/30/19 12:35 Matrix: Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	<b>0.63</b>	mg/kg	0.063	0.0040	5	05/31/19 09:40	06/06/19 12:58	191-24-2	
Benzo(k)fluoranthene	<b>0.48</b>	mg/kg	0.063	0.0053	5	05/31/19 09:40	06/06/19 12:58	207-08-9	
Chrysene	<b>0.94</b>	mg/kg	0.063	0.0086	5	05/31/19 09:40	06/06/19 12:58	218-01-9	
Dibenz(a,h)anthracene	<b>0.19</b>	mg/kg	0.013	0.00058	1	05/31/19 09:40	06/06/19 04:15	53-70-3	
Fluoranthene	<b>1.3</b>	mg/kg	0.063	0.0027	5	05/31/19 09:40	06/06/19 12:58	206-44-0	
Fluorene	<b>0.039</b>	mg/kg	0.013	0.00039	1	05/31/19 09:40	06/06/19 04:15	86-73-7	
Indeno(1,2,3-cd)pyrene	<b>0.52</b>	mg/kg	0.063	0.0042	5	05/31/19 09:40	06/06/19 12:58	193-39-5	
Naphthalene	<b>0.18</b>	mg/kg	0.013	0.00097	1	05/31/19 09:40	06/06/19 04:15	91-20-3	
Phenanthrene	<b>0.63</b>	mg/kg	0.063	0.012	5	05/31/19 09:40	06/06/19 12:58	85-01-8	
Pyrene	<b>1.2</b>	mg/kg	0.063	0.0096	5	05/31/19 09:40	06/06/19 12:58	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	<b>1.3</b>	mg/kg	0.063	0.063	5	05/31/19 09:40	06/06/19 12:58		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	80	%.	30-125		1	05/31/19 09:40	06/06/19 04:15	321-60-8	
p-Terphenyl-d14 (S)	82	%.	30-125		1	05/31/19 09:40	06/06/19 04:15	1718-51-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-6/0-2 **Lab ID:** 10477057006 **Collected:** 05/30/19 10:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.041	mg/kg	0.041	0.011	1	05/30/19 18:52	06/01/19 05:54	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.041	mg/kg	0.041	0.014	1	05/30/19 18:52	06/01/19 05:54	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.041	mg/kg	0.041	0.016	1	05/30/19 18:52	06/01/19 05:54	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.041	mg/kg	0.041	0.014	1	05/30/19 18:52	06/01/19 05:54	53469-21-9	
PCB-1248 (Aroclor 1248)	0.22	mg/kg	0.041	0.012	1	05/30/19 18:52	06/01/19 05:54	12672-29-6	
PCB-1254 (Aroclor 1254)	0.18	mg/kg	0.041	0.012	1	05/30/19 18:52	06/01/19 05:54	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.041	mg/kg	0.041	0.0098	1	05/30/19 18:52	06/01/19 05:54	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.041	mg/kg	0.041	0.014	1	05/30/19 18:52	06/01/19 05:54	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.041	mg/kg	0.041	0.013	1	05/30/19 18:52	06/01/19 05:54	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	67	%	57-125		1	05/30/19 18:52	06/01/19 05:54	877-09-8	
Decachlorobiphenyl (S)	57	%	49-125		1	05/30/19 18:52	06/01/19 05:54	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	106	mg/kg	35.4	13.8	5	06/03/19 09:17	06/04/19 21:14		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	88	%	44-143		5	06/03/19 09:17	06/04/19 21:14	638-68-6	1M
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.79; Final pH: 1.75									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:10	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	5.9	mg/kg	1.2	0.24	1	06/04/19 07:04	06/04/19 15:00	7440-38-2	
Barium	138	mg/kg	0.59	0.094	1	06/04/19 07:04	06/04/19 15:00	7440-39-3	
Cadmium	5.4	mg/kg	0.18	0.036	1	06/04/19 07:04	06/04/19 15:00	7440-43-9	
Chromium	43.9	mg/kg	0.59	0.12	1	06/04/19 07:04	06/04/19 15:00	7440-47-3	
Lead	261	mg/kg	0.59	0.13	1	06/04/19 07:04	06/04/19 15:00	7439-92-1	
Selenium	<1.2	mg/kg	1.2	0.39	1	06/04/19 07:04	06/04/19 15:00	7782-49-2	
Silver	0.82	mg/kg	0.59	0.043	1	06/04/19 07:04	06/05/19 11:24	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.25	mg/kg	0.023	0.010	1	06/04/19 07:27	06/04/19 15:25	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	19.7	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.062	mg/kg	0.062	0.0025	5	05/31/19 09:40	06/06/19 13:19	83-32-9	
Acenaphthylene	0.080	mg/kg	0.062	0.0031	5	05/31/19 09:40	06/06/19 13:19	208-96-8	
Anthracene	0.098	mg/kg	0.062	0.0029	5	05/31/19 09:40	06/06/19 13:19	120-12-7	
Benzo(a)anthracene	0.44	mg/kg	0.062	0.0067	5	05/31/19 09:40	06/06/19 13:19	56-55-3	
Benzo(a)pyrene	0.47	mg/kg	0.062	0.0043	5	05/31/19 09:40	06/06/19 13:19	50-32-8	
Benzo(b)fluoranthene	0.75	mg/kg	0.062	0.0023	5	05/31/19 09:40	06/06/19 13:19	205-99-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-6/0-2 **Lab ID:** 10477057006 **Collected:** 05/30/19 10:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	0.43	mg/kg	0.062	0.0039	5	05/31/19 09:40	06/06/19 13:19	191-24-2	
Benzo(k)fluoranthene	0.26	mg/kg	0.062	0.0053	5	05/31/19 09:40	06/06/19 13:19	207-08-9	
Chrysene	0.51	mg/kg	0.062	0.0085	5	05/31/19 09:40	06/06/19 13:19	218-01-9	
Dibenz(a,h)anthracene	0.15	mg/kg	0.062	0.0029	5	05/31/19 09:40	06/06/19 13:19	53-70-3	
Fluoranthene	0.70	mg/kg	0.062	0.0027	5	05/31/19 09:40	06/06/19 13:19	206-44-0	
Fluorene	<0.062	mg/kg	0.062	0.0019	5	05/31/19 09:40	06/06/19 13:19	86-73-7	
Indeno(1,2,3-cd)pyrene	0.34	mg/kg	0.062	0.0042	5	05/31/19 09:40	06/06/19 13:19	193-39-5	
Naphthalene	0.14	mg/kg	0.062	0.0048	5	05/31/19 09:40	06/06/19 13:19	91-20-3	
Phenanthrene	0.39	mg/kg	0.062	0.012	5	05/31/19 09:40	06/06/19 13:19	85-01-8	
Pyrene	0.67	mg/kg	0.062	0.0095	5	05/31/19 09:40	06/06/19 13:19	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	0.74	mg/kg	0.062	0.062	5	05/31/19 09:40	06/06/19 13:19		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	78	%.	30-125		5	05/31/19 09:40	06/06/19 13:19	321-60-8	D4
p-Terphenyl-d14 (S)	82	%.	30-125		5	05/31/19 09:40	06/06/19 13:19	1718-51-0	

