Long-Term Monitoring Report

Year One - SLRIDT Project

Prepared for
XIK Corp.,
Minnesota Department of Natural Resources, and
Minnesota Pollution Control Agency

December 2013

BARR

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Executive Summary

The St. Louis River/Interlake/Duluth Tar (SLRIDT) site caps are performing as designed to contain polynuclear aromatic hydrocarbon (PAH)-impacted sediment, in accordance with the Remedial Design/Response Action Plan (RD/RAP) and the Minnesota Pollution Control Agency (MPCA) Record of Decision (ROD), based on monitoring completed in accordance with the Long-Term Monitoring & Maintenance Plan (LTM&M).

LTM&M monitoring identified no major deficiencies and only three minor deficiencies despite a 500-year storm and flood in June 2012 that involved the entire St. Louis River estuary, including both the SLRIDT and Tallas Island sites. The minor deficiencies included two pore water samples slightly exceeding the Tier 1 monitoring criteria (one in Stryker Bay and one in Slip 7), and some limited areas where the cap thickness is less than the design thickness or visible erosion has occurred. These minor deficiencies will be further evaluated during scheduled Tier 1 monitoring in 2014, in accordance with the LTM&M plan.

This report presents the methods, procedures, and results from the first year of cap stability, pore water and bulk sediment monitoring at SLRIDT in 2013. Pore water monitoring of the Contained Aquatic Disposal (CAD) facility cap was completed for the US Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO) project and a final report issued to EPA. The EPA-required monitoring, which is not included or discussed in detail in this report, indicated the CAD cap is performing as designed with respect to pore water migration.

Vegetation monitoring has been completed for the past three years at SLRIDT and Tallas Island, in accordance with a Public Waters Restoration Permit issued by the Minnesota Department of Natural Resources (MNDNR), with the results presented in this report. Spraying of invasive species will likely be necessary in future years to control invasive plant species, but no other remedial actions are necessary based on the 2013 aquatic and upland vegetation monitoring.

1.0 Introduction

The Minnesota Pollution Control Agency (MPCA)-approved Long-Term Monitoring & Maintenance Plan [LTM&M, Hard Hat Services (HHS), 2013] for the St. Louis River/Interlake/Duluth Tar (SLRIDT) site focuses on areas of the Sediment Operable Unit (SedOU) where caps were designed and installed to contain polynuclear aromatic hydrocarbon (PAH)-impacted sediments during implementation of the Response Actions (RAs). The LTM&M inspections and samples were biased to the capped areas with PAH-impacted sediment remaining in place to provide the greatest probability of detecting PAHs migrating into the site caps. PAHs are the contaminants of concern (COC) with respect to the LTM&M of the SLRIDT caps. Aquatic and upland vegetation monitoring has been completed annually since 2011, but 2013 is the first year of pore water, bulk sediment and cap stability monitoring. Benthic assemblage and bioaccumulation monitoring will begin in 2014.

The monitoring and maintenance sampling and inspection activities include:

- Pore water sampling,
- Bulk sediment sampling,
- Visual inspections of above-water cap areas,
- Cap thickness measurements,
- Survey activities below water to confirm the continued presence of cobble materials placed during the RA,
- Monitoring vegetation recovery at the SLRIDT site and the Tallas Island Mitigation Project (TICMP) site,
- Monitoring benthic community recovery at the SLRIDT site, and
- Recommendations for and documentation of maintenance repairs identified from sampling and inspection activities (if applicable).

Tier I sampling and analysis activities are focused at the base of the bioactive zone (BAZ) to serve as an early indicator of potential PAH migration into site caps prior to potential impacts to the benthic organisms. The Tier I sampling requirements will be followed until one of the following conditions occurs:

- A PAH exceedance is observed and confirmed, at which time Tier II sampling activities will be implemented.

- Modification is requested and approved by XIK and the MPCA.
- An extenuating circumstance at the SLRIDT site requires an immediate elevation from Tier I to Tier III.

Cap maintenance activities will be categorized as Minor Deficiencies or Major Deficiencies and will be remedied in accordance with the following descriptions:

- **Minor Deficiencies** are classified as isolated areas of erosion, disruptive cap settlement, lack of vegetation, or animal burrows where cap or bank stability may become compromised. These areas must be repaired by adding materials that meet the specification as defined in the RD/RAP or the TICMP permit requirements. The MPCA must be notified of these minor deficiencies when they are identified and shall be repaired as soon as practical.
- **Major Deficiencies** are classified as areas where the cap integrity may be compromised and/or contaminated sediments exposed. No repairs shall be made until a repair-specific remedial plan is approved by the MPCA. All areas where visual inspections and minor/major repair maintenance activities have taken place must be documented within the Annual LTM&M Report. The dates, activities, equipment, materials, and photos of the repairs shall be included within the Annual LTM&M Report.

1.1 Site Description

The SLRIDT site is located within the West Duluth neighborhood of the City of Duluth on the north bank of the St. Louis River, approximately four river miles upstream from Lake Superior (Figure 1).

The SLRIDT site includes approximately 255 acres of land and river embankments, wetlands, and shipping slips. The land portion of the SLRIDT site includes the 59th Avenue (Hallett) Peninsula and the 54th Avenue Peninsula, and is bounded on the north by the Burlington Northern railroad right-of-way and on the south by the St. Louis River.

The aquatic portion of the SLRIDT site includes Stryker Bay (approximately 41 acres and defining the western boundary of the SLRIDT site), Slip 6 (approximately 15 acres), and Keene Creek Bay/Slip 7 including the 48-inch outfall area and the Minnesota Channel (approximately 34 acres and defining the eastern boundary), and a portion of the St. Louis River south of the two peninsulas and

the former shipping slips. A small portion of the SedOU (approximately 0.3 acres at the mouth of Slip 6 and 1.1 acres in the Minnesota Channel) is within the waters of the State of Wisconsin.

Residents are located west of the SLRIDT site on the 63rd Avenue Peninsula (on the west side of Stryker Bay), and to the north of the railroad tracks that form the northern boundary of the SLRIDT site. Approximately 800 people live within one mile of the SLRIDT site. The Tallas Island site is located approximately 1.5 miles upstream from the SLRIDT site. Figure 1 shows the Tallas Island site location. The Tallas Island site includes approximately 30 acres of land, river embankments and wetlands. The land portion of the Tallas Island site is bounded on the north by Bayhill Drive.

The SLRIDT and Tallas Island sites experienced a 500-year flood event that occurred throughout the area in June 2012.

1.2 Institutional Controls

Response actions for the SedOU portion of the SLRIDT site did not require establishment of institutional controls; the response actions for the Soil Operable Unit (SOU) included establishment of a groundwater use restriction that does not influence the LTM&M for the SedOU.

Current zoning for the land portion of the site is “Industrial-General”, and is intended for general to heavy impact industrial, processing, assembly, fabrication, and manufacturing uses. Office uses are allowed provided they are clearly incidental to and supportive of on-site industrial uses. The district is intended primarily for locations close to major transportation corridors and active commercial centers. This district should be located away from residential development.

The water covered portion of the site is unrestricted in its use, based on the response actions completed in the SedOU, but limited by water depth to primarily recreational activities. Slip 7 has sufficient water depth to berth commercial vessels such as barges, but does not have sufficient water depth or dock wall integrity to berth ships or larger commercial vessels. (http://www.duluthmn.gov/planning/zoning_regulations/documents/Article2July2013.pdf)

2.0 Annual Sampling and Monitoring

2.1 Pore Water

2.1.1 Introduction

Pore water samples were collected from the base of the BAZ using SedPoint samplers in accordance with the LTM&M Plan. SedPoint samplers consisting of a 6-inch-long, polypropylene screen attached in line to ¼-inch ID polyethylene tubing were installed at the locations shown on Figure 2 between October 21 and November 14, 2013.

Pore water monitoring completed for the US Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO) project in the CAD has been completed and a final report issued to EPA. A copy of the report will be provided upon request.

2.1.2 Methods

The SedPoints were installed from a boat using a stainless steel SedPoint Installation Tool in accordance with construction and installation methods provided by the SedPoint manufacturer, MHE Products presented in Exhibit A of the LTM&M Plan.

The SedPoint screen was pushed through the capping sand to the base of the bio-active zone (BAZ), defined in the LTM&M Plan as a depth of 1 meter in areas with water depths less than 8 feet, and 0.5 meter in areas with water depths greater than 8 feet. A hand held concrete vibrator tool was used as an aid while hand pushing the installation tool through the capping material. The installation tool was then removed, leaving the SedPoint sampler tip typically within 3- inches of the driven depth, depending on the amount of friction encountered inside the installation tool. The SedPoint screen spanned the lower 6 inches of the BAZ if placement of the tip of the sampler was precisely at the target depth.

Pore water samples were collected on November 6, 7, 8, and 14, 2013, in accordance with the Low Flow Sampling Procedure presented in Exhibit C of the LTM&M Plan. Samples were collected using a peristaltic pump to draw pore water through the SedPoints at a flow rate of less than 500 milliliters per minute. At least 5 tubing volumes of water were purged from the sampling points prior to collecting analytical samples. Two 1-liter amber sample jars were filled at each sample location. Samples were submitted to Braun Intertec for laboratory analysis of PAHs using EPA method 8270C SIM.

Pore water PAH concentrations were compared to the PAH specific Final Chronic Values (FCVs) presented in the U.S. Environmental Protection Agency (EPA)'s Equilibrium Partitioning Sediment Benchmark for the Protection of Benthic Organisms document from November 2003, in accordance with Remedial Design/Response Action Plan (RD/RAP) Appendix B, Quality Assurance Project Plan and Monitoring Plan, Table B-7. The site-specific list of 17 PAHs comprising the total PAH concentration will be used during the LTM&M monitoring activities and the sum of the ratios will be used for the compliance standard.

2.1.3 Results

Target PAH compound concentrations were less than detection limits and/or FCVs in 18 of the 20 samples. Two sample locations contained naphthalene at concentrations exceeding FCVs: 750 micrograms per liter (µg/l) in sample SB-PW-02 in Stryker Bay, and 1200 µg/l in sample S7-PW-06 located in the filled portion of Slip 7 (Figure 2). These two samples represent the only locations where a compound-specific FCV (naphthalene) was exceeded, and are the only two samples where the sum of the PAH to FCV ratios exceeded 1. No other PAH compound concentrations exceeded FCVs. Analytical results of the pore water samples are summarized on Table 1; validation information is presented on Tables 2 and 3.

The actual sample depths were at the target depths, except at sample locations where less than 1 meter of cap materials were present (Table 4). The shallower samples within Stryker Bay were collected from immediately above the Activated Carbon Mat (ACM).

2.1.4 Discussion

Naphthalene was the only PAH compound detected at concentrations that exceeded the FCVs at two locations:

- S7-PW-06 located in a capped area of Slip 7 (Figure 2) that is now upland after cap placement. The naphthalene exceedance at this location appears to be isolated, based on naphthalene concentrations below FCVs at adjacent sample locations.
- SB-PW-02 is located within Stryker Bay in an area that previously had high PAH concentrations in sediment. The naphthalene exceedance at this location appears to be isolated, based on naphthalene concentrations below FCVs at adjacent sample locations.

Laboratory quality assurance/quality control (QA/QC) analysis for the pore water samples identified the potential for concentrations to be biased high. Naphthalene was detected in each of the three method blank samples at concentrations between 0.0146 and 0.0163 µg/l (Table 2). Associated sample concentrations within five times the method blank sample concentrations were "b" qualified and should be considered potentially false positive concentrations.

Samples S7-PW-06 and SB-PW-02 served as the field duplicate samples. In all but one case, the relative percent differences (RPD) between PAH concentrations in the sample and duplicate were within acceptable ranges (Table 3). The field duplicate RPD for anthracene for sample S7-PW-06 and its field duplicate sample was 75% which exceeded the acceptance limits (40%), therefore, the associated data were "*" qualified and should be considered estimated.

Overall, the laboratory data are considered useable with qualification assigned during the data evaluation process. A detailed QA/QC summary is presented in Appendix A .

Annual Tier I pore water monitoring will be conducted in 2014, in accordance with the approved LTM&M plan. If PAH concentrations exceeding the Post Remedial Action Objectives (PRAOs) at locations S7-PW-06 and/or SB-PW-02 are confirmed in 2014 sampling and analysis, a Tier II monitoring plan will be submitted to the MPCA.

2.2 Bulk Sediment

2.2.1 Introduction

Bulk sediment sampling activities were completed at the base of the BAZ, as described in Section 1.1, to detect PAH migration into the cap prior to impacting the benthic communities. Bulk sediment samples will be collected every other year, beginning in 2013.

Bulk sediments are defined as the solid phase materials below the sediment surface and, as such, the bulk sediment samples consisted of sand cap materials. Bulk sediment samples were not collected from cap areas with cobble and gravel armoring.

Bulk sediment samples were collected from the following approximate depths, based on water depth and cap construction:

- 3 feet below the top of the cap in cores collected from the Contained Aquatic Disposal (CAD) facility (formerly Slip 6), Slip 7, and the North and South Wetlands with less than 8 feet of water;
- 1.5 feet below the top of the cap in cores collected from the CAD, Slip 7, and the North and South Wetlands with greater than 8 feet of water; and,
- Directly above the activated carbon mat (ACM) in cores collected from Stryker Bay.

Table 4 presents the unique sample identification number, water depth at time of sampling, cap depth determined in cores or probes, as well as the SedPoint installation depth, and description of sediments collected in the cores.

2.2.2 Methods

Bulk sediment sampling was completed in accordance with the Bulk Sediment Sampling Procedures in Exhibit D and Exhibit G of the LTM&M Plan at the locations shown on Figure 2. After a bulk sediment core was collected at a given location, a pore water sampling point was installed adjacent to the core (Section 2.1 includes a discussion of the pore water sampling methods).

Bulk sediment core samples were collected between October 21 and November 1, 2013, using either a hand-push core with a portable concrete vibrator, or a vibracore. The vibracore, manufactured by PVL Technologies, was deployed using a pontoon boat equipped with an electric winch. The tubing was extracted using the winch, and the core sample was extruded onto a tray for examination and collection of laboratory analytical samples. The bulk sediment sampling locations on land and in the North and South Wetlands were collected by vibrating and pushing aluminum tubing into the sediments with a portable concrete vibrator. The tubing was extracted with a hand-operated jack and the sample extruded onto a tray for examination and collection of laboratory analytical samples.

The extruded sample recovery was measured, but the measurements should be considered estimates because changes in sample volume and length likely occurred during sample collection and extrusion. Sample cores were photographed, logged with the sediment type and depth, and laboratory analytical samples were collected, typically from a 3-inch zone at the target depth. Samples submitted for laboratory analysis were labelled, stored, and shipped in accordance with standard operating procedures. Samples were submitted to Braun Intertec for laboratory analysis of PAHs using EPA method 8270C SIM.

Bulk sediment Total PAH concentrations were compared to 13.7 milligrams per kilogram (mg/kg) or parts per million (ppm), in accordance with RD/RAP Appendix B, Quality Assurance Project Plan and Monitoring Plan, Table B-7. The site-specific list of 17 PAHs comprising the Total PAH concentration will be used during the LTM&M monitoring activities and the sum of the ratios will be used for the compliance standard.

2.2.3 Results

No sample concentrations exceeded the site-specific criteria of 13.7 mg/kg Total PAHs (the sum or the site-specific list of 17 PAH compounds). The maximum concentration of Total PAHs was 0.34 ppm; found in two samples. Analytical results of the bulk sediment samples are summarized on Table 5; laboratory QA/QC information is presented on Tables 6 and 7 and discussed in Appendix A.

2.2.4 Discussion

Naphthalene was detected in one of the two method blank samples at concentrations of 0.000593 mg/kg (Table 6). Associated sample concentrations within five times the method blank sample concentrations were "b" qualified and should be considered potentially false positive concentrations.

Samples S6-BS-05 3 FT and S7-BS-04 1.5 FT served as the field duplicate samples. The field duplicate RPD for several PAH compounds exceeded the acceptance limits (40%) for sample S7-BS-04 1.5 FT and its field duplicate sample. Sample concentrations near the practical quantitation limit can exaggerate the deviation of the RPD. Since the most of the PAH sample concentrations were within five times the MDL/RL, only the naphthalene results for S7-BS-04 1.5 FT and its corresponding field duplicate samples was "*" qualified (estimated) based upon the field duplicate RPD calculation.

Overall, the laboratory data were considered useable with qualification assigned during the data evaluation process. A detailed QA/QC summary is presented in Appendix A.

Tier I bulk sediment monitoring will be conducted in 2015, in accordance with the LTM&M Plan because no bulk sediment samples exceeded the Total PAH criteria of 13.7 mg/kg.

2.3 Cap Stability

2.3.1 Introduction

Cap stability monitoring is intended to identify cap areas that have been compromised and no longer meet the requirements of the MPCA Record of Decision (ROD), in accordance with the LTM&M Plan.

2.3.2 Methods

Cap stability monitoring consists of a combination of the following components:

- Visual observations for areas above, and leading into, the water;
- Cap thickness measurements for the subaqueous areas with sand caps;
    - Sand caps underlain with geosynthetics were probed to confirm the cap thickness,
    - Sand caps without geosynthetics were cored and measured to confirm thickness
- Survey measurements and probing to determine the presence or absence of armor material and identify the elevation of caps containing gravel and cobble materials; and,
- Visual inspection of dock walls above the water level in the CAD and Slip 7 from shore and/or water for deterioration that may have the potential to negatively impact the cap stability.

Photo documentation of the above-water caps was collected at the locations presented on Figure 3 on November 18, 2013, with photographs taken in the directions noted and listed by degrees in Table 8 and Appendix B. The photos are intended to serve as a year-by-year comparison to review visual changes over longer periods of time. Additional cap stability monitoring information is included in subsequent sections.

Visual inspection of the shoreline at the TICMP site will be completed during vegetation monitoring at that location beginning in 2014. The banks of the TICMP site will be inspected for erosion, sparsely vegetated areas, slumping of bank materials, and any other unusual condition. The inspection will take place via boat and photo documentation will be collected of all suspect or deficient areas.

Dock wall inspections and riparian buffer zone transects above water inspections (Figure 4) were also conducted at this time. Results were recorded on the inspection report form provided in the LTM&M Plan during the inspection.

Cap thickness measurements were conducted by probing to the depth of the ACM, or by collecting sediment core samples and measuring the thickness of cap materials in the sample core in capped areas where no ACM was installed. The cap thickness measurements were completed in accordance with the LTM&M Plan at the locations shown on Figure 2.

The presence of gravel or cobble below the current water elevation was probed with a rod to determine the presence or absence of the armor materials at the locations shown on Figure 2.

2.3.3 Results

Some erosional areas were identified on Stryker Bay's east shoreline. The largest area is at the north end, near the French drain, which is intact and appears to be working as intended. Erosion in the form of shallow rivulets has continued in this area despite the functioning water diversion. Water runoff from an uphill source has also created a shallow channel through the red cap sand and into the dolomite cap material from the base of the hill to the shore of Stryker Bay. (Appendix B; Photo Location 1, 150 Degrees). There are also tire tracks that enter the area from the north end, and they continue along the beach. Near the center of the east shoreline, where the bay widens at the southern extent of the inspection transect, there continues to be erosion from the hillside, creating channels near the base of the hill. (Appendix B; Photo Location 2, 150 degrees, Appendix D; photos 1, 2, and 3) Further south, smaller-scale erosional channels are visible at the transition from the cap to the vegetated areas further upland (Appendix D; Photo 4).

The south shore of the 59th Avenue Peninsula appears to have dense vegetative cover. Along the inspection transect, there was mostly 100% vegetation coverage and no identified erosion. The cobble shoreline protection was intact (Appendix B; Locations 4 and 5).

The dock wall along the western edge of Slip 6 (CAD) appears to be intact and relatively unchanged since capping was completed. At the Slip 6 (CAD) shoreline, there was minimal erosion observed. The vegetative cover was sparse along the eastern shoreline transect, with only 10-20% coverage in some areas. Silt fence installed near the shoreline to protect newly planted areas in the riparian buffer zone is in disrepair, but is no longer necessary (Appendix D; photo 9).

At the southern end of the 54th Ave. West Peninsula on the western corner, there is minimal erosion along the shoreline and the revised hill slope. Ponding was observed during the site visit landward of the cobble and rock revetment. Large vehicle tracks were also observed, and appeared to be from a vehicle that got mired or stuck in the ponded area (Appendix D; photos 5, 6). This track continued north to the culvert crossing (Appendix B; Location 21 photos).

The western shore of Slip 7 central transects had approximately 75% to 85% upland vegetative cover, although only about 20% coverage near the water's edge. Some shallow erosion channels (less than 0.5 feet deep and less than 8 feet long) were observed at two central locations.

Along the Slip 7 dock wall, there were several photo locations visited. The dock wall is in disrepair, but appears to be in similar condition to when Slip 7 was being capped. Holes and depressions were observed on the landward side of the dock wall where erosion has occurred adjacent to the wall.

Tallas Island was not inspected at the same time as the rest of the site. Observations were made during the vegetation survey in July. There is an area at the outlet of Knowlton Creek that was heavily impacted by the June 2012 flooding event. A large portion of the waterway at that location has been filled by material that washed down the stream.

Cap thickness measurements ranged from 2.3 to 4.6 feet at the pore water and bulk sediment sample locations shown on Figure 2 and presented on Table 4. The cap thickness ranged from 2.3 to 7.0 at the cap thickness survey locations shown on Figure 2.

Armoring was present at the test locations (SB-AS-01, S6-AS-01, S7-AS-01) and the elevation of the measured armored surface is shown on Figure 2.

The erosion inspections conducted along transects shown on Figure 4 are described in this section. Inspection report forms and photographs are provided in Appendix B, C and D.

2.3.4 Discussion

The inspected caps appear to be stable and performing as designed, but there are some minor areas to be addressed in accordance with the LTM&M Plan.

Shallow channel and rivulet erosion observed on some sections of the cap above the water surface likely occurred during the intense rain and flood event in June 2012, but does not appear to adversely diminish the cap thickness at these locations.

The erosional areas identified are minor deficiencies, and will be evaluated and repaired, if necessary, during the 2014 construction season.

Silt fencing is no longer required as construction activities area complete and the vegetation has grown in the area, so silt fencing that is in disrepair will be removed as part of the maintenance activities.

2.4 Benthic Assemblage and Abundance

2.4.1 Introduction

Benthic macroinvertebrate assemblage (community composition) and abundance will be monitored at the SLRIDT site in order to track the reestablishment of the biotic community. This testing includes the relationships between body-size, species abundance and diversity in benthic macroinvertebrate assemblages. The benthic macroinvertebrate assemblage and abundance sampling at the SLRIDT site will be compared to the North Bay reference site. Specifically, Stryker Bay, Slip 7 and the CAD will be monitored for the reestablishment of the benthic macroinvertebrate communities, compared to the North Bay reference site, every two years starting in 2014.

It is expected that the initial benthic monitoring event will take place in 2014.

2.5 Aquatic and Upland Vegetation Sampling

2.5.1 Introduction

A Public Waters Restoration Permit issued by the Minnesota Department of Natural Resources (MNDNR) includes requirements for vegetation monitoring at the SLRIDT site and at the TICMP site.

Sampling methods, locations and frequencies for vegetation monitoring at SLRIDT, TICMP, and a reference site (Kingsbury Bay) are described in the draft LTM&M Plan. Sample locations are shown on Figures 5 and 6. Sample locations and sampling methods will remain constant during the five years of annual monitoring to allow for documentation of vegetation changes over time across all of the sites.

Vegetation monitoring began in 2011 in accordance with the draft LTM&M Plan, pending approval of the final LTM&M Plan. Field work for the second annual survey was completed in August of 2012, after the 500-year flood event that occurred on the St. Louis River following a large storm on June 20, 2012. This event may have been a significant factor on plant growth in general, because of the severity of the flooding and the extended period of high water levels and turbid conditions in the St. Louis River estuary.

2.5.2 Vegetation Sampling

2.5.2.1 Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) sample locations were determined in 2011 by placing evenly spaced transects within each water body within the SLRIDT and TICMP project areas (Figures 5 and 6), and those locations were sampled again in 2012 and 2013. sample points were placed at regular intervals along each transect, depending on the transect length.

SAV sampling was completed in accordance with standard methodologies: lake rake sampling for SAV (Owen, et al, 2010; Kenow, et al, 2007; and Rodusky, et al, 2005), and in accordance with the SAV sampling procedure (Yin, Winkelman and Langrehr, 2011), as described in the draft LTMMP. Field scientists used a boat to access pre-determined points at the SLRIDT site. Water depth was determined at each sample location with a rod graduated to the nearest 0.05 meters. Samples were collected at locations where water depth was 8 feet deep and less.

A rake was used to retrieve plants from a one square meter sampling area off the side of the boat. Most plants were identified in the field. Those not identified in the field were assessed in an off-site laboratory shortly after collection. Individual species and different life forms of aquatic vegetation (e.g., submersed and rooted floating–leaf) were recorded as either present or absent at each subsampling area based on visual examination and a rake sample. When present, submersed species were given a density rating (Table 9) based on their thickness on the rake teeth. When present, rooted floating–leaf and emergent species were given a percent cover rating based on visual examination.

Table 9 Rake Method Density Ratings

Percent of rake teeth filled	Density rating
76-100	4
51-75	3
26-50	2
1-25	1
no plants retrieved	0

Species that had not been recorded in the six subsampling areas but were observed at the site were recorded and marked as "additional" species. If any sediment adhered to the rake, it was also assessed and noted at that time. Plant species were determined using field guides and plant keys in the field, and percentages of those plants collected in each rake sample were estimated.

2.5.2.2 Upland Vegetation

Emergent and upland vegetation monitoring was performed at six pre-determined locations at the SLRIDT site in 2011, 2012 and 2013 (Figure 5). Each assessment location consisted of a 15 square meter area. The vegetation was identified in the field, and the plant density was measured using cover classes (Daubenmire, 1959). The vegetation cover classes are included in the survey results for the upland vegetation in Appendix F. Plant species were determined using field guides and plant keys in the field by a botanist/plant taxonomist and a technician, under the guidance and supervision of a senior botanist/plant taxonomist.

2.5.2.3 Invasive and Non-Native Species Assessment

The third year of site walks were performed in June and October of 2013 along the eastern shoreline of Stryker Bay and on the 54th Avenue Peninsula to survey the areas seeded or planted during Response Actions for the presence of invasive species (MN DNR, 2012). During the October assessment, tansy *(Tanacetum vulgare)* was the only invasive present having more than just a few plants present at all of the assessment areas. All survey areas had been spot treated, and had very few thistle plants (*Cirsium arvense*), cattail *(Typha latifolia)*, purple loosestrife *(Lythrum salicaria)*, spotted knapweed *(Centaurea maculosa)*, Birds-foot trefoil *(Lotus corniculatus)*, sweet clover *(Mellilotus alba/officianalis)*, or Reed canary grass *(Phalaris arundinaceae*). No herbicidal spray was applied in 2013. These invasive species are present in the adjacent non-managed portions of the SLRIDT site, on other properties surrounding the site, and in the St. Louis River estuary:

- Canadian thistle (*Cirsium arvense*)
- Purple loosestrife (*Lythrum salicaria*)
- Spotted knapweed (*Centaurea maculosa*)
- Birds-foot trefoil *(Lotus corniculatus)*
- Reed canary grass *(Phalaris arundinaceae)*
- Common Reed *(Phragmites australis* subsp. *australis)*

The inventory of the invasive species list was updated during the October site visit. Common Tansy is still the most prevalent, and there are a few spotted knapweed (*Centurea maculosa*) on the 59th Avenue Peninsula. There was only Common Tansy and less than 1% Reed canary grass (*Phalaris arundinaceae*) noted at the Slip 7 site. Common Reed (Phragmites australis) was observed at four locations; the southwestern corner, the north edge of the southern wetland, at the culvert crossing at the north end, and north of the culvert crossing. There was also Common Reed observed at the north end of Dock 7 (Appendix D; photos 7 and 8).

2.6 Data Analysis

2.6.1 Data Analysis Methods

2.6.1.1 Species Present and Species Richness

The total number of species present, or the number of species occurring in a plot or study area is termed species richness and is a measure of species diversity. Species richness is sensitive to sample unit area and the skill of the observer.

Species richness can be expressed as the average number of species per sampling unit:

$$\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$$

Where:

yi = the number of species in sampling unit *i*
n = the number of sampling units.

2.6.1.2 Non-Native Species

Non-native species or exotic plant species which are often invasive are those that have been introduced by human action, and often disrupt natural/native plant communities or ecosystems. Seed sources on adjacent lands and within the St. Louis River estuary will likely be on-going contributors of invasive plant species in the SedOU work areas. These species were, and will be, documented and managed as necessary during the vegetation monitoring program.

2.6.1.3 Species Diversity

Species diversity for plant sampling will be measured using the H' – the Shannon Diversity Index (Macgurran, 1988).

$$H' = -\sum_{i=1}^{S} p_i \ln p_i$$

where: S = The number of species. Also called species richness
p_i = The relative abundance of each species, calculated as the proportion of the total sample belonging to the ith species: $\frac{n_i}{N}$

2.6.1.4 Coefficients of Conservatism

The concept of individual species conservatism to natural habitats and communities is a fundamental principle in the Floristic Quality Assessment Index (FQAI). The Coefficient of Conservatism (*C*) value is simply a numerical rating of an individual species' conservatism and habitat fidelity in relation to disturbance. *C*-values range from 0 to 10 and are assigned to each native species in a flora based upon the best professional judgment of an expert review panel within the region for which the values are applicable. Non-native species are not assigned *C*-values, as they were not present during the evolution of native species and local plant communities. They may, however, be included in index calculations with a value of 0. Species that are least conservative, or show the least fidelity to specific natural habitats, are assigned a value of 0, while 10 is reserved for those species that are most conservative (Milburn, et al., 2007). *C*-values from Milburn, et al. (2007) are used and the mean value for all species in a plot were calculated.

2.6.1.5 Plant Community Quality, or Floristic Quality Assessment Index

The Floristic Quality Assessment Index (FQAI) and its relationship to wetland disturbance and quality have been previously investigated by Mack (2001). The principal concept underlying the FQAI is that the "quality" of a natural community can be objectively evaluated by examining the degree of ecological conservatism (or tolerance) of the plant species in that community, regardless of the type of community or the abundance, dominance, growth form, etc. of the plants that comprise it. Previous investigations cited in Mack (2001) have found significant correlations between a wetland's FQAI score and the degree of human disturbance at the site.

A floristic quality index (I) is developed by assigning a *C*-value to all species identified within a plot, summing those coefficients, and dividing by the square root of the total species identified (N), or

$$\mathbf{I = \sum (c_{1+}\ c_2 + \ldots . c_n)/\sqrt{N}}$$

Where: I = the FQAI score,

C_n = the coefficient of conservatism of a plant,
N = the total number of native species at the site being evaluated.

A weighted floristic quality index (I_i) is developed by including the relative abundance of each species into the calculation, or

$$\mathbf{I_i = \sum (p_1 c_{1+}\ p_2 c_2 + \ldots .\ p_n c_n)/\sqrt{N}}$$

Where: I_i = the weighted FQAI score,
c_n = the coefficient of conservatism of a plant,
p_n = proportional areal coverage of plant n,
N = the total number of native species at the site being evaluated.

The FQAI was calculated with and without non-native plants for this assessment.

2.6.1.6 Percent Cover (rooted floating–leaf and emergent life form)

Cover is commonly measured as "total cover", which is the percentage of all vegetation covering the ground surface inside the plot, or as "species cover", which is the percentage of the target species covering the ground surface inside the plot.

The percent cover of rooted floating–leaf and emergent life forms in a stratum was computed using the following formula:

$$C = \frac{\sum_{j=1}^{m} L_j \cdot A}{M}$$

Where:
Lj is the cover rating at individual sites, and
A is the midpoint of the corresponding percent cover, and
M is the total number of sites in the stratum.

Percent cover in a pool was computed as the average of all shallow water strata, weighted by acreage:

$$C = \frac{\sum_{j=1}^{m} C_j \cdot S_j}{\sum_{j=1}^{m} S_j}$$

Where:

Cj is percent cover in stratum j and Sj is the acreage of stratum j.

2.6.1.7 Relative Cover

Relative cover for plants represents the proportion of the whole sample represented by each species. The sum of all species relative cover within a plot will equal 100 percent. Relative cover is calculated using the cover class midpoint value for each species.

$$p_i = x_i / N$$

Where: $N = \sum x_i$

Where:

p_i = the relative cover of plant species *i*

x_i = the cover class midpoint value for species *i*

N = the sum of all species cover classes

2.6.1.8 Plant Community Similarity – Jaccard's Index

Similarity was measured using the Jaccard coefficient, which describes the degree of similarity between two communities in terms of shared species. The Jaccard coefficient takes two sample sets and divides the intersection of elements in the two sets by the union of elements within the two sets.

Jaccard coefficient = $J(A,B) = |A \cap B| / |A \cup B|$

A coefficient of 1.0 demonstrates 100% similarity between two communities; the closer the coefficient approaches 0.0, the more dissimilar. Each SAV community was compared to the Kingsbury Bay reference site for degree of species similarity.

2.7 Vegetation Monitoring Results – 2013

2.7.1 General Plot Descriptions

2.7.1.1 Slip 7

Sample plots in the Slip 7 project area were set up at regularly spaced intervals on evenly spaced horizontal transects (Figure 5). The locations were analyzed with the most recent bathymetry to determine depth restrictions for the best vegetation sampling. Due to the historic boat slip configuration, only a very narrow zone close to the western shore would have submerged aquatic plants given that the depth of water within the slip is greater than 8 feet. The near shore area was extremely shallow. Depth increases rapidly and follows the historic slip configuration along the eastern edge.

2.7.1.2 Slip 6

In Slip 6, the sampling transects were evenly spaced north to south with sampling points along each transect (Figure 5). The depth of Slip 6 was mostly less than 8 feet. This allowed for some variability in the plot locations.

2.7.1.3 Stryker Bay

Stryker Bay plots were also located along horizontal transects (Figure 5). The irregular configuration of both east and west shorelines made the plots evenly spaced along each transect, but did not line up north and south.

2.7.1.4 Tallas Island

Tallas Island transects were oriented perpendicular to each shoreline, and were evenly spaced from one end of the bay behind the island to the other end, (Figure 6). Since each transect was a different length, the plots and plot amounts were determined by those lengths, ranging from 1-3 plots per transect.

2.7.1.5 Kingsbury Bay

Kingsbury Bay was the reference site to compare SAV recovery of the work areas; plots were also located along horizontal transects (Figure 5).

2.7.1.6 Upland Sites

The upland sites included in this survey were located along the shoreline at two places on Stryker Bay, one at the river end of the 54th Avenue Peninsula, and three more on the 54th Avenue Peninsula (Figure 5). These results are tabulated separately from the aquatic sites. (Appendix F).

2.7.1.7 Transect Inspection Assessment Sites

Inspection transects, as shown on Figure 4, are located along the northeast shoreline of Stryker Bay, the southern shore of the 59th Avenue West Peninsula, the eastern shore of the CAD, and four are along the western shoreline of Slip 7; at the north and south ends, with two centrally located. Completion of this assessment will help determine distribution, composition, density, and recovery of the upland vegetation.

2.7.1.8 SAV Species Presence and Species Richness

Plants were identified from all aquatic sites. SAV species distribution across sites is shown in Figure 7, and species richness is summarized in Table 10. More plant species were observed at most sites than were collected with the rake (see Appendix G for complete SAV species list).

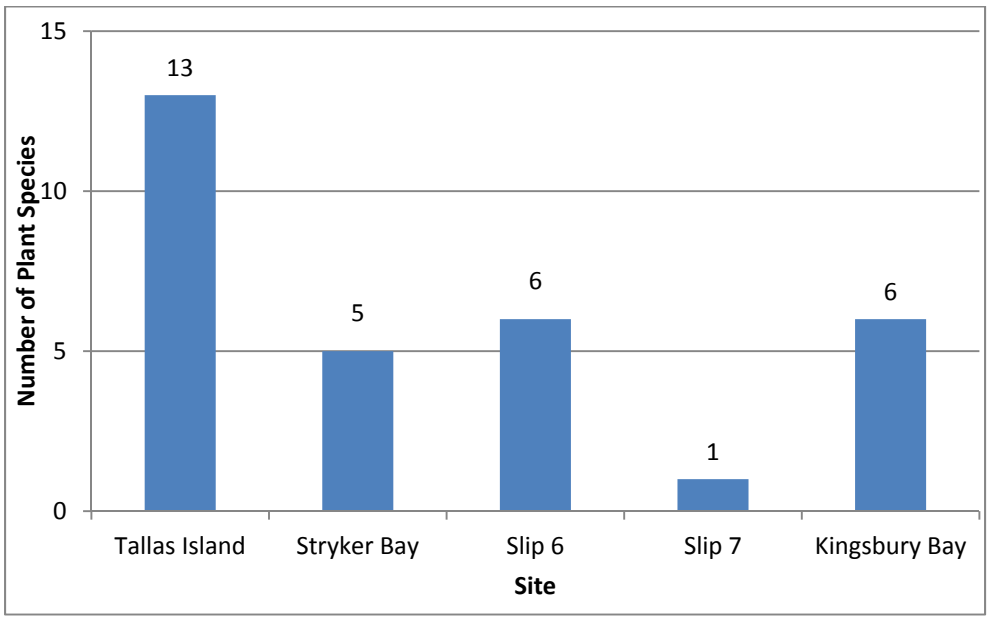


Figure 7 Number of Plant Species per Site, 2013

Table 10 Species Richness for SAV Sites 2013

	Tallas Island	Stryker Bay	Slip 6	Slip 7	Kingsbury Bay
# of Sampling Points	21	18	21	12	11
Sample Points with Vegetation	15	11	11	3	9
Number of Plant Species per Site	13	5	6	1	6
% of Sample Points with vegetation	71.4%	61.1%	52.4%	25.0%	11.7%

2.7.1.9 SAV Non-native Species

Non-native plant species were not observed in any of the SAV sampling plots. Purple loosestrife was observed along the shoreline at Tallas Island.

2.7.1.10 SAV Species Diversity

Species diversity indices were not calculated using the information collected this season. Vegetative cover was sparse, and density was consistently too low to allow development of meaningful cover numbers. Due to low vegetation densities, the Rake Method did not facilitate collecting all visible vegetation, nor was the rake able to harvest plants with long, straight leaf configuration. Plants located nearby were recorded in the field notes and are included in the vegetation assessment.

2.7.1.11 SAV Coefficients of Conservatism

The results of the 2013 mean coefficient of conservatism values by site are presented in Figure 8. The mean *C*-values ranged from a low of 4.0 at Stryker Bay to a high of 6.0 at Slip 7, with the reference site (Kingsbury Bay) scoring at 5.0. Slip 6 scored identically to the reference site, Kingsbury Bay.

As with *C*, *mean C* scores range from 0-10. The closer to "10" a site ranks, the greater the biodiversity, richness, and level of habitat fidelity, as defined in Table 11.

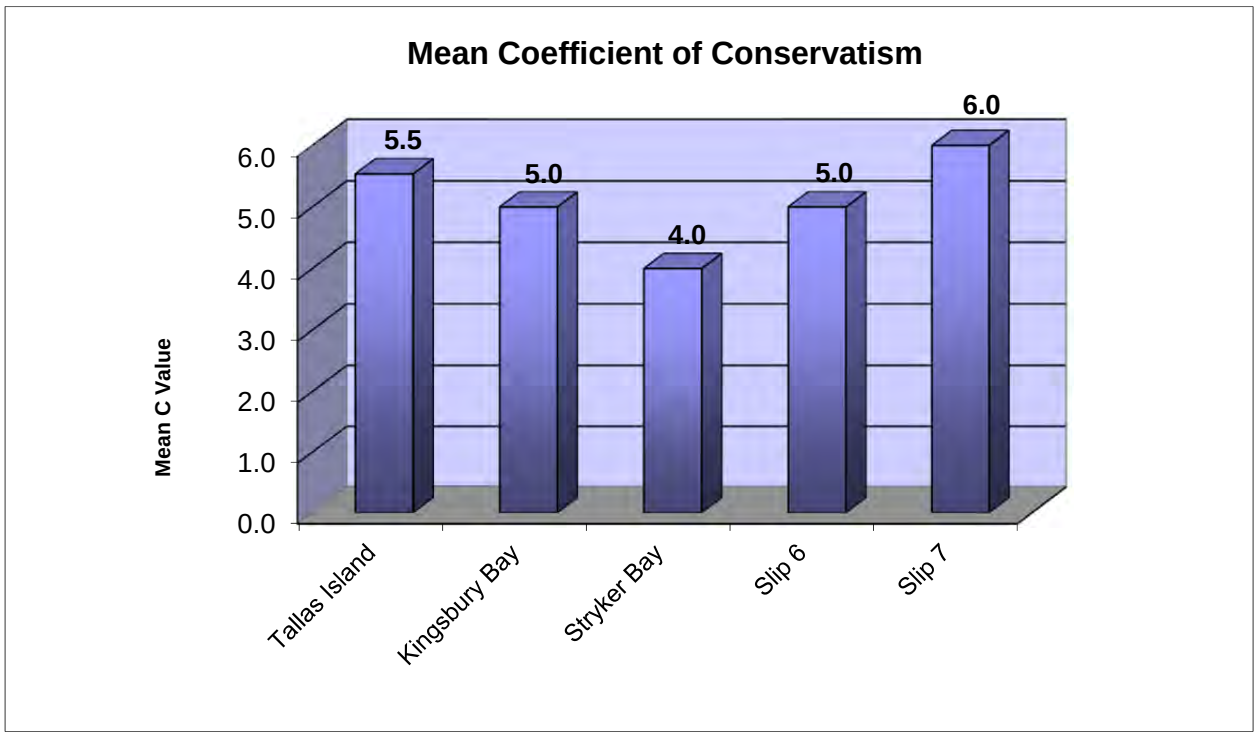


Figure 8 2013 Mean Coefficient of Conservatism by Site

Table 11 Coefficient of Conservatism Scale Descriptions

C-value	Description
0	Plants with a wide range of ecological tolerances. Often these plants are opportunistic invaders of natural communities (e.g. *Phalaris arundinacea)* or native species typical of disturbed or ruderal communities (e.g., *Ambrosia artemisiifolia* or *Hordeum jubatum* ssp. *jubatum*)
1-2	Widespread taxa that are not typical of a particular community (e.g., *Impatiens capensis* or *Acer negundo*)
3-5	Plants with an intermediate range of ecological tolerances that typify a stable phase of some native communities, but persist under some disturbance (e.g., *Carex comosa* or *Potamogeton richardsonii*)
6-8	Plants with a moderately narrow range of ecological tolerances that typify stable or late successional native plant communities (e.g., *Epilobium leptophyllum* or *Vallisneria americana*)
9-10	Plants with a narrow range of ecological tolerances that exhibit very high fidelity to a narrow range of stable habitat requirements (e.g., *Arethusa bulbosa* or *Salix candida*)

2.7.1.12 SAV Plant Community Quality - Floristic Quality Assessment Index

The Floristic Quality Assessment (*FQA*) is a tool used to objectively quantify the natural quality of a given habitat. Used over time, performing an *FQA* assists in demonstrating whether mitigation performance standards are being met.

FQA is performed by calculating a Mean Coefficient of Conservatism (*mean C*) and a Floristic Quality Index (*FQI*). *Mean C* is calculated by summing the Coefficient of Conservatism (*C*) for each taxa at a site and dividing by the total number of taxa (*n*) to obtain a mean:

$$(\overline{C} = \sum C/n)$$

As with *C*, *mean C* scores range from 0-10. The closer to "10" a site ranks, the greater the biodiversity, richness, and level of habitat fidelity, as defined in Table 11.

FQI is a weighted index of species richness and allows for comparisons between dissimilar sites. To obtain the *FQI*, the *mean C* is multiplied by the square root of *n*:

$$(FQI = \overline{C}\sqrt{n})$$

It is interpreted that the higher the *FQI* value, the more similar the site is to the pre-European settlement condition.

The results of the *FQA* are presented below in Figure 9. Unexpectedly, Tallas Island scored higher in both *mean C* and *FQI* than the reference site, Kingsbury Bay. Based on the results, Tallas Island represents moderately valuable natural habitat. Kingsbury Bay, Stryker Bay, and Slip 6 scored nearly identically in both factors. Slip 7 scored lowest of all sites, most notably in *FQI.*

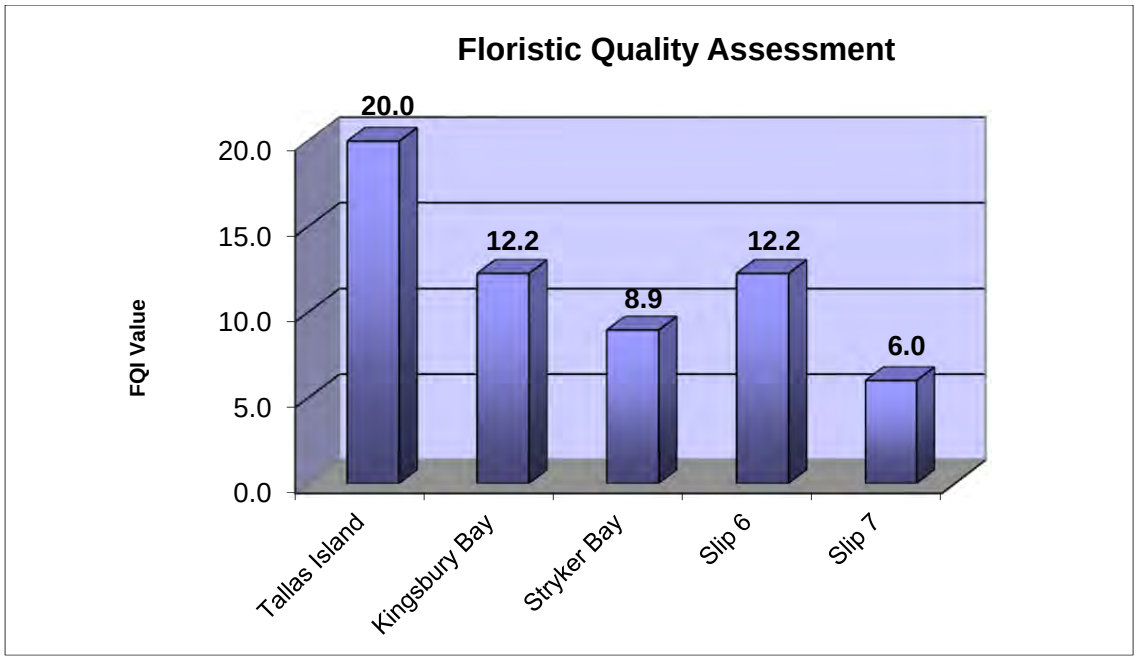


Figure 9 2013 Floristic Quality Index Values by Site

2.7.1.13 Cover – Absolute and Relative Cover

As was noted for species diversity assessment, cover measures were not calculated using the information collected for 2012 or 2013. Vegetative cover was sparse, and density was consistently too low to allow for meaningful cover numbers to be developed. Because of the low vegetation densities the Rake Method was unable to collect as much vegetation as was visible, nor was the rake able to harvest the plants with long, straight leaf configuration. Plants not collected by the rake were recorded in the field notes and are included in the vegetation assessment but as such do not have cover values. Table 12 provides the sampling results that provide an overview of surrogates of plant cover; in particular the percentage of sample points with vegetation provides an indirect measure of plant cover.

2.7.1.14 Plant Community Similarity (Jaccard's)

The SAV sites were only recently considered completed/restored - since this is the third year of monitoring, the vegetation has not yet reached its potential growth and diversity maximum. A Jaccard's coefficient of 1.0 demonstrates 100% similarity between two communities; the closer the coefficient approaches 0.0, the more dissimilar. The results of the 2013 Jaccard's coefficient values as compared to Kingsbury Bay are presented in Table 12. As seen in all monitoring years to date (2011, 2012, and 2013), the Slip 7 site has been considered the most different with a coefficient of

0.31 in 2013. Stryker Bay scored a similar Jaccard's coefficient compared with Slip 7 in 2013, with a coefficient of 0.38.

With a coefficient of 0.71, Slip 6 was the most similar to the Kingsbury Bay reference site in 2013. Tallas Island scored secondly similar when compared to Kingsbury Bay, with a coefficient of 0.46.

Table 12 2013 Jaccard's Index Summary for Comparison with Kingsbury Bay

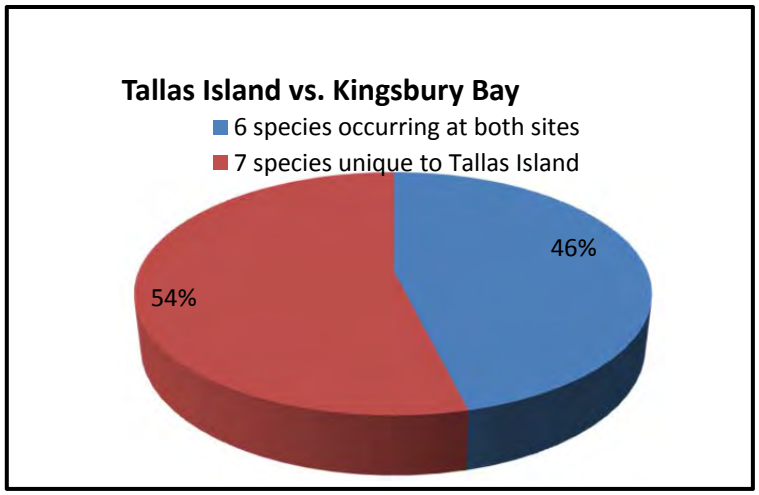
Jaccard's Index Summary	2013
Tallas Island	0.46
Stryker Bay	0.38
Slip 6	0.71
Slip 7	0.31

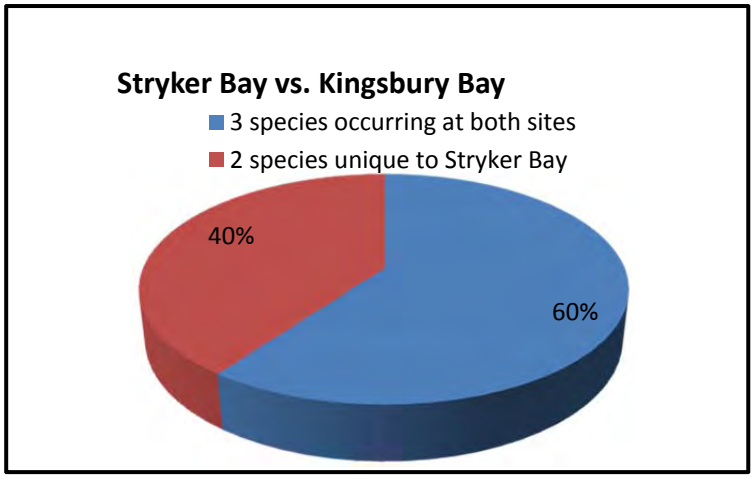
2.7.2 Upland Monitoring

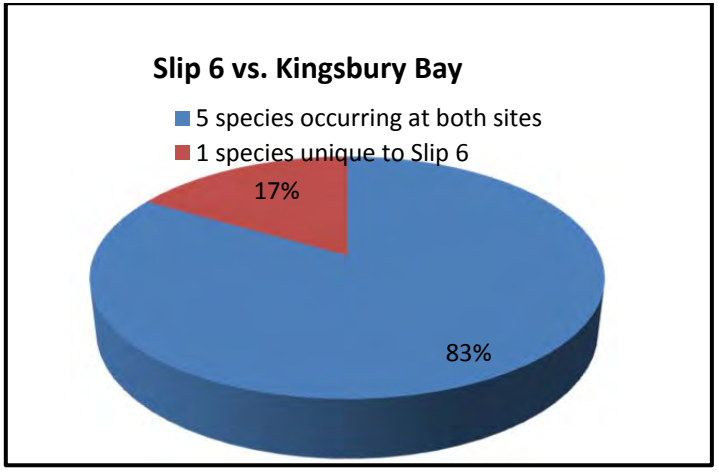
Monitoring results from the upland areas indicate variable coverage – ranging from 85% coverage to 145% across the sites (see Table 13). See Appendix F for the complete plant species lists and cover classes for the upland monitoring sites.

Table 13 Upland Monitoring Location Summary, 2013

Site	Number of Species	Absolute Cover (%)	Non-native species present
Site: 59-UV-01	25	145	Yes
Site: 59-UV-02	15	88	No
Site: 54-UV-01	18	107	No
Site: 54-UV-02	12	90	Yes
Site: 54-UV-03	19	85	No
Site: 54-UV-04	30	92	Yes







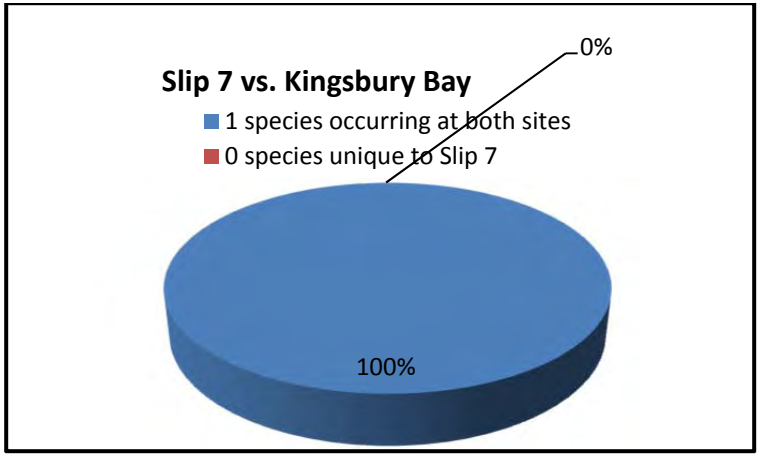


Figure 10 2013 Number of Species per SLRIDT Site vs. Kingsbury Bay

2.7.3 Monitoring Summary – 2013

The 2013 vegetation survey assessed the progress of post-Response Action construction re-vegetation at the SLRIDT and Tallas Island sites. Kingsbury Bay was utilized as a reference site for SAV. Vegetation monitoring will be conducted annually for a period of five years; this third round (July 2013) of monitoring showed that:

- Species composition for SAV was greatest in Tallas Island (13 species). Kingsbury Bay (6 species), Stryker Bay (5 species), and Slip 6 (6 species) have slightly lower species richness, and Slip 7 (1 species) had the lowest species richness.
- Percent cover for SAV was not calculated for 2013 due to the low plant density. Percent of sample plots with vegetation was used as a surrogate for cover – Tallas Island (71.4%) and Stryker Bay (61.1%) had the highest percentages of plots with vegetation. Slip 6, Slip 7, and Kingsbury Bay had the lowest percentages of plots with vegetation at 52.4%, 25.0%, and 11.7%, respectively.
- All of the upland plots had exotic/invasive species present (example, Appendix D; photo10).

Coverage and species richness results are comparable to expectations for recently restored sites. Species numbers for Stryker Bay and Slip 6 approach the species richness of Kingsbury Bay (reference site). Slip7 has a bathymetry that is the least conducive to SAV growth due to the depth of water (mean sampling depth = 18.3 feet) and most exposed to potential wave energy impacts. Slip 7 has the lowest percentage of plots with SAV and has the lowest species richness. Of all the sites, Tallas Island had nearly complete coverage of SAV and the greatest number of aquatic plant species in 2013, indicating it has recovered well from disturbance; the anticipated re-vegetation of the dredged area is occurring. Stryker Bay and Slip 6 may continue to increase in SAV coverage over time given the number of species present in 2012 and 2013.

Monitoring results from the upland areas indicate increased coverage – ranging from 85% coverage to more than 100% across the sites. Management was completed in 2012 for several invasive species including tansy, thistle, and clover.

2.8 Assessment of 2011, 2012 and 2013 Results

Vegetation sampling completed in 2013 represents the third year of the five year monitoring effort to document the restoration progress. The 2011, 2012, and 2013 data were compared in an effort to determine year-to-year progress in the establishment of the vegetation restoration, and to compare the restoration sites to the reference site (Kingsbury Bay). A number of the vegetation monitoring

metrics were compared using the t-Test Two Samples to determine if the changes were statistically significant.

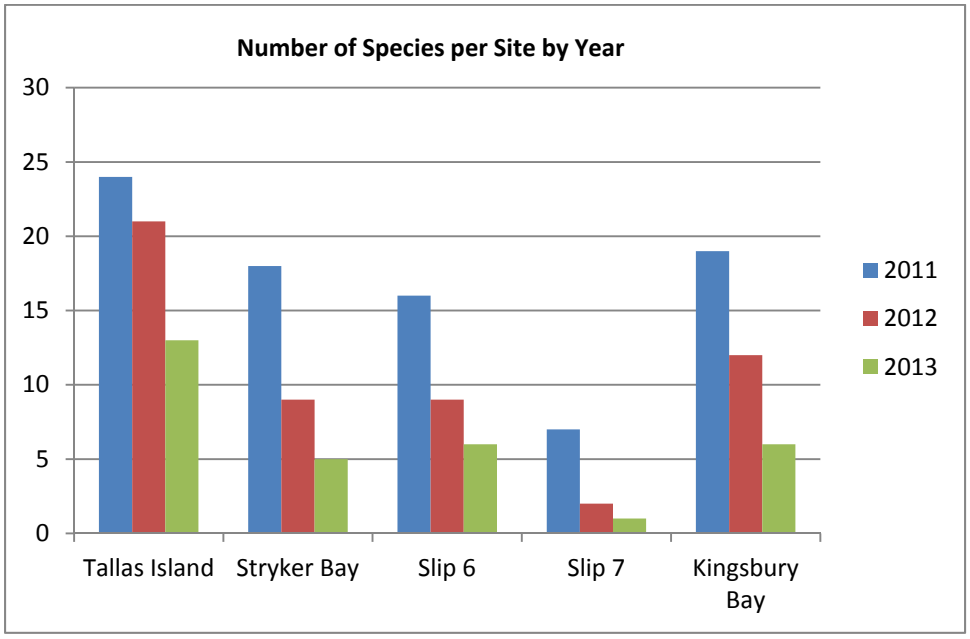
An important consideration when comparing 2013 to the 2012 vegetation monitoring results is that field sampling in 2012 occurred after a 500-year flood event that affected the St. Louis River estuary. The extremely high water levels and the extended period of inundation and high turbidity may have affected plant communities and plant survival rates in 2012.

2.8.1 SAV

The characteristics of the SAV community across all sites were assessed with regard to number of species and presence/absence of vegetation to evaluate the significance of the difference between the 2011, 2012 and 2013 results (Table 14 and Figure 11). At all sites the number of species present in 2012 and 2013 were less than in 2011, but the number of sampling points with vegetation in 2012 was greater or equal to 2011 at all sites except Kingsbury Bay (reference site). The only site to have fewer sampling locations with vegetation in 2012 was Tallas Island. Based upon the t-Test analysis, the changes were statistically significant for differences in number of species of SAV ($p = 0.002$), but were not statistically different for the percent of sampling points with vegetation. The 2012 flood event likely contributed to these changes. In 2013, all sites had a smaller number of species per sampling point. Further assessment of these data after future surveys will provide insight as to whether this change was related to this one-time event, or are part of a longer term trend.