### 8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<1.7	mg/kg	1.7	0.53	1	06/06/19 10:16	06/06/19 14:51	67-64-1	
Allyl chloride	<0.34	mg/kg	0.34	0.071	1	06/06/19 10:16	06/06/19 14:51	107-05-1	
Benzene	<0.034	mg/kg	0.034	0.0048	1	06/06/19 10:16	06/06/19 14:51	71-43-2	
Bromobenzene	<0.085	mg/kg	0.085	0.0052	1	06/06/19 10:16	06/06/19 14:51	108-86-1	
Bromochloromethane	<0.085	mg/kg	0.085	0.029	1	06/06/19 10:16	06/06/19 14:51	74-97-5	
Bromodichloromethane	<0.085	mg/kg	0.085	0.029	1	06/06/19 10:16	06/06/19 14:51	75-27-4	
Bromoform	<0.34	mg/kg	0.34	0.13	1	06/06/19 10:16	06/06/19 14:51	75-25-2	
Bromomethane	<0.85	mg/kg	0.85	0.10	1	06/06/19 10:16	06/06/19 14:51	74-83-9	
2-Butanone (MEK)	<0.43	mg/kg	0.43	0.045	1	06/06/19 10:16	06/06/19 14:51	78-93-3	
n-Butylbenzene	<0.085	mg/kg	0.085	0.041	1	06/06/19 10:16	06/06/19 14:51	104-51-8	
sec-Butylbenzene	<0.085	mg/kg	0.085	0.016	1	06/06/19 10:16	06/06/19 14:51	135-98-8	
tert-Butylbenzene	<0.085	mg/kg	0.085	0.016	1	06/06/19 10:16	06/06/19 14:51	98-06-6	
Carbon tetrachloride	<0.085	mg/kg	0.085	0.041	1	06/06/19 10:16	06/06/19 14:51	56-23-5	
Chlorobenzene	<0.085	mg/kg	0.085	0.0048	1	06/06/19 10:16	06/06/19 14:51	108-90-7	
Chloroethane	<0.85	mg/kg	0.85	0.044	1	06/06/19 10:16	06/06/19 14:51	75-00-3	
Chloroform	<0.085	mg/kg	0.085	0.043	1	06/06/19 10:16	06/06/19 14:51	67-66-3	
Chloromethane	<0.34	mg/kg	0.34	0.020	1	06/06/19 10:16	06/06/19 14:51	74-87-3	
2-Chlorotoluene	<0.085	mg/kg	0.085	0.0042	1	06/06/19 10:16	06/06/19 14:51	95-49-8	
4-Chlorotoluene	<0.085	mg/kg	0.085	0.0044	1	06/06/19 10:16	06/06/19 14:51	106-43-4	
1,2-Dibromo-3-chloropropane	<0.85	mg/kg	0.85	0.30	1	06/06/19 10:16	06/06/19 14:51	96-12-8	
Dibromochloromethane	<0.34	mg/kg	0.34	0.0099	1	06/06/19 10:16	06/06/19 14:51	124-48-1	
1,2-Dibromoethane (EDB)	<0.085	mg/kg	0.085	0.0090	1	06/06/19 10:16	06/06/19 14:51	106-93-4	
Dibromomethane	<0.085	mg/kg	0.085	0.016	1	06/06/19 10:16	06/06/19 14:51	74-95-3	
1,2-Dichlorobenzene	<0.085	mg/kg	0.085	0.0034	1	06/06/19 10:16	06/06/19 14:51	95-50-1	
1,3-Dichlorobenzene	<0.085	mg/kg	0.085	0.0031	1	06/06/19 10:16	06/06/19 14:51	541-73-1	
1,4-Dichlorobenzene	<0.085	mg/kg	0.085	0.0053	1	06/06/19 10:16	06/06/19 14:51	106-46-7	
Dichlorodifluoromethane	<0.34	mg/kg	0.34	0.028	1	06/06/19 10:16	06/06/19 14:51	75-71-8	
1,1-Dichloroethane	<0.085	mg/kg	0.085	0.0096	1	06/06/19 10:16	06/06/19 14:51	75-34-3	
1,2-Dichloroethane	<0.085	mg/kg	0.085	0.0094	1	06/06/19 10:16	06/06/19 14:51	107-06-2	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-6/0-2 **Lab ID:** 10477057006 **Collected:** 05/30/19 10:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b> Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1-Dichloroethene	<0.085	mg/kg	0.085	0.026	1	06/06/19 10:16	06/06/19 14:51	75-35-4	
cis-1,2-Dichloroethene	<0.085	mg/kg	0.085	0.014	1	06/06/19 10:16	06/06/19 14:51	156-59-2	
trans-1,2-Dichloroethene	<0.085	mg/kg	0.085	0.040	1	06/06/19 10:16	06/06/19 14:51	156-60-5	
Dichlorofluoromethane	<0.85	mg/kg	0.85	0.12	1	06/06/19 10:16	06/06/19 14:51	75-43-4	N2
1,2-Dichloropropane	<0.085	mg/kg	0.085	0.015	1	06/06/19 10:16	06/06/19 14:51	78-87-5	
1,3-Dichloropropane	<0.085	mg/kg	0.085	0.012	1	06/06/19 10:16	06/06/19 14:51	142-28-9	
2,2-Dichloropropane	<0.34	mg/kg	0.34	0.011	1	06/06/19 10:16	06/06/19 14:51	594-20-7	
1,1-Dichloropropene	<0.085	mg/kg	0.085	0.039	1	06/06/19 10:16	06/06/19 14:51	563-58-6	
cis-1,3-Dichloropropene	<0.085	mg/kg	0.085	0.012	1	06/06/19 10:16	06/06/19 14:51	10061-01-5	
trans-1,3-Dichloropropene	<0.085	mg/kg	0.085	0.012	1	06/06/19 10:16	06/06/19 14:51	10061-02-6	
Diethyl ether (Ethyl ether)	<0.34	mg/kg	0.34	0.052	1	06/06/19 10:16	06/06/19 14:51	60-29-7	
Ethylbenzene	0.39	mg/kg	0.085	0.0046	1	06/06/19 10:16	06/06/19 14:51	100-41-4	
Hexachloro-1,3-butadiene	<0.43	mg/kg	0.43	0.021	1	06/06/19 10:16	06/06/19 14:51	87-68-3	
Isopropylbenzene (Cumene)	<0.085	mg/kg	0.085	0.0038	1	06/06/19 10:16	06/06/19 14:51	98-82-8	
p-Isopropyltoluene	<0.085	mg/kg	0.085	0.026	1	06/06/19 10:16	06/06/19 14:51	99-87-6	
Methylene Chloride	<0.34	mg/kg	0.34	0.16	1	06/06/19 10:16	06/06/19 14:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	<0.43	mg/kg	0.43	0.018	1	06/06/19 10:16	06/06/19 14:51	108-10-1	
Methyl-tert-butyl ether	<0.085	mg/kg	0.085	0.010	1	06/06/19 10:16	06/06/19 14:51	1634-04-4	
Naphthalene	<0.34	mg/kg	0.34	0.080	1	06/06/19 10:16	06/06/19 14:51	91-20-3	
n-Propylbenzene	<0.085	mg/kg	0.085	0.0045	1	06/06/19 10:16	06/06/19 14:51	103-65-1	
Styrene	<0.085	mg/kg	0.085	0.0039	1	06/06/19 10:16	06/06/19 14:51	100-42-5	
1,1,1,2-Tetrachloroethane	<0.085	mg/kg	0.085	0.027	1	06/06/19 10:16	06/06/19 14:51	630-20-6	
1,1,2,2-Tetrachloroethane	<0.085	mg/kg	0.085	0.015	1	06/06/19 10:16	06/06/19 14:51	79-34-5	
Tetrachloroethene	<0.085	mg/kg	0.085	0.030	1	06/06/19 10:16	06/06/19 14:51	127-18-4	
Tetrahydrofuran	<3.4	mg/kg	3.4	0.12	1	06/06/19 10:16	06/06/19 14:51	109-99-9	
Toluene	0.59	mg/kg	0.085	0.021	1	06/06/19 10:16	06/06/19 14:51	108-88-3	
1,2,3-Trichlorobenzene	<0.085	mg/kg	0.085	0.014	1	06/06/19 10:16	06/06/19 14:51	87-61-6	
1,2,4-Trichlorobenzene	<0.085	mg/kg	0.085	0.019	1	06/06/19 10:16	06/06/19 14:51	120-82-1	
1,1,1-Trichloroethane	<0.085	mg/kg	0.085	0.040	1	06/06/19 10:16	06/06/19 14:51	71-55-6	
1,1,2-Trichloroethane	<0.085	mg/kg	0.085	0.010	1	06/06/19 10:16	06/06/19 14:51	79-00-5	
Trichloroethene	0.090	mg/kg	0.085	0.013	1	06/06/19 10:16	06/06/19 14:51	79-01-6	
Trichlorofluoromethane	<0.34	mg/kg	0.34	0.15	1	06/06/19 10:16	06/06/19 14:51	75-69-4	
1,2,3-Trichloropropane	<0.34	mg/kg	0.34	0.022	1	06/06/19 10:16	06/06/19 14:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	<0.34	mg/kg	0.34	0.099	1	06/06/19 10:16	06/06/19 14:51	76-13-1	
1,2,4-Trimethylbenzene	0.18	mg/kg	0.085	0.017	1	06/06/19 10:16	06/06/19 14:51	95-63-6	
1,3,5-Trimethylbenzene	0.085	mg/kg	0.085	0.014	1	06/06/19 10:16	06/06/19 14:51	108-67-8	
Vinyl chloride	<0.034	mg/kg	0.034	0.017	1	06/06/19 10:16	06/06/19 14:51	75-01-4	
Xylene (Total)	1.3	mg/kg	0.26	0.020	1	06/06/19 10:16	06/06/19 14:51	1330-20-7	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-125		1	06/06/19 10:16	06/06/19 14:51	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1	06/06/19 10:16	06/06/19 14:51	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1	06/06/19 10:16	06/06/19 14:51	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-7/2-4 **Lab ID:** 10477057007 **Collected:** 05/30/19 11:30 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.047	mg/kg	0.047	0.013	1	05/30/19 18:52	06/01/19 05:23	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.047	mg/kg	0.047	0.017	1	05/30/19 18:52	06/01/19 05:23	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.047	mg/kg	0.047	0.019	1	05/30/19 18:52	06/01/19 05:23	11141-16-5	
PCB-1242 (Aroclor 1242)	2.9	mg/kg	0.094	0.032	2	05/30/19 18:52	06/03/19 12:48	53469-21-9	
PCB-1248 (Aroclor 1248)	<0.047	mg/kg	0.047	0.014	1	05/30/19 18:52	06/01/19 05:23	12672-29-6	
PCB-1254 (Aroclor 1254)	0.57	mg/kg	0.047	0.014	1	05/30/19 18:52	06/01/19 05:23	11097-69-1	
PCB-1260 (Aroclor 1260)	<0.047	mg/kg	0.047	0.011	1	05/30/19 18:52	06/01/19 05:23	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.047	mg/kg	0.047	0.016	1	05/30/19 18:52	06/01/19 05:23	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.047	mg/kg	0.047	0.015	1	05/30/19 18:52	06/01/19 05:23	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	66	%	57-125		1	05/30/19 18:52	06/01/19 05:23	877-09-8	
Decachlorobiphenyl (S)	63	%	49-125		1	05/30/19 18:52	06/01/19 05:23	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	1660	mg/kg	410	159	50	06/03/19 09:17	06/05/19 09:30		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	0	%	44-143		50	06/03/19 09:17	06/05/19 09:30	638-68-6	1M,S4
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 8.81; Final pH: 2.21									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:19	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	7.1	mg/kg	1.3	0.27	1	06/04/19 07:04	06/04/19 15:03	7440-38-2	
Barium	191	mg/kg	0.67	0.11	1	06/04/19 07:04	06/04/19 15:03	7440-39-3	
Cadmium	2.1	mg/kg	0.20	0.040	1	06/04/19 07:04	06/04/19 15:03	7440-43-9	
Chromium	61.2	mg/kg	0.67	0.13	1	06/04/19 07:04	06/04/19 15:03	7440-47-3	
Lead	268	mg/kg	0.67	0.15	1	06/04/19 07:04	06/04/19 15:03	7439-92-1	
Selenium	<1.3	mg/kg	1.3	0.44	1	06/04/19 07:04	06/04/19 15:03	7782-49-2	
Silver	2.0	mg/kg	0.67	0.049	1	06/04/19 07:04	06/05/19 11:27	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.16	mg/kg	0.027	0.012	1	06/04/19 07:27	06/04/19 15:27	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	30.3	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	0.081	mg/kg	0.014	0.00059	1	05/31/19 09:40	06/06/19 13:40	83-32-9	
Acenaphthylene	0.027	mg/kg	0.014	0.00071	1	05/31/19 09:40	06/06/19 13:40	208-96-8	
Anthracene	0.055	mg/kg	0.014	0.00067	1	05/31/19 09:40	06/06/19 13:40	120-12-7	
Benzo(a)anthracene	0.17	mg/kg	0.014	0.0015	1	05/31/19 09:40	06/06/19 13:40	56-55-3	
Benzo(a)pyrene	0.22	mg/kg	0.014	0.00098	1	05/31/19 09:40	06/06/19 13:40	50-32-8	
Benzo(b)fluoranthene	0.32	mg/kg	0.014	0.00053	1	05/31/19 09:40	06/06/19 13:40	205-99-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-7/2-4 **Lab ID:** 10477057007 **Collected:** 05/30/19 11:30 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	0.21	mg/kg	0.014	0.00091	1	05/31/19 09:40	06/06/19 13:40	191-24-2	
Benzo(k)fluoranthene	0.11	mg/kg	0.014	0.0012	1	05/31/19 09:40	06/06/19 13:40	207-08-9	
Chrysene	0.26	mg/kg	0.014	0.0019	1	05/31/19 09:40	06/06/19 13:40	218-01-9	
Dibenz(a,h)anthracene	0.058	mg/kg	0.014	0.00066	1	05/31/19 09:40	06/06/19 13:40	53-70-3	
Fluoranthene	0.29	mg/kg	0.014	0.00061	1	05/31/19 09:40	06/06/19 13:40	206-44-0	
Fluorene	0.11	mg/kg	0.014	0.00045	1	05/31/19 09:40	06/06/19 13:40	86-73-7	
Indeno(1,2,3-cd)pyrene	0.16	mg/kg	0.014	0.00096	1	05/31/19 09:40	06/06/19 13:40	193-39-5	
Naphthalene	0.44	mg/kg	0.014	0.0011	1	05/31/19 09:40	06/06/19 13:40	91-20-3	
Phenanthrene	0.38	mg/kg	0.014	0.0027	1	05/31/19 09:40	06/06/19 13:40	85-01-8	
Pyrene	0.35	mg/kg	0.014	0.0022	1	05/31/19 09:40	06/06/19 13:40	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	0.33	mg/kg	0.014	0.014	1	05/31/19 09:40	06/06/19 13:40		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	77	%.	30-125		1	05/31/19 09:40	06/06/19 13:40	321-60-8	
p-Terphenyl-d14 (S)	73	%.	30-125		1	05/31/19 09:40	06/06/19 13:40	1718-51-0	