Table 14 2011 – 2012 – 2013 SAV Comparison

2011	Tallas Island	Stryker Bay	Slip 6	Slip 7	Kingsbury Bay
# of Sampling Points	25	18	21	12	12
Sample Points with Vegetation	19	7	11	1	12
Number of Plant Species per Site	24	18	16	7	19
% of Sample Points with Vegetation	76.0%	38.9%	52.4%	8.3%	100.0%
2012	**Tallas Island**	**Stryker Bay**	**Slip 6**	**Slip 7**	**Kingsbury Bay**
# of Sampling Points	23	18	21	12	12
Sample Points with Vegetation	19	12	13	1	10
Number of Plant Species per Site	21	9	9	2	12
% of Sample Points with Vegetation	82.6%	66.7%	61.9%	8.3%	83.3%
2013	**Tallas Island**	**Stryker Bay**	**Slip 6**	**Slip 7**	**Kingsbury Bay**
# of Sampling Points	21	18	21	12	11
Sample Points with Vegetation	15	11	11	3	9
Number of Plant Species per Site	13	5	6	1	6
% of Sample Points with Vegetation	71.4%	61.1%	52.4%	25.0%	11.7%



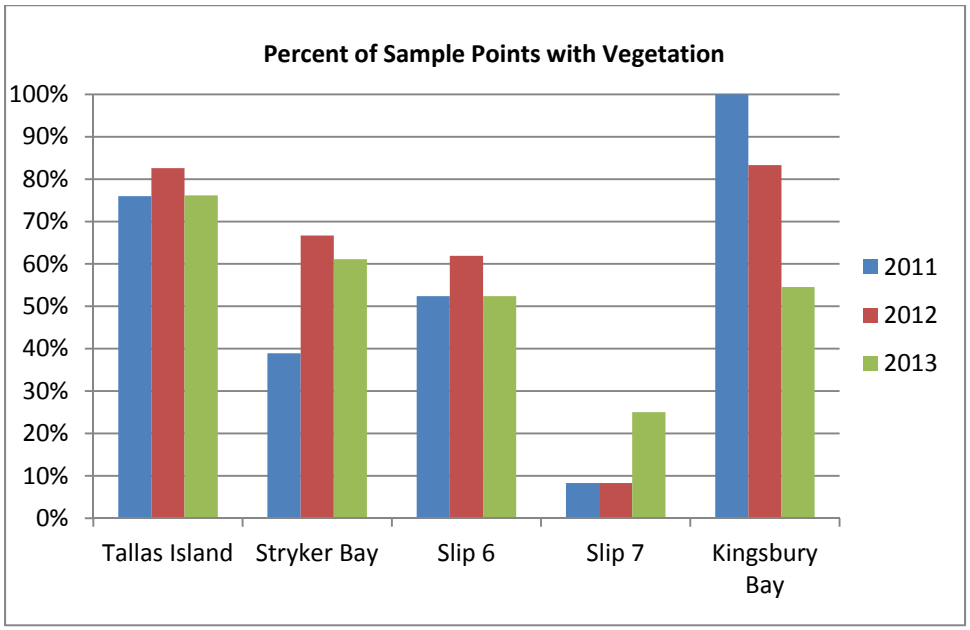


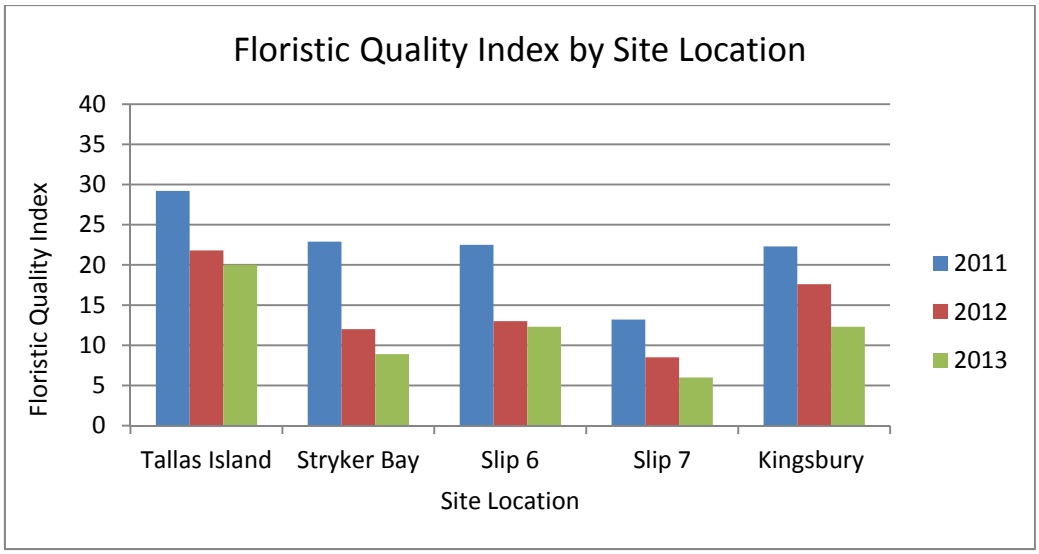
Figure 11 2011 - 2013 SAV Comparison

2.8.1.2 SAV Plant Community Floristic Quality Assessment

The characteristics of the SAV community across all sites were assessed with regard to the floristic quality index (FQI) and mean coefficient of conservatism values to evaluate the significance of the changes between the 2011, 2012, and 2013 results (Table 14 and Figure 9). At all sites the number of species present in 2013 were less than 2012, which was less than in 2011 so this likely contributed to the lower FQI values in both 2012 and 2013. The mean coefficient of conservatism values in 2012 were lower than in 2011 at all sites except Slip 7, which had only two species present. Based upon the t-Test analysis, the changes were statistically significant for the decrease in FQI ($p = 0.002$), but were not statistically different for changes in coefficient of conservatism mean values. The 2012 decrease in the number of species may have contributed to these changes. Further assessment of these data after future surveys will provide further insight as to whether this was related to this one-time event or a longer term trend.

Table 15 2011-2013 SAV Comparison - Floristic Quality

2011	Tallas Island	Stryker Bay	Slip 6	Slip 7	Kingsbury Bay
Mean Coefficient of Conservatism	6.0	5.4	5.6	5.0	5.4
Floristic Quality Index	29.2	22.9	22.5	13.2	22.3
Number of Plant Species per Site	24	18	16	7	19
% of Sample Points with Vegetation	76.0%	38.9%	52.4%	8.3%	100.0%
2012	**Tallas Island**	**Stryker Bay**	**Slip 6**	**Slip 7**	**Kingsbury Bay**
Mean Coefficient of Conservatism	4.8	4.0	4.3	6.0	5.1
Floristic Quality Index	21.8	12.0	13.0	8.5	17.6
Number of Plant Species per Site	21	9	9	2	12
% of Sample Points with Vegetation	82.6%	66.7%	61.9%	8.3%	83.3%
2013	**Tallas Island**	**Stryker Bay**	**Slip 6**	**Slip 7**	**Kingsbury Bay**
Mean Coefficient of Conservatism	5.5	4.0	5.0	6.0	5.0
Floristic Quality Index	20.0	8.9	12.3	6.0	12.3
Number of Plant Species per Site	13	5	6	1	6
% of Sample Points with Vegetation	71.4%	61.1%	52.4%	25.0%	11.7%



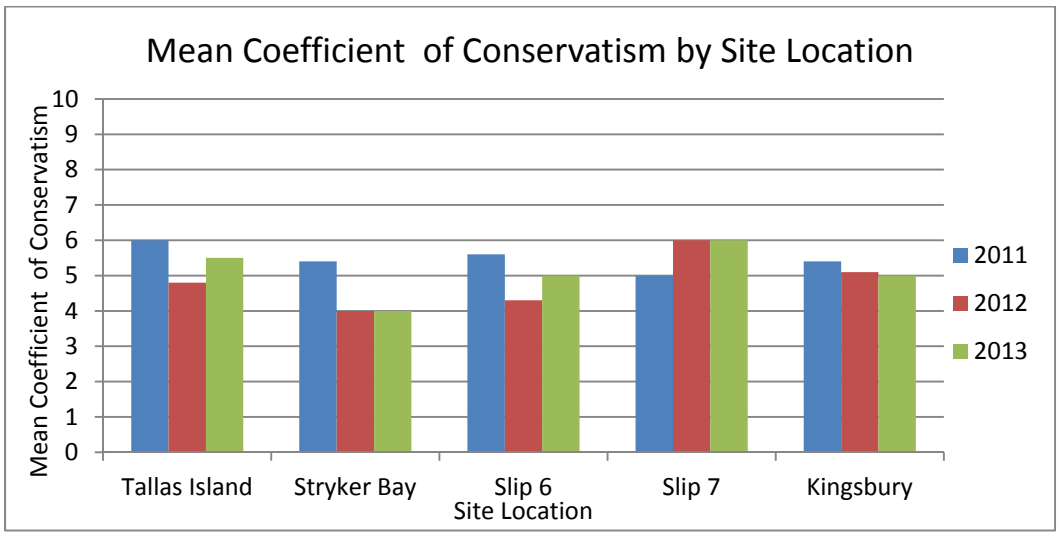


Figure 12 2011 - 2013 SAV Comparison - Floristic Quality

2.8.1.3 Cover – Absolute and Relative Cover

Absolute and relative cover were not calculated for the 2011 and 2012 sampling seasons as vegetative cover was sparse, and density was consistently too low to allow for meaningful cover numbers to be developed. No comparisons can be made between the three years.

2.8.1.4 SAV Plant Community Similarity

The SAV sites were only recently considered completed/restored, and since this is the third year of monitoring the vegetation has not yet reached its potential growth or diversity maximum. The results

of the 2013 Jaccard's coefficient values are presented in Table 12. As seen in all monitoring years to date (2011, 2012, and 2013), the Slip 7 site has been considered the most different from Kinsgbury Bay with a coefficient of 0.31, 0.31, and 0.09, respectively. Stryker Bay scored a similar Jaccard's coefficient compared with Slip 7 in 2013, with a coefficient of 0.38.

With a coefficient of 0.71, Slip 6 was the most similar to the Kingsbury Bay reference site in 2013. Tallas Island was the next most similar when compared to Kingsbury Bay, with a coefficient of 0.46.

Table 16 Jaccard's Index Summary for Comparison with Kingsbury Bay

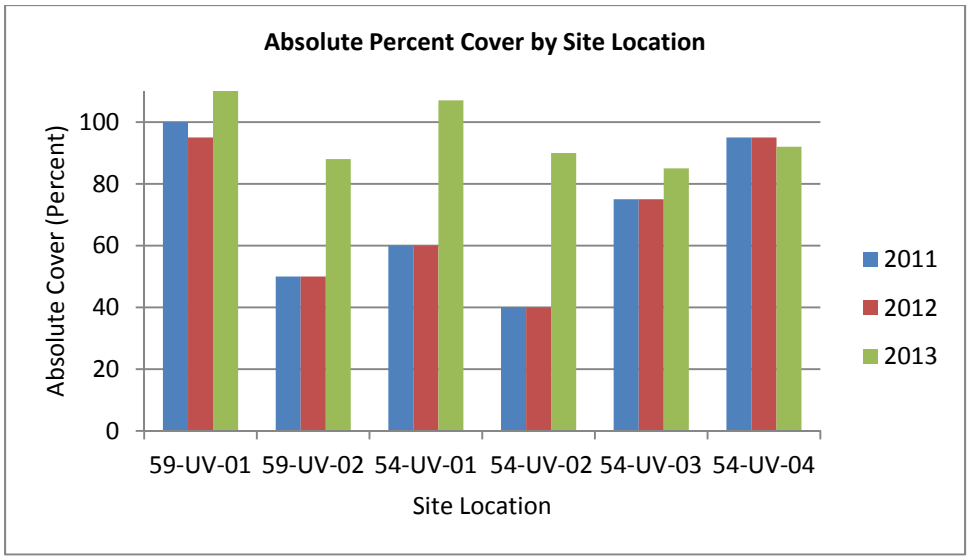
Jaccard's Index Summary	2011	2012	2013
Tallas Island	0.32	0.52	0.46
Stryker Bay	0.38	0.62	0.38
Slip 6	0.35	0.47	0.71
Slip 7	0.09	0.31	0.31

2.8.2 Upland Monitoring

The characteristics of the upland vegetation community were assessed with regard to number of species and absolute cover to evaluate the significance of the differences between the 2011, 2012 and the 2013 results (Table 17 and Figure 13). At all sites the number of species present in 2012 were greater than in 2011, and amount of vegetation cover – as absolute cover - in 2012 were unchanged. At all but one site, the number of plant species decreased from 2012 to 2013. Based upon the t-Test analysis, the increase in the number of species present were statistically significant ($p = 0.003$), but changes in absolute percent cover of sampling point vegetation were not statistically different. Three data points do not equal a strong trend, but the increased number of species appears to show that the upland restoration is proceeding with regard to the establishment of new species. Absolute cover values for all sites have increased as well.

Table 17 Upland Site Comparisons, 2011, 2012, and 2013

Site	Number of Species			Absolute Cover (%)			Non-native species		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Site: 59-UV-01	10	19	25	100	95	145	Yes	Yes	Yes
Site: 59-UV-02	13	17	15	50	50	88	No	No	No
Site: 54-UV-01	6	21	18	60	60	107	No	No	No
Site: 54-UV-02	12	15	12	40	40	90	Yes	Yes	Yes
Site: 54-UV-03	11	25	19	75	75	85	No	No	No
Site: 54-UV-04	21	35	30	95	95	92	Yes	Yes	Yes



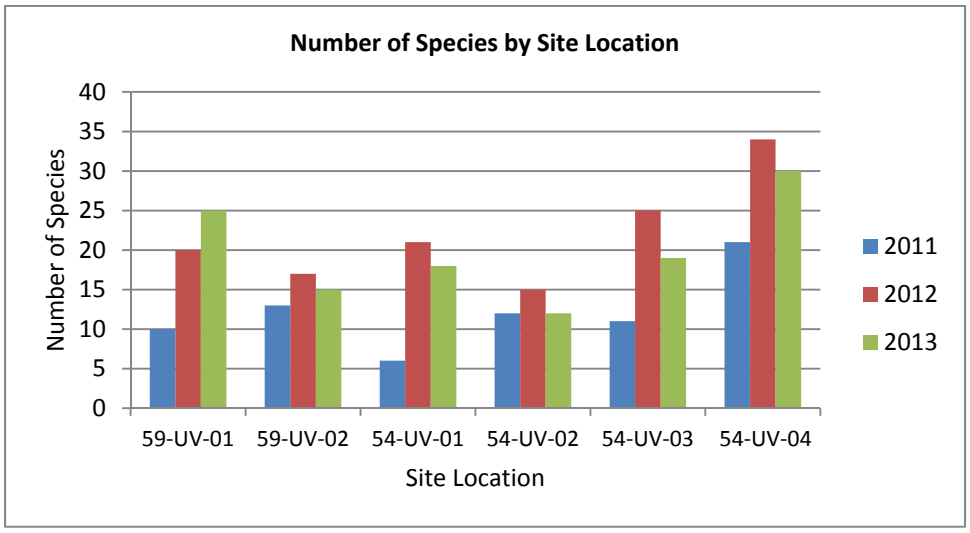


Figure 13 Upland Site Comparisons, 2011, 2012 and 2013

2.8.3 Transect Monitoring

Visual inspection of the upland transects for identification of exotic and invasive plant species in 2013 found that none of the transects had exotic or invasive species, although these were found in other locations across the site as a whole. The Stryker Bay and CAD transects had very little vegetative cover between the edge of the water and the upland edge of the cap (Appendix B; Location 2 and 6 photos, Appendix D; photos 1 and 2,). The other transects, at the south end of the 59th Avenue West Peninsula (Appendix B; Location 4 photos), and all of the transects along the eastern side of the 54th Avenue West Peninsula had at least 50% vegetative coverage (Appendix B; Locations 19, 20, 21 photos).

2.9 Benthic Bioaccumulation Monitoring

2.9.1 Introduction

Benthic bioaccumulation monitoring will be completed to assess the impact on the benthic invertebrate communities at the SLRIDT site. Monitoring will be conducted in 2015 to confirm that the cap is preventing the upward migration of COC at the SLRIDT site and that human health and environment are being protected.

In year 5, bioaccumulation sampling will be completed at both the capped areas at the SLRIDT site and the North Bay reference area (US EPA, 2000). If the year 5 sampling Long Term Monitoring and Maintenance Plan Revision 2 Saint Louis River/Interlake/Duluth Tar Site Sediment Operable Unit Remediation Long Term Monitoring and Maintenance Plan 17 event provides similar results between North Bay and the SLRIDT site then no other bioaccumulation sampling will be conducted unless the tiered approach to long term monitoring indicates otherwise. Following the tiered approach to sampling, bioaccumulation sampling will be necessary only if there are two consecutive sample results at a particular location that exceed the PRAOs for PAHs or other triggers for Tier III as discussed in the sections above.

3.0 Conclusions and Recommendations

The caps at the SLRIDT are performing as designed, despite a 500-year storm and flood on the St. Louis River in 2012, with a limited number of minor deficiencies, based on LTM&M monitoring performed in 2013.

3.1 Pore Water, Bulk Sediment and Cap Stability

Pore water and bulk sediment sampling completed near the base of the BAZ to ensure detection of potential PAH migration into the cap from underlying PAH-impacted sediment identified two locations where one compound exceeded the FCV. Cap stability identified limited areas with minor erosion and/or measure cap thickness less than the design thickness.

3.1.1 Minor Deficiencies

Two pore water samples exceeded FCVs; one in Slip 7 (S7-PW-06) and one in Stryker Bay (SB-PW-02). If PAH concentrations exceed the Post Remedial Action Objectives (PRAOs) in samples S7-PW-06 and/or SB-PW-02 in during annual Tier I monitoring in 2014, a Tier II monitoring plan will be submitted to the MPCA.

Areas where the cap thickness is less than the design thickness, or where visible erosion has occurred will be evaluated and repaired, if necessary, using appropriate cap materials in accordance with the RD/RAP Table 13-1 (Response Action Specifications) during the 2014 construction season.

The Slip 7 dock wall was observed to be in a state of disrepair similar to the condition of the dock wall during implementation of response actions.

3.1.2 Major Deficiencies

No major deficiencies have been identified to date.

3.3 Aquatic and Upland Vegetation

This third annual vegetation survey assessed the progress of post-Response Action construction re-vegetation at the SLRIDT and Tallas Island sites. Kingsbury Bay was utilized as a reference site for SAV. The comparison of the 2011, 2012, and 2013 seasons showed that:

- Species composition for SAV was again greatest at Tallas Island (24 species in 2011, 21 in 2012, 13 in 2013) and Kingsbury Bay (19 species in 2011, 12 in 2012, 6 in 2013). Stryker

Bay (18 species in 2011,9 in 2012, 6 in 2013) and Slip 6 (16 species in 2011, 9 in 2012, 6 in 2013) have slightly lower species richness, and Slip 7 (7 species in 2011, 2 in 2012, 1 in 2013) had the lowest species richness.

- Percent of sample plots with vegetation was used as a surrogate for cover – Tallas Island (76% in 2011, 82.6% in 2012, 76.2% in 2013) and Kingsbury Bay (100% in 2011, 83% in 2012, 54.6% in 2013) had the highest percentages of plots with vegetation. Stryker Bay (39% in 2011, 67% in 2012, 61% in 2013), Slip 6 (52% in 2011, 62% in 2012, 52.4% in 2013) and Slip 7 (8% 2011 and 2012, 25% in 2013) had the lowest percentages of plots with vegetation.
- The changes in SAV were statistically significant for differences in number of species of SAV at all sites ($p = 0.002$), but were not statistically different for the percent of sampling points with vegetation between 2011 and 2012.
- None of the SAV plots had exotic/invasive species present, although purple loosestrife *(Lythrum salicaria)* was observed on the shoreline of the Tallas Island area

A 500-year flood event which occurred in June 2012 may have affected vegetation growth for some SAV species in 2012, as evidenced by the lower number of species found, while the percentage of sample plots with vegetation remained at a similar percent of locations. Surveys scheduled to be conducted in subsequent years will provide additional data to evaluate changes.

Of all the sites, Tallas Island had the highest coverage of SAV and the greatest number of aquatic plant species in 2011, 2012, and 2013, indicating it has recovered well from disturbance; the anticipated re-vegetation of the dredged area is occurring. Stryker Bay and Slip 6 will likely continue to increase in SAV coverage over time given the number of species present in 2011, 2012, and 2013. Slip 7 will likely increase in SAV coverage along the narrow zone of shallow water adjacent to the 54th Avenue Peninsula, but may always have a low number of plant species. Review of the 2013 survey results do not show any appreciable recovery or increase in the number or diversity of aquatic plants.

Monitoring results from the upland areas showed the percent coverage has increased overall, to 85% and greater. The species diversity has not changed appreciably, and the number of different species stayed the same from 2012 to 2013. Management had been required for 2011 and 2012 for several invasive species including: Canadian thistle, tansy, and clover. More invasive plant species have been observed within the restoration areas and adjacent non-managed areas, and the list now includes spotted knapweed, bird's foot trefoil, reed canary grass, purple loosestrife, and common reed.

Spraying of invasive species will likely be necessary in future years to control invasive plant species. No other remedial actions are recommended based on the 2013 aquatic and upland vegetation monitoring.

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Tables

Table 1
Porewater Analytical Data Summary
SLRIDT Site
XIK Corporation

	Location	NW-PW-01		S6-PW-01		S6-PW-02		S6-PW-03		S6-PW-04	
	Date	11/07/2013		11/08/2013		11/08/2013		11/14/2013		11/08/2013	
	Depth							2 ft			
	Sample Type	N		N		N		N		N	
Parameter	EPA's FCVs	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio
Effective Date	03/24/2003										
SVOCs											
2-Methylnaphthalene	72.16 ug/l	0.023 j ug/l	0.00032 a	1.2 ug/l	0.017	0.0053 j ug/l	0.000073 a	0.016 j ug/l	0.00022 a	< 0.0049 ug/l	0.000034
Acenaphthene	55.85 ug/l	0.013 j ug/l	0.00023 a	0.31 ug/l	0.0056	0.0079 j ug/l	0.00014 a	< 0.0050 ug/l	0.000045	< 0.0050 ug/l	0.000045
Acenaphthylene	306.9 ug/l	< 0.0047 ug/l	0.0000077	1.1 * ug/l	0.0036 a	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075
Anthracene	20.73 ug/l	< 0.0059 ug/l	0.00014	0.014 j ug/l	0.00068 a	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014
Benzo(a)anthracene	2.227 ug/l	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036
Benzo(a)pyrene	0.9008 ug/l	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056
Benzo(b&j)fluoranthene	0.6774 ug/l	< 0.0018 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013
Benzo(g,h,i)perylene	0.4391 ug/l	< 0.0020 ug/l	0.0023	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022
Benzo(k)fluoranthene	0.6415 ug/l	< 0.0034 ug/l	0.0027	< 0.0033 ug/l	0.0026	< 0.0033 ug/l	0.0026	< 0.0033 ug/l	0.0026	< 0.0033 ug/l	0.0026
Chrysene	2.042 ug/l	< 0.0016 ug/l	0.00039	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037
Dibenz(a,h)anthracene	0.2825 ug/l	< 0.0016 ug/l	0.0028	< 0.0015 ug/l	0.0027	< 0.0015 ug/l	0.0027	< 0.0015 ug/l	0.0027	< 0.0015 ug/l	0.0027
Fluoranthene	7.109 ug/l	< 0.0041 ug/l	0.00029	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028
Fluorene	39.9 ug/l	< 0.0064 ug/l	0.000080	0.31 ug/l	0.0078	< 0.0062 ug/l	0.000078	< 0.0062 ug/l	0.000078	< 0.0062 ug/l	0.000078
Indeno(1,2,3-cd)pyrene	0.275 ug/l	< 0.0020 ug/l	0.0036	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035
Naphthalene	193.5 ug/l	1.2 ug/l	0.0062	69 ug/l	0.36	0.01 jb ug/l	0.000052 a	0.021 jb ug/l	0.00011 a	0.04 jb ug/l	0.00021 a
Phenanthrene	19.13 ug/l	< 0.0068 ug/l	0.00018	0.097 ug/l	0.0051	< 0.0066 ug/l	0.00017	< 0.0066 ug/l	0.00017	< 0.0066 ug/l	0.00017
Pyrene	10.11 ug/l	< 0.0043 ug/l	0.00021	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.0002	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020
PAH Ratio (USEPA FCV) Additive Model Porewater Value (ND=1/2)		0.022 a		0.41 a		0.015 a		0.015 a		0.015 a	

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 1
Porewater Analytical Data Summary
SLRIDT Site
XIK Corporation

Location		S6-PW-05		S6-PW-06		S7-PW-01		S7-PW-02		S7-PW-03		S7-PW-04	
Date		11/08/2013		11/08/2013		11/08/2013		11/08/2013		11/08/2013		11/14/2013	
Depth												1.5 ft	
Sample Type		N		N		N		N		N		N	
Parameter	EPA's FCVs	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio
Effective Date	03/24/2003												
SVOCs													
2-Methylnaphthalene	72.16 ug/l	0.0058 j ug/l	0.000080 a	0.0075 j ug/l	0.00010 a	0.0051 j ug/l	0.000071 a	0.013 j ug/l	0.00018 a	< 0.0060 ug/l	0.000042	0.02 j ug/l	0.00028 a
Acenaphthene	55.85 ug/l	0.085 ug/l	0.0015	< 0.0050 ug/l	0.000045	< 0.0051 ug/l	0.000046	1.2 ug/l	0.021	0.039 ug/l	0.00070	< 0.0056 ug/l	0.000050
Acenaphthylene	306.9 ug/l	0.028 * ug/l	0.000091 a	< 0.0046 ug/l	0.0000075	< 0.0047 ug/l	0.0000077	< 0.0060 ug/l	0.0000098	< 0.0056 ug/l	0.0000091	< 0.0052 ug/l	0.0000085
Anthracene	20.73 ug/l	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0059 ug/l	0.00014	0.022 j ug/l	0.0011 a	< 0.0070 ug/l	0.00017	0.0078 j ug/l	0.00038 a
Benzo(a)anthracene	2.227 ug/l	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0021 ug/l	0.00047	< 0.0019 ug/l	0.00043	< 0.0018 ug/l	0.00040
Benzo(a)pyrene	0.9008 ug/l	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0013 ug/l	0.00072	< 0.0012 ug/l	0.00067	< 0.0011 ug/l	0.00061
Benzo(b&j)fluoranthene	0.6774 ug/l	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0018 ug/l	0.0013	< 0.0022 ug/l	0.0016	< 0.0021 ug/l	0.0016	< 0.0019 ug/l	0.0014
Benzo(g,h,i)perylene	0.4391 ug/l	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0020 ug/l	0.0023	< 0.0026 ug/l	0.0030	< 0.0024 ug/l	0.0027	< 0.0022 ug/l	0.0025
Benzo(k)fluoranthene	0.6415 ug/l	< 0.0033 ug/l	0.0026	< 0.0033 ug/l	0.0026	< 0.0034 ug/l	0.0027	< 0.0043 ug/l	0.0034	< 0.0040 ug/l	0.0031	< 0.0037 ug/l	0.0029
Chrysene	2.042 ug/l	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037	0.0025 j ug/l	0.0012 a	< 0.0020 ug/l	0.00049	< 0.0018 ug/l	0.00044	< 0.0017 ug/l	0.00042
Dibenz(a,h)anthracene	0.2825 ug/l	< 0.0015 ug/l	0.0027	< 0.0015 ug/l	0.0027	< 0.0016 ug/l	0.0028	< 0.0020 ug/l	0.0035	< 0.0019 ug/l	0.0034	< 0.0017 ug/l	0.0030
Fluoranthene	7.109 ug/l	< 0.0040 ug/l	0.00028	0.0047 j ug/l	0.00066 a	0.0061 j ug/l	0.00086 a	0.01 j ug/l	0.0014 a	< 0.0048 ug/l	0.00034	< 0.0044 ug/l	0.00031
Fluorene	39.9 ug/l	0.0064 j ug/l	0.00016 a	< 0.0062 ug/l	0.000078	< 0.0064 ug/l	0.000080	0.27 ug/l	0.0068	0.019 j ug/l	0.00048 a	0.024 ug/l	0.00060
Indeno(1,2,3-cd)pyrene	0.275 ug/l	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035	< 0.0020 ug/l	0.0036	< 0.0026 ug/l	0.0047	< 0.0024 ug/l	0.0044	< 0.0022 ug/l	0.0040
Naphthalene	193.5 ug/l	0.02 jb ug/l	0.00010 a	0.011 jb ug/l	0.000057 a	0.1 ug/l	0.00052	0.071 b ug/l	0.00037 a	0.04 jb ug/l	0.00021 a	0.038 jb ug/l	0.0002 a
Phenanthrene	19.13 ug/l	< 0.0066 ug/l	0.00017	< 0.0066 ug/l	0.00017	< 0.0068 ug/l	0.00018	0.072 ug/l	0.0038	< 0.0080 ug/l	0.00021	0.013 j ug/l	0.00068 a
Pyrene	10.11 ug/l	< 0.0041 ug/l	0.00020	0.0042 j ug/l	0.00042 a	0.0055 j ug/l	0.00054 a	0.0091 j ug/l	0.0009 a	< 0.0050 ug/l	0.00025	< 0.0046 ug/l	0.00023
PAH Ratio (USEPA FCV) Additive Model Porewater Value (ND=1/2)		0.016 a		0.015 a		0.017 a		0.054 a		0.019 a		0.018 a	

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 1
Porewater Analytical Data Summary
SLRIDT Site
XIK Corporation

Location		S7-PW-05		S7-PW-06				SB-PW-01		SB-PW-02			
Date		11/07/2013		11/07/2013				11/06/2013		11/06/2013			
Depth													
Sample Type		N		N		FD		N		N		FD	
		Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio
Parameter	EPA's FCVs												
Effective Date	03/24/2003												
SVOCs													
2-Methylnaphthalene	72.16 ug/l	0.026 j* ug/l	0.00036 a	22 * ug/l	0.3 a	25 ug/l	0.35	0.011 j ug/l	0.00015 a	32 ug/l	0.44	35 ug/l	0.49
Acenaphthene	55.85 ug/l	< 0.0053 ug/l	0.000047	12 * ug/l	0.21 a	10 ug/l	0.18	< 0.0051 ug/l	0.000046	8.2 ug/l	0.15	8.2 ug/l	0.15
Acenaphthylene	306.9 ug/l	< 0.0049 ug/l	0.0000080	33 * ug/l	0.11 a	34 * ug/l	0.11 a	< 0.0047 ug/l	0.0000077	14 * ug/l	0.046 a	14 * ug/l	0.046 a
Anthracene	20.73 ug/l	0.0092 j* ug/l	0.00044 a	0.091 * ug/l	0.0044 a	0.2 * ug/l	0.0096 a	< 0.0059 ug/l	0.00014	0.31 ug/l	0.015	0.33 ug/l	0.016
Benzo(a)anthracene	2.227 ug/l	< 0.0017 ug/l	0.00038	0.0080 j ug/l	0.0036 a	< 0.0017 ug/l	0.00038	0.0039 j ug/l	0.0018 a	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036
Benzo(a)pyrene	0.9008 ug/l	< 0.0011 ug/l	0.00061	0.0026 j ug/l	0.0029 a	< 0.0011 ug/l	0.00061	0.0030 j ug/l	0.0033 a	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056
Benzo(b&j)fluoranthene	0.6774 ug/l	< 0.0018 ug/l	0.0013	< 0.0019 ug/l	0.0014	< 0.0018 ug/l	0.0013	< 0.0018 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013
Benzo(g,h,i)perylene	0.4391 ug/l	< 0.0021 ug/l	0.0024	< 0.0022 ug/l	0.0025	< 0.0021 ug/l	0.0024	< 0.0020 ug/l	0.0023	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022
Benzo(k)fluoranthene	0.6415 ug/l	< 0.0035 ug/l	0.0027	< 0.0037 ug/l	0.0029	< 0.0035 ug/l	0.0027	< 0.0034 ug/l	0.0027	< 0.0033 ug/l	0.0026	< 0.0033 ug/l	0.0026
Chrysene	2.042 ug/l	< 0.0016 ug/l	0.00039	0.0043 j* ug/l	0.0021 a	< 0.0016 ug/l	0.00039	0.0036 j ug/l	0.0018 a	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037
Dibenz(a,h)anthracene	0.2825 ug/l	< 0.0016 ug/l	0.0028	< 0.0017 ug/l	0.0030	< 0.0016 ug/l	0.0028	0.0049 j ug/l	0.017 a	< 0.0015 ug/l	0.0027	< 0.0015 ug/l	0.0027
Fluoranthene	7.109 ug/l	< 0.0042 ug/l	0.00030	< 0.0044 ug/l	0.00031	< 0.0042 ug/l	0.00030	< 0.0041 ug/l	0.00029	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028
Fluorene	39.9 ug/l	< 0.0066 ug/l	0.000083	3 * ug/l	0.075 a	3.2 ug/l	0.080	< 0.0064 ug/l	0.000080	5.6 ug/l	0.14	5.9 ug/l	0.15
Indeno(1,2,3-cd)pyrene	0.275 ug/l	< 0.0021 ug/l	0.0038	< 0.0022 ug/l	0.0040	< 0.0021 ug/l	0.0038	< 0.0020 ug/l	0.0036	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035
Naphthalene	193.5 ug/l	1.3 * ug/l	0.0067 a	1200 * ug/l	6.2 a	1200 ug/l	6.2	0.29 ug/l	0.0015	750 ug/l	3.9	710 ug/l	3.7
Phenanthrene	19.13 ug/l	< 0.0070 ug/l	0.00018	1.8 * ug/l	0.094 a	1.3 ug/l	0.068	< 0.0068 ug/l	0.00018	2.4 ug/l	0.13	2.6 ug/l	0.14
Pyrene	10.11 ug/l	< 0.0044 ug/l	0.00022	< 0.0046 ug/l	0.00023	< 0.0044 ug/l	0.00022	< 0.0043 ug/l	0.00021	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020
PAH Ratio (USEPA FCV) Additive Model Porewater Value (ND=1/2)		0.023 a		7.0 a		7.0 a		0.037 a		4.8 a		4.7 a	

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 1
Porewater Analytical Data Summary
SLRIDT Site
XIK Corporation

Location		SB-PW-03		SB-PW-04		SB-PW-05		SB-PW-06		SB-PW-06		SW-PW-01	
Date		11/06/2013		11/06/2013		11/06/2013		11/06/2013		11/06/2013		11/06/2013	
Depth													
Sample Type		N		N		N		N		N		N	
		Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio	Sample Concentration	Concentration/ FCV ratio
Parameter	EPA's FCVs												
Effective Date	03/24/2003												
SVOCs													
2-Methylnaphthalene	72.16 ug/l	0.0085 j ug/l	0.00012 a	0.021 j ug/l	0.00029 a	0.043 j ug/l	0.0006 a	0.07 ug/l	0.00097	0.13 ug/l	0.0018	0.0088 j ug/l	0.00012 a
Acenaphthene	55.85 ug/l	0.15 ug/l	0.0027	< 0.0050 ug/l	0.000045	0.19 ug/l	0.0034	0.051 ug/l	0.00091	0.083 ug/l	0.0015	< 0.0050 ug/l	0.000045
Acenaphthylene	306.9 ug/l	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075	< 0.0046 ug/l	0.0000075
Anthracene	20.73 ug/l	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014	< 0.0057 ug/l	0.00014
Benzo(a)anthracene	2.227 ug/l	< 0.0016 ug/l	0.00036	0.0042 j ug/l	0.0019 a	0.0028 j ug/l	0.0013 a	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036	< 0.0016 ug/l	0.00036
Benzo(a)pyrene	0.9008 ug/l	< 0.0010 ug/l	0.00056	0.0028 j ug/l	0.0031 a	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056	< 0.0010 ug/l	0.00056
Benzo(b&j)fluoranthene	0.6774 ug/l	< 0.0017 ug/l	0.0013	0.0076 j ug/l	0.011 a	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013	< 0.0017 ug/l	0.0013
Benzo(g,h,i)perylene	0.4391 ug/l	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022	< 0.0019 ug/l	0.0022
Benzo(k)fluoranthene	0.6415 ug/l	< 0.0033 ug/l	0.0026	0.0080 j ug/l	0.012 a	< 0.0033 ug/l	0.0026	< 0.0033 * ug/l	0.0026 a	< 0.0033 * ug/l	0.0026 a	< 0.0033 ug/l	0.0026
Chrysene	2.042 ug/l	< 0.0015 ug/l	0.00037	0.0064 j ug/l	0.0031 a	0.0025 j ug/l	0.0012 a	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037	< 0.0015 ug/l	0.00037
Dibenz(a,h)anthracene	0.2825 ug/l	< 0.0015 ug/l	0.0027	0.0051 j ug/l	0.018 a	0.0021 j ug/l	0.0074 a	< 0.0015 * ug/l	0.0027 a	< 0.0015 * ug/l	0.0027 a	< 0.0015 ug/l	0.0027
Fluoranthene	7.109 ug/l	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028	< 0.0040 ug/l	0.00028
Fluorene	39.9 ug/l	< 0.0062 ug/l	0.000078	< 0.0062 ug/l	0.000078	< 0.0062 ug/l	0.000078	0.017 j ug/l	0.00043 a	0.03 ug/l	0.00075	< 0.0062 ug/l	0.000078
Indeno(1,2,3-cd)pyrene	0.275 ug/l	< 0.0019 ug/l	0.0035	0.0092 j ug/l	0.033 a	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035	< 0.0019 ug/l	0.0035
Naphthalene	193.5 ug/l	0.16 ug/l	0.00083	0.38 ug/l	0.0020	14 ug/l	0.072	2.9 ug/l	0.015	5 ug/l	0.026	0.076 b ug/l	0.00039 a
Phenanthrene	19.13 ug/l	< 0.0066 ug/l	0.00017	0.0086 j ug/l	0.00045 a	< 0.0066 ug/l	0.00017	< 0.0066 ug/l	0.00017	0.0092 j ug/l	0.00048 a	< 0.0066 ug/l	0.00017
Pyrene	10.11 ug/l	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020	< 0.0041 ug/l	0.00020
PAH Ratio (USEPA FCV) Additive Model Porewater Value (ND=1/2)		0.018 a		0.089 a		0.097 a		0.031 a		0.044 a		0.015 a	

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 2
Porewater Analytical Data - QA/QC
SLRIDT Site
XIK Corporation

Location Date Sample Type	QC 11/12/2013 Method Blank	QC 11/14/2013 Method Blank	QC 11/16/2013 Method Blank
Parameter			
SVOCs			
2-Methylnaphthalene	< 0.0049 ug/l	< 0.0049 ug/l	< 0.0049 ug/l
Acenaphthene	< 0.0050 ug/l	< 0.0050 ug/l	< 0.0050 ug/l
Acenaphthylene	< 0.0046 ug/l	< 0.0046 ug/l	< 0.0046 ug/l
Anthracene	< 0.0057 ug/l	< 0.0057 ug/l	< 0.0057 ug/l
Benzo(a)anthracene	< 0.0016 ug/l	< 0.0016 ug/l	< 0.0016 ug/l
Benzo(a)pyrene	< 0.0010 ug/l	< 0.0010 ug/l	< 0.0010 ug/l
Benzo(b&j)fluoranthene	< 0.0017 ug/l	< 0.0017 ug/l	< 0.0017 ug/l
Benzo(g,h,i)perylene	< 0.0019 ug/l	< 0.0019 ug/l	< 0.0019 ug/l
Benzo(k)fluoranthene	< 0.0033 ug/l	< 0.0033 ug/l	< 0.0033 ug/l
Chrysene	< 0.0015 ug/l	< 0.0015 ug/l	< 0.0015 ug/l
Dibenz(a,h)anthracene	< 0.0015 ug/l	< 0.0015 ug/l	< 0.0015 ug/l
Fluoranthene	< 0.0040 ug/l	< 0.0040 ug/l	< 0.0040 ug/l
Fluorene	< 0.0062 ug/l	< 0.0062 ug/l	< 0.0062 ug/l
Indeno(1,2,3-cd)pyrene	< 0.0019 ug/l	< 0.0019 ug/l	< 0.0019 ug/l
Naphthalene	**0.0155 j ug/l**	**0.0163 j ug/l**	**0.0146 j ug/l**
Phenanthrene	< 0.0066 ug/l	< 0.0066 ug/l	< 0.0066 ug/l
Pyrene	< 0.0041 ug/l	< 0.0041 ug/l	< 0.0041 ug/l

j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 3
Porewater Analytical Data
Relative Percent Difference
SLRIDT Site
XIK Corporation

	Location	S7-PW-06			SB-PW-02		
	Date	11/07/2013			11/06/2013		
	Sample Type	N	FD	RPD %	N	FD	RPD %
Chemical Name	Analysis Location						
SVOCs							
2-Methylnaphthalene	Lab	**22 * ug/l**	**25 ug/l**	**13**	**32 ug/l**	**35 ug/l**	**9.0**
Acenaphthene	Lab	**12 * ug/l**	**10 ug/l**	**18**	**8.2 ug/l**	**8.2 ug/l**	**0**
Acenaphthylene	Lab	**33 * ug/l**	**34 * ug/l**	**3.0**	**14 * ug/l**	**14 * ug/l**	**0**
Anthracene	Lab	**0.091 * ug/l**	**0.2 * ug/l**	**75**	**0.31 ug/l**	**0.33 ug/l**	**6.2**
Benzo(a)anthracene	Lab	**0.0080 j ug/l**	< 0.0017 ug/l		< 0.0016 ug/l	< 0.0016 ug/l	
Benzo(a)pyrene	Lab	**0.0026 j ug/l**	< 0.0011 ug/l		< 0.0010 ug/l	< 0.0010 ug/l	
Benzo(b&j)fluoranthene	Lab	< 0.0019 ug/l	< 0.0018 ug/l		< 0.0017 ug/l	< 0.0017 ug/l	
Benzo(g,h,i)perylene	Lab	< 0.0022 ug/l	< 0.0021 ug/l		< 0.0019 ug/l	< 0.0019 ug/l	
Benzo(k)fluoranthene	Lab	< 0.0037 ug/l	< 0.0035 ug/l		< 0.0033 ug/l	< 0.0033 ug/l	
Chrysene	Lab	**0.0043 j* ug/l**	< 0.0016 ug/l		< 0.0015 ug/l	< 0.0015 ug/l	
Dibenz(a,h)anthracene	Lab	< 0.0017 ug/l	< 0.0016 ug/l		< 0.0015 ug/l	< 0.0015 ug/l	
Fluoranthene	Lab	< 0.0044 ug/l	< 0.0042 ug/l		< 0.0040 ug/l	< 0.0040 ug/l	
Fluorene	Lab	**3 * ug/l**	**3.2 ug/l**	**6.5**	**5.6 ug/l**	**5.9 ug/l**	**5.2**
Indeno(1,2,3-cd)pyrene	Lab	< 0.0022 ug/l	< 0.0021 ug/l		< 0.0019 ug/l	< 0.0019 ug/l	
Naphthalene	Lab	**1200 * ug/l**	**1200 ug/l**	**0**	**750 ug/l**	**710 ug/l**	**5.5**
Phenanthrene	Lab	**1.8 * ug/l**	**1.3 ug/l**	**32**	**2.4 ug/l**	**2.6 ug/l**	**8.0**
Pyrene	Lab	< 0.0046 ug/l	< 0.0044 ug/l		< 0.0041 ug/l	< 0.0041 ug/l	
PAH Ratio (USEPA FCV) Additive Model Porewater Value (ND=1/2)	Barr Calculation	**7.0 a**	**7.0 a**	**0**	**4.8 a**	**4.7 a**	**2.1**

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

%RPD = | (N - FD) / (N + FD) / 2 | X 100
Where: N = 1st Value
FD = 2nd Value

Table 4
Bulk Sediment and Pore Water Sample Information
SLRIDT Site
XIK Corporation

Location ID	Water depth at time of sampling (feet)	Cap depth (feet) determined in cores or probes	Bulk sediment sample depth (feet)	SedPt install depth (feet)	Sediment depth and description (feet)	
NW-BS-01	3.0	3.4	3.0	3.0	0-0.6	Brown organic silt/topsoil w/roots
					0.6-3.4	Red cap sand
					3.4-4	Black silty slag
S6-BS-01	6.5	4.0	3.0	3.0	0-0.75	Dark brown silt, very soft
					0.75-3	Red cap sand
					3-4	Limestone cap sand
S6-BS-02	4.0	3.0	3.0	3.0	0-1	Brown silt, trace fine sand and organics
					1-2.7	Red cap sand
					2.7-3	Red and limestone cap sand mix
S6-BS-03	3.5	3.8	3.0	3.0	0-2.4	Brown silt, trace sand and organics
					2.4-3.8	Red cap sand
S6-BS-04	3.8	3.8	3.0	3.0	0-0.5	Brown silt, soft
					0.5-2.25	Red cap sand
					2.25-3.75	Limestone cap sand
S6-BS-05	4.8	4.6	3.0	3.0	0-0.75	Brown silt, trace fine sand and organics
					0.75-2.7	Red cap sand
					2.7-4.6	Limestone cap sand
S6-BS-06	2.9	3.5	3.0	3.0	0-0.5	Brown silt, trace fine sand and organics
					0.5-2.0	Red cap sand
					2.0-3.5	Limestone cap sand
S7-BS-01	6.3	3.8	3.0	3.0	0-0.1	Red cap sand w/trace silt
					0.1-3.8	Red cap sand
					3.8-5.5	Dark brown silty clay w/organics, moist, soft
					5.5-6.5	Black silty clay w/organics, soft, moderate petroleum hydrocarbon-like odor

Table 4
Bulk Sediment and Pore Water Sample Information
SLRIDT Site
XIK Corporation

Location ID	Water depth at time of sampling (feet)	Cap depth (feet) determined in cores or probes	Bulk sediment sample depth (feet)	SedPt install depth (feet)	Sediment depth and description (feet)	
S7-BS-02	19.7	2.8	1.5	1.5	0-1.5	Brown sandy silt w/organics
					1.5-2.8	Red cap sand
					2.8-3.4	Red cap sand and dark brown silt apparent mixing zone. Moderate petroleum hydrocarbon-like odor
					3.4-4	Dark brown silt
S7-BS-03	21.1	3.3	1.5	1.5	0-0.6	Brown silt, trace sand, very soft
					0.6-1	Gravel w/sand, little (10%) silt
					1-3.3	Red cap sand
					3.3-4	Dark brown silt, soft; sand seam @3.7'
S7-BS-04	12.2	2.8	1.5	1.5	0-0.75	Brown silt, trace sand and organics, very soft
					0.75-2.8	Red cap sand
					2.8-3.5	Dark brown silty clay w/organics, soft
S7-BS-05	on land	3.6	3.0	3.0	0-0.25	Dark brown organic topsoil w/roots
					0.25-3.6	Red cap sand. Top 1' wet, likely from adding water to create suction in core tube
	not encountered					
S7-BS-06	-1.0	3.3	3.0	3.0	0-0.3	Dark brown organic topsoil w/roots
					0.3-1.8	Red cap sand
					1.8-3.3	Limestone cap sand
S7-CT-02	19.3	3.1	--	--	0-1	Brown silt w/organics
					1-3.1	Red cap sand
					3.1-5	Dark brown silt
S7-CT-03	21.7	2.3	--	--	--	probed

Table 4
Bulk Sediment and Pore Water Sample Information
SLRIDT Site
XIK Corporation

Location ID	Water depth at time of sampling (feet)	Cap depth (feet) determined in cores or probes	Bulk sediment sample depth (feet)	SedPt install depth (feet)	Sediment depth and description (feet)	
SB-BS-01	1.9	2.0	2.1	2.0	0-0.5	Dark brown organic silt
					0.5-2.0	Limestone cap sand
SB-BS-02	3.0	2.8	2.8	2.8	0-0.25	Dark brown organic silt
					0.25-2.8	Limestone cap sand
SB-BS-03	3.0	2.3	2.3	2.3	0-0.25	Dark brown silt w/fine fiberous organics
					0.25-2.3	Limestone cap sand
SB-BS-04	Not recorded	3.3	3.0	3.3	0-0.5	Dark brown organic silt
					0.5-3.3	Limestone cap sand
SB-BS-05	2.0	2.2	2.2	2.2	0-0.75	Brown fine-medium sand, trace silt and organics
					0.75-2.2	Limestone cap sand
SB-BS-06	2.5	2.7	2.7	2.7	0-0.3	Brown silt/Limestone cap sand mix
					0.3-2.65	Limestone cap sand
					2.65-2.7	Limestone silt, finely laminated
SW-BS-01	3.0	3.0	3.0	3.0	0-0.8	Organic silt w/sand
					0.8-2.6	Limestone cap sand
					2.6-3.0	Red cap sand
					3.0-5.0	Dark grey sand w/silt, color lightens downward

Table 5
Soil Analytical Data Summary
SLRIDT Site
XIK Corporation

		Location	NW-BS-01	S6-BS-01	S6-BS-02	S6-BS-03	S6-BS-04	S6-BS-05		S6-BS-06	S7-BS-01	S7-BS-02	S7-BS-03
		Date	11/01/2013	10/22/2013	10/24/2013	10/24/2013	10/22/2013	10/24/2013		10/24/2013	10/24/2013	10/31/2013	10/31/2013
		Depth	3 ft	3 ft	3 ft	3 ft	3 ft	3 ft	3 ft	3 ft	3 ft	1.5 ft	1.5 ft
		Sample Type	N	N	N	N	N	N	FD	N	N	N	N
Parameter	Analysis Location	XIK SLRIDT Sum of 17 PAHs Criteria											
Exceedance Key		No Exceed											
General Parameters													
Solids, percent	Lab		83 % wt	82 % wt	83 % wt	85 % wt	81 % wt	93 % wt	84 % wt	83 % wt	83 % wt	80 % wt	76 % wt
SVOCs													
2-Methylnaphthalene	Lab		0.00067 j mg/kg	0.0022 j mg/kg	0.012 mg/kg	0.00046 j mg/kg	0.00062 j mg/kg	< 0.00042 mg/kg	0.00066 j mg/kg	0.00051 j mg/kg	0.0041 mg/kg	0.0069 mg/kg	0.014 mg/kg
Acenaphthene	Lab		< 0.00033 mg/kg	0.00087 j mg/kg	< 0.00032 mg/kg	< 0.00032 mg/kg	< 0.00034 mg/kg	0.00057 j mg/kg	0.00075 j mg/kg	< 0.00033 mg/kg	0.00098 j mg/kg	0.0064 mg/kg	0.0062 mg/kg
Acenaphthylene	Lab		< 0.00045 mg/kg	0.0014 j* mg/kg	0.0027 * mg/kg	< 0.00044 mg/kg	< 0.00046 mg/kg	< 0.00040 mg/kg	< 0.00044 mg/kg	< 0.00045 mg/kg	0.0023 j* mg/kg	0.0013 j mg/kg	< 0.00049 * mg/kg
Anthracene	Lab		< 0.00048 mg/kg	0.0016 j mg/kg	0.0033 mg/kg	< 0.00047 mg/kg	< 0.00049 mg/kg	< 0.00043 mg/kg	0.00079 j mg/kg	< 0.00048 mg/kg	0.0077 mg/kg	0.0035 mg/kg	0.013 mg/kg
Benzo(a)anthracene	Lab		< 0.00046 mg/kg	0.0032 mg/kg	0.01 mg/kg	< 0.00044 mg/kg	< 0.00047 mg/kg	< 0.00041 mg/kg	0.0023 j mg/kg	< 0.00046 mg/kg	0.0066 mg/kg	0.0037 mg/kg	0.02 mg/kg
Benzo(a)pyrene	Lab		< 0.00025 mg/kg	0.0030 mg/kg	0.0096 mg/kg	< 0.00024 mg/kg	0.00029 j mg/kg	< 0.00022 mg/kg	0.0019 j mg/kg	< 0.00025 mg/kg	0.0048 mg/kg	0.0033 mg/kg	0.017 mg/kg
Benzo(b&j)fluoranthene	Lab		< 0.00066 mg/kg	0.0035 j mg/kg	0.012 mg/kg	< 0.00064 mg/kg	< 0.00068 mg/kg	< 0.00059 mg/kg	0.0023 j mg/kg	< 0.00066 mg/kg	0.0078 mg/kg	0.0045 j mg/kg	0.021 mg/kg
Benzo(g,h,i)perylene	Lab		< 0.00036 mg/kg	0.0025 mg/kg	0.0087 mg/kg	< 0.00035 mg/kg	< 0.00037 mg/kg	< 0.00032 mg/kg	0.0015 j mg/kg	< 0.00036 mg/kg	0.0029 mg/kg	< 0.00037 mg/kg	0.0065 mg/kg
Benzo(k)fluoranthene	Lab		< 0.00073 mg/kg	0.0022 j mg/kg	0.0053 mg/kg	< 0.00071 mg/kg	< 0.00075 mg/kg	< 0.00065 mg/kg	0.0014 j mg/kg	< 0.00074 mg/kg	0.0038 mg/kg	0.0021 j mg/kg	0.011 mg/kg
Chrysene	Lab		< 0.00083 mg/kg	0.0041 mg/kg	0.012 mg/kg	< 0.00081 mg/kg	< 0.00086 mg/kg	< 0.00074 mg/kg	0.0032 mg/kg	< 0.00084 mg/kg	0.01 mg/kg	0.0041 mg/kg	0.021 mg/kg
Dibenz(a,h)anthracene	Lab		< 0.00029 mg/kg	0.00063 j mg/kg	0.0021 j mg/kg	< 0.00028 mg/kg	< 0.00030 mg/kg	< 0.00026 mg/kg	0.00041 j mg/kg	< 0.00029 mg/kg	0.00087 j mg/kg	0.00052 j mg/kg	0.0026 mg/kg
Fluoranthene	Lab		< 0.0012 mg/kg	0.0051 mg/kg	0.017 mg/kg	< 0.0011 mg/kg	< 0.0012 mg/kg	< 0.0010 mg/kg	0.0043 mg/kg	< 0.0012 mg/kg	0.016 mg/kg	0.0072 mg/kg	0.037 mg/kg
Fluorene	Lab		< 0.00039 mg/kg	< 0.00040 mg/kg	< 0.00039 mg/kg	< 0.00038 mg/kg	< 0.00041 mg/kg	< 0.00035 mg/kg	< 0.00039 mg/kg	< 0.00040 mg/kg	0.0034 mg/kg	0.0082 mg/kg	0.012 mg/kg
Indeno(1,2,3-cd)pyrene	Lab		< 0.00071 mg/kg	0.0023 j mg/kg	0.0075 mg/kg	< 0.00069 mg/kg	< 0.00073 mg/kg	< 0.00063 mg/kg	0.0013 j mg/kg	< 0.00071 mg/kg	0.0033 mg/kg	0.0018 j mg/kg	0.0089 mg/kg
Naphthalene	Lab		0.0012 j mg/kg	0.027 mg/kg	0.0088 mg/kg	0.00078 jb mg/kg	0.00098 jb mg/kg	0.00072 jb mg/kg	0.0011 jb mg/kg	0.00094 jb mg/kg	0.048 mg/kg	0.027 mg/kg	0.09 * mg/kg
Phenanthrene	Lab		< 0.0019 mg/kg	0.0035 mg/kg	0.013 mg/kg	< 0.0019 mg/kg	< 0.0020 mg/kg	< 0.0017 mg/kg	0.0030 mg/kg	< 0.0020 mg/kg	0.011 mg/kg	0.0080 mg/kg	0.036 mg/kg
Pyrene	Lab		< 0.00064 mg/kg	0.0046 mg/kg	0.015 mg/kg	< 0.00063 mg/kg	< 0.00066 mg/kg	< 0.00057 mg/kg	0.0035 mg/kg	< 0.00065 mg/kg	0.012 mg/kg	0.0055 mg/kg	0.027 mg/kg
Sum of Total PAH Compounds, NDs at 1/2	Barr Calculation	13.7 mg/kg	0.0066 a mg/kg	0.068 a mg/kg	0.14 a mg/kg	0.0059 a mg/kg	0.0068 a mg/kg	0.0056 a mg/kg	0.029 a mg/kg	0.0064 a mg/kg	0.15 a mg/kg	0.094 a mg/kg	0.34 a mg/kg

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 5
Soil Analytical Data Summary
SLRIDT Site
XIK Corporation

		Location	S7-BS-04		S7-BS-05	S7-BS-06	SB-BS-01	SB-BS-02	SB-BS-03	SB-BS-04	SB-BS-05	SB-BS-06	SW-BS-01
		Date	10/24/2013		10/25/2013	10/25/2013	10/21/2013	10/22/2013	10/22/2013	10/21/2013	10/22/2013	10/22/2013	11/01/2013
		Depth	1.5 ft	1.5 ft	3 ft	3 ft	2.1 ft	2.8 ft	2.3 ft	3 ft	2.2 ft	2.7 ft	3 ft
		Sample Type	N	FD	N	N	N	N	N	N	N	N	N
Parameter	Analysis Location	XIK SLRIDT Sum of 17 PAHs Criteria											
Exceedance Key		No Exceed											
General Parameters													
Solids, percent	Lab		79 % wt	81 % wt	89 % wt	92 % wt	93 % wt	95 % wt	85 % wt	89 % wt	92 % wt	88 % wt	86 % wt
SVOCs													
2-Methylnaphthalene	Lab		0.0037 mg/kg	0.011 mg/kg	0.00078 j mg/kg	0.0070 mg/kg	0.00071 j mg/kg	0.0036 mg/kg	0.00064 j mg/kg	0.00057 j mg/kg	0.00049 j mg/kg	0.0018 j mg/kg	0.0011 j mg/kg
Acenaphthene	Lab		0.0012 j mg/kg	< 0.00033 mg/kg	< 0.00030 mg/kg	0.038 mg/kg	0.00090 j mg/kg	0.0014 j mg/kg	< 0.00032 mg/kg	< 0.00030 mg/kg	0.00057 j mg/kg	0.00077 j mg/kg	< 0.00031 mg/kg
Acenaphthylene	Lab		0.0017 j* mg/kg	0.0021 j* mg/kg	< 0.00042 mg/kg	0.0042 * mg/kg	< 0.00040 mg/kg	0.0010 j* mg/kg	< 0.00044 mg/kg	< 0.00042 mg/kg	< 0.00041 mg/kg	0.00051 j* mg/kg	< 0.00043 mg/kg
Anthracene	Lab		0.0031 mg/kg	0.0055 mg/kg	< 0.00045 mg/kg	< 0.00043 mg/kg	< 0.00043 mg/kg	0.00085 j mg/kg	< 0.00047 mg/kg	< 0.00045 mg/kg	< 0.00043 mg/kg	< 0.00045 mg/kg	0.00056 j mg/kg
Benzo(a)anthracene	Lab		0.0055 mg/kg	0.0098 mg/kg	0.00048 j mg/kg	0.00050 j mg/kg	< 0.00041 mg/kg	< 0.00040 mg/kg	0.00062 j mg/kg	0.00045 j mg/kg	< 0.00041 mg/kg	0.00072 j mg/kg	0.00078 j mg/kg
Benzo(a)pyrene	Lab		0.0056 mg/kg	0.0080 mg/kg	0.00049 j mg/kg	0.00047 j mg/kg	< 0.00022 mg/kg	< 0.00022 mg/kg	0.00061 j mg/kg	0.00042 j mg/kg	< 0.00023 mg/kg	0.00057 j mg/kg	< 0.00024 mg/kg
Benzo(b&j)fluoranthene	Lab		0.0091 mg/kg	0.012 mg/kg	0.00090 j mg/kg	0.00071 j mg/kg	< 0.00059 mg/kg	< 0.00057 mg/kg	0.00069 j mg/kg	< 0.00061 mg/kg	< 0.00059 mg/kg	0.00075 j mg/kg	0.00091 j mg/kg
Benzo(g,h,i)perylene	Lab		0.0044 mg/kg	0.0060 mg/kg	0.00065 j mg/kg	< 0.00033 mg/kg	< 0.00032 mg/kg	< 0.00032 mg/kg	< 0.00035 mg/kg	< 0.00034 mg/kg	< 0.00033 mg/kg	< 0.00034 mg/kg	0.00041 j mg/kg
Benzo(k)fluoranthene	Lab		0.0041 mg/kg	0.0051 mg/kg	< 0.00068 mg/kg	< 0.00066 mg/kg	< 0.00065 mg/kg	< 0.00064 mg/kg	< 0.00072 mg/kg	< 0.00068 mg/kg	< 0.00066 mg/kg	< 0.00069 mg/kg	< 0.00070 mg/kg
Chrysene	Lab		0.0075 mg/kg	0.013 mg/kg	< 0.00078 mg/kg	0.00079 j mg/kg	< 0.00074 mg/kg	< 0.00073 mg/kg	< 0.00082 mg/kg	< 0.00078 mg/kg	< 0.00075 mg/kg	0.00092 j mg/kg	0.00096 j mg/kg
Dibenz(a,h)anthracene	Lab		0.0010 j mg/kg	0.0014 j mg/kg	< 0.00027 mg/kg	< 0.00026 mg/kg	< 0.00026 mg/kg	< 0.00025 mg/kg	< 0.00028 mg/kg	< 0.00027 mg/kg	< 0.00026 mg/kg	< 0.00027 mg/kg	< 0.00028 mg/kg
Fluoranthene	Lab		0.011 mg/kg	0.022 mg/kg	< 0.0011 mg/kg	< 0.0011 mg/kg	< 0.0010 mg/kg	< 0.0010 mg/kg	< 0.0011 mg/kg	< 0.0011 mg/kg	< 0.0011 mg/kg	0.0014 j mg/kg	0.0013 j mg/kg
Fluorene	Lab		0.0025 mg/kg	0.0052 mg/kg	< 0.00037 mg/kg	< 0.00035 mg/kg	< 0.00035 mg/kg	0.0026 mg/kg	< 0.00039 mg/kg	< 0.00037 mg/kg	< 0.00036 mg/kg	0.00070 j mg/kg	0.00061 j mg/kg
Indeno(1,2,3-cd)pyrene	Lab		0.0047 mg/kg	0.0060 mg/kg	< 0.00066 mg/kg	< 0.00064 mg/kg	< 0.00063 mg/kg	< 0.00062 mg/kg	< 0.00070 mg/kg	< 0.00066 mg/kg	< 0.00064 mg/kg	< 0.00067 mg/kg	< 0.00068 mg/kg
Naphthalene	Lab		0.011 * mg/kg	0.02 * mg/kg	0.00091 jb mg/kg	0.094 mg/kg	0.0016 jb mg/kg	0.0097 mg/kg	0.0019 jb mg/kg	0.00098 jb mg/kg	0.0018 jb mg/kg	0.0095 mg/kg	0.0076 mg/kg
Phenanthrene	Lab		0.0061 mg/kg	0.013 mg/kg	< 0.0018 mg/kg	< 0.0017 mg/kg	< 0.0017 mg/kg	0.0058 mg/kg	< 0.0019 mg/kg	< 0.0018 mg/kg	< 0.0018 mg/kg	< 0.0018 mg/kg	< 0.0019 mg/kg
Pyrene	Lab		0.0093 mg/kg	0.019 mg/kg	0.00068 j mg/kg	0.00080 j mg/kg	< 0.00057 mg/kg	< 0.00056 mg/kg	0.00083 j mg/kg	0.00081 j mg/kg	< 0.00058 mg/kg	0.0014 j mg/kg	< 0.00062 mg/kg
Sum of Total PAH Compounds, NDs at 1/2	Barr Calculation	13.7 mg/kg	0.092 a mg/kg	0.16 a mg/kg	0.0083 a mg/kg	0.15 a mg/kg	0.0073 a mg/kg	0.028 a mg/kg	0.0090 a mg/kg	0.0071 a mg/kg	0.0071 a mg/kg	0.021 a mg/kg	0.017 a mg/kg