### 8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<1.7	mg/kg	1.7	0.54	1	06/06/19 10:16	06/06/19 19:22	67-64-1	
Allyl chloride	<0.35	mg/kg	0.35	0.073	1	06/06/19 10:16	06/06/19 19:22	107-05-1	
Benzene	0.14	mg/kg	0.035	0.0049	1	06/06/19 10:16	06/06/19 19:22	71-43-2	
Bromobenzene	<0.087	mg/kg	0.087	0.0054	1	06/06/19 10:16	06/06/19 19:22	108-86-1	
Bromochloromethane	<0.087	mg/kg	0.087	0.030	1	06/06/19 10:16	06/06/19 19:22	74-97-5	
Bromodichloromethane	<0.087	mg/kg	0.087	0.030	1	06/06/19 10:16	06/06/19 19:22	75-27-4	
Bromoform	<0.35	mg/kg	0.35	0.13	1	06/06/19 10:16	06/06/19 19:22	75-25-2	
Bromomethane	<0.87	mg/kg	0.87	0.10	1	06/06/19 10:16	06/06/19 19:22	74-83-9	
2-Butanone (MEK)	<0.44	mg/kg	0.44	0.046	1	06/06/19 10:16	06/06/19 19:22	78-93-3	
n-Butylbenzene	0.43	mg/kg	0.087	0.042	1	06/06/19 10:16	06/06/19 19:22	104-51-8	
sec-Butylbenzene	0.29	mg/kg	0.087	0.017	1	06/06/19 10:16	06/06/19 19:22	135-98-8	
tert-Butylbenzene	<0.087	mg/kg	0.087	0.017	1	06/06/19 10:16	06/06/19 19:22	98-06-6	
Carbon tetrachloride	<0.087	mg/kg	0.087	0.042	1	06/06/19 10:16	06/06/19 19:22	56-23-5	
Chlorobenzene	<0.087	mg/kg	0.087	0.0049	1	06/06/19 10:16	06/06/19 19:22	108-90-7	
Chloroethane	<0.87	mg/kg	0.87	0.045	1	06/06/19 10:16	06/06/19 19:22	75-00-3	
Chloroform	<0.087	mg/kg	0.087	0.044	1	06/06/19 10:16	06/06/19 19:22	67-66-3	
Chloromethane	<0.35	mg/kg	0.35	0.021	1	06/06/19 10:16	06/06/19 19:22	74-87-3	
2-Chlorotoluene	<0.087	mg/kg	0.087	0.0043	1	06/06/19 10:16	06/06/19 19:22	95-49-8	
4-Chlorotoluene	<0.087	mg/kg	0.087	0.0045	1	06/06/19 10:16	06/06/19 19:22	106-43-4	
1,2-Dibromo-3-chloropropane	<0.87	mg/kg	0.87	0.30	1	06/06/19 10:16	06/06/19 19:22	96-12-8	
Dibromochloromethane	<0.35	mg/kg	0.35	0.010	1	06/06/19 10:16	06/06/19 19:22	124-48-1	
1,2-Dibromoethane (EDB)	<0.087	mg/kg	0.087	0.0092	1	06/06/19 10:16	06/06/19 19:22	106-93-4	
Dibromomethane	<0.087	mg/kg	0.087	0.016	1	06/06/19 10:16	06/06/19 19:22	74-95-3	
1,2-Dichlorobenzene	0.090	mg/kg	0.087	0.0035	1	06/06/19 10:16	06/06/19 19:22	95-50-1	
1,3-Dichlorobenzene	<0.087	mg/kg	0.087	0.0032	1	06/06/19 10:16	06/06/19 19:22	541-73-1	
1,4-Dichlorobenzene	<0.087	mg/kg	0.087	0.0054	1	06/06/19 10:16	06/06/19 19:22	106-46-7	
Dichlorodifluoromethane	<0.35	mg/kg	0.35	0.028	1	06/06/19 10:16	06/06/19 19:22	75-71-8	
1,1-Dichloroethane	<0.087	mg/kg	0.087	0.0098	1	06/06/19 10:16	06/06/19 19:22	75-34-3	
1,2-Dichloroethane	<0.087	mg/kg	0.087	0.0096	1	06/06/19 10:16	06/06/19 19:22	107-06-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-7/2-4 **Lab ID:** 10477057007 **Collected:** 05/30/19 11:30 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b> Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1-Dichloroethene	<0.087	mg/kg	0.087	0.026	1	06/06/19 10:16	06/06/19 19:22	75-35-4	
cis-1,2-Dichloroethene	<0.087	mg/kg	0.087	0.014	1	06/06/19 10:16	06/06/19 19:22	156-59-2	
trans-1,2-Dichloroethene	<0.087	mg/kg	0.087	0.041	1	06/06/19 10:16	06/06/19 19:22	156-60-5	
Dichlorofluoromethane	<0.87	mg/kg	0.87	0.12	1	06/06/19 10:16	06/06/19 19:22	75-43-4	N2
1,2-Dichloropropane	<0.087	mg/kg	0.087	0.015	1	06/06/19 10:16	06/06/19 19:22	78-87-5	
1,3-Dichloropropane	<0.087	mg/kg	0.087	0.012	1	06/06/19 10:16	06/06/19 19:22	142-28-9	
2,2-Dichloropropane	<0.35	mg/kg	0.35	0.011	1	06/06/19 10:16	06/06/19 19:22	594-20-7	
1,1-Dichloropropene	<0.087	mg/kg	0.087	0.040	1	06/06/19 10:16	06/06/19 19:22	563-58-6	
cis-1,3-Dichloropropene	<0.087	mg/kg	0.087	0.013	1	06/06/19 10:16	06/06/19 19:22	10061-01-5	
trans-1,3-Dichloropropene	<0.087	mg/kg	0.087	0.012	1	06/06/19 10:16	06/06/19 19:22	10061-02-6	
Diethyl ether (Ethyl ether)	<0.35	mg/kg	0.35	0.053	1	06/06/19 10:16	06/06/19 19:22	60-29-7	
Ethylbenzene	2.6	mg/kg	0.087	0.0048	1	06/06/19 10:16	06/06/19 19:22	100-41-4	
Hexachloro-1,3-butadiene	<0.44	mg/kg	0.44	0.021	1	06/06/19 10:16	06/06/19 19:22	87-68-3	
Isopropylbenzene (Cumene)	0.16	mg/kg	0.087	0.0039	1	06/06/19 10:16	06/06/19 19:22	98-82-8	
p-Isopropyltoluene	0.17	mg/kg	0.087	0.027	1	06/06/19 10:16	06/06/19 19:22	99-87-6	
Methylene Chloride	<0.35	mg/kg	0.35	0.16	1	06/06/19 10:16	06/06/19 19:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	<0.44	mg/kg	0.44	0.018	1	06/06/19 10:16	06/06/19 19:22	108-10-1	
Methyl-tert-butyl ether	<0.087	mg/kg	0.087	0.010	1	06/06/19 10:16	06/06/19 19:22	1634-04-4	
Naphthalene	0.61	mg/kg	0.35	0.082	1	06/06/19 10:16	06/06/19 19:22	91-20-3	
n-Propylbenzene	0.51	mg/kg	0.087	0.0047	1	06/06/19 10:16	06/06/19 19:22	103-65-1	
Styrene	<0.087	mg/kg	0.087	0.0040	1	06/06/19 10:16	06/06/19 19:22	100-42-5	
1,1,1,2-Tetrachloroethane	<0.087	mg/kg	0.087	0.027	1	06/06/19 10:16	06/06/19 19:22	630-20-6	
1,1,2,2-Tetrachloroethane	<0.087	mg/kg	0.087	0.015	1	06/06/19 10:16	06/06/19 19:22	79-34-5	
Tetrachloroethene	<0.087	mg/kg	0.087	0.031	1	06/06/19 10:16	06/06/19 19:22	127-18-4	
Tetrahydrofuran	<3.5	mg/kg	3.5	0.13	1	06/06/19 10:16	06/06/19 19:22	109-99-9	
Toluene	0.73	mg/kg	0.087	0.021	1	06/06/19 10:16	06/06/19 19:22	108-88-3	
1,2,3-Trichlorobenzene	<0.087	mg/kg	0.087	0.014	1	06/06/19 10:16	06/06/19 19:22	87-61-6	
1,2,4-Trichlorobenzene	<0.087	mg/kg	0.087	0.019	1	06/06/19 10:16	06/06/19 19:22	120-82-1	
1,1,1-Trichloroethane	<0.087	mg/kg	0.087	0.041	1	06/06/19 10:16	06/06/19 19:22	71-55-6	
1,1,2-Trichloroethane	<0.087	mg/kg	0.087	0.010	1	06/06/19 10:16	06/06/19 19:22	79-00-5	
Trichloroethene	0.10	mg/kg	0.087	0.013	1	06/06/19 10:16	06/06/19 19:22	79-01-6	
Trichlorofluoromethane	<0.35	mg/kg	0.35	0.15	1	06/06/19 10:16	06/06/19 19:22	75-69-4	
1,2,3-Trichloropropane	<0.35	mg/kg	0.35	0.023	1	06/06/19 10:16	06/06/19 19:22	96-18-4	
1,1,2-Trichlorotrifluoroethane	<0.35	mg/kg	0.35	0.10	1	06/06/19 10:16	06/06/19 19:22	76-13-1	
1,2,4-Trimethylbenzene	1.6	mg/kg	0.087	0.017	1	06/06/19 10:16	06/06/19 19:22	95-63-6	
1,3,5-Trimethylbenzene	0.36	mg/kg	0.087	0.014	1	06/06/19 10:16	06/06/19 19:22	108-67-8	
Vinyl chloride	<0.035	mg/kg	0.035	0.017	1	06/06/19 10:16	06/06/19 19:22	75-01-4	
Xylene (Total)	3.4	mg/kg	0.26	0.020	1	06/06/19 10:16	06/06/19 19:22	1330-20-7	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-125		1	06/06/19 10:16	06/06/19 19:22	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1	06/06/19 10:16	06/06/19 19:22	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1	06/06/19 10:16	06/06/19 19:22	460-00-4	

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

**Sample:** LTT-8/0-2 **Lab ID:** 10477057008 **Collected:** 05/30/19 11:45 **Received:** 05/30/19 12:35 **Matrix:** Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082A GCS PCB</b> Analytical Method: EPA 8082A Preparation Method: EPA 3550									
PCB-1016 (Aroclor 1016)	<0.044	mg/kg	0.044	0.012	1	05/30/19 18:52	06/01/19 06:09	12674-11-2	
PCB-1221 (Aroclor 1221)	<0.044	mg/kg	0.044	0.015	1	05/30/19 18:52	06/01/19 06:09	11104-28-2	
PCB-1232 (Aroclor 1232)	<0.044	mg/kg	0.044	0.018	1	05/30/19 18:52	06/01/19 06:09	11141-16-5	
PCB-1242 (Aroclor 1242)	<0.044	mg/kg	0.044	0.015	1	05/30/19 18:52	06/01/19 06:09	53469-21-9	
PCB-1248 (Aroclor 1248)	0.28	mg/kg	0.044	0.013	1	05/30/19 18:52	06/01/19 06:09	12672-29-6	
PCB-1254 (Aroclor 1254)	<0.044	mg/kg	0.044	0.013	1	05/30/19 18:52	06/01/19 06:09	11097-69-1	
PCB-1260 (Aroclor 1260)	0.39	mg/kg	0.044	0.011	1	05/30/19 18:52	06/01/19 06:09	11096-82-5	
PCB-1262 (Aroclor 1262)	<0.044	mg/kg	0.044	0.015	1	05/30/19 18:52	06/01/19 06:09	37324-23-5	
PCB-1268 (Aroclor 1268)	<0.044	mg/kg	0.044	0.014	1	05/30/19 18:52	06/01/19 06:09	11100-14-4	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	75	%	57-125		1	05/30/19 18:52	06/01/19 06:09	877-09-8	
Decachlorobiphenyl (S)	65	%	49-125		1	05/30/19 18:52	06/01/19 06:09	2051-24-3	
<b>WIDRO GCS Silica Gel</b> Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	89.2	mg/kg	6.9	2.7	1	06/03/19 09:17	06/05/19 08:31		T6,T7
<b>Surrogates</b>									
n-Triacontane (S)	73	%	44-143		1	06/03/19 09:17	06/05/19 08:31	638-68-6	2M
<b>6010D MET ICP, TCLP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 06/12/19 17:11 Initial pH: 6.5; Final pH: 1.79									
Lead	<0.10	mg/L	0.10	0.0020	1	06/13/19 11:50	06/14/19 12:22	7439-92-1	
<b>6010D MET ICP</b> Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Arsenic	5.4	mg/kg	1.3	0.26	1	06/04/19 07:04	06/04/19 15:06	7440-38-2	
Barium	98.5	mg/kg	0.63	0.099	1	06/04/19 07:04	06/04/19 15:06	7440-39-3	
Cadmium	1.1	mg/kg	0.19	0.038	1	06/04/19 07:04	06/04/19 15:06	7440-43-9	
Chromium	75.1	mg/kg	0.63	0.13	1	06/04/19 07:04	06/04/19 15:06	7440-47-3	
Lead	173	mg/kg	0.63	0.14	1	06/04/19 07:04	06/04/19 15:06	7439-92-1	
Selenium	<1.3	mg/kg	1.3	0.41	1	06/04/19 07:04	06/04/19 15:06	7782-49-2	
Silver	0.66	mg/kg	0.63	0.045	1	06/04/19 07:04	06/05/19 11:30	7440-22-4	
<b>7471B Mercury</b> Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.20	mg/kg	0.027	0.012	1	06/04/19 07:27	06/04/19 15:29	7439-97-6	
<b>Dry Weight / %M by ASTM D2974</b> Analytical Method: ASTM D2974									
Percent Moisture	25.4	%	0.10	0.10	1		06/05/19 17:36		
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.027	mg/kg	0.027	0.0011	2	05/31/19 09:40	06/06/19 14:01	83-32-9	
Acenaphthylene	<0.027	mg/kg	0.027	0.0013	2	05/31/19 09:40	06/06/19 14:01	208-96-8	
Anthracene	0.073	mg/kg	0.027	0.0013	2	05/31/19 09:40	06/06/19 14:01	120-12-7	
Benzo(a)anthracene	0.29	mg/kg	0.027	0.0029	2	05/31/19 09:40	06/06/19 14:01	56-55-3	
Benzo(a)pyrene	0.35	mg/kg	0.027	0.0018	2	05/31/19 09:40	06/06/19 14:01	50-32-8	
Benzo(b)fluoranthene	0.47	mg/kg	0.027	0.0010	2	05/31/19 09:40	06/06/19 14:01	205-99-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

**Sample:** LTT-8/0-2 **Lab ID:** 10477057008 Collected: 05/30/19 11:45 Received: 05/30/19 12:35 Matrix: Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV PAH by SIM</b> Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(g,h,i)perylene	0.30	mg/kg	0.027	0.0017	2	05/31/19 09:40	06/06/19 14:01	191-24-2	
Benzo(k)fluoranthene	0.20	mg/kg	0.027	0.0023	2	05/31/19 09:40	06/06/19 14:01	207-08-9	
Chrysene	0.35	mg/kg	0.027	0.0036	2	05/31/19 09:40	06/06/19 14:01	218-01-9	
Dibenz(a,h)anthracene	0.090	mg/kg	0.027	0.0012	2	05/31/19 09:40	06/06/19 14:01	53-70-3	
Fluoranthene	0.43	mg/kg	0.027	0.0011	2	05/31/19 09:40	06/06/19 14:01	206-44-0	
Fluorene	<0.027	mg/kg	0.027	0.00084	2	05/31/19 09:40	06/06/19 14:01	86-73-7	
Indeno(1,2,3-cd)pyrene	0.23	mg/kg	0.027	0.0018	2	05/31/19 09:40	06/06/19 14:01	193-39-5	
Naphthalene	0.14	mg/kg	0.027	0.0021	2	05/31/19 09:40	06/06/19 14:01	91-20-3	
Phenanthrene	0.36	mg/kg	0.027	0.0051	2	05/31/19 09:40	06/06/19 14:01	85-01-8	
Pyrene	0.40	mg/kg	0.027	0.0041	2	05/31/19 09:40	06/06/19 14:01	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	0.52	mg/kg	0.027	0.027	2	05/31/19 09:40	06/06/19 14:01		
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	79	%.	30-125		2	05/31/19 09:40	06/06/19 14:01	321-60-8	D4
p-Terphenyl-d14 (S)	84	%.	30-125		2	05/31/19 09:40	06/06/19 14:01	1718-51-0	

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch: 609930 Analysis Method: EPA 7471B  
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

METHOD BLANK: 3296349 Matrix: Solid  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	0.0084	06/04/19 14:35	

LABORATORY CONTROL SAMPLE: 3296350

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.5	0.52	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3296351 3296352

Parameter	Units	10476849001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.13	0.56	0.53	0.76	0.76	112	119	80-120	0	20	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch:	612635	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010	Analysis Description:	6010D TCLP
Associated Lab Samples:	10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008		

METHOD BLANK: 3310048 Matrix: Water  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lead	mg/L	<0.10	0.10	0.0020	06/14/19 11:29	

METHOD BLANK: 3308326 Matrix: Water  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lead	mg/L	<0.10	0.10	0.0020	06/14/19 11:32	

LABORATORY CONTROL SAMPLE: 3310049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/L	1	0.98	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3310050 3310051

Parameter	Units	10477057001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/L	<0.10	1	1	1.0	1.0	95	96	75-125	0	20	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch:	609891	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3050	Analysis Description:	6010D Solids
Associated Lab Samples:	10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008		

METHOD BLANK:	3296192	Matrix:	Solid
Associated Lab Samples:	10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.99	0.99	0.20	06/04/19 13:41	
Barium	mg/kg	<0.50	0.50	0.078	06/04/19 13:41	
Cadmium	mg/kg	<0.15	0.15	0.030	06/04/19 13:41	
Chromium	mg/kg	<0.50	0.50	0.099	06/04/19 13:41	
Lead	mg/kg	<0.50	0.50	0.11	06/04/19 13:41	
Selenium	mg/kg	<0.99	0.99	0.32	06/04/19 13:41	
Silver	mg/kg	<0.50	0.50	0.036	06/04/19 13:41	

LABORATORY CONTROL SAMPLE: 3296193

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	46.3	41.8	90	80-120	
Barium	mg/kg	46.3	44.6	96	80-120	
Cadmium	mg/kg	46.3	42.3	91	80-120	
Chromium	mg/kg	46.3	44.4	96	80-120	
Lead	mg/kg	46.3	42.5	92	80-120	
Selenium	mg/kg	46.3	41.1	89	80-120	
Silver	mg/kg	23.1	20.7	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3296194 3296195