* = Estimated value, QA/QC criteria not met.
a = Estimated value, calculated using some or all values that are estimates.
b = Potential false positive value based on blank data validation procedures.
j = Reported value less than stated laboratory quantitation limit and considered an esti

Table 6
Soil Analytical Data - QA/QC
SLRIDT Site
XIK Corporation

Location Date Sample Type	QC 10/28/2013 Method Blank	QC 11/04/2013 Method Blank	QC 11/04/2013 Method Blank	QC 11/11/2013 Method Blank
Parameter				
General Parameters				
Solids, percent	**0.0288 j % wt**	**0.0308 j % wt**	--	--
SVOCs				
2-Methylnaphthalene	--	--	< 0.00039 mg/kg	< 0.00039 mg/kg
Acenaphthene	--	--	< 0.00027 mg/kg	< 0.00027 mg/kg
Acenaphthylene	--	--	< 0.00037 mg/kg	< 0.00037 mg/kg
Anthracene	--	--	< 0.00040 mg/kg	< 0.00040 mg/kg
Benzo(a)anthracene	--	--	< 0.00038 mg/kg	< 0.00038 mg/kg
Benzo(a)pyrene	--	--	< 0.00021 mg/kg	< 0.00021 mg/kg
Benzo(b&j)fluoranthene	--	--	< 0.00054 mg/kg	< 0.00054 mg/kg
Benzo(g,h,i)perylene	--	--	< 0.00030 mg/kg	< 0.00030 mg/kg
Benzo(k)fluoranthene	--	--	< 0.00061 mg/kg	< 0.00061 mg/kg
Chrysene	--	--	< 0.00069 mg/kg	< 0.00069 mg/kg
Dibenz(a,h)anthracene	--	--	< 0.00024 mg/kg	< 0.00024 mg/kg
Fluoranthene	--	--	< 0.00097 mg/kg	< 0.00097 mg/kg
Fluorene	--	--	< 0.00033 mg/kg	< 0.00033 mg/kg
Indeno(1,2,3-cd)pyrene	--	--	< 0.00059 mg/kg	< 0.00059 mg/kg
Naphthalene	--	--	**0.000593 j mg/kg**	< 0.00049 mg/kg
Phenanthrene	--	--	< 0.0016 mg/kg	< 0.0016 mg/kg
Pyrene	--	--	< 0.00053 mg/kg	< 0.00053 mg/kg

j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

Table 7
Soil Analytical Data
Relative Percent Difference
SLRIDT Site
XIK Corporation

	Location	S6-BS-05			S7-BS-04		
	Sample Date	10/24/2013			10/24/2013		
	Depth Interval	3 ft	3 ft	RPD %	1.5 ft	1.5 ft	RPD %
	Sample Type	N	FD		N	FD	
Chemical Name	Analysis Location						
General Parameters							
Solids, percent	Lab	**93 % wt**	**84 % wt**	**10**	**79 % wt**	**81 % wt**	**2.5**
SVOCs							
2-Methylnaphthalene	Lab	< 0.00042 mg/kg	**0.00066 j mg/kg**		**0.0037 mg/kg**	**0.011 mg/kg**	**99**
Acenaphthene	Lab	**0.00057 j mg/kg**	**0.00075 j mg/kg**	**27**	**0.0012 j mg/kg**	< 0.00033 mg/kg	
Acenaphthylene	Lab	< 0.00040 mg/kg	< 0.00044 mg/kg		**0.0017 j* mg/kg**	**0.0021 j* mg/kg**	**21**
Anthracene	Lab	< 0.00043 mg/kg	**0.00079 j mg/kg**		**0.0031 mg/kg**	**0.0055 mg/kg**	**56**
Benzo(a)anthracene	Lab	< 0.00041 mg/kg	**0.0023 j mg/kg**		**0.0055 mg/kg**	**0.0098 mg/kg**	**56**
Benzo(a)pyrene	Lab	< 0.00022 mg/kg	**0.0019 j mg/kg**		**0.0056 mg/kg**	**0.0080 mg/kg**	**35**
Benzo(b&j)fluoranthene	Lab	< 0.00059 mg/kg	**0.0023 j mg/kg**		**0.0091 mg/kg**	**0.012 mg/kg**	**28**
Benzo(g,h,i)perylene	Lab	< 0.00032 mg/kg	**0.0015 j mg/kg**		**0.0044 mg/kg**	**0.0060 mg/kg**	**31**
Benzo(k)fluoranthene	Lab	< 0.00065 mg/kg	**0.0014 j mg/kg**		**0.0041 mg/kg**	**0.0051 mg/kg**	**22**
Chrysene	Lab	< 0.00074 mg/kg	**0.0032 mg/kg**		**0.0075 mg/kg**	**0.013 mg/kg**	**54**
Dibenz(a,h)anthracene	Lab	< 0.00026 mg/kg	**0.00041 j mg/kg**		**0.0010 j mg/kg**	**0.0014 j mg/kg**	**33**
Fluoranthene	Lab	< 0.0010 mg/kg	**0.0043 mg/kg**		**0.011 mg/kg**	**0.022 mg/kg**	**67**
Fluorene	Lab	< 0.00035 mg/kg	< 0.00039 mg/kg		**0.0025 mg/kg**	**0.0052 mg/kg**	**70**
Indeno(1,2,3-cd)pyrene	Lab	< 0.00063 mg/kg	**0.0013 j mg/kg**		**0.0047 mg/kg**	**0.0060 mg/kg**	**24**
Naphthalene	Lab	**0.00072 jb mg/kg**	**0.0011 jb mg/kg**	**N/A**	**0.011 * mg/kg**	**0.02 * mg/kg**	**58**
Phenanthrene	Lab	< 0.0017 mg/kg	**0.0030 mg/kg**		**0.0061 mg/kg**	**0.013 mg/kg**	**72**
Pyrene	Lab	< 0.00057 mg/kg	**0.0035 mg/kg**		**0.0093 mg/kg**	**0.019 mg/kg**	**69**
Sum of Total PAH Compounds, NDs at 1/2	Barr Calculation	**0.0056 mg/kg**	**0.029 mg/kg**	**135**	**0.092 mg/kg**	**0.16 mg/kg**	**54**

* = Estimated value, QA/QC criteria not met.

b = Potential false positive value based on blank data validation procedures.

j = Reported value less than stated laboratory quantitation limit and considered an estimated value.

%RPD = | (N - FD) / (N + FD) / 2 | X 100
Where: N = 1st Value
FD = 2nd Value

Photo Locations by Station and Degrees		
Location #	Degrees	Degrees
1	150	225
2	150	220
3	30	330
4	255	330
5	165	240
6	50	120
7	145	215
8	50	130
9	145	215
10	55	125
11	140	215
12	170	245
13	50	130
14	145	215
15	190	260
16	50	125
17	190	260
18	100	170
19	35	320
20	35	320
21	190	270
22	145	215
23	145	215
24	235	330
25	145	215
26	235	330

Figures

SLRIDT SITE

KINGSBURY BAY

TALLAS SITE

NORTH BAY

UPPER ST. LOUIS RIVER
SCALE 1:30,000
SOUNDINGS IN FEET

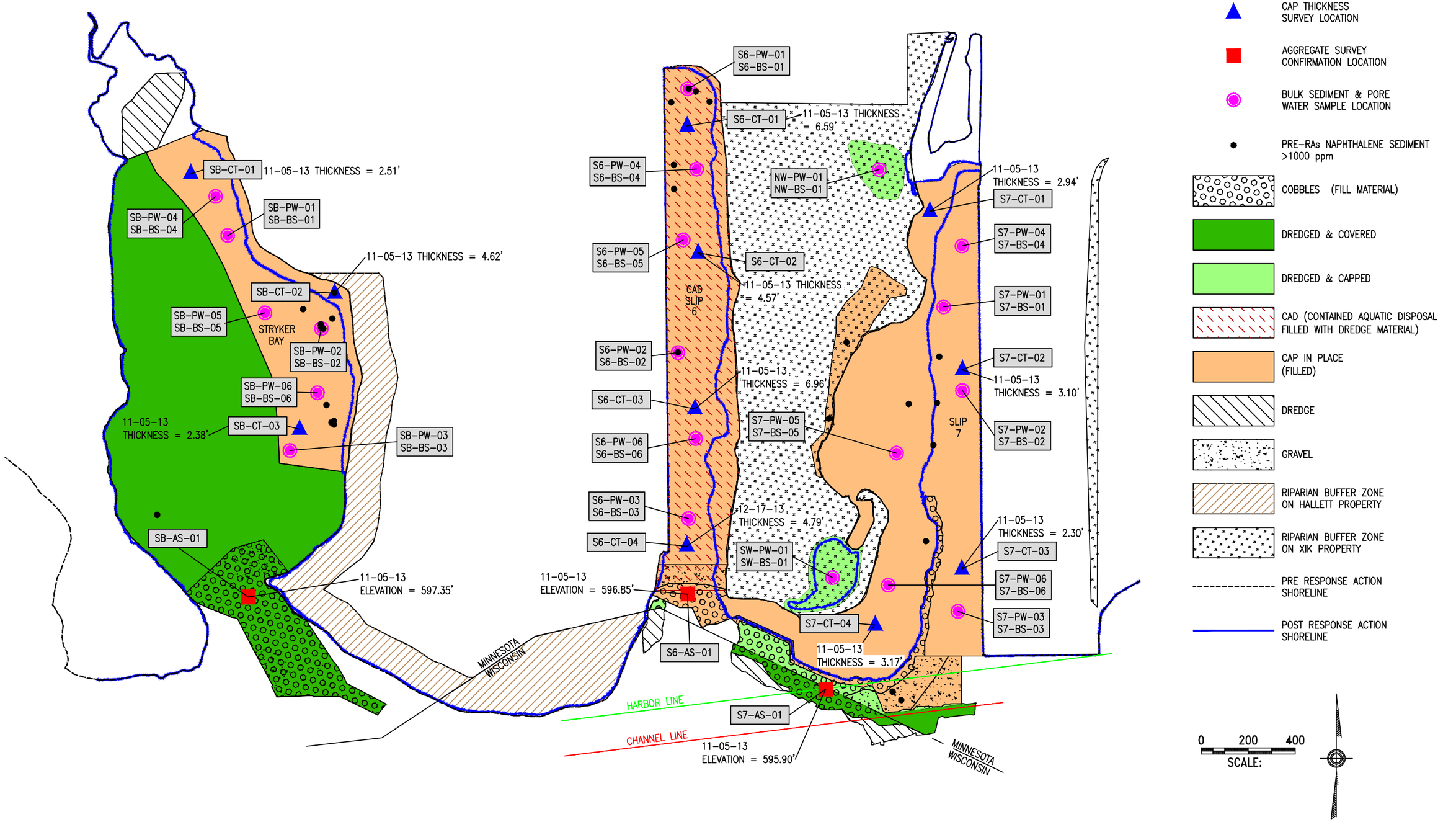
NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
E				4/16/12	DRAFT SUBMITTED
D				5/31/11	DRAFT SUBMITTED
C					
B					
A					

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 1 – TALLAS ISLAND AND SLRIDT SITE LOCATION MAP

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.



CADD USER: Brian L. Jurek FILE: M:\CAD\23690B77 SLRIDT\2013\LTM\STAKEOUT SAMPLE LOCATIONS 110513\FIGURE 2 - SAMPLE MONITORING LOCATIONS 121713 .DWG PLOT SCALE: 1:2 PLOT DATE: 12/17/2013 6:01 PM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
E					
D					
C					
B				7/12/12	DRAFT SUBMITTED
A					

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 2 – SAMPLE MONITORING LOCATIONS FALL 2013

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.

LEGEND

1 PHOTO LOCATION WITH VIEW DIRECTION

STRYKER BAY

KINGSBURY BAY

59th PENINSULA

54th PENINSULA

CAD

SLIP 7

HARBOR LINE

CHANNEL LINE

MINNESOTA

WISCONSIN

ST. LOUIS RIVER

0 100 200

SCALE IN FEET

CADD USER: Brian L. Jurek FILE: E:\SLRIDT BACKUP\BLJ\CIVIL 3D PROJECTS\SLRIDT\2011\LTM\FIGURES\FIGURE 4 - ANNUAL PHOTO LOCATIONS.DWG PLOT SCALE: 1:2 PLOT DATE: 4/2/2012 11:55 AM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
				5/31/11	DRAFT SUBMITTED
				4/02/12	REVISED PHOTO LOCATIONS

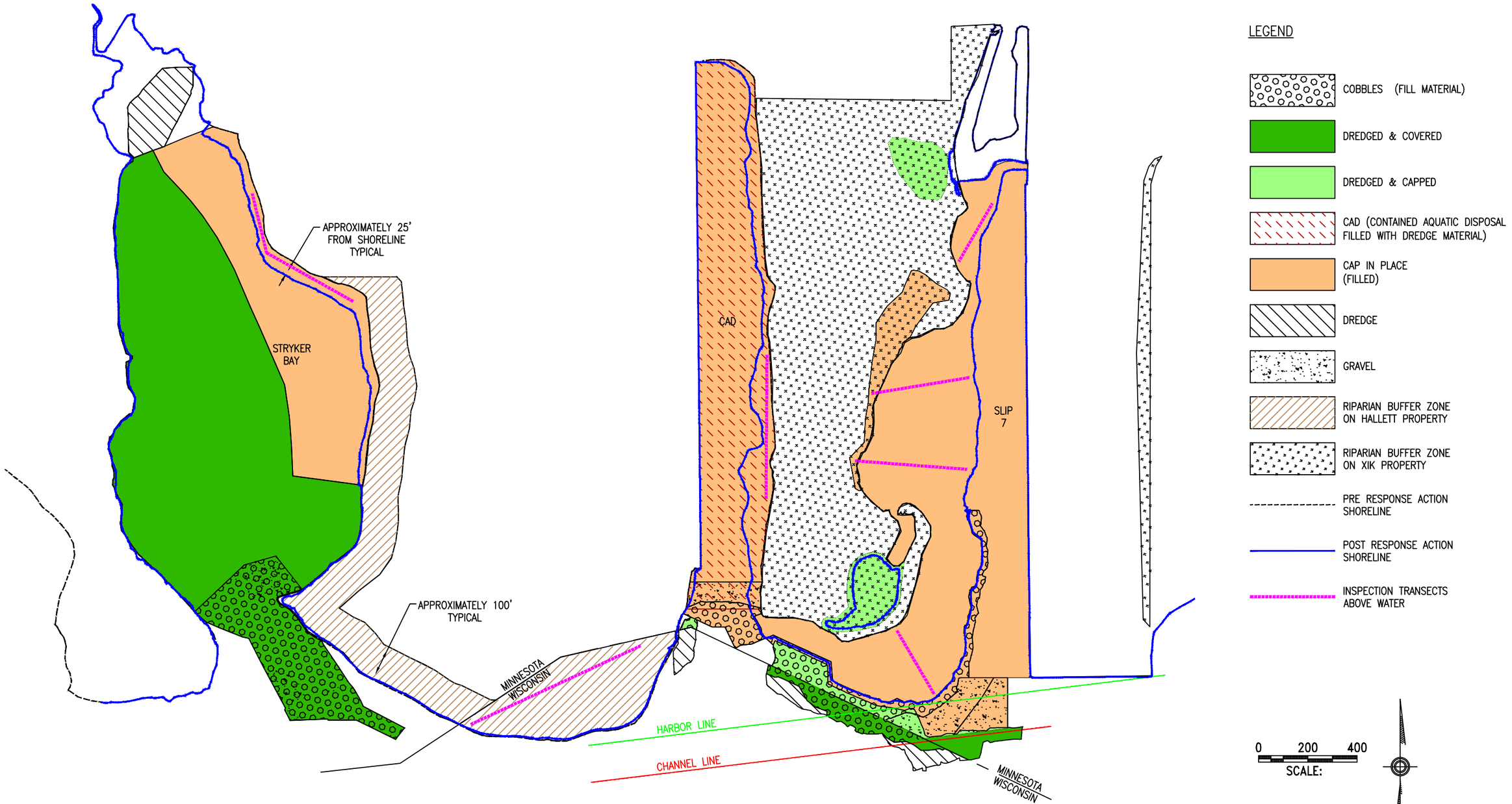
DRAFT

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 4 – ANNUAL PHOTO LOCATIONS

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.



CADD USER: Brian L. Jurek FILE: M:\CAD\23690B77 SLRIDT\2012\LTM\FIGURES\FIGURE 7 - SLRIDT CAP AND RIPARIAN BUFFER ZONE INSPECTION TRANSECTS 060812_BAR.DWG PLOT SCALE: 1:2 PLOT DATE: 7/12/2012 7:49 AM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
E					
D					
C					
B					
A				7/12/12	REFERENCED FROM RD/RAP FIGURE 1-2

DRAFT

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 7
SLRIDT CAP AND RIPARIAN BUFFER ZONE
INSPECTION TRANSECTS ABOVE WATER

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.

LEGEND

- SHORELINE
- KB–AV–01 AQUATIC VEGETATION SAMPLING TRANSECT
- SB–AA–01 ASSEMBLAGE AND ABUNDANCE SAMPLE LOCATION
- 54–UV–01 UPLAND VEGETATION SAMPLE LOCATION
- SB–BA–01 BIOACCUMULATION SAMPLE LOCATION

SB–AA–01
TRANSECT SB–AV–01
SB–AA–02
SB–BA–01
TRANSECT SB–AV–02
59–UV–01
SB–AA–03
TRANSECT SB–AV–03
SB–AA–04
TRANSECT SB–AV–04
SB–BA–02
SB–AA–05
TRANSECT SB–AV–05
SB–AA–06
TRANSECT SB–AV–06
59–UV–02
TRANSECT KB–AV–01
TRANSECT KB–AV–02
TRANSECT KB–AV–03
TRANSECT KB–AV–04
KINGSBURY BAY
STRYKER BAY
59th PENINSULA
S6–AA–01
TRANSECT S6–AV–01
S6–AA–02
TRANSECT S6–AV–02
S6–BA–01
S6–AA–03
TRANSECT S6–AV–03
S6–AA–04
TRANSECT S6–AV–04
S6–AA–05
TRANSECT S6–AV–05
S6–BA–02
S6–AA–06
TRANSECT S6–AV–06
S6–AA–07
TRANSECT S6–AV–07
CAD
54–UV–01
54–UV–02
54–UV–03
54–UV–04
54th PENINSULA
S7–AA–01
TRANSECT S7–AV–01
S7–BA–01
S7–AA–02
TRANSECT S7–AV–02
S7–AA–03
TRANSECT S7–AV–03
S7–BA–02
S7–AA–04
TRANSECT S7–AV–04
SLIP 7
HARBOR LINE
CHANNEL LINE
ST. LOUIS RIVER
MINNESOTA
WISCONSIN
0 100 200
SCALE IN FEET

CADD USER: Brian L. Jurek FILE: M:\CAD\23690B77 SLRIDT\2012\LTM\FIGURES\FIGURE 5 – SLRIDT VEGETATION AND BENTHIC MONITORING PLAN.DWG PLOT SCALE: 1:2 PLOT DATE: 4/16/2012 8:40 AM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
				5/31/11	DRAFT SUBMITTED
				4/16/12	DRAFT SUBMITTED

DRAFT

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 5 – SLRIDT VEGETATION & BENTHIC MONITORING PLAN

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.

CADD USER: Brian L. Jurek FILE: E:\SLRIDT BACKUP\BLJ\CIVIL 3D PROJECTS\SLRIDT\2011\LTM\FIGURES\FIGURE 6 – TICMP VEGETATION MONITORING PLAN.DWG PLOT SCALE: 1:2 PLOT DATE: 6/3/2011 2:27 PM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
				5/31/11	DRAFT SUBMITTED

XIK CORPORATION
DULUTH, MN

SLRIDT
DULUTH, MN

FIGURE 6 – TICMP VEGETATION MONITORING PLAN

BARR PROJECT No. 23690B77
CLIENT PROJECT No.
DWG. No.
REV. No.

Appendices

Appendix A

QA/QC Evaluation and Analytical Reports

Quality control data from the Long Term Monitoring were evaluated to assess the integrity of the sampling procedures and the validity of the analytical results for the sampling events. The quality control procedures conducted at the laboratory included the use of approved methodologies, analysis of method (laboratory) blanks, laboratory control samples (LCS) and laboratory control samples (LCSD), and duplicate samples, matrix spike (MS) samples and matrix spike duplicate (MSD) samples and surrogate spikes. Quality control procedures conducted in the field consisted of collecting four field duplicate samples.

Barr Engineering Company (Barr) located in Duluth, Minnesota collected the samples and submitted them for analysis. Water samples were collected and sent to Braun Intertec (Braun) located in Bloomington, Minnesota for semi-volatile organic compounds using U.S. EPA method 8270D selected ion monitoring (SIM). Braun is certified by the Minnesota Department of Health to perform U.S. EPA 8270D analyses under the RCRA program.

1.1 Laboratory Quality Control

Braun conducts quality control/quality assurance procedures on an ongoing basis to validate the data generated by their analytical systems. Established acceptance criteria are used to measure the degree of precision and accuracy obtained by the analytical processes.

Per the chain-of-custody and subsequent laboratory acknowledgement receipt forms, the samples were received intact with a temperature of 0.6 to 7.8 °C upon receipt at the laboratory. The samples were stored at 4 °C until analysis. The technical holding times were evaluated to determine if the time period between sample collection and analysis affected the sample results. The poly aromatic hydrocarbon (PAH) analysis was conducted within published USEPA guidelines. No qualifiers were assigned due to holding times, preservation, or storage issues.

Sample concentrations detected above the method detection limit (MDL) and below the laboratory reporting limit (RL) were “J” qualified and should be considered estimated. Naphthalene was detected above the MDL and below the RL in four of the five method blank samples; therefore, the associated sample concentrations within five times the method blank sample concentration were “b” qualified and should be considered potentially false positive detections.

The continuing calibration verifications (CCVs) did not meet method specifications for acenaphthylene in every analytical run sequence for the PAH instrument. In each case, the CCV failure would result in a potentially high data bias; therefore, only positive detections of this compound were “*” qualified (estimated) in the associated project samples. Fifteen samples were qualified based upon the acenaphthylene CCV failure and the data are presented in the data summary tables.

The laboratory sample duplicates, laboratory control sample (LCS) and laboratory control sample duplicates (LCSDs) and matrix spike (MS) and matrix spike duplicate (MSD) samples met laboratory acceptance criteria for precision and accuracy except where detailed below. The LCS/LCDS percent recovery for acenaphthylene in batch B3J0746 exceeded the laboratory acceptance limits for precision; however, no additional qualification was deemed necessary because the affected results were already "*" qualified based upon the CCV results previously described. Samples S6-BS-02 3 FT, S7-BS-03 1.5 FT and SB-PW-06 served as the MS/MSD samples for this project. One or more MS/MSD percent recoveries and/or relative percent differences (RPDs) for samples S6-BS-02 3 FT, S7-BS-03 1.5 FT did not meet the established acceptance limits for PAHs; therefore, the associated data for select compounds were "*" qualified where one or more MS/MSD percent recoveries or RPD were more than five percent beyond the applicable acceptance criteria. This affected benzo(k)fluoranthene and dibenz(a,h)anthracene for samples SB-PW-06 and SB-PW-06 MS/MSD and naphthalene for sample S7-BS-03 1.5 FT.

Sample surrogate percent recoveries were within laboratory acceptance criteria with the following exceptions. One or more surrogate spike recoveries did not meet the laboratory acceptance limits for one method blank sample and samples S7-PW-05, S7-PW-06, S6-BS-04 3 FT, S7,BS-04 1.5 FT and S7-BS-01 3 FT. Samples results where the surrogate recoveries were greater than 5 percent beyond the lower/upper laboratory acceptance limits were "*" qualified (estimated). This affected 2-methylnaphthalene, anthracene, naphthalene for sample S7-PW-05 and 2-methylnaphthalene, acenaphthene, chrysene, fluorene, naphthalene and phenanthrene for sample S7-PW-06.

1.2 Field Quality Control

Samples S6-BS-05 3 FT, S7-BS-04 1.5 FT, S7-PW-06 and SB-PW-02 served as the field duplicate samples during the sampling event. Per Barr's data evaluation SOP, relative percent difference (RPD) is not calculated where both samples have no detections above the laboratory RL. Field duplicate samples met the RPD criteria (40%) with the exception of one or more compounds for sample S7-BS-04 1.5 FT and S7-PW-06 and their field duplicate samples. Sample concentrations near the practical quantitation limit can exaggerate the deviation of the RPD. Since the most of the PAH sample concentrations were within five times the MDL/RL, only the naphthalene results for S7-BS-04 1.5 FT and the anthracene results for S7-PW-06 and their corresponding field duplicate samples were "*" qualified (estimated) based upon the field duplicate RPD calculation.

1.3 Data Package Completeness

All sediment and porewater samples were analyzed and reported during this event.

1.4 Summary of Data Evaluation

Overall, the laboratory data were considered useable with qualification assigned during the data evaluation process.

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11001 Hampshire Avenue S.
Minneapolis, MN 55438

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Fax: 952.995.2020
Web: braunintertec.com

Mr. Guy Partch
Barr Engineering Company
332 W Superior St Suite 600
Duluth, MN 55802

November 07, 2013

Report #: 1306090

RE: 23/69-0B77.00 2013 010
23/69-0B77.00 2013 010

Dear Guy Partch:

Braun Intertec Corporation received samples for the project identified above on October 25, 2013. Analytical results are summarized in the following report.

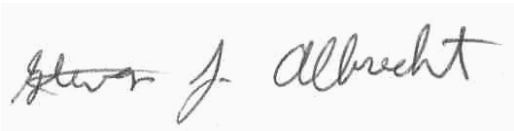
All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Braun Intertec Corporation for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,



Steven J. Albrecht
Project Manager

Certification/Accreditation Number

Minnesota Department of Health #027-053-117

BRAUN INTERTEC

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Minneapolis, MN 55438
952.995.2000 Phone
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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Qualifiers and Abbreviations

vn	The surrogate recovery is below the laboratory generated control limits.
sur	One or more surrogate recoveries reported with this sample analysis are outside of the laboratory control limits.
J	Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
go	The laboratory control sample recovery is outside of laboratory control limits.
A2	Acenaphthylene recovery for the continuing calibration sample is 161%. Method requirements are 80% to 120%. There may be a high bias in the reported results.
A1	Acenaphthylene recovery for the continuing calibration sample is 170%. Method requirements are 80% to 120%. There may be a high bias in the reported results.
ca	This field of testing is not certifiable by the Minnesota Department of Health.
COC	Chain of Custody
dry	Sample results reported on a dry weight basis
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
ND	Analyte NOT DETECTED above the MDL value
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference
VOC	Volatile Organic Compound

A field of testing is the combination of analyte, matrix, method, and regulatory program.