Parameter	Units	10476849001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.6	56.3	59.1	51.2	54.6	84	86	75-125	6	20	
Barium	mg/kg	85.5	56.3	59.1	131	140	80	93	75-125	7	20	
Cadmium	mg/kg	<0.18	56.3	59.1	45.2	49.8	80	84	75-125	10	20	
Chromium	mg/kg	8.7	56.3	59.1	58.2	61.7	88	90	75-125	6	20	
Lead	mg/kg	43.4	56.3	59.1	86.9	108	77	109	75-125	22	20 R1	
Selenium	mg/kg	<1.2	56.3	59.1	46.8	49.5	83	84	75-125	6	20	
Silver	mg/kg	<0.60	28.2	29.6	25.2	26.7	89	90	75-125	6	20	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch:	610597	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008		

SAMPLE DUPLICATE: 3299590

Parameter	Units	10477015001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.5	14.3	8	30	

SAMPLE DUPLICATE: 3300167

Parameter	Units	10477065001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.3	12.0	3	30	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch: 610910 Analysis Method: EPA 8260B  
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level  
Associated Lab Samples: 10477057004, 10477057006, 10477057007

METHOD BLANK: 3300777 Matrix: Solid

Associated Lab Samples: 10477057004, 10477057006, 10477057007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	<0.050	0.050	0.016	06/06/19 13:03	
1,1,1-Trichloroethane	mg/kg	<0.050	0.050	0.023	06/06/19 13:03	
1,1,2,2-Tetrachloroethane	mg/kg	<0.050	0.050	0.0088	06/06/19 13:03	
1,1,2-Trichloroethane	mg/kg	<0.050	0.050	0.0060	06/06/19 13:03	
1,1,2-Trichlorotrifluoroethane	mg/kg	<0.20	0.20	0.058	06/06/19 13:03	
1,1-Dichloroethane	mg/kg	<0.050	0.050	0.0056	06/06/19 13:03	
1,1-Dichloroethene	mg/kg	<0.050	0.050	0.015	06/06/19 13:03	
1,1-Dichloropropene	mg/kg	<0.050	0.050	0.023	06/06/19 13:03	
1,2,3-Trichlorobenzene	mg/kg	<0.050	0.050	0.0080	06/06/19 13:03	
1,2,3-Trichloropropane	mg/kg	<0.20	0.20	0.013	06/06/19 13:03	
1,2,4-Trichlorobenzene	mg/kg	<0.050	0.050	0.011	06/06/19 13:03	
1,2,4-Trimethylbenzene	mg/kg	<0.050	0.050	0.010	06/06/19 13:03	
1,2-Dibromo-3-chloropropane	mg/kg	<0.50	0.50	0.17	06/06/19 13:03	
1,2-Dibromoethane (EDB)	mg/kg	<0.050	0.050	0.0053	06/06/19 13:03	
1,2-Dichlorobenzene	mg/kg	<0.050	0.050	0.0020	06/06/19 13:03	
1,2-Dichloroethane	mg/kg	<0.050	0.050	0.0055	06/06/19 13:03	
1,2-Dichloropropane	mg/kg	<0.050	0.050	0.0086	06/06/19 13:03	
1,3,5-Trimethylbenzene	mg/kg	<0.050	0.050	0.0080	06/06/19 13:03	
1,3-Dichlorobenzene	mg/kg	<0.050	0.050	0.0018	06/06/19 13:03	
1,3-Dichloropropane	mg/kg	<0.050	0.050	0.0069	06/06/19 13:03	
1,4-Dichlorobenzene	mg/kg	<0.050	0.050	0.0031	06/06/19 13:03	
2,2-Dichloropropane	mg/kg	<0.20	0.20	0.0062	06/06/19 13:03	
2-Butanone (MEK)	mg/kg	<0.25	0.25	0.027	06/06/19 13:03	
2-Chlorotoluene	mg/kg	<0.050	0.050	0.0025	06/06/19 13:03	
4-Chlorotoluene	mg/kg	<0.050	0.050	0.0026	06/06/19 13:03	
4-Methyl-2-pentanone (MIBK)	mg/kg	<0.25	0.25	0.010	06/06/19 13:03	
Acetone	mg/kg	<1.0	1.0	0.31	06/06/19 13:03	
Allyl chloride	mg/kg	<0.20	0.20	0.042	06/06/19 13:03	
Benzene	mg/kg	<0.020	0.020	0.0028	06/06/19 13:03	
Bromobenzene	mg/kg	<0.050	0.050	0.0031	06/06/19 13:03	
Bromochloromethane	mg/kg	<0.050	0.050	0.017	06/06/19 13:03	
Bromodichloromethane	mg/kg	<0.050	0.050	0.017	06/06/19 13:03	
Bromoform	mg/kg	<0.20	0.20	0.076	06/06/19 13:03	
Bromomethane	mg/kg	<0.50	0.50	0.058	06/06/19 13:03	
Carbon tetrachloride	mg/kg	<0.050	0.050	0.024	06/06/19 13:03	
Chlorobenzene	mg/kg	<0.050	0.050	0.0028	06/06/19 13:03	
Chloroethane	mg/kg	<0.50	0.50	0.026	06/06/19 13:03	
Chloroform	mg/kg	<0.050	0.050	0.025	06/06/19 13:03	
Chloromethane	mg/kg	<0.20	0.20	0.012	06/06/19 13:03	
cis-1,2-Dichloroethene	mg/kg	<0.050	0.050	0.0083	06/06/19 13:03	
cis-1,3-Dichloropropene	mg/kg	<0.050	0.050	0.0072	06/06/19 13:03	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

METHOD BLANK: 3300777 Matrix: Solid

Associated Lab Samples: 10477057004, 10477057006, 10477057007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	mg/kg	<0.20	0.20	0.0058	06/06/19 13:03	
Dibromomethane	mg/kg	<0.050	0.050	0.0092	06/06/19 13:03	
Dichlorodifluoromethane	mg/kg	<0.20	0.20	0.016	06/06/19 13:03	
Dichlorofluoromethane	mg/kg	<0.50	0.50	0.069	06/06/19 13:03	N2
Diethyl ether (Ethyl ether)	mg/kg	<0.20	0.20	0.031	06/06/19 13:03	
Ethylbenzene	mg/kg	<0.050	0.050	0.0027	06/06/19 13:03	
Hexachloro-1,3-butadiene	mg/kg	<0.25	0.25	0.012	06/06/19 13:03	
Isopropylbenzene (Cumene)	mg/kg	<0.050	0.050	0.0022	06/06/19 13:03	
Methyl-tert-butyl ether	mg/kg	<0.050	0.050	0.0060	06/06/19 13:03	
Methylene Chloride	mg/kg	<0.20	0.20	0.094	06/06/19 13:03	
n-Butylbenzene	mg/kg	<0.050	0.050	0.024	06/06/19 13:03	
n-Propylbenzene	mg/kg	<0.050	0.050	0.0027	06/06/19 13:03	
Naphthalene	mg/kg	<0.20	0.20	0.047	06/06/19 13:03	
p-Isopropyltoluene	mg/kg	<0.050	0.050	0.015	06/06/19 13:03	
sec-Butylbenzene	mg/kg	<0.050	0.050	0.0096	06/06/19 13:03	
Styrene	mg/kg	<0.050	0.050	0.0023	06/06/19 13:03	
tert-Butylbenzene	mg/kg	<0.050	0.050	0.0096	06/06/19 13:03	
Tetrachloroethene	mg/kg	<0.050	0.050	0.018	06/06/19 13:03	
Tetrahydrofuran	mg/kg	<2.0	2.0	0.073	06/06/19 13:03	
Toluene	mg/kg	<0.050	0.050	0.012	06/06/19 13:03	
trans-1,2-Dichloroethene	mg/kg	<0.050	0.050	0.023	06/06/19 13:03	
trans-1,3-Dichloropropene	mg/kg	<0.050	0.050	0.0070	06/06/19 13:03	
Trichloroethene	mg/kg	<0.050	0.050	0.0077	06/06/19 13:03	
Trichlorofluoromethane	mg/kg	<0.20	0.20	0.087	06/06/19 13:03	
Vinyl chloride	mg/kg	<0.020	0.020	0.0098	06/06/19 13:03	
Xylene (Total)	mg/kg	<0.15	0.15	0.012	06/06/19 13:03	
1,2-Dichloroethane-d4 (S)	%	108	75-125		06/06/19 13:03	
4-Bromofluorobenzene (S)	%	101	75-125		06/06/19 13:03	
Toluene-d8 (S)	%	102	75-125		06/06/19 13:03	

LABORATORY CONTROL SAMPLE: 3300778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	1	1.0	103	53-125	
1,1,1-Trichloroethane	mg/kg	1	1.0	105	53-146	
1,1,2,2-Tetrachloroethane	mg/kg	1	1.1	107	51-125	
1,1,2-Trichloroethane	mg/kg	1	1.0	103	55-125	
1,1,2-Trichlorotrifluoroethane	mg/kg	1	0.95	95	49-150	
1,1-Dichloroethane	mg/kg	1	0.96	96	56-125	
1,1-Dichloroethene	mg/kg	1	0.81	81	48-148	
1,1-Dichloropropene	mg/kg	1	0.92	92	55-142	
1,2,3-Trichlorobenzene	mg/kg	1	1.0	103	47-125	
1,2,3-Trichloropropane	mg/kg	1	1.0	105	52-125	
1,2,4-Trichlorobenzene	mg/kg	1	1.1	107	48-125	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