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Case Narrative

The sample containers in Cooler 1 were received at 7.8 °C. This exceeds the regulatory requirement of 6 °C.

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-BS-01 (2.1 ft)	1306090-01	Soil	10/21/13 15:15	10/25/13 16:30
SB-BS-02 (2.8 ft)	1306090-02	Soil	10/22/13 10:00	10/25/13 16:30
SB-BS-03 (2.3 ft)	1306090-03	Soil	10/22/13 13:30	10/25/13 16:30
SB-BS-04 (3 ft)	1306090-04	Soil	10/21/13 16:50	10/25/13 16:30
SB-BS-05 (2.2 ft)	1306090-05	Soil	10/22/13 10:40	10/25/13 16:30
SB-BS-06 (2.7 ft)	1306090-06	Soil	10/22/13 11:15	10/25/13 16:30
S6-BS-01 (3 ft)	1306090-07	Soil	10/22/13 15:10	10/25/13 16:30
S6-BS-02 (3 ft)	1306090-08	Soil	10/24/13 10:00	10/25/13 16:30
S6-BS-03 (3 ft)	1306090-10	Soil	10/24/13 11:10	10/25/13 16:30
S6-BS-04 (3 ft)	1306090-11	Soil	10/22/13 15:45	10/25/13 16:30
S6-BS-05 (3 ft)	1306090-12	Soil	10/24/13 09:15	10/25/13 16:30
S6-BS-05 DUP (3 ft)	1306090-13	Soil	10/24/13 09:25	10/25/13 16:30
S6-BS-06 (3 ft)	1306090-14	Soil	10/24/13 10:30	10/25/13 16:30
S7-BS-01 (3 ft)	1306090-15	Soil	10/24/13 14:35	10/25/13 16:30
S7-BS-04 (1.5 ft)	1306090-16	Soil	10/24/13 13:15	10/25/13 16:30
S7-BS-04 DUP (1.5 ft)	1306090-17	Soil	10/24/13 13:25	10/25/13 16:30
S7-BS-05 (3 ft)	1306090-18	Soil	10/25/13 12:05	10/25/13 16:30
S7-BS-06 (3 ft)	1306090-19	Soil	10/25/13 11:45	10/25/13 16:30

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Conditions Upon Receipt

Cooler: Cooler 1

Temperature:	7.8 °C	**COC Included:**	Yes	**Custody Seals Used:**	Yes
Temperature Blank:	No	**COC Complete:**	Yes	**Custody Seals Intact:**	Yes
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-01 (2.1 ft)

1306090-01 (Soil)

10/21/13 15:15

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**93**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.71 J	2.1	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.90 J	2.1	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.1	0.40	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.1	0.43	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.1	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.1	0.22	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.3	0.59	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.1	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.1	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.1	0.74	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.1	0.26	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.1	1.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.1	0.35	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.1	0.63	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	1.6 J	2.1	0.52	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.1	1.7	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.1	0.57	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*63.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*71.5 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*85.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-02 (2.8 ft)

1306090-02 (Soil)

10/22/13 10:00

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**95**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**3.6**	2.1	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	1.4 J	2.1	0.28	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	1.0 J	2.1	0.39	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	0.85 J	2.1	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.1	0.40	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.1	0.22	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.2	0.57	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.1	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.1	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.1	0.73	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.1	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.1	1.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	**2.6**	2.1	0.34	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.1	0.62	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	**9.7**	2.1	0.51	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	**5.8**	2.1	1.7	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.1	0.56	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*73.9 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*78.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*85.3 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-03 (2.3 ft)

1306090-03 (Soil)

10/22/13 13:30

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**85**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.64 J	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.4	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.4	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.4	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	0.62 J	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.61 J	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	0.69 J	4.7	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.4	0.35	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.4	0.72	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.4	0.82	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.4	0.28	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.4	1.1	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.4	0.39	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.4	0.70	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	1.9 J	2.4	0.57	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.4	1.9	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	0.83 J	2.4	0.63	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*35.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*56.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*88.4 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-04 (3 ft)

1306090-04 (Soil)

10/21/13 16:50

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**89**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.57 J	2.2	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.2	0.30	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.2	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.2	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	0.45 J	2.2	0.43	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.42 J	2.2	0.23	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.5	0.61	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.2	0.34	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.2	0.68	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.2	0.78	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.2	0.27	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.2	1.1	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.2	0.37	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.2	0.66	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	0.98 J	2.2	0.55	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.2	1.8	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	0.81 J	2.2	0.60	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*71.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*74.9 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.8 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-05 (2.2 ft)

1306090-05 (Soil)

10/22/13 10:40

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**92**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.49 J	2.2	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.57 J	2.2	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.2	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.2	0.43	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.2	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.2	0.23	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.4	0.59	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.2	0.33	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.2	0.66	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.2	0.75	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.2	0.26	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.2	1.1	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.2	0.36	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.2	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	1.8 J	2.2	0.53	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.2	1.8	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.2	0.58	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*64.8 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*68.0 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

SB-BS-06 (2.7 ft)

1306090-06 (Soil)

10/22/13 11:15

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**88**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	1.8 J	2.3	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.77 J	2.3	0.31	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	0.51 J	2.3	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.3	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	0.72 J	2.3	0.43	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.57 J	2.3	0.24	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	0.75 J	4.5	0.62	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.3	0.34	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.3	0.69	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	0.92 J	2.3	0.78	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.3	0.27	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	1.4 J	2.3	1.1	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	0.70 J	2.3	0.37	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.3	0.67	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	**9.5**	2.3	0.55	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.3	1.8	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	1.4 J	2.3	0.60	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*61.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*66.3 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*92.0 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-01 (3 ft)

1306090-07 (Soil)

10/22/13 15:10

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**82**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	2.2 J	2.4	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.87 J	2.4	0.33	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	1.4 J	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	1.6 J	2.4	0.48	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	**3.2**	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	**3.0**	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	3.5 J	4.9	0.66	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	**2.5**	2.4	0.37	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	2.2 J	2.4	0.74	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	**4.1**	2.4	0.84	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	0.63 J	2.4	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	**5.1**	2.4	1.2	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.4	0.40	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	2.3 J	2.4	0.72	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	**27**	2.4	0.59	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	**3.5**	2.4	2.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	**4.6**	2.4	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*43.5 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*60.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.8 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-02 (3 ft)

1306090-08 (Soil)

10/24/13 10:00

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**83**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**12**	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.4	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	**2.7**	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	**3.3**	2.4	0.48	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	**10**	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	**9.6**	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	**12**	4.8	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	**8.7**	2.4	0.36	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	**5.3**	2.4	0.73	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	**12**	2.4	0.83	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	2.1 J	2.4	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	**17**	2.4	1.2	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.4	0.39	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	**7.5**	2.4	0.71	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	**8.8**	2.4	0.58	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	**13**	2.4	1.9	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	**15**	2.4	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*64.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*75.5 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-03 (3 ft)

1306090-10 (Soil)

10/24/13 11:10

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**85**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.46 J	2.3	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.3	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.3	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.3	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.3	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.3	0.24	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.7	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.3	0.35	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.3	0.71	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.3	0.81	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.3	0.28	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.3	1.1	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.3	0.38	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.3	0.69	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	0.78 J	2.3	0.57	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.3	1.9	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.3	0.63	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*43.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*60.3 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*87.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-04 (3 ft)

1306090-11 (Soil)

10/22/13 15:45

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**81**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sur

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.62 J	2.5	0.48	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.5	0.34	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.5	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.5	0.49	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.5	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.29 J	2.5	0.26	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	5.0	0.68	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.5	0.37	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.5	0.75	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.5	0.86	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.5	0.30	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.5	1.2	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.5	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.5	0.73	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	0.98 J	2.5	0.60	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.5	2.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.5	0.66	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*29.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	*vn*
Surrogate: Nitrobenzene-d5	*56.9 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*87.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-05 (3 ft)

1306090-12 (Soil)

10/24/13 9:15

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**93**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	ND	2.2	0.42	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.57 J	2.2	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.2	0.40	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.2	0.43	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.2	0.41	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.2	0.22	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.3	0.59	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.2	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.2	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.2	0.74	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.2	0.26	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.2	1.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.2	0.35	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.2	0.63	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	0.72 J	2.2	0.52	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.2	1.7	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.2	0.57	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*53.9 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*54.4 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*87.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-05 DUP (3 ft)

1306090-13 (Soil)

10/24/13 9:25

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**84**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.66 J	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	0.75 J	2.4	0.32	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.4	0.44	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	0.79 J	2.4	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	2.3 J	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	1.9 J	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	2.3 J	4.8	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	1.5 J	2.4	0.36	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	1.4 J	2.4	0.72	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	**3.2**	2.4	0.82	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	0.41 J	2.4	0.28	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	**4.3**	2.4	1.2	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.4	0.39	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	1.3 J	2.4	0.70	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	1.1 J	2.4	0.58	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	**3.0**	2.4	1.9	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	**3.5**	2.4	0.64	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*50.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*63.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*92.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S6-BS-06 (3 ft)

1306090-14 (Soil)

10/24/13 10:30

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**83**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.51 J	2.4	0.47	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.4	0.33	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	A1, go
Anthracene	ND	2.4	0.48	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.8	0.66	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.4	0.36	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.4	0.74	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.4	0.84	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.4	0.29	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.4	1.2	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.4	0.40	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.4	0.71	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Naphthalene	0.94 J	2.4	0.59	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.4	2.0	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Pyrene	ND	2.4	0.65	ug/kg dry	1	B3J0746	11/4/13	11/5/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*38.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*62.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*93.4 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/5/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S7-BS-01 (3 ft)

1306090-15 (Soil)

10/24/13 14:35

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**83**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sur

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**4.1**	2.4	0.47	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthene	0.98 J	2.4	0.33	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthylene	2.3 J	2.4	0.45	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	A2, go
Anthracene	**7.7**	2.4	0.48	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	**6.6**	2.4	0.46	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	**4.8**	2.4	0.25	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	**7.8**	4.8	0.66	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	**2.9**	2.4	0.36	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	**3.8**	2.4	0.74	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	go
Chrysene	**10**	2.4	0.84	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	0.87 J	2.4	0.29	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluoranthene	**16**	2.4	1.2	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluorene	**3.4**	2.4	0.40	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	**3.3**	2.4	0.71	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Naphthalene	**48**	2.4	0.59	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Phenanthrene	**11**	2.4	2.0	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Pyrene	**12**	2.4	0.65	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*25.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	*vn*
Surrogate: Nitrobenzene-d5	*55.9 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*94.4 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S7-BS-04 (1.5 ft)

1306090-16 (Soil)

10/24/13 13:15

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**79**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sur

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**3.7**	2.5	0.49	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthene	1.2 J	2.5	0.34	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthylene	1.7 J	2.5	0.47	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	A2, go
Anthracene	**3.1**	2.5	0.50	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	**5.5**	2.5	0.48	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	**5.6**	2.5	0.26	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	**9.1**	5.1	0.69	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	**4.4**	2.5	0.38	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	**4.1**	2.5	0.77	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	go
Chrysene	**7.5**	2.5	0.87	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	1.0 J	2.5	0.30	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluoranthene	**11**	2.5	1.2	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluorene	**2.5**	2.5	0.41	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	**4.7**	2.5	0.75	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Naphthalene	**11**	2.5	0.61	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Phenanthrene	**6.1**	2.5	2.0	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Pyrene	**9.3**	2.5	0.68	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*29.5 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	*vn*
Surrogate: Nitrobenzene-d5	*41.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*94.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S7-BS-04 DUP (1.5 ft)

1306090-17 (Soil)

10/24/13 13:25

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**81**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**11**	2.5	0.48	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.5	0.33	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthylene	2.1 J	2.5	0.46	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	A2, go
Anthracene	**5.5**	2.5	0.49	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	**9.8**	2.5	0.47	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	**8.0**	2.5	0.26	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	**12**	4.9	0.67	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	**6.0**	2.5	0.37	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	**5.1**	2.5	0.75	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	go
Chrysene	**13**	2.5	0.85	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	1.4 J	2.5	0.29	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluoranthene	**22**	2.5	1.2	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluorene	**5.2**	2.5	0.40	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	**6.0**	2.5	0.73	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Naphthalene	**20**	2.5	0.60	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Phenanthrene	**13**	2.5	2.0	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Pyrene	**19**	2.5	0.66	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*70.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*81.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*91.2 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S7-BS-05 (3 ft)

1306090-18 (Soil)

10/25/13 12:05

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**89**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.78 J	2.2	0.44	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	2.2	0.30	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	2.2	0.42	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	A2, go
Anthracene	ND	2.2	0.45	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	0.48 J	2.2	0.43	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.49 J	2.2	0.23	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	0.90 J	4.5	0.61	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	0.65 J	2.2	0.34	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.2	0.68	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	go
Chrysene	ND	2.2	0.78	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.2	0.27	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.2	1.1	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.2	0.37	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.2	0.66	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Naphthalene	0.91 J	2.2	0.55	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.2	1.8	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Pyrene	0.68 J	2.2	0.60	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*68.1 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*72.4 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*90.6 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

S7-BS-06 (3 ft)

1306090-19 (Soil)

10/25/13 11:45

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**92**	0.050	0.010	% Wt	1	B3J0647	10/28/13	10/28/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**7.0**	2.2	0.42	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthene	**38**	2.2	0.29	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Acenaphthylene	**4.2**	2.2	0.40	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	A2, go
Anthracene	ND	2.2	0.43	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	0.50 J	2.2	0.41	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	0.47 J	2.2	0.23	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	0.71 J	4.3	0.59	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.2	0.33	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.2	0.66	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	go
Chrysene	0.79 J	2.2	0.75	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.2	0.26	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	2.2	1.1	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Fluorene	ND	2.2	0.35	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.2	0.64	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Naphthalene	**94**	2.2	0.53	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	2.2	1.7	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Pyrene	0.80 J	2.2	0.58	ug/kg dry	1	B3J0746	11/4/13	11/6/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*77.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*73.7 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*88.8 %*	*Limits: 30-120%*				*B3J0746*	*11/4/13*	*11/6/13*	*SGM*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Classical Chemistry Parameters - Quality Control

Batch B3J0647 - % Solids

Method Blank (B3J0647-BLK1) Prepared & Analyzed: 10/28/13

Analyte	Result		MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	0.0288	J	0.050	0.010	% Wt	NA	NA	NA	NA	NA	NA	

Duplicate (B3J0647-DUP1) **Source: 1306090-01** Prepared & Analyzed: 10/28/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	91.4	0.050	0.010	% Wt	NA	93.1	NA	NA	1.82	20	

Standard Reference Material (B3J0647-SRM1) Prepared & Analyzed: 10/28/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	92.4			% Wt	92.8	NA	99.5	90-110	NA	NA	

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Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3J0746 - EPA 3546

Method Blank (B3J0746-BLK1) Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	2.0	0.39	ug/kg	NA	NA	NA	NA	NA	NA	
Acenaphthene	ND	2.0	0.27	ug/kg	NA	NA	NA	NA	NA	NA	
Acenaphthylene	ND	2.0	0.37	ug/kg	NA	NA	NA	NA	NA	NA	
Anthracene	ND	2.0	0.40	ug/kg	NA	NA	NA	NA	NA	NA	
Benz(a)anthracene	ND	2.0	0.38	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	ND	2.0	0.21	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(b&j)fluoranthenes	ND	4.0	0.54	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	ND	2.0	0.30	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	ND	2.0	0.61	ug/kg	NA	NA	NA	NA	NA	NA	
Chrysene	ND	2.0	0.69	ug/kg	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	ND	2.0	0.24	ug/kg	NA	NA	NA	NA	NA	NA	
Fluoranthene	ND	2.0	0.97	ug/kg	NA	NA	NA	NA	NA	NA	
Fluorene	ND	2.0	0.33	ug/kg	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	ND	2.0	0.59	ug/kg	NA	NA	NA	NA	NA	NA	
Naphthalene	0.593 J	2.0	0.49	ug/kg	NA	NA	NA	NA	NA	NA	
Phenanthrene	ND	2.0	1.6	ug/kg	NA	NA	NA	NA	NA	NA	
Pyrene	ND	2.0	0.53	ug/kg	NA	NA	NA	NA	NA	NA	
Surrogate: 2-Fluorobiphenyl	*37.4*			ug/kg	*62.4*	*NA*	*59.9*	*30-120*			
Surrogate: Nitrobenzene-d5	*26.1*			ug/kg	*62.4*	*NA*	*41.9*	*30-120*			
Surrogate: Terphenyl-d14	*44.1*			ug/kg	*62.4*	*NA*	*70.7*	*30-120*			

Laboratory Control Sample (B3J0746-BS1) Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	34.6	2.0	0.39	ug/kg	49.9	NA	69.4	50-120	NA	NA	
Acenaphthene	50.6	2.0	0.27	ug/kg	49.9	NA	101	50-120	NA	NA	
Acenaphthylene	72.2	2.0	0.37	ug/kg	49.9	NA	145	50-120	NA	NA	
Anthracene	49.2	2.0	0.40	ug/kg	49.9	NA	98.7	50-120	NA	NA	
Benz(a)anthracene	55.3	2.0	0.38	ug/kg	49.9	NA	111	50-120	NA	NA	
Benzo(a)pyrene	53.0	2.0	0.21	ug/kg	49.9	NA	106	50-120	NA	NA	
Benzo(b&j)fluoranthenes	99.1	4.0	0.54	ug/kg	99.8	NA	99.3	50-120	NA	NA	
Benzo(g,h,i)perylene	58.0	2.0	0.30	ug/kg	49.9	NA	116	50-120	NA	NA	
Benzo(k)fluoranthene	60.7	2.0	0.61	ug/kg	49.9	NA	122	50-120	NA	NA	
Chrysene	56.9	2.0	0.69	ug/kg	49.9	NA	114	50-120	NA	NA	
Dibenz(a,h)anthracene	58.6	2.0	0.24	ug/kg	49.9	NA	117	50-120	NA	NA	
Fluoranthene	52.2	2.0	0.97	ug/kg	49.9	NA	105	50-120	NA	NA	
Fluorene	49.1	2.0	0.33	ug/kg	49.9	NA	98.3	50-120	NA	NA	
Indeno(1,2,3-cd)pyrene	57.2	2.0	0.59	ug/kg	49.9	NA	115	50-120	NA	NA	
Naphthalene	37.7	2.0	0.49	ug/kg	49.9	NA	75.5	50-120	NA	NA	
Phenanthrene	50.3	2.0	1.6	ug/kg	49.9	NA	101	50-120	NA	NA	
Pyrene	52.2	2.0	0.53	ug/kg	49.9	NA	105	50-120	NA	NA	
Surrogate: 2-Fluorobiphenyl	*43.4*			ug/kg	*62.4*	*NA*	*69.6*	*30-120*			
Surrogate: Nitrobenzene-d5	*32.4*			ug/kg	*62.4*	*NA*	*52.0*	*30-120*			
Surrogate: Terphenyl-d14	*53.7*			ug/kg	*62.4*	*NA*	*86.1*	*30-120*			

EPA Lab ID: MN00063

BRAUN INTERTEC

11001 Hampshire Ave. S.
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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3J0746 - EPA 3546

Laboratory Control Sample (B3J0746-BS1) Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Laboratory Control Sample Duplicate (B3J0746-BSD1) Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	32.7	2.0	0.39	ug/kg	49.9	NA	65.5	50-120	5.71	20	
Acenaphthene	48.9	2.0	0.27	ug/kg	49.9	NA	98.0	50-120	3.48	20	
Acenaphthylene	70.7	2.0	0.37	ug/kg	49.9	NA	142	50-120	2.06	20	
Anthracene	44.5	2.0	0.40	ug/kg	49.9	NA	89.3	50-120	10.0	20	
Benz(a)anthracene	48.2	2.0	0.38	ug/kg	49.9	NA	96.7	50-120	13.7	20	
Benzo(a)pyrene	46.0	2.0	0.21	ug/kg	49.9	NA	92.3	50-120	14.0	20	
Benzo(b&j)fluoranthenes	85.2	4.0	0.54	ug/kg	99.8	NA	85.4	50-120	15.1	20	
Benzo(g,h,i)perylene	51.1	2.0	0.30	ug/kg	49.9	NA	102	50-120	12.7	20	
Benzo(k)fluoranthene	54.7	2.0	0.61	ug/kg	49.9	NA	110	50-120	10.3	20	
Chrysene	49.7	2.0	0.69	ug/kg	49.9	NA	99.6	50-120	13.5	20	
Dibenz(a,h)anthracene	51.5	2.0	0.24	ug/kg	49.9	NA	103	50-120	12.8	20	
Fluoranthene	45.0	2.0	0.97	ug/kg	49.9	NA	90.3	50-120	14.7	20	
Fluorene	47.3	2.0	0.33	ug/kg	49.9	NA	94.9	50-120	3.57	20	
Indeno(1,2,3-cd)pyrene	49.9	2.0	0.59	ug/kg	49.9	NA	100	50-120	13.6	20	
Naphthalene	35.1	2.0	0.49	ug/kg	49.9	NA	70.4	50-120	7.05	20	
Phenanthrene	45.5	2.0	1.6	ug/kg	49.9	NA	91.1	50-120	10.2	20	
Pyrene	46.1	2.0	0.53	ug/kg	49.9	NA	92.3	50-120	12.5	20	
Surrogate: 2-Fluorobiphenyl	*38.3*			ug/kg	*62.4*	*NA*	*61.3*	*30-120*			
Surrogate: Nitrobenzene-d5	*29.4*			ug/kg	*62.4*	*NA*	*47.1*	*30-120*			
Surrogate: Terphenyl-d14	*47.5*			ug/kg	*62.4*	*NA*	*76.1*	*30-120*			

Matrix Spike (B3J0746-MS1) **Source: 1306090-08** Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	39.1	2.4	0.46	ug/kg dry	59.8	12.5	44.5	30-130	NA	NA	
Acenaphthene	55.9	2.4	0.32	ug/kg dry	59.8	ND	93.4	30-130	NA	NA	
Acenaphthylene	77.8	2.4	0.45	ug/kg dry	59.8	2.67	125	30-130	NA	NA	
Anthracene	63.1	2.4	0.48	ug/kg dry	59.8	3.31	100	30-130	NA	NA	
Benz(a)anthracene	74.4	2.4	0.45	ug/kg dry	59.8	10.3	107	30-130	NA	NA	
Benzo(a)pyrene	71.8	2.4	0.25	ug/kg dry	59.8	9.61	104	30-130	NA	NA	
Benzo(b&j)fluoranthenes	129	4.8	0.65	ug/kg dry	120	12.4	97.1	30-130	NA	NA	
Benzo(g,h,i)perylene	76.9	2.4	0.36	ug/kg dry	59.8	8.68	114	30-130	NA	NA	
Benzo(k)fluoranthene	79.9	2.4	0.73	ug/kg dry	59.8	5.31	125	30-130	NA	NA	
Chrysene	76.0	2.4	0.83	ug/kg dry	59.8	12.3	106	30-130	NA	NA	
Dibenz(a,h)anthracene	71.4	2.4	0.29	ug/kg dry	59.8	2.14	116	30-130	NA	NA	
Fluoranthene	72.1	2.4	1.2	ug/kg dry	59.8	16.5	92.8	30-130	NA	NA	
Fluorene	59.8	2.4	0.39	ug/kg dry	59.8	ND	99.8	30-130	NA	NA	
Indeno(1,2,3-cd)pyrene	73.3	2.4	0.71	ug/kg dry	59.8	7.46	110	30-130	NA	NA	
Naphthalene	39.0	2.4	0.58	ug/kg dry	59.8	8.85	50.3	30-130	NA	NA	

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3J0746 - EPA 3546

Matrix Spike (B3J0746-MS1) **Source: 1306090-08** Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Phenanthrene	66.8	2.4	1.9	ug/kg dry	59.8	13.1	89.8	30-130	NA	NA	
Pyrene	71.3	2.4	0.64	ug/kg dry	59.8	14.8	94.4	30-130	NA	NA	
Surrogate: 2-Fluorobiphenyl	*43.4*			ug/kg dry	*74.8*	*NA*	*58.1*	*30-120*			
Surrogate: Nitrobenzene-d5	*50.8*			ug/kg dry	*74.8*	*NA*	*67.8*	*30-120*			
Surrogate: Terphenyl-d14	*64.8*			ug/kg dry	*74.8*	*NA*	*86.6*	*30-120*			

Matrix Spike Duplicate (B3J0746-MSD1) **Source: 1306090-08** Prepared: 11/04/13 Analyzed: 11/05/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	39.2	2.4	0.46	ug/kg dry	59.9	12.5	44.6	30-130	0.228	25	
Acenaphthene	57.4	2.4	0.32	ug/kg dry	59.9	ND	95.8	30-130	2.68	25	
Acenaphthylene	76.2	2.4	0.45	ug/kg dry	59.9	2.67	123	30-130	2.01	25	
Anthracene	62.1	2.4	0.48	ug/kg dry	59.9	3.31	98.2	30-130	1.65	25	
Benz(a)anthracene	74.4	2.4	0.45	ug/kg dry	59.9	10.3	107	30-130	0.0131	25	
Benzo(a)pyrene	71.1	2.4	0.25	ug/kg dry	59.9	9.61	103	30-130	0.974	25	
Benzo(b&j)fluoranthenes	125	4.8	0.65	ug/kg dry	120	12.4	93.8	30-130	3.00	25	
Benzo(g,h,i)perylene	73.6	2.4	0.36	ug/kg dry	59.9	8.68	108	30-130	4.37	25	
Benzo(k)fluoranthene	76.5	2.4	0.73	ug/kg dry	59.9	5.31	119	30-130	4.28	25	
Chrysene	74.1	2.4	0.83	ug/kg dry	59.9	12.3	103	30-130	2.45	25	
Dibenz(a,h)anthracene	69.0	2.4	0.29	ug/kg dry	59.9	2.14	112	30-130	3.36	25	
Fluoranthene	71.3	2.4	1.2	ug/kg dry	59.9	16.5	91.5	30-130	1.04	25	
Fluorene	58.7	2.4	0.39	ug/kg dry	59.9	ND	98.0	30-130	1.73	25	
Indeno(1,2,3-cd)pyrene	71.2	2.4	0.71	ug/kg dry	59.9	7.46	106	30-130	2.92	25	
Naphthalene	39.1	2.4	0.58	ug/kg dry	59.9	8.85	50.4	30-130	0.210	25	
Phenanthrene	65.1	2.4	1.9	ug/kg dry	59.9	13.1	86.8	30-130	2.65	25	
Pyrene	71.6	2.4	0.64	ug/kg dry	59.9	14.8	94.8	30-130	0.355	25	
Surrogate: 2-Fluorobiphenyl	*40.4*			ug/kg dry	*74.9*	*NA*	*53.9*	*30-120*			
Surrogate: Nitrobenzene-d5	*47.8*			ug/kg dry	*74.9*	*NA*	*63.8*	*30-120*			
Surrogate: Terphenyl-d14	*63.2*			ug/kg dry	*74.9*	*NA*	*84.4*	*30-120*			

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

1306090

Chain of Custody

BARR 4700 West 77th Street, Minneapolis, MN 55435-4803, (952) 832-2600

Project Number: 2369ØB77.ØØ 2013 Ø1Ø
Project Name: SLRIDT
Sample Origination State MN (use two letter postal state abbreviation)
COC Number: Nº 41398

COC 1 of 2
Project Manager: GMP
Project QC Contact:
Sampled by: GM
Laboratory: Braun

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO_3); Total Metals (HNO_3); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H_2SO_4) #4; SLRIDT 17 PAHs. Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.). Total Number Of Containers.

	Location (letter "S", not number "5")	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	SLRIDT 17 PAHs	VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers
01.	SB-BS-01	2.1	2.1	ft	10/21/2013	15:15		X	X										X							1
02.	SB-BS-02	2.8	2.8		10/22/2013	10:00																				
03.	SB-BS-03	2.3	2.3		10/22/2013	13:30																				
04.	SB-BS-04	3	3		10/21/13	16:50																				
05.	SB-BS-05	2.2	2.2		10/22/13	10:40																				
06.	SB-BS-06	2.7	2.7		10/22/13	11:15																				
07.	SG-BS-01	3	3		10/22/13	15:10																				
08.	SG-BS-02	3	3		10/24/13	10:00																				
09.	SG-BS-02-MS/MSD	3	3		10/24/13	10:05					X															
10.	SG-BS-03	3	3	↓	10/24/13	11:10	↓		↓	↓									↓							↓

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

	On Ice?	Date	Time		Date	Time
Relinquished By:	On Ice? (Y N)	Date	Time	Received by:	Date	Time
	ON	10/25/13	1215		10/25/13	1630
Relinquished By:	On Ice? (Y N)	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

7.8°C ICE

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/09

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Barr Engineering Company	Client Ref: 23/69-0B77.00 2013 010	Report #: 1306090
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number: 23/69-0B77.00 2013 010	Account ID: B01058

1306090

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23690B77.00 2013 010
Project Name: SLRIDT
Sample Origination State: MN (use two letter postal state abbreviation)
COC Number: № 41399

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO_3); Total Metals (HNO_3); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H_2SO_4) #4 SLRIDT 17 PAHs. Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.). Total Number Of Containers.

COC 2 of 2

Project Manager: GMP
Project QC Contact:
Sampled by: IGM
Laboratory: Braun

	Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Matrix: SED	Type: Grab	Type: Comp.	Type: QC	VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	SLRIDT 17 PAHs	VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers
11.	S6-BS-04	3	3	ft	10/22/2013	1545			X	X										X							1
12.	S6-BS-05	3	3		10/24/2013	0915																					
13.	S6-BS-05-DUP	3	3		10/24/2013	0925					X																
14.	S6-BS-06	3	3		10/24/13	1030																					
15.	S7-BS-01	3	3		10/24/13	1435																					
16.	S7-BS-04	1.5	1.5		10/24/13	1315																					
17.	S7-BS-04-DUP	1.5	1.5		10/24/13	1325					X																
18.	S7-BS-05	3	3		10/25/13	1205																					
19.	S7-BS-06	3	3		10/25/13	11:45																					
20.																											

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

	On Ice?	Date	Time		Date	Time
Relinquished By:	(Y) N	10/25/13	1215	Received by:	10/25/13	1630
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☒ Other: JWJ
Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

7.8°C ICE

H:RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/09

BRAUN INTERTEC

Braun Intertec Corporation
11001 Hampshire Avenue S.
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Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

Mr. Guy Partch
Barr Engineering Company
332 W Superior St Suite 600
Duluth, MN 55802

November 18, 2013

Report #: 1306232

RE: SLRIDT 23690B77.00-2013-010

Dear Guy Partch:

Braun Intertec Corporation received samples for the project identified above on November 01, 2013. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Braun Intertec Corporation for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

Steven J. Albrecht
Project Manager

Certification/Accreditation Number

Minnesota Department of Health #027-053-117

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Qualifiers and Abbreviations

vn	The surrogate recovery is below the laboratory generated control limits.
qo	The relative percent difference (RPD) was outside of laboratory control limits for the matrix spike (MS) and matrix spike duplicate (MSD) samples.
qn	The spike recovery is outside of laboratory control limits for the matrix spike (MS) and/or the matrix spike duplicate (MSD).
J	Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
A2	Acenaphthylene recovery for the continuing calibration sample is 144%. Method requirements are 80% to 120%. There may be a high bias in the reported results.
ca	This field of testing is not certifiable by the Minnesota Department of Health.
COC	Chain of Custody
dry	Sample results reported on a dry weight basis
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
ND	Analyte NOT DETECTED above the MDL value
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference
VOC	Volatile Organic Compound

A field of testing is the combination of analyte, matrix, method, and regulatory program.

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S7-BS-03 (1.5 ft)	1306232-01	Soil	10/31/13 12:30	11/01/13 16:13
S7-BS-02 (1.5 ft)	1306232-02	Soil	10/31/13 15:15	11/01/13 16:13
SW-BS-01 (3 ft)	1306232-03	Soil	11/01/13 10:45	11/01/13 16:13
NW-BS-01 (3 ft)	1306232-04	Soil	11/01/13 12:05	11/01/13 16:13

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Conditions Upon Receipt

Cooler: Cooler 1

Temperature:	2.4 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

S7-BS-03 (1.5 ft)

1306232-01 (Soil)

10/31/13 12:30

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**76**	0.050	0.010	% Wt	1	B3K0035	11/4/13	11/4/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**14**	2.6	0.51	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qo
Acenaphthene	**6.2**	2.6	0.35	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	2.6	0.49	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	A2
Anthracene	**13**	2.6	0.52	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benz(a)anthracene	**20**	2.6	0.50	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn
Benzo(a)pyrene	**17**	2.6	0.27	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn
Benzo(b&j)fluoranthenes	**21**	5.3	0.72	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	**6.5**	2.6	0.39	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn
Benzo(k)fluoranthene	**11**	2.6	0.80	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn
Chrysene	**21**	2.6	0.91	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	**2.6**	2.6	0.31	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluoranthene	**37**	2.6	1.3	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluorene	**12**	2.6	0.43	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	**8.9**	2.6	0.78	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn
Naphthalene	**90**	2.6	0.64	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	qn, qo
Phenanthrene	**36**	2.6	2.1	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Pyrene	**27**	2.6	0.70	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*43.6 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*45.2 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.2 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

S7-BS-02 (1.5 ft)

1306232-02 (Soil)

10/31/13 15:15

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**80**	0.050	0.010	% Wt	1	B3K0035	11/4/13	11/4/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**6.9**	2.5	0.48	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthene	**6.4**	2.5	0.34	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthylene	1.3 J	2.5	0.46	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	A2
Anthracene	**3.5**	2.5	0.49	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benz(a)anthracene	**3.7**	2.5	0.47	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	**3.3**	2.5	0.26	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	4.5 J	5.0	0.68	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.5	0.37	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	2.1 J	2.5	0.76	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Chrysene	**4.1**	2.5	0.86	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	0.52 J	2.5	0.30	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluoranthene	**7.2**	2.5	1.2	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluorene	**8.2**	2.5	0.41	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	1.8 J	2.5	0.73	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Naphthalene	**27**	2.5	0.60	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Phenanthrene	**8.0**	2.5	2.0	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Pyrene	**5.5**	2.5	0.66	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*55.8 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*68.3 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*86.2 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SW-BS-01 (3 ft)

1306232-03 (Soil)

11/1/13 10:45

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**86**	0.050	0.010	% Wt	1	B3K0035	11/4/13	11/4/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	1.1 J	2.3	0.45	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthene	ND	2.3	0.31	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	2.3	0.43	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	A2
Anthracene	0.56 J	2.3	0.46	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benz(a)anthracene	0.78 J	2.3	0.44	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.3	0.24	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	0.91 J	4.6	0.63	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	0.41 J	2.3	0.35	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.3	0.70	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Chrysene	0.96 J	2.3	0.80	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.3	0.28	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluoranthene	1.3 J	2.3	1.1	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluorene	0.61 J	2.3	0.38	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.3	0.68	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Naphthalene	**7.6**	2.3	0.56	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Phenanthrene	ND	2.3	1.9	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Pyrene	ND	2.3	0.62	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*59.3 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*66.4 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*89.3 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

NW-BS-01 (3 ft)

1306232-04 (Soil)

11/1/13 12:05

Classical Chemistry Parameters

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
% Solids	**83**	0.050	0.010	% Wt	1	B3K0035	11/4/13	11/4/13	MJW	EPA 3545A 11.4	ca

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	0.67 J	2.4	0.47	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthene	ND	2.4	0.33	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	2.4	0.45	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	A2
Anthracene	ND	2.4	0.48	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	2.4	0.46	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	2.4	0.25	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	4.8	0.66	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	2.4	0.36	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	2.4	0.73	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Chrysene	ND	2.4	0.83	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	2.4	0.29	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluoranthene	ND	2.4	1.2	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Fluorene	ND	2.4	0.39	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	2.4	0.71	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Naphthalene	1.2 J	2.4	0.59	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Phenanthrene	ND	2.4	1.9	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Pyrene	ND	2.4	0.64	ug/kg dry	1	B3K0175	11/11/13	11/11/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*43.8 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*61.3 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*88.8 %*	*Limits: 30-120%*				*B3K0175*	*11/11/13*	*11/11/13*	*LET*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Classical Chemistry Parameters - Quality Control

Batch B3K0035 - % Solids

Method Blank (B3K0035-BLK1) Prepared & Analyzed: 11/04/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	0.0308 J	0.050	0.010	% Wt	NA	NA	NA	NA	NA	NA	

Duplicate (B3K0035-DUP1) **Source: 1306204-01** Prepared & Analyzed: 11/04/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	5.56	0.050	0.010	% Wt	NA	5.58	NA	NA	0.356	20	

Standard Reference Material (B3K0035-SRM1) Prepared & Analyzed: 11/04/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
% Solids	91.8			% Wt	92.8	NA	99.0	90-110	NA	NA	

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Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0175 - EPA 3546

Method Blank (B3K0175-BLK1) Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	2.0	0.39	ug/kg	NA	NA	NA	NA	NA	NA	
Acenaphthene	ND	2.0	0.27	ug/kg	NA	NA	NA	NA	NA	NA	
Acenaphthylene	ND	2.0	0.37	ug/kg	NA	NA	NA	NA	NA	NA	
Anthracene	ND	2.0	0.40	ug/kg	NA	NA	NA	NA	NA	NA	
Benz(a)anthracene	ND	2.0	0.38	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	ND	2.0	0.21	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(b&j)fluoranthenes	ND	4.0	0.54	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	ND	2.0	0.30	ug/kg	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	ND	2.0	0.61	ug/kg	NA	NA	NA	NA	NA	NA	
Chrysene	ND	2.0	0.69	ug/kg	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	ND	2.0	0.24	ug/kg	NA	NA	NA	NA	NA	NA	
Fluoranthene	ND	2.0	0.97	ug/kg	NA	NA	NA	NA	NA	NA	
Fluorene	ND	2.0	0.33	ug/kg	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	ND	2.0	0.59	ug/kg	NA	NA	NA	NA	NA	NA	
Naphthalene	ND	2.0	0.49	ug/kg	NA	NA	NA	NA	NA	NA	
Phenanthrene	ND	2.0	1.6	ug/kg	NA	NA	NA	NA	NA	NA	
Pyrene	ND	2.0	0.53	ug/kg	NA	NA	NA	NA	NA	NA	
Surrogate: 2-Fluorobiphenyl	*24.4*			ug/kg	*62.3*	*NA*	*39.1*	*30-120*			
Surrogate: Nitrobenzene-d5	*10.9*			ug/kg	*62.3*	*NA*	*17.5*	*30-120*			*vn*
Surrogate: Terphenyl-d14	*31.6*			ug/kg	*62.3*	*NA*	*50.7*	*30-120*			

Laboratory Control Sample (B3K0175-BS1) Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	30.0	2.0	0.39	ug/kg	49.8	NA	60.2	50-120	NA	NA	
Acenaphthene	40.7	2.0	0.27	ug/kg	49.8	NA	81.8	50-120	NA	NA	
Acenaphthylene	53.5	2.0	0.37	ug/kg	49.8	NA	108	50-120	NA	NA	
Anthracene	46.0	2.0	0.40	ug/kg	49.8	NA	92.4	50-120	NA	NA	
Benz(a)anthracene	52.2	2.0	0.38	ug/kg	49.8	NA	105	50-120	NA	NA	
Benzo(a)pyrene	50.3	2.0	0.21	ug/kg	49.8	NA	101	50-120	NA	NA	
Benzo(b&j)fluoranthenes	92.7	4.0	0.54	ug/kg	99.5	NA	93.1	50-120	NA	NA	
Benzo(g,h,i)perylene	54.3	2.0	0.30	ug/kg	49.8	NA	109	50-120	NA	NA	
Benzo(k)fluoranthene	54.0	2.0	0.61	ug/kg	49.8	NA	109	50-120	NA	NA	
Chrysene	51.9	2.0	0.69	ug/kg	49.8	NA	104	50-120	NA	NA	
Dibenz(a,h)anthracene	55.6	2.0	0.24	ug/kg	49.8	NA	112	50-120	NA	NA	
Fluoranthene	45.4	2.0	0.97	ug/kg	49.8	NA	91.3	50-120	NA	NA	
Fluorene	43.5	2.0	0.33	ug/kg	49.8	NA	87.4	50-120	NA	NA	
Indeno(1,2,3-cd)pyrene	53.0	2.0	0.59	ug/kg	49.8	NA	106	50-120	NA	NA	
Naphthalene	29.0	2.0	0.49	ug/kg	49.8	NA	58.3	50-120	NA	NA	
Phenanthrene	45.4	2.0	1.6	ug/kg	49.8	NA	91.3	50-120	NA	NA	
Pyrene	44.7	2.0	0.53	ug/kg	49.8	NA	89.8	50-120	NA	NA	
Surrogate: 2-Fluorobiphenyl	*36.9*			ug/kg	*62.2*	*NA*	*59.3*	*30-120*			
Surrogate: Nitrobenzene-d5	*19.0*			ug/kg	*62.2*	*NA*	*30.6*	*30-120*			
Surrogate: Terphenyl-d14	*46.5*			ug/kg	*62.2*	*NA*	*74.8*	*30-120*			

EPA Lab ID: MN00063

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Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0175 - EPA 3546

Laboratory Control Sample (B3K0175-BS1) Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Laboratory Control Sample Duplicate (B3K0175-BSD1) Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	30.8	2.0	0.39	ug/kg	49.8	NA	62.0	50-120	2.90	20	
Acenaphthene	43.8	2.0	0.27	ug/kg	49.8	NA	88.0	50-120	7.36	20	
Acenaphthylene	57.4	2.0	0.37	ug/kg	49.8	NA	115	50-120	7.05	20	
Anthracene	45.9	2.0	0.40	ug/kg	49.8	NA	92.2	50-120	0.225	20	
Benz(a)anthracene	52.0	2.0	0.38	ug/kg	49.8	NA	105	50-120	0.372	20	
Benzo(a)pyrene	50.1	2.0	0.21	ug/kg	49.8	NA	101	50-120	0.321	20	
Benzo(b&j)fluoranthenes	93.9	4.0	0.54	ug/kg	99.5	NA	94.4	50-120	1.32	20	
Benzo(g,h,i)perylene	54.5	2.0	0.30	ug/kg	49.8	NA	110	50-120	0.322	20	
Benzo(k)fluoranthene	53.1	2.0	0.61	ug/kg	49.8	NA	107	50-120	1.80	20	
Chrysene	52.1	2.0	0.69	ug/kg	49.8	NA	105	50-120	0.363	20	
Dibenz(a,h)anthracene	55.5	2.0	0.24	ug/kg	49.8	NA	111	50-120	0.263	20	
Fluoranthene	46.0	2.0	0.97	ug/kg	49.8	NA	92.5	50-120	1.37	20	
Fluorene	45.2	2.0	0.33	ug/kg	49.8	NA	90.8	50-120	3.81	20	
Indeno(1,2,3-cd)pyrene	53.3	2.0	0.59	ug/kg	49.8	NA	107	50-120	0.579	20	
Naphthalene	29.8	2.0	0.49	ug/kg	49.8	NA	60.0	50-120	2.90	20	
Phenanthrene	46.0	2.0	1.6	ug/kg	49.8	NA	92.5	50-120	1.28	20	
Pyrene	44.7	2.0	0.53	ug/kg	49.8	NA	89.9	50-120	0.107	20	
Surrogate: 2-Fluorobiphenyl	*36.0*			ug/kg	*62.2*	*NA*	*57.9*	*30-120*			
Surrogate: Nitrobenzene-d5	*19.4*			ug/kg	*62.2*	*NA*	*31.3*	*30-120*			
Surrogate: Terphenyl-d14	*47.1*			ug/kg	*62.2*	*NA*	*75.8*	*30-120*			

Matrix Spike (B3K0175-MS1) **Source: 1306232-01** Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	36.3	2.6	0.51	ug/kg dry	65.5	14.1	33.8	30-130	NA	NA	
Acenaphthene	52.3	2.6	0.35	ug/kg dry	65.5	6.25	70.4	30-130	NA	NA	
Acenaphthylene	70.6	2.6	0.49	ug/kg dry	65.5	ND	108	30-130	NA	NA	
Anthracene	82.2	2.6	0.52	ug/kg dry	65.5	13.5	105	30-130	NA	NA	
Benz(a)anthracene	98.0	2.6	0.50	ug/kg dry	65.5	19.6	120	30-130	NA	NA	
Benzo(a)pyrene	89.7	2.6	0.27	ug/kg dry	65.5	17.1	111	30-130	NA	NA	
Benzo(b&j)fluoranthenes	164	5.3	0.72	ug/kg dry	131	20.8	109	30-130	NA	NA	
Benzo(g,h,i)perylene	84.9	2.6	0.39	ug/kg dry	65.5	6.47	120	30-130	NA	NA	
Benzo(k)fluoranthene	85.7	2.6	0.80	ug/kg dry	65.5	10.8	114	30-130	NA	NA	
Chrysene	92.9	2.6	0.91	ug/kg dry	65.5	20.7	110	30-130	NA	NA	
Dibenz(a,h)anthracene	80.6	2.6	0.31	ug/kg dry	65.5	2.56	119	30-130	NA	NA	
Fluoranthene	106	2.6	1.3	ug/kg dry	65.5	36.7	105	30-130	NA	NA	
Fluorene	68.0	2.6	0.43	ug/kg dry	65.5	12.5	84.8	30-130	NA	NA	
Indeno(1,2,3-cd)pyrene	85.2	2.6	0.78	ug/kg dry	65.5	8.91	117	30-130	NA	NA	
Naphthalene	101	2.6	0.64	ug/kg dry	65.5	90.3	17.1	30-130	NA	NA	qn

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0175 - EPA 3546

Matrix Spike (B3K0175-MS1) **Source: 1306232-01** Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Phenanthrene	102	2.6	2.1	ug/kg dry	65.5	36.0	101	30-130	NA	NA	
Pyrene	95.6	2.6	0.70	ug/kg dry	65.5	27.1	105	30-130	NA	NA	
Surrogate: 2-Fluorobiphenyl	*31.5*			ug/kg dry	*81.9*	*NA*	*38.5*	*30-120*			
Surrogate: Nitrobenzene-d5	*41.2*			ug/kg dry	*81.9*	*NA*	*50.4*	*30-120*			
Surrogate: Terphenyl-d14	*70.8*			ug/kg dry	*81.9*	*NA*	*86.5*	*30-120*			

Matrix Spike Duplicate (B3K0175-MSD1) **Source: 1306232-01** Prepared & Analyzed: 11/11/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	50.8	2.6	0.51	ug/kg dry	65.6	14.1	56.0	30-130	33.5	25	qo
Acenaphthene	64.3	2.6	0.35	ug/kg dry	65.6	6.25	88.6	30-130	20.5	25	
Acenaphthylene	73.6	2.6	0.49	ug/kg dry	65.6	ND	112	30-130	4.21	25	
Anthracene	82.1	2.6	0.52	ug/kg dry	65.6	13.5	105	30-130	0.192	25	
Benz(a)anthracene	108	2.6	0.50	ug/kg dry	65.6	19.6	135	30-130	9.48	25	qn
Benzo(a)pyrene	107	2.6	0.27	ug/kg dry	65.6	17.1	137	30-130	17.6	25	qn
Benzo(b&j)fluoranthenes	180	5.3	0.72	ug/kg dry	131	20.8	122	30-130	9.73	25	
Benzo(g,h,i)perylene	93.4	2.6	0.39	ug/kg dry	65.6	6.47	133	30-130	9.52	25	qn
Benzo(k)fluoranthene	96.6	2.6	0.80	ug/kg dry	65.6	10.8	131	30-130	12.0	25	qn
Chrysene	104	2.6	0.91	ug/kg dry	65.6	20.7	126	30-130	10.8	25	
Dibenz(a,h)anthracene	80.1	2.6	0.31	ug/kg dry	65.6	2.56	118	30-130	0.618	25	
Fluoranthene	112	2.6	1.3	ug/kg dry	65.6	36.7	115	30-130	6.18	25	
Fluorene	74.4	2.6	0.43	ug/kg dry	65.6	12.5	94.4	30-130	8.95	25	
Indeno(1,2,3-cd)pyrene	96.7	2.6	0.78	ug/kg dry	65.6	8.91	134	30-130	12.6	25	qn
Naphthalene	148	2.6	0.64	ug/kg dry	65.6	90.3	87.6	30-130	37.1	25	qo
Phenanthrene	115	2.6	2.1	ug/kg dry	65.6	36.0	121	30-130	11.8	25	
Pyrene	102	2.6	0.70	ug/kg dry	65.6	27.1	115	30-130	6.75	25	
Surrogate: 2-Fluorobiphenyl	*38.5*			ug/kg dry	*81.9*	*NA*	*47.0*	*30-120*			
Surrogate: Nitrobenzene-d5	*43.8*			ug/kg dry	*81.9*	*NA*	*53.5*	*30-120*			
Surrogate: Terphenyl-d14	*68.6*			ug/kg dry	*81.9*	*NA*	*83.7*	*30-120*			

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00-2013-010	Report #: 1306232
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

1306232

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23690B77.00-2013-010
Project Name: SLRIDT
Sample Origination State: MN (use two letter postal state abbreviation)
COC Number: № 42543

COC 1 of 1
Project Manager: GMP
Project QC Contact:
Sampled by: IGM
Laboratory: Braun

Number of Containers/Preservative

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	Soil: GRO, BTEX (tared MeOH) #1	Soil: DRO (tared unpreserved)	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Total Number Of Containers
1. S7-BS-03	1.5	1.5	ft	10/31/2013	12:30		X	X									1							1
2. S7-BS-02	1.5	1.5	ft	11	15:15		X	X									1							1
3. SW-BS-01	3.0	3.0	ft	11/01/2013	10:45	X		X									1							1
4. MW-BS-01	3.0	3.0	ft	11	12:05		X	X									1							1
5.																								
6.																								
7.																								
8.																								
9.																								
10.																								

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

	On Ice?	Date	Time		Date	Time
Relinquished By:	(Y) N	11-1-2013	15:25	Received by:	11/1/13	1613
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

2.4°C +ICE +TB

H:\RLG\STD\FORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/08

Braun Intertec Corporation
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Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

Mr. Guy Partch
Barr Engineering Company
332 W Superior St Suite 600
Duluth, MN 55802

November 18, 2013

Report #: 1306351

RE: SLRIDT 23690B77.00 2013 010

Dear Guy Partch:

Braun Intertec Corporation received samples for the project identified above on November 08, 2013. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Braun Intertec Corporation for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

Steven J. Albrecht
Project Manager

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Qualifiers and Abbreviations

vm	The surrogate recovery is above the laboratory generated control limits.
vfa	The method reporting limit (MRL) was raised for one or more analytes; a dilution of the sample was necessary due to high analyte levels and/or matrix interferences.
sur	One or more surrogate recoveries reported with this sample analysis are outside of the laboratory control limits.
sd	See case narrative section for further information.
qn	The spike recovery is outside of laboratory control limits for the matrix spike (MS) and/or the matrix spike duplicate (MSD).
J	Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
COC	Chain of Custody
dry	Sample results reported on a dry weight basis
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
ND	Analyte NOT DETECTED above the MDL value
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference
VOC	Volatile Organic Compound

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Case Narrative

In the analysis of 8270D SIM PAH WATER, Acenaphthylene failed the method requirements of 80%-120% for all the Continuing Calibration Verification (CCV) standards that were analyzed. The recovery of Acenaphthylene ranged from 127%-141%. There may be a high bias in the reported results.

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Duluth, MN 55802	PO Number:	Account ID: B01058

Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-PW-01	1306351-01	Water	11/06/13 13:30	11/08/13 10:25
SB-PW-02	1306351-02	Water	11/06/13 13:30	11/08/13 10:25
SB-PW-03	1306351-03	Water	11/06/13 14:34	11/08/13 10:25
SB-PW-04	1306351-04	Water	11/06/13 13:00	11/08/13 10:25
SB-PW-05	1306351-05	Water	11/06/13 14:52	11/08/13 10:25
SB-PW-06	1306351-06	Water	11/06/13 13:58	11/08/13 10:25
SB-PW-02-DUP	1306351-07	Water	11/06/13 13:37	11/08/13 10:25
SB-PW-06-MS/MSD	1306351-08	Water	11/06/13 14:06	11/08/13 10:25
SW-PW-01	1306351-09	Water	11/06/13 15:29	11/08/13 10:25
S7-PW-05	1306351-10	Water	11/07/13 10:40	11/08/13 10:25
S7-PW-06	1306351-11	Water	11/07/13 10:00	11/08/13 10:25
NW-PW-01	1306351-12	Water	11/07/13 11:05	11/08/13 10:25
S7-PW-06-DUP	1306351-13	Water	11/07/13 10:00	11/08/13 10:25

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Duluth, MN 55802	PO Number:	Account ID: B01058

Conditions Upon Receipt

Cooler: 1

Temperature:	1.0 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

Cooler: 2

Temperature:	0.6 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

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Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-01

1306351-01 (Water)

11/6/13 13:30

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	11 J	52	5.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthene	ND	21	5.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	21	4.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	sd
Anthracene	ND	21	5.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	3.9 J	21	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	3.0 J	21	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	21	1.8	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	21	2.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	21	3.4	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	3.6 J	21	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	4.9 J	21	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	21	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	ND	21	6.4	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	21	2.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**290**	52	4.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Phenanthrene	ND	21	6.8	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Pyrene	ND	21	4.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*89.9 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*89.4 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*108 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-02

1306351-02 (Water)

11/6/13 13:30

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**32000**	1200	120	ng/L	25	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Acenaphthene	**8200**	100	25	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Acenaphthylene	**14000**	500	110	ng/L	25	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	sd, vfa
Anthracene	**310**	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	**5600**	100	31	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**750000**	25000	2300	ng/L	500	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Phenanthrene	**2400**	100	33	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*82.5 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*96.2 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*103 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-03

1306351-03 (Water)

11/6/13 14:34

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	8.5 J	50	4.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthene	**150**	20	5.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**160**	50	4.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*98.2 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*94.3 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*110 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-04

1306351-04 (Water)

11/6/13 13:00

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	21 J	50	4.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthene	ND	20	5.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	4.2 J	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	2.8 J	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	7.6 J	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	8.0 J	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	6.4 J	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	5.1 J	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	9.2 J	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**380**	50	4.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Phenanthrene	8.6 J	20	6.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*89.7 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*93.4 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*106 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-05

1306351-05 (Water)

11/6/13 14:52

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	43 J	50	4.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthene	**190**	20	5.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	2.8 J	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	2.5 J	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	2.1 J	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**14000**	500	45	ng/L	10	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Phenanthrene	ND	20	6.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*97.3 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*96.7 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*108 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-06

1306351-06 (Water)

11/6/13 13:58

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**70**	50	4.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthene	**51**	20	5.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	17 J	20	6.2	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**2900**	250	23	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Phenanthrene	ND	20	6.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*56.6 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*57.2 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*103 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-02-DUP

1306351-07 (Water)

11/6/13 13:37

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**35000**	1200	120	ng/L	25	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Acenaphthene	**8200**	100	25	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Acenaphthylene	**14000**	500	110	ng/L	25	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	sd, vfa
Anthracene	**330**	20	5.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Fluorene	**5900**	100	31	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Naphthalene	**710000**	25000	2300	ng/L	500	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Phenanthrene	**2600**	100	33	ng/L	5	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	vfa
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/12/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*78.0 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*91.3 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*105 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/12/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SB-PW-06-MS/MSD

1306351-08 (Water)

11/6/13 14:06

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**130**	50	4.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthene	**83**	20	5.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	qn, sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	qn
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	qn
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	**30**	20	6.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**5000**	250	23	ng/L	5	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	qn, vfa
Phenanthrene	9.2 J	20	6.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*95.9 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*94.7 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*111 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

SW-PW-01

1306351-09 (Water)

11/6/13 15:29

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	8.8 J	50	4.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthene	ND	20	5.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	sd
Anthracene	ND	20	5.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**76**	50	4.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*97.9 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*97.7 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*106 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

S7-PW-05

1306351-10 (Water)

11/7/13 10:40

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sur

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	26 J	53	5.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthene	ND	21	5.3	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	21	4.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	sd
Anthracene	9.2 J	21	6.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	21	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	21	1.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	21	1.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	21	2.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	21	3.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Chrysene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluoranthene	ND	21	4.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	ND	21	6.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	21	2.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**1300**	53	4.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Phenanthrene	ND	21	7.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	21	4.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*144 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*
Surrogate: Nitrobenzene-d5	*143 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*
Surrogate: Terphenyl-d14	*150 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

S7-PW-06

1306351-11 (Water)

11/7/13 10:00

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**22000**	1400	140	ng/L	25	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Acenaphthene	**12000**	560	140	ng/L	25	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Acenaphthylene	**33000**	560	130	ng/L	25	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	sd, vfa
Anthracene	**91**	22	6.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	8.0 J	22	1.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	2.6 J	22	1.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	22	1.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	22	2.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	22	3.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Chrysene	4.3 J	22	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	22	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluoranthene	ND	22	4.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	**3000**	110	35	ng/L	5	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Indeno(1,2,3-cd)pyrene	ND	22	2.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**1200000**	56000	5100	ng/L	1000	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Phenanthrene	**1800**	22	7.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	22	4.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*128 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*
Surrogate: Nitrobenzene-d5	*140 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*
Surrogate: Terphenyl-d14	*163 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	*vm*

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

NW-PW-01

1306351-12 (Water)

11/7/13 11:05

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	23 J	52	5.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthene	13 J	21	5.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	21	4.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	sd
Anthracene	ND	21	5.9	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	21	1.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	21	1.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	21	2.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	21	3.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Chrysene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluoranthene	ND	21	4.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	ND	21	6.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	21	2.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**1200**	52	4.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Phenanthrene	ND	21	6.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	21	4.3	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*87.7 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*88.9 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*92.0 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	

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332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

S7-PW-06-DUP

1306351-13 (Water)

11/7/13 10:00

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**25000**	1300	130	ng/L	25	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Acenaphthene	**10000**	110	26	ng/L	5	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Acenaphthylene	**34000**	530	120	ng/L	25	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	sd, vfa
Anthracene	**200**	21	6.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	21	1.7	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	21	1.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	21	1.8	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	21	2.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	21	3.5	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Chrysene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	21	1.6	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluoranthene	ND	21	4.2	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Fluorene	**3200**	110	33	ng/L	5	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Indeno(1,2,3-cd)pyrene	ND	21	2.1	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Naphthalene	**1200000**	53000	4800	ng/L	1000	B3K0201	11/12/13	11/14/13	LET	EPA 8270D SIM	vfa
Phenanthrene	**1300**	21	7.0	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Pyrene	ND	21	4.4	ng/L	1	B3K0201	11/12/13	11/13/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*79.6 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*86.1 %*	*Limits: 30-120%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*105 %*	*Limits: 40-140%*				*B3K0201*	*11/12/13*	*11/13/13*	*LET*	*EPA 8270D SIM*	

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Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0201 - EPA 3510C