LABORATORY CONTROL SAMPLE: 3300778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	mg/kg	1	0.97	97	51-126	
1,2-Dibromo-3-chloropropane	mg/kg	2.5	2.5	98	50-125	
1,2-Dibromoethane (EDB)	mg/kg	1	0.96	96	52-125	
1,2-Dichlorobenzene	mg/kg	1	1.1	106	50-125	
1,2-Dichloroethane	mg/kg	1	0.85	85	51-125	
1,2-Dichloropropane	mg/kg	1	0.94	94	57-125	
1,3,5-Trimethylbenzene	mg/kg	1	1.0	100	52-127	
1,3-Dichlorobenzene	mg/kg	1	1.0	100	50-128	
1,3-Dichloropropane	mg/kg	1	0.97	97	55-125	
1,4-Dichlorobenzene	mg/kg	1	0.98	98	51-125	
2,2-Dichloropropane	mg/kg	1	1.0	101	41-136	
2-Butanone (MEK)	mg/kg	5	4.2	83	43-125	
2-Chlorotoluene	mg/kg	1	1.1	114	52-126	
4-Chlorotoluene	mg/kg	1	1.1	107	53-126	
4-Methyl-2-pentanone (MIBK)	mg/kg	5	5.2	104	39-125	
Acetone	mg/kg	5	4.5	91	46-136	
Allyl chloride	mg/kg	1	0.83	83	48-130	
Benzene	mg/kg	1	0.83	83	48-125	
Bromobenzene	mg/kg	1	1.0	102	51-125	
Bromochloromethane	mg/kg	1	0.87	87	52-125	
Bromodichloromethane	mg/kg	1	0.98	98	51-131	
Bromoform	mg/kg	1	1.0	102	52-125	
Bromomethane	mg/kg	1	1.0	100	30-150	
Carbon tetrachloride	mg/kg	1	1.0	104	59-129	
Chlorobenzene	mg/kg	1	0.96	96	54-125	
Chloroethane	mg/kg	1	1.2	118	61-132	
Chloroform	mg/kg	1	0.88	88	52-125	
Chloromethane	mg/kg	1	0.87	87	46-125	
cis-1,2-Dichloroethene	mg/kg	1	0.89	89	54-127	
cis-1,3-Dichloropropene	mg/kg	1	0.92	92	50-134	
Dibromochloromethane	mg/kg	1	0.99	99	54-125	
Dibromomethane	mg/kg	1	0.87	87	51-125	
Dichlorodifluoromethane	mg/kg	1	0.81	81	42-125	
Dichlorofluoromethane	mg/kg	1	1.0	103	30-150	N2
Diethyl ether (Ethyl ether)	mg/kg	1	0.87	87	50-127	
Ethylbenzene	mg/kg	1	0.99	99	51-125	
Hexachloro-1,3-butadiene	mg/kg	1	1.3	126	41-133	
Isopropylbenzene (Cumene)	mg/kg	1	1.0	100	54-134	
Methyl-tert-butyl ether	mg/kg	1	0.91	91	53-125	
Methylene Chloride	mg/kg	1	0.82	82	48-125	
n-Butylbenzene	mg/kg	1	1.1	113	49-135	
n-Propylbenzene	mg/kg	1	1.0	101	55-129	
Naphthalene	mg/kg	1	0.89	89	51-125	
p-Isopropyltoluene	mg/kg	1	1.1	107	53-134	
sec-Butylbenzene	mg/kg	1	1.0	103	52-134	
Styrene	mg/kg	1	0.99	99	53-128	
tert-Butylbenzene	mg/kg	1	0.92	92	51-133	

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

LABORATORY CONTROL SAMPLE: 3300778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	mg/kg	1	0.97	97	54-131	
Tetrahydrofuran	mg/kg	10	8.3	83	42-145	
Toluene	mg/kg	1	0.91	91	51-125	
trans-1,2-Dichloroethene	mg/kg	1	0.77	77	50-130	
trans-1,3-Dichloropropene	mg/kg	1	1.0	100	52-125	
Trichloroethene	mg/kg	1	0.92	92	55-131	
Trichlorofluoromethane	mg/kg	1	1.2	125	30-150	SS
Vinyl chloride	mg/kg	1	0.96	96	58-125	
Xylene (Total)	mg/kg	3	3.0	99	52-125	
1,2-Dichloroethane-d4 (S)	%			103	75-125	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			104	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3300779 3300780

Parameter	Units	10477218004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	mg/kg	ND	1.2	1.1	1.2	1.1	105	99	68-150	12	30	
1,1,1-Trichloroethane	mg/kg	ND	1.2	1.1	1.2	1.0	105	92	63-150	19	30	
1,1,2,2-Tetrachloroethane	mg/kg	ND	1.2	1.1	1.1	0.97	96	86	60-146	16	30	
1,1,2-Trichloroethane	mg/kg	ND	1.2	1.1	1.2	1.0	99	92	63-143	12	30	
1,1,2-Trichloroethane	mg/kg	ND	1.2	1.1	1.0	0.93	87	83	30-150	9	30	
Trichlorotrifluoroethane												
1,1-Dichloroethane	mg/kg	ND	1.2	1.1	1.2	1.0	99	89	63-144	16	30	
1,1-Dichloroethene	mg/kg	ND	1.2	1.1	0.95	0.85	81	76	30-150	11	30	
1,1-Dichloropropene	mg/kg	ND	1.2	1.1	1.1	0.92	93	82	54-150	18	30	
1,2,3-Trichlorobenzene	mg/kg	ND	1.2	1.1	1.2	1.0	101	90	63-142	16	30	
1,2,3-Trichloropropane	mg/kg	ND	1.2	1.1	1.2	1.1	101	95	59-147	12	30	
1,2,4-Trichlorobenzene	mg/kg	ND	1.2	1.1	1.3	1.0	108	91	66-142	23	30	
1,2,4-Trimethylbenzene	mg/kg	ND	1.2	1.1	1.2	1.0	99	93	65-145	12	30	
1,2-Dibromo-3-chloropropane	mg/kg	ND	3	2.8	3.0	2.3	101	83	60-142	25	30	
1,2-Dibromoethane (EDB)	mg/kg	ND	1.2	1.1	1.2	1.0	99	90	67-135	14	30	
1,2-Dichlorobenzene	mg/kg	ND	1.2	1.1	1.2	1.0	100	93	68-141	13	30	
1,2-Dichloroethane	mg/kg	ND	1.2	1.1	1.0	0.86	87	77	56-132	18	30	
1,2-Dichloropropane	mg/kg	ND	1.2	1.1	1.2	0.99	99	89	58-150	16	30	
1,3,5-Trimethylbenzene	mg/kg	ND	1.2	1.1	1.2	1.1	97	94	66-148	9	30	
1,3-Dichlorobenzene	mg/kg	ND	1.2	1.1	1.2	1.0	102	92	63-148	16	30	
1,3-Dichloropropane	mg/kg	ND	1.2	1.1	1.2	0.96	98	86	63-142	19	30	
1,4-Dichlorobenzene	mg/kg	ND	1.2	1.1	1.2	1.0	101	93	68-140	13	30	
2,2-Dichloropropane	mg/kg	ND	1.2	1.1	1.2	1.0	102	93	62-143	14	30	
2-Butanone (MEK)	mg/kg	ND	5.9	5.6	4.5	3.7	76	66	53-138	20	30	
2-Chlorotoluene	mg/kg	ND	1.2	1.1	1.1	1.0	96	92	64-145	10	30	
4-Chlorotoluene	mg/kg	ND	1.2	1.1	1.1	1.0	95	91	63-149	10	30	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	5.9	5.6	5.5	4.8	94	87	47-150	13	30	

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3300779 3300780											
Parameter	Units	10477218004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Acetone	mg/kg	ND	5.9	5.6	4.9	4.0	82	71	64-150	20	30
Allyl chloride	mg/kg	ND	1.2	1.1	0.97	0.88	82	78	49-146	10	30
Benzene	mg/kg	ND	1.2	1.1	1.1	0.91	91	81	63-136	17	30
Bromobenzene	mg/kg	ND	1.2	1.1	1.1	0.98	94	87	63-142	13	30
Bromochloromethane	mg/kg	ND	1.2	1.1	1.1	0.89	94	80	61-139	21	30
Bromodichloromethane	mg/kg	ND	1.2	1.1	1.1	1.0	97	90	63-150	12	30
Bromoform	mg/kg	ND	1.2	1.1	1.2	1.1	104	99	64-140	10	30
Bromomethane	mg/kg	ND	1.2	1.1	1.0	1.0	85	90	56-148	1	30
Carbon tetrachloride	mg/kg	ND	1.2	1.1	1.1	0.99	97	89	75-148	15	30
Chlorobenzene	mg/kg	ND	1.2	1.1	1.1	0.98	95	88	62-147	14	30
Chloroethane	mg/kg	ND	1.2	1.1	1.1	1.2	90	105	37-150	9	30
Chloroform	mg/kg	ND	1.2	1.1	1.2	0.95	99	85	66-130	21	30
Chloromethane	mg/kg	ND	1.2	1.1	0.98	1.0	83	89	35-131	2	30
cis-1,2-Dichloroethene	mg/kg	ND	1.2	1.1	1.1	0.98	94	88	63-143	13	30
cis-1,3-Dichloropropene	mg/kg	ND	1.2	1.1	1.1	0.95	93	85	60-150	14	30
Dibromochloromethane	mg/kg	ND	1.2	1.1	1.2	1.1	105	95	64-144	16	30
Dibromomethane	mg/kg	ND	1.2	1.1	1.1	0.98	95	88	59-148	13	30
Dichlorodifluoromethane	mg/kg	ND	1.2	1.1	0.69	0.76	58	68	30-125	10	30
Dichlorofluoromethane	mg/kg	ND	1.2	1.1	1.0	1.1	87	97	39-150	5	30 N2
Diethyl ether (Ethyl ether)	mg/kg	ND	1.2	1.1	0.90	0.79	76	71	59-149	13	30
Ethylbenzene	mg/kg	ND	1.2	1.1	1.1	0.98	96	88	64-142	15	30
Hexachloro-1,3-butadiene	mg/kg	ND	1.2	1.1	1.3	1.1	111	96	58-150	20	30
Isopropylbenzene (Cumene)	mg/kg	ND	1.2	1.1	1.2	1.2	105	105	67-150	5	30
Methyl-tert-butyl ether	mg/kg	ND	1.2	1.1	1.1	0.95	93	85	69-134	15	30
Methylene Chloride	mg/kg	ND	1.2	1.1	1.0	0.91	88	82	56-134	13	30
n-Butylbenzene	mg/kg	ND	1.2	1.1	1.2	1.1	105	100	64-150	11	30
n-Propylbenzene	mg/kg	ND	1.2	1.1	1.2	1.0	103	93	65-150	16	30
Naphthalene	mg/kg	ND	1.2	1.1	1.2	0.95	104	85	63-148	26	30
p-Isopropyltoluene	mg/kg	ND	1.2	1.1	1.2	1.1	103	94	69-150	15	30
sec-Butylbenzene	mg/kg	ND	1.2	1.1	1.2	1.0	100	94	69-150	13	30
Styrene	mg/kg	ND	1.2	1.1	1.1	1.1	97	95	63-150	8	30
tert-Butylbenzene	mg/kg	ND	1.2	1.1	1.2	1.1	106	99	67-150	12	30
Tetrachloroethene	mg/kg	ND	1.2	1.1	1.1	1.0	93	91	62-150	7	30
Tetrahydrofuran	mg/kg	ND	11.8	11.1	11.3	9.2	96	82	53-150	21	30
Toluene	mg/kg	ND	1.2	1.1	1.1	1.1	93	94	61-141	4	30
trans-1,2-Dichloroethene	mg/kg	ND	1.2	1.1	0.98	0.88	83	79	52-148	11	30
trans-1,3-Dichloropropene	mg/kg	ND	1.2	1.1	1.1	1.0	96	94	62-142	8	30
Trichloroethene	mg/kg	ND	1.2	1.1	1.1	0.95	94	85	59-150	16	30
Trichlorofluoromethane	mg/kg	ND	1.2	1.1	1.1	1.2	97	105	30-150	3	30
Vinyl chloride	mg/kg	ND	1.2	1.1	1.1	1.1	90	99	44-144	4	30
Xylene (Total)	mg/kg	ND	3.5	3.3	3.4	3.1	97	92	67-145	11	30
1,2-Dichloroethane-d4 (S)	%						99	98	75-125		
4-Bromofluorobenzene (S)	%						101	98	75-125		
Toluene-d8 (S)	%						106	115	75-125		

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

QC Batch: 609401 Analysis Method: EPA 8082A  
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB  
Associated Lab Samples: 10477057003, 10477057004, 10477057006, 10477057007, 10477057008

METHOD BLANK: 3293235 Matrix: Solid  
Associated Lab Samples: 10477057003, 10477057004, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	<0.033	0.033	0.0092	06/01/19 01:37	
PCB-1221 (Aroclor 1221)	mg/kg	<0.033	0.033	0.012	06/01/19 01:37	
PCB-1232 (Aroclor 1232)	mg/kg	<0.033	0.033	0.013	06/01/19 01:37	
PCB-1242 (Aroclor 1242)	mg/kg	<0.033	0.033	0.011	06/01/19 01:37	
PCB-1248 (Aroclor 1248)	mg/kg	<0.033	0.033	0.0099	06/01/19 01:37	
PCB-1254 (Aroclor 1254)	mg/kg	<0.033	0.033	0.0097	06/01/19 01:37	
PCB-1260 (Aroclor 1260)	mg/kg	<0.033	0.033	0.0079	06/01/19 01:37	
PCB-1262 (Aroclor 1262)	mg/kg	<0.033	0.033	0.011	06/01/19 01:37	
PCB-1268 (Aroclor 1268)	mg/kg	<0.033	0.033	0.011	06/01/19 01:37	
Decachlorobiphenyl (S)	%	74	49-125		06/01/19 01:37	
Tetrachloro-m-xylene (S)	%	66	57-125		06/01/19 01:37	

LABORATORY CONTROL SAMPLE: 3293236

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	0.67	0.76	114	69-125	
PCB-1260 (Aroclor 1260)	mg/kg	0.67	0.78	116	63-125	
Decachlorobiphenyl (S)	%			102	49-125	
Tetrachloro-m-xylene (S)	%			93	57-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3293237 3293238

Parameter	Units	10475343014 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	mg/kg	<35.6 ug/kg	0.73	0.73	0.39	0.44	55	61	56-125	10	30	M1
PCB-1260 (Aroclor 1260)	mg/kg	<35.6 ug/kg	0.73	0.73	0.38	0.39	53	55	45-125	4	30	
Decachlorobiphenyl (S)	%						48	57	49-125			S0
Tetrachloro-m-xylene (S)	%						39	42	57-125			S0

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

QC Batch: 609973 Analysis Method: EPA 8082A  
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB  
Associated Lab Samples: 10477057001, 10477057002, 10477057005

METHOD BLANK: 3296468 Matrix: Solid  
Associated Lab Samples: 10477057001, 10477057002, 10477057005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	<0.033	0.033	0.0092	06/05/19 16:39	
PCB-1221 (Aroclor 1221)	mg/kg	<0.033	0.033	0.012	06/05/19 16:39	
PCB-1232 (Aroclor 1232)	mg/kg	<0.033	0.033	0.013	06/05/19 16:39	
PCB-1242 (Aroclor 1242)	mg/kg	<0.033	0.033	0.011	06/05/19 16:39	
PCB-1248 (Aroclor 1248)	mg/kg	<0.033	0.033	0.0099	06/05/19 16:39	
PCB-1254 (Aroclor 1254)	mg/kg	<0.033	0.033	0.0097	06/05/19 16:39	
PCB-1260 (Aroclor 1260)	mg/kg	<0.033	0.033	0.0079	06/05/19 16:39	
PCB-1262 (Aroclor 1262)	mg/kg	<0.033	0.033	0.011	06/05/19 16:39	
PCB-1268 (Aroclor 1268)	mg/kg	<0.033	0.033	0.011	06/05/19 16:39	
Decachlorobiphenyl (S)	%	116	49-125		06/05/19 16:39	CH
Tetrachloro-m-xylene (S)	%	89	57-125		06/05/19 16:39	

LABORATORY CONTROL SAMPLE: 3296469

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	0.67	0.59	88	69-125	
PCB-1260 (Aroclor 1260)	mg/kg	0.67	0.60	90	63-125	
Decachlorobiphenyl (S)	%			118	49-125	CH
Tetrachloro-m-xylene (S)	%			89	57-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3296646 3296647

Parameter	Units	10477037001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	mg/kg	<38.4 ug/kg	0.79	0.77	0.53	0.63	68	81	56-125	16	30	
PCB-1260 (Aroclor 1260)	mg/kg	<38.4 ug/kg	0.79	0.77	0.44	0.56	57	73	45-125	24	30	
Decachlorobiphenyl (S)	%						75	98	49-125			CH
Tetrachloro-m-xylene (S)	%						72	84	57-125			

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch:	609600	Analysis Method:	EPA 8270D by SIM
QC Batch Method:	EPA 3550	Analysis Description:	8270D Solid PAH by SIM MSSV
Associated Lab Samples:	10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008		

METHOD BLANK: 3294378 Matrix: Solid  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	mg/kg	<0.010	0.010	0.00041	06/05/19 17:18	
Acenaphthylene	mg/kg	<0.010	0.010	0.00050	06/05/19 17:18	
Anthracene	mg/kg	<0.010	0.010	0.00047	06/05/19 17:18	
Benzo(a)anthracene	mg/kg	<0.010	0.010	0.0011	06/05/19 17:18	
Benzo(a)pyrene	mg/kg	<0.010	0.010	0.00069	06/05/19 17:18	
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	0.00037	06/05/19 17:18	
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	0.00063	06/05/19 17:18	
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	0.00084	06/05/19 17:18	
Chrysene	mg/kg	<0.010	0.010	0.0014	06/05/19 17:18	
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	0.00046	06/05/19 17:18	
Fluoranthene	mg/kg	<0.010	0.010	0.00043	06/05/19 17:18	
Fluorene	mg/kg	<0.010	0.010	0.00031	06/05/19 17:18	
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	0.00067	06/05/19 17:18	
Naphthalene	mg/kg	<0.010	0.010	0.00077	06/05/19 17:18	
Phenanthrene	mg/kg	<0.010	0.010	0.0019	06/05/19 17:18	
Pyrene	mg/kg	<0.010	0.010	0.0015	06/05/19 17:18	
2-Fluorobiphenyl (S)	%	65	30-125		06/05/19 17:18	
p-Terphenyl-d14 (S)	%	92	30-125		06/05/19 17:18	

LABORATORY CONTROL SAMPLE: 3294379

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	mg/kg	0.033	0.020	60	46-125	
Acenaphthylene	mg/kg	0.033	0.019	58	44-125	
Anthracene	mg/kg	0.033	0.025	74	62-125	
Benzo(a)anthracene	mg/kg	0.033	0.030	89	53-125	
Benzo(a)pyrene	mg/kg	0.033	0.030	89	62-125	
Benzo(b)fluoranthene	mg/kg	0.033	0.035	105	51-125	
Benzo(g,h,i)perylene	mg/kg	0.033	0.032	96	58-125	
Benzo(k)fluoranthene	mg/kg	0.033	0.035	104	59-125	
Chrysene	mg/kg	0.033	0.032	97	59-125	
Dibenz(a,h)anthracene	mg/kg	0.033	0.033	99	60-125	
Fluoranthene	mg/kg	0.033	0.030	89	67-125	
Fluorene	mg/kg	0.033	0.023	68	51-125	
Indeno(1,2,3-cd)pyrene	mg/kg	0.033	0.033	98	59-125	
Naphthalene	mg/kg	0.033	0.019	57	47-125	
Phenanthrene	mg/kg	0.033	0.027	81	61-125	
Pyrene	mg/kg	0.033	0.030	91	52-125	

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

LABORATORY CONTROL SAMPLE: 3294379

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Fluorobiphenyl (S)	%.			58	30-125	
p-Terphenyl-d14 (S)	%.			90	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3294380 3294381

Parameter	Units	10476509005	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Acenaphthene	mg/kg	1.9J ug/kg	0.055	0.055	0.045	0.042	77	72	30-125	6	30	
Acenaphthylene	mg/kg	41.7 ug/kg	0.055	0.055	0.064	0.064	40	41	30-125	0	30	
Anthracene	mg/kg	17.8 ug/kg	0.055	0.055	0.055	0.052	67	62	30-131	5	30	
Benzo(a)anthracene	mg/kg	40.4 ug/kg	0.055	0.055	0.072	0.070	57	54	30-126	2	30	
Benzo(a)pyrene	mg/kg	45.1 ug/kg	0.055	0.055	0.079	0.072	62	49	30-150	9	30	
Benzo(b)fluoranthene	mg/kg	53.6 ug/kg	0.055	0.055	0.084	0.081	55	49	30-150	4	30	
Benzo(g,h,i)perylene	mg/kg	34.3 ug/kg	0.055	0.055	0.069	0.065	63	56	30-150	6	30	
Benzo(k)fluoranthene	mg/kg	30.9 ug/kg	0.055	0.055	0.069	0.066	69	64	30-150	4	30	
Chrysene	mg/kg	61.4 ug/kg	0.055	0.055	0.078	0.077	30	29	30-150	1	30 M1	
Dibenz(a,h)anthracene	mg/kg	11.3J ug/kg	0.055	0.055	0.053	0.052	75	73	30-143	2	30	
Fluoranthene	mg/kg	63.4 ug/kg	0.055	0.055	0.076	0.081	22	33	30-143	8	30 M1	
Fluorene	mg/kg	4.3J ug/kg	0.055	0.055	0.051	0.049	84	81	30-138	4	30	
Indeno(1,2,3-cd)pyrene	mg/kg	24.5 ug/kg	0.055	0.055	0.066	0.062	76	67	30-150	7	30	
Naphthalene	mg/kg	5.3J ug/kg	0.055	0.055	0.038	0.043	59	69	30-125	13	30	
Phenanthrene	mg/kg	48.6 ug/kg	0.055	0.055	0.064	0.076	28	50	30-142	17	30 M1	
Pyrene	mg/kg	90.5 ug/kg	0.055	0.055	0.092	0.095	3	7	30-149	3	30 M1	
2-Fluorobiphenyl (S)	%.						72	70	30-125			
p-Terphenyl-d14 (S)	%.						89	90	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALITY CONTROL DATA

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

QC Batch: 609985 Analysis Method: WI MOD DRO  
QC Batch Method: WI MOD DRO Analysis Description: WIDRO Solid GCV  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

METHOD BLANK: 3296497 Matrix: Solid  
Associated Lab Samples: 10477057001, 10477057002, 10477057003, 10477057004, 10477057005, 10477057006, 10477057007, 10477057008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	<10.0	10.0	3.9	06/04/19 20:28	
n-Triacontane (S)	%.	89	44-143		06/04/19 20:28	

LABORATORY CONTROL SAMPLE & LCSD: 3296498

3296499

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	73.9	72.4	92	91	61-125	2	20	
n-Triacontane (S)	%.				92	90	44-143			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

## REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: VPP-Kasota-Revised Report  
Pace Project No.: 10477057

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

1M	Samples requiring thermal preservation exceeded method recommended temperature limits after receipt but before extraction or digestion was conducted. Results are estimated
2M	Samples requiring thermal preservation exceeded method recommended temperature limits after receipt but before extraction or digestion was conducted. Results are estimated.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D4	Sample was diluted due to the presence of high levels of target analytes.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.
T7	Low boiling point hydrocarbons are present in the sample.

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10477057001	LTT-1/1-2	EPA 3550	609973	EPA 8082A	610367
10477057002	LTT-2/2-3	EPA 3550	609973	EPA 8082A	610367
10477057003	LTT-3/0-2	EPA 3550	609401	EPA 8082A	609757
10477057004	LTT-4/2-4	EPA 3550	609401	EPA 8082A	609757
10477057005	LTT-5/0-2	EPA 3550	609973	EPA 8082A	610367
10477057006	LTT-6/0-2	EPA 3550	609401	EPA 8082A	609757
10477057007	LTT-7/2-4	EPA 3550	609401	EPA 8082A	609757
10477057008	LTT-8/0-2	EPA 3550	609401	EPA 8082A	609757
10477057001	LTT-1/1-2	WI MOD DRO	609985	WI MOD DRO	610571
10477057002	LTT-2/2-3	WI MOD DRO	609985	WI MOD DRO	610571
10477057003	LTT-3/0-2	WI MOD DRO	609985	WI MOD DRO	610571
10477057004	LTT-4/2-4	WI MOD DRO	609985	WI MOD DRO	610571
10477057005	LTT-5/0-2	WI MOD DRO	609985	WI MOD DRO	610571
10477057006	LTT-6/0-2	WI MOD DRO	609985	WI MOD DRO	610571
10477057007	LTT-7/2-4	WI MOD DRO	609985	WI MOD DRO	610571
10477057008	LTT-8/0-2	WI MOD DRO	609985	WI MOD DRO	610571
10477057001	LTT-1/1-2	EPA 3010	612635	EPA 6010D	612902
10477057002	LTT-2/2-3	EPA 3010	612635	EPA 6010D	612902
10477057003	LTT-3/0-2	EPA 3010	612635	EPA 6010D	612902
10477057004	LTT-4/2-4	EPA 3010	612635	EPA 6010D	612902
10477057005	LTT-5/0-2	EPA 3010	612635	EPA 6010D	612902
10477057006	LTT-6/0-2	EPA 3010	612635	EPA 6010D	612902
10477057007	LTT-7/2-4	EPA 3010	612635	EPA 6010D	612902
10477057008	LTT-8/0-2	EPA 3010	612635	EPA 6010D	612902
10477057001	LTT-1/1-2	EPA 3050	609891	EPA 6010D	610349
10477057002	LTT-2/2-3	EPA 3050	609891	EPA 6010D	610349
10477057003	LTT-3/0-2	EPA 3050	609891	EPA 6010D	610349
10477057004	LTT-4/2-4	EPA 3050	609891	EPA 6010D	610349
10477057005	LTT-5/0-2	EPA 3050	609891	EPA 6010D	610349
10477057006	LTT-6/0-2	EPA 3050	609891	EPA 6010D	610349
10477057007	LTT-7/2-4	EPA 3050	609891	EPA 6010D	610349
10477057008	LTT-8/0-2	EPA 3050	609891	EPA 6010D	610349
10477057001	LTT-1/1-2	EPA 7471B	609930	EPA 7471B	610352
10477057002	LTT-2/2-3	EPA 7471B	609930	EPA 7471B	610352
10477057003	LTT-3/0-2	EPA 7471B	609930	EPA 7471B	610352
10477057004	LTT-4/2-4	EPA 7471B	609930	EPA 7471B	610352
10477057005	LTT-5/0-2	EPA 7471B	609930	EPA 7471B	610352
10477057006	LTT-6/0-2	EPA 7471B	609930	EPA 7471B	610352
10477057007	LTT-7/2-4	EPA 7471B	609930	EPA 7471B	610352
10477057008	LTT-8/0-2	EPA 7471B	609930	EPA 7471B	610352
10477057001	LTT-1/1-2	ASTM D2974	610597		
10477057002	LTT-2/2-3	ASTM D2974	610597		
10477057003	LTT-3/0-2	ASTM D2974	610597		
10477057004	LTT-4/2-4	ASTM D2974	610597		
10477057005	LTT-5/0-2	ASTM D2974	610597		

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: VPP-Kasota-Revised Report

Pace Project No.: 10477057

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10477057006	LTT-6/0-2	ASTM D2974	610597		
10477057007	LTT-7/2-4	ASTM D2974	610597		
10477057008	LTT-8/0-2	ASTM D2974	610597		
10477057001	LTT-1/1-2	EPA 3550	609600	EPA 8270D by SIM	610775
10477057002	LTT-2/2-3	EPA 3550	609600	EPA 8270D by SIM	610775
10477057003	LTT-3/0-2	EPA 3550	609600	EPA 8270D by SIM	610775
10477057004	LTT-4/2-4	EPA 3550	609600	EPA 8270D by SIM	610775
10477057005	LTT-5/0-2	EPA 3550	609600	EPA 8270D by SIM	610775
10477057006	LTT-6/0-2	EPA 3550	609600	EPA 8270D by SIM	610775
10477057007	LTT-7/2-4	EPA 3550	609600	EPA 8270D by SIM	610775
10477057008	LTT-8/0-2	EPA 3550	609600	EPA 8270D by SIM	610775
10477057004	LTT-4/2-4	EPA 5035/5030B	610910	EPA 8260B	610978
10477057006	LTT-6/0-2	EPA 5035/5030B	610910	EPA 8260B	610978
10477057007	LTT-7/2-4	EPA 5035/5030B	610910	EPA 8260B	610978

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.


<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:		Page: <b>2</b> of <b>2</b>	
Company: <b>Landmark Environmental</b>		Report To: <b>Shannon Russell</b>		Attention: <b>Account Payable</b>		<b>2302710</b>	
Address:		Copy To: <b>Jerry Mullin</b>		Company Name: <b>Landmark</b>			
Email To: <b>Shannon Russell</b>		Purchase Order No.:		Address:		<b>REGULATORY AGENCY</b> <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
Phone:   Fax:		Project Name: <b>VPP-Kasota</b>		Pace Quote Reference:			
Requested Due Date/TAT: <b>Normal</b>		Project Number:		Pace Project Manager: <b>Annika Asp</b>		Site Location	
				Pace Profile #:		STATE:	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other				
					DATE	TIME	DATE	TIME														
1	LTT-1 / 4-S		SL	G	5/30/19	830																009
2	LTT-2 / 4-S					900																010
3	LTT-3 / 2-4					930																011
4	LTT-4 / 0-2					945																012
5	LTT-5 / 2-4					1030																013
6	LTT-6 / 2-4					1100																014
7	LTT-7 / 0-2					1115																015
8	LTT-8 / 2-4					1200																016
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i>	5/30/19	1235	15-PACE	5/30/19	1235	1.2	Y	N	Y

ORIGINAL

<b>SAMPLER NAME AND SIGNATURE</b>		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <b>Shannon Russell</b>					
SIGNATURE of SAMPLER: <i>[Signature]</i>					
DATE Signed (MM/DD/YY): <b>05/30/19</b>					

	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 09May2019 Page 1 of 1
	Document No.: <b>F-MN-L-213-rev.28</b>	Issuing Authority: Pace Minnesota Quality Office

<b>Sample Condition Upon Receipt</b>	Client Name: <u>Landmark Environmental</u>	Project #: <b>WO# : 10477057</b>
	Courier: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Pace <input type="checkbox"/> SpeedDee <input type="checkbox"/> Commercial <input type="checkbox"/> See Exception	PM: AKA Due Date: 06/06/19 CLIENT: LANDMARK ENV
Tracking Number: _____		

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No     
 Seals Intact? ☐ Yes ☒ No     
 Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A  
 Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other: PB     
 Temp Blank? ☒ Yes ☐ No  
 Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459)  
☐ T4(0254) ☒ T5(0489)     
 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>1.7</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>-0.2</u>	Cooler Temp Corrected w/temp blank: <u>1.2</u> °C		

USDA Regulated Soil: ( ☐ N/A, water sample/Other: \_\_\_\_\_ )     
 Date/Initials of Person Examining Contents: CG 5/30/19  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☒ No     
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other _____		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample # _____  <input type="checkbox"/> NaOH <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> Zinc Acetate Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No      pH Paper Lot# _____ Res. Chlorine <input type="checkbox"/> 0-6 Roll <input type="checkbox"/> 0-6 Strip <input type="checkbox"/> 0-14 Strip
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): <u>N/A</u>

CLIENT NOTIFICATION/RESOLUTION  
 Person Contacted: Shannon Russell      Date/Time: 6/11/19 1525  
 Comments/Resolution: Client requested TCLP lead analysis on samples 001 - 008.

Project Manager Review: Anna Asp      Date: 5/31/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: Chit