Method Blank (B3K0201-BLK1) Prepared & Analyzed: 11/12/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	50	4.9	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthene	ND	20	5.0	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthylene	ND	20	4.6	ng/L	NA	NA	NA	NA	NA	NA	
Anthracene	ND	20	5.7	ng/L	NA	NA	NA	NA	NA	NA	
Benz(a)anthracene	ND	20	1.6	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	ND	20	1.0	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	NA	NA	NA	NA	NA	NA	
Chrysene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Fluoranthene	ND	20	4.0	ng/L	NA	NA	NA	NA	NA	NA	
Fluorene	ND	20	6.2	ng/L	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Naphthalene	15.5 J	50	4.5	ng/L	NA	NA	NA	NA	NA	NA	
Phenanthrene	ND	20	6.6	ng/L	NA	NA	NA	NA	NA	NA	
Pyrene	ND	20	4.1	ng/L	NA	NA	NA	NA	NA	NA	
Surrogate: 2-Fluorobiphenyl	*505*			ng/L	*625*	*NA*	*80.7*	*30-120*			
Surrogate: Nitrobenzene-d5	*512*			ng/L	*625*	*NA*	*82.0*	*30-120*			
Surrogate: Terphenyl-d14	*671*			ng/L	*625*	*NA*	*107*	*40-140*			

Laboratory Control Sample (B3K0201-BS1) Prepared: 11/12/13 Analyzed: 11/13/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	323	50	4.9	ng/L	500	NA	64.6	40-100	NA	NA	
Acenaphthene	406	20	5.0	ng/L	500	NA	81.2	40-110	NA	NA	
Acenaphthylene	498	20	4.6	ng/L	500	NA	99.6	40-110	NA	NA	
Anthracene	469	20	5.7	ng/L	500	NA	93.8	50-110	NA	NA	
Benz(a)anthracene	534	20	1.6	ng/L	500	NA	107	80-120	NA	NA	
Benzo(a)pyrene	523	20	1.0	ng/L	500	NA	105	65-130	NA	NA	
Benzo(b&j)fluoranthenes	1040	20	1.7	ng/L	1000	NA	104	80-130	NA	NA	
Benzo(g,h,i)perylene	538	20	1.9	ng/L	500	NA	108	75-130	NA	NA	
Benzo(k)fluoranthene	580	20	3.3	ng/L	500	NA	116	85-130	NA	NA	
Chrysene	559	20	1.5	ng/L	500	NA	112	80-120	NA	NA	
Dibenz(a,h)anthracene	515	20	1.5	ng/L	500	NA	103	70-130	NA	NA	
Fluoranthene	524	20	4.0	ng/L	500	NA	105	75-110	NA	NA	
Fluorene	414	20	6.2	ng/L	500	NA	82.7	50-110	NA	NA	
Indeno(1,2,3-cd)pyrene	553	20	1.9	ng/L	500	NA	111	70-140	NA	NA	
Naphthalene	372	50	4.5	ng/L	500	NA	74.3	40-100	NA	NA	
Phenanthrene	486	20	6.6	ng/L	500	NA	97.2	60-105	NA	NA	
Pyrene	539	20	4.1	ng/L	500	NA	108	80-120	NA	NA	
Surrogate: 2-Fluorobiphenyl	*422*			ng/L	*625*	*NA*	*67.5*	*30-120*			
Surrogate: Nitrobenzene-d5	*432*			ng/L	*625*	*NA*	*69.1*	*30-120*			

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0201 - EPA 3510C

Laboratory Control Sample (B3K0201-BS1) Prepared: 11/12/13 Analyzed: 11/13/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*590*			ng/L	*625*	*NA*	*94.4*	*40-140*			

Laboratory Control Sample Duplicate (B3K0201-BSD1) Prepared: 11/12/13 Analyzed: 11/13/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	320	50	4.9	ng/L	500	NA	64.0	40-100	0.849	20	
Acenaphthene	412	20	5.0	ng/L	500	NA	82.4	40-110	1.53	20	
Acenaphthylene	525	20	4.6	ng/L	500	NA	105	40-110	5.33	20	
Anthracene	482	20	5.7	ng/L	500	NA	96.3	50-110	2.67	20	
Benz(a)anthracene	531	20	1.6	ng/L	500	NA	106	80-120	0.575	20	
Benzo(a)pyrene	525	20	1.0	ng/L	500	NA	105	65-130	0.395	20	
Benzo(b&j)fluoranthenes	1020	20	1.7	ng/L	1000	NA	102	80-130	1.27	20	
Benzo(g,h,i)perylene	538	20	1.9	ng/L	500	NA	108	75-130	0.0149	20	
Benzo(k)fluoranthene	594	20	3.3	ng/L	500	NA	119	85-130	2.49	20	
Chrysene	559	20	1.5	ng/L	500	NA	112	80-120	0.00537	20	
Dibenz(a,h)anthracene	562	20	1.5	ng/L	500	NA	112	70-130	8.79	20	
Fluoranthene	542	20	4.0	ng/L	500	NA	108	75-110	3.34	20	
Fluorene	431	20	6.2	ng/L	500	NA	86.3	50-110	4.24	20	
Indeno(1,2,3-cd)pyrene	548	20	1.9	ng/L	500	NA	110	70-140	0.814	20	
Naphthalene	372	50	4.5	ng/L	500	NA	74.3	40-100	0.00807	20	
Phenanthrene	488	20	6.6	ng/L	500	NA	97.5	60-105	0.333	20	
Pyrene	550	20	4.1	ng/L	500	NA	110	80-120	2.02	20	
Surrogate: 2-Fluorobiphenyl	*426*			ng/L	*625*	*NA*	*68.2*	*30-120*			
Surrogate: Nitrobenzene-d5	*429*			ng/L	*625*	*NA*	*68.7*	*30-120*			
Surrogate: Terphenyl-d14	*601*			ng/L	*625*	*NA*	*96.2*	*40-140*			

Matrix Spike (B3K0201-MS1) **Source: 1306351-08** Prepared & Analyzed: 11/12/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	547	51	5.0	ng/L	513	132	81.0	30-130	NA	NA	
Acenaphthene	587	21	5.1	ng/L	513	82.5	98.4	30-130	NA	NA	
Acenaphthylene	711	21	4.7	ng/L	513	ND	139	30-130	NA	NA	qn
Anthracene	569	21	5.9	ng/L	513	ND	111	30-130	NA	NA	
Benz(a)anthracene	643	21	1.6	ng/L	513	ND	125	30-130	NA	NA	
Benzo(a)pyrene	638	21	1.0	ng/L	513	ND	124	30-130	NA	NA	
Benzo(b&j)fluoranthenes	1210	21	1.7	ng/L	1030	ND	118	30-130	NA	NA	
Benzo(g,h,i)perylene	653	21	2.0	ng/L	513	ND	127	30-130	NA	NA	
Benzo(k)fluoranthene	739	21	3.4	ng/L	513	ND	144	30-130	NA	NA	qn
Chrysene	660	21	1.5	ng/L	513	ND	129	30-130	NA	NA	
Dibenz(a,h)anthracene	707	21	1.6	ng/L	513	ND	138	30-130	NA	NA	qn
Fluoranthene	632	21	4.1	ng/L	513	ND	123	30-130	NA	NA	
Fluorene	588	21	6.3	ng/L	513	30.1	109	30-130	NA	NA	
Indeno(1,2,3-cd)pyrene	667	21	2.0	ng/L	513	ND	130	30-130	NA	NA	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0201 - EPA 3510C

Matrix Spike (B3K0201-MS1) **Source: 1306351-08** Prepared & Analyzed: 11/12/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Naphthalene	5120	51	4.7	ng/L	513	5000	22.2	30-130	NA	NA	E, qn
Phenanthrene	570	21	6.7	ng/L	513	9.15	109	30-130	NA	NA	
Pyrene	633	21	4.2	ng/L	513	ND	123	30-130	NA	NA	
Surrogate: 2-Fluorobiphenyl	*557*			ng/L	*641*	*NA*	*86.8*	*30-120*			
Surrogate: Nitrobenzene-d5	*559*			ng/L	*641*	*NA*	*87.2*	*30-120*			
Surrogate: Terphenyl-d14	*690*			ng/L	*641*	*NA*	*108*	*40-140*			

Matrix Spike Duplicate (B3K0201-MSD1) **Source: 1306351-08** Prepared & Analyzed: 11/12/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	517	52	5.1	ng/L	521	132	73.9	30-130	5.74	25	
Acenaphthene	549	21	5.2	ng/L	521	82.5	89.6	30-130	6.71	25	
Acenaphthylene	670	21	4.8	ng/L	521	ND	129	30-130	5.94	25	
Anthracene	549	21	6.0	ng/L	521	ND	105	30-130	3.42	25	
Benz(a)anthracene	643	21	1.6	ng/L	521	ND	123	30-130	0.00663	25	
Benzo(a)pyrene	642	21	1.0	ng/L	521	ND	123	30-130	0.550	25	
Benzo(b&j)fluoranthenes	1220	21	1.8	ng/L	1040	ND	117	30-130	1.45	25	
Benzo(g,h,i)perylene	654	21	2.0	ng/L	521	ND	126	30-130	0.204	25	
Benzo(k)fluoranthene	731	21	3.4	ng/L	521	ND	140	30-130	1.03	25	qn
Chrysene	660	21	1.6	ng/L	521	ND	127	30-130	0.0209	25	
Dibenz(a,h)anthracene	684	21	1.6	ng/L	521	ND	131	30-130	3.35	25	qn
Fluoranthene	624	21	4.1	ng/L	521	ND	120	30-130	1.15	25	
Fluorene	550	21	6.4	ng/L	521	30.1	99.8	30-130	6.76	25	
Indeno(1,2,3-cd)pyrene	676	21	2.0	ng/L	521	ND	130	30-130	1.30	25	
Naphthalene	4830	52	4.7	ng/L	521	5000	NR	30-130	5.80	25	E, qn
Phenanthrene	560	21	6.8	ng/L	521	9.15	106	30-130	1.67	25	
Pyrene	621	21	4.3	ng/L	521	ND	119	30-130	1.83	25	
Surrogate: 2-Fluorobiphenyl	*519*			ng/L	*651*	*NA*	*79.7*	*30-120*			
Surrogate: Nitrobenzene-d5	*525*			ng/L	*651*	*NA*	*80.6*	*30-120*			
Surrogate: Terphenyl-d14	*686*			ng/L	*651*	*NA*	*105*	*40-140*			

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

1306351

Chain of Custody

BARR 4700 West 77th Street, Minneapolis, MN 55435-4803, (952) 832-2600

COC 1 of 2

Project Number: 23690B77.00 2013 010
Project Name: SLRIDT
Project Manager: GMP
Project QC Contact:
Sampled by: GM
Laboratory: Braun
Sample Origination State MN (use two letter postal state abbreviation)
COC Number: № 37221

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO_3); Total Metals (HNO_3); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H_2SO_4) #4 SLRIDT 17 PAHs. Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.). Total Number Of Containers.

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4 SLRIDT 17 PAHs	Soil: VOCs (tared MeOH) #1	Soil: GRO, BTEX (tared MeOH) #1	Soil: DRO (tared unpreserved)	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Total Number Of Containers
1. SB-PW-01				11/06/2013	13:30	X		X									X						2
2. SB-PW-02					13:30																		
3. SB-PW-03					14:34																		
4. SB-PW-04					13:00																		
5. SB-PW-05					14:52																		
6. SB-PW-06					13:58																		
7. SB-PW-02-DUP					13:37					X													
8. SB-PW-06-MS/MSD					14:06					X													4
9. SW-PW-01					15:29			X															2
10.																							

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	11/7/13	13:00	[signature]	11/8/13	1025
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

1.0°C ICE TB

H:RLGISTDFORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/09

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306351
332 W Superior St Suite 600	Client Contact: Mr. Guy Partch	Project Mgr: Steven J. Albrecht
Duluth, MN 55802	PO Number:	Account ID: B01058

1306351

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23690B77.00 2013 010
Project Name: SLRIDT
Sample Origination State MN (use two letter postal state abbreviation)
COC Number: № 37220

COC 1 of 2
Project Manager: GMP
Project QC Contact:
Sampled by: JGM
Laboratory: Braun

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative: Water: VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers
1. S7-PW-05				11/07/2013	10:40	X		X									X (SLRIDT 17 PAHs)							2
2. S7-PW-06					10:00																			
3. NW-PW-01					11:05																			
4. S7-PW-06-DUP					10:00					X														
5.																								
6.																								
7.																								
8.																								
9.																								
10.																								

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

	On Ice?	Date	Time		Date	Time
Relinquished By: Dim Mosby	(Y) N	11/7/13	13:00	Received by:	11/8/13	1023
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

0.6°C TB ICE

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

Braun Intertec Corporation
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Fax: 952.995.2020
Web: braunintertec.com

Ms. Andrea Nord
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

November 25, 2013

Report #: 1306397

RE: SLRIDT 23690B77.00 2013 010

Dear Andrea Nord:

Braun Intertec Corporation received samples for the project identified above on November 12, 2013. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Braun Intertec Corporation for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

Steven J. Albrecht
Project Manager

Certification/Accreditation Number

Minnesota Department of Health #027-053-117

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306397
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Qualifiers and Abbreviations

vg	The method reporting limits (MRLs) were raised due to reduced sample volume as a result of high sample sediment content.
vfa	The method reporting limit (MRL) was raised for one or more analytes; a dilution of the sample was necessary due to high analyte levels and/or matrix interferences.
sd	See case narrative section for further information.
J	Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
A1	Acenaphthylene recovery for the continuing calibration sample is 129%. Method requirements are 80% to 120%. There may be a high bias in the reported results.
COC	Chain of Custody
dry	Sample results reported on a dry weight basis
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
ND	Analyte NOT DETECTED above the MDL value
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference
VOC	Volatile Organic Compound

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Case Narrative

In the analysis of 8270D SIM PAH WATER, the Matrix Spike (MS)/Matrix Spike Duplicate (MSD) results from preparation batch B3K0257 are not reported because insufficient sample was provided to prepare these quality control samples.

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S6-PW-06	1306397-01	Water	11/08/13 09:45	11/12/13 10:12
S6-PW-02	1306397-02	Water	11/08/13 10:00	11/12/13 10:12
S6-PW-05	1306397-03	Water	11/08/13 10:20	11/12/13 10:12
S6-PW-04	1306397-04	Water	11/08/13 10:35	11/12/13 10:12
S6-PW-01	1306397-05	Water	11/08/13 10:45	11/12/13 10:12
S7-PW-03	1306397-06	Water	11/08/13 11:20	11/12/13 10:12
S7-PW-02	1306397-07	Water	11/08/13 11:45	11/12/13 10:12
S7-PW-01	1306397-08	Water	11/08/13 12:10	11/12/13 10:12

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Conditions Upon Receipt

Cooler: Cooler #1

Temperature:	2.0 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

Cooler: Cooler #2

Temperature:	2.3 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-06

1306397-01 (Water)

11/8/13 9:45

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	7.5 J	50	4.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	ND	20	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	20	5.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	4.7 J	20	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	11 J	50	4.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	4.2 J	20	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*102 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*105 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*110 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306397
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-02

1306397-02 (Water)

11/8/13 10:00

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	5.3 J	50	4.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	7.9 J	20	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	20	5.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	10 J	50	4.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*97.9 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*102 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*109 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-05

1306397-03 (Water)

11/8/13 10:20

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	5.8 J	50	4.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	**85**	20	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	**28**	20	4.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	20	5.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	6.4 J	20	6.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	20 J	50	4.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*90.1 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*98.3 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*107 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-04

1306397-04 (Water)

11/8/13 10:35

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	ND	50	4.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	ND	20	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	20	5.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	40 J	50	4.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*100 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*106 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*109 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-01

1306397-05 (Water)

11/8/13 10:45

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	**1200**	50	4.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	**310**	20	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	**1100**	20	4.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	14 J	20	5.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	**310**	20	6.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	**69000**	2500	230	ng/L	50	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	vfa
Phenanthrene	**97**	20	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*88.6 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*91.0 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*109 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306397
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S7-PW-03

1306397-06 (Water)

11/8/13 11:20

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	ND	61	6.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	**39**	24	6.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	24	5.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	24	7.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	24	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	24	1.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	24	2.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	24	2.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	24	4.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	24	1.8	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	24	1.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	ND	24	4.8	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	19 J	24	7.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	24	2.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	40 J	61	5.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	24	8.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	ND	24	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*98.7 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*108 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*103 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S7-PW-02

1306397-07 (Water)

11/8/13 11:45

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd, vg

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	13 J	66	6.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	**1200**	26	6.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	26	6.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	22 J	26	7.5	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	26	2.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	26	1.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	26	2.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	26	2.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	26	4.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	ND	26	2.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	26	2.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	10 J	26	5.2	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	**270**	26	8.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	26	2.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	**71**	66	6.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	**72**	26	8.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	9.1 J	26	5.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*93.5 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*108 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*101 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S7-PW-01

1306397-08 (Water)

11/8/13 12:10

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	5.1 J	52	5.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthene	ND	21	5.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Acenaphthylene	ND	21	4.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	A1
Anthracene	ND	21	5.9	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benz(a)anthracene	ND	21	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(a)pyrene	ND	21	1.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	21	1.8	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	21	2.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	21	3.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Chrysene	2.5 J	21	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	21	1.6	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluoranthene	6.1 J	21	4.1	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Fluorene	ND	21	6.4	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	21	2.0	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Naphthalene	**100**	52	4.7	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Phenanthrene	ND	21	6.8	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Pyrene	5.5 J	21	4.3	ng/L	1	B3K0257	11/14/13	11/15/13	LET	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*86.5 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*92.2 %*	*Limits: 30-120%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*103 %*	*Limits: 40-140%*				*B3K0257*	*11/14/13*	*11/15/13*	*LET*	*EPA 8270D SIM*	

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306397
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0257 - EPA 3510C

Method Blank (B3K0257-BLK1) Prepared: 11/14/13 Analyzed: 11/15/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	50	4.9	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthene	ND	20	5.0	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthylene	ND	20	4.6	ng/L	NA	NA	NA	NA	NA	NA	
Anthracene	ND	20	5.7	ng/L	NA	NA	NA	NA	NA	NA	
Benz(a)anthracene	ND	20	1.6	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	ND	20	1.0	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	NA	NA	NA	NA	NA	NA	
Chrysene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Fluoranthene	ND	20	4.0	ng/L	NA	NA	NA	NA	NA	NA	
Fluorene	ND	20	6.2	ng/L	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Naphthalene	16.3 J	50	4.5	ng/L	NA	NA	NA	NA	NA	NA	
Phenanthrene	ND	20	6.6	ng/L	NA	NA	NA	NA	NA	NA	
Pyrene	ND	20	4.1	ng/L	NA	NA	NA	NA	NA	NA	
Surrogate: 2-Fluorobiphenyl	*375*			ng/L	*625*	*NA*	*60.0*	*30-120*			
Surrogate: Nitrobenzene-d5	*390*			ng/L	*625*	*NA*	*62.4*	*30-120*			
Surrogate: Terphenyl-d14	*639*			ng/L	*625*	*NA*	*102*	*40-140*			

Laboratory Control Sample (B3K0257-BS1) Prepared: 11/14/13 Analyzed: 11/15/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	287	50	4.9	ng/L	500	NA	57.4	40-100	NA	NA	
Acenaphthene	350	20	5.0	ng/L	500	NA	70.0	40-110	NA	NA	
Acenaphthylene	426	20	4.6	ng/L	500	NA	85.2	40-110	NA	NA	
Anthracene	421	20	5.7	ng/L	500	NA	84.1	50-110	NA	NA	
Benz(a)anthracene	526	20	1.6	ng/L	500	NA	105	80-120	NA	NA	
Benzo(a)pyrene	531	20	1.0	ng/L	500	NA	106	65-130	NA	NA	
Benzo(b&j)fluoranthenes	986	20	1.7	ng/L	1000	NA	98.6	80-130	NA	NA	
Benzo(g,h,i)perylene	542	20	1.9	ng/L	500	NA	108	75-130	NA	NA	
Benzo(k)fluoranthene	606	20	3.3	ng/L	500	NA	121	85-130	NA	NA	
Chrysene	549	20	1.5	ng/L	500	NA	110	80-120	NA	NA	
Dibenz(a,h)anthracene	557	20	1.5	ng/L	500	NA	111	70-130	NA	NA	
Fluoranthene	517	20	4.0	ng/L	500	NA	103	75-110	NA	NA	
Fluorene	358	20	6.2	ng/L	500	NA	71.5	50-110	NA	NA	
Indeno(1,2,3-cd)pyrene	553	20	1.9	ng/L	500	NA	111	70-140	NA	NA	
Naphthalene	331	50	4.5	ng/L	500	NA	66.2	40-100	NA	NA	
Phenanthrene	425	20	6.6	ng/L	500	NA	85.1	60-105	NA	NA	
Pyrene	530	20	4.1	ng/L	500	NA	106	80-120	NA	NA	
Surrogate: 2-Fluorobiphenyl	*372*			ng/L	*625*	*NA*	*59.6*	*30-120*			
Surrogate: Nitrobenzene-d5	*385*			ng/L	*625*	*NA*	*61.6*	*30-120*			

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4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0257 - EPA 3510C

Laboratory Control Sample (B3K0257-BS1) Prepared: 11/14/13 Analyzed: 11/15/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*600*			ng/L	*625*	*NA*	*96.0*	*40-140*			

Laboratory Control Sample Duplicate (B3K0257-BSD1) Prepared: 11/14/13 Analyzed: 11/15/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	285	50	4.9	ng/L	500	NA	57.1	40-100	0.618	20	
Acenaphthene	363	20	5.0	ng/L	500	NA	72.6	40-110	3.56	20	
Acenaphthylene	433	20	4.6	ng/L	500	NA	86.7	40-110	1.75	20	
Anthracene	407	20	5.7	ng/L	500	NA	81.5	50-110	3.22	20	
Benz(a)anthracene	512	20	1.6	ng/L	500	NA	102	80-120	2.66	20	
Benzo(a)pyrene	515	20	1.0	ng/L	500	NA	103	65-130	2.98	20	
Benzo(b&j)fluoranthenes	966	20	1.7	ng/L	1000	NA	96.6	80-130	1.99	20	
Benzo(g,h,i)perylene	519	20	1.9	ng/L	500	NA	104	75-130	4.28	20	
Benzo(k)fluoranthene	582	20	3.3	ng/L	500	NA	116	85-130	3.99	20	
Chrysene	533	20	1.5	ng/L	500	NA	107	80-120	2.99	20	
Dibenz(a,h)anthracene	532	20	1.5	ng/L	500	NA	106	70-130	4.48	20	
Fluoranthene	503	20	4.0	ng/L	500	NA	101	75-110	2.85	20	
Fluorene	369	20	6.2	ng/L	500	NA	73.7	50-110	3.03	20	
Indeno(1,2,3-cd)pyrene	523	20	1.9	ng/L	500	NA	105	70-140	5.48	20	
Naphthalene	324	50	4.5	ng/L	500	NA	64.8	40-100	2.14	20	
Phenanthrene	413	20	6.6	ng/L	500	NA	82.7	60-105	2.84	20	
Pyrene	519	20	4.1	ng/L	500	NA	104	80-120	2.22	20	
Surrogate: 2-Fluorobiphenyl	*376*			ng/L	*625*	*NA*	*60.1*	*30-120*			
Surrogate: Nitrobenzene-d5	*381*			ng/L	*625*	*NA*	*61.0*	*30-120*			
Surrogate: Terphenyl-d14	*580*			ng/L	*625*	*NA*	*92.9*	*40-140*			

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1306397

Chain of Custody

BARR 4700 West 77th Street, Minneapolis, MN 55435-4803, (952) 832-2600

Project Number: 23690B77.00 2013010
Project Name: SLRIDT
Sample Origination State MN (use two letter postal state abbreviation)
COC Number: № 37218

COC 1 of 1
Project Manager: GMP
Project QC Contact:
Sampled by: KM
Laboratory: Braun

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO_3); Total Metals (HNO_3); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H_2SO_4) #4 = SLRIDT 17 PAHs. Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.). Total Number Of Containers

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: Nutrients #4 = SLRIDT 17 PAHs	Total Number Of Containers
1. S6-PW-06				11/08/2013	0945	X		X			X	2
2. S6-PW-02					1000							
3. S6-PW-05					1020							
4. S6-PW-04					1035							
5. S6-PW-01					1045							
6. S7-PW-03					1120							
7. S7-PW-02					1145							
8. S7-PW-01					1210							
9.												
10.												

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

	On Ice?	Date	Time		Date	Time
Relinquished By:	(Y) N	11/11/13	1515	Received by:	11/12/13	1012
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Cooler #1: 2.0°C #2: 2.3°C + ICE + TB

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

BRAUN INTERTEC

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Ms. Andrea Nord
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

December 03, 2013

Report #: 1306477
(Revised)

RE: SLRIDT 23690B77.00 2013 010

Dear Andrea Nord:

Braun Intertec Corporation received samples for the project identified above on November 15, 2013. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Braun Intertec Corporation for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

Steven J. Albrecht
Project Manager

Certification/Accreditation Number

Minnesota Department of Health #027-053-117

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306477
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Qualifiers and Abbreviations

sd	See case narrative section for further information.
J	Detected but below the Method Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
A1	Acenaphthylene recovery for the continuing calibration sample is 127%. Method requirements are 80% to 120%. There may be a high bias in the reported results.
COC	Chain of Custody
dry	Sample results reported on a dry weight basis
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
ND	Analyte NOT DETECTED above the MDL value
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference
VOC	Volatile Organic Compound

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Case Narrative

In the analysis of 8270D SIM PAH Water, the Matrix Spike (MS)/Matrix Spike Duplicate (MSD) results from preparation batch B3K0311 are not reported because insufficient sample was provided to prepare these quality control samples.

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Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S6-PW-03 (2 ft)	1306477-01	Water	11/14/13 12:30	11/15/13 10:04
S7-PW-04 (1.5 ft)	1306477-02	Water	11/14/13 13:00	11/15/13 10:04

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Conditions Upon Receipt

Cooler: Cooler 1

Temperature:	0.6 °C	**COC Included:**	Yes	**Custody Seals Used:**	No
Temperature Blank:	Yes	**COC Complete:**	Yes	**Custody Seals Intact:**	NA
Received on Ice:	Yes	**COC & Labels Agree:**	Yes	**Hand Delivered by Client:**	No
Preservation Confirmed:	No	**Sufficient Sample Provided:**	Yes	**Headspace Present (VOC):**	No

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Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

S6-PW-03 (2 ft)

1306477-01 (Water)

11/14/13 12:30

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	16 J	50	4.9	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	20	5.0	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	20	4.6	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	A1
Anthracene	ND	20	5.7	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	20	1.6	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	20	1.0	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Chrysene	ND	20	1.5	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	20	4.0	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Fluorene	ND	20	6.2	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Naphthalene	21 J	50	4.5	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Phenanthrene	ND	20	6.6	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Pyrene	ND	20	4.1	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*102 %*	*Limits: 30-120%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*106 %*	*Limits: 30-120%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*104 %*	*Limits: 40-140%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	

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S7-PW-04 (1.5 ft)

1306477-02 (Water)

11/14/13 13:00

Polyaromatic Hydrocarbons by Selected Ion Monitoring

Sample Note(s): sd

Analyte	Result	MRL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Analyst	Method	Notes
2-Methylnaphthalene	20 J	56	5.5	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Acenaphthene	ND	22	5.6	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Acenaphthylene	ND	22	5.2	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	A1
Anthracene	7.8 J	22	6.4	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benz(a)anthracene	ND	22	1.8	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(a)pyrene	ND	22	1.1	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(b&j)fluoranthenes	ND	22	1.9	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(g,h,i)perylene	ND	22	2.2	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Benzo(k)fluoranthene	ND	22	3.7	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Chrysene	ND	22	1.7	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Dibenz(a,h)anthracene	ND	22	1.7	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Fluoranthene	ND	22	4.4	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Fluorene	**24**	22	6.9	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Indeno(1,2,3-cd)pyrene	ND	22	2.2	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Naphthalene	38 J	56	5.1	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Phenanthrene	13 J	22	7.4	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Pyrene	ND	22	4.6	ng/L	1	B3K0311	11/16/13	11/18/13	SGM	EPA 8270D SIM	
Surrogate: 2-Fluorobiphenyl	*101 %*	*Limits: 30-120%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Nitrobenzene-d5	*104 %*	*Limits: 30-120%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	
Surrogate: Terphenyl-d14	*95.7 %*	*Limits: 40-140%*				*B3K0311*	*11/16/13*	*11/18/13*	*SGM*	*EPA 8270D SIM*	

BRAUN INTERTEC

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Barr Engineering Company	Client Ref: SLRIDT 23690B77.00 2013 010	Report #: 1306477
4700 West 77th Street	Client Contact: Ms. Andrea Nord	Project Mgr: Steven J. Albrecht
Minneapolis, MN 55435-4803	PO Number:	Account ID: B01058

Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0311 - EPA 3510C

Method Blank (B3K0311-BLK1) Prepared: 11/16/13 Analyzed: 11/18/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	ND	50	4.9	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthene	ND	20	5.0	ng/L	NA	NA	NA	NA	NA	NA	
Acenaphthylene	ND	20	4.6	ng/L	NA	NA	NA	NA	NA	NA	
Anthracene	ND	20	5.7	ng/L	NA	NA	NA	NA	NA	NA	
Benz(a)anthracene	ND	20	1.6	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	ND	20	1.0	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(b&j)fluoranthenes	ND	20	1.7	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	ND	20	3.3	ng/L	NA	NA	NA	NA	NA	NA	
Chrysene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	ND	20	1.5	ng/L	NA	NA	NA	NA	NA	NA	
Fluoranthene	ND	20	4.0	ng/L	NA	NA	NA	NA	NA	NA	
Fluorene	ND	20	6.2	ng/L	NA	NA	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	ND	20	1.9	ng/L	NA	NA	NA	NA	NA	NA	
Naphthalene	14.6 J	50	4.5	ng/L	NA	NA	NA	NA	NA	NA	
Phenanthrene	ND	20	6.6	ng/L	NA	NA	NA	NA	NA	NA	
Pyrene	ND	20	4.1	ng/L	NA	NA	NA	NA	NA	NA	
Surrogate: 2-Fluorobiphenyl	*504*			ng/L	*625*	*NA*	*80.7*	*30-120*			
Surrogate: Nitrobenzene-d5	*525*			ng/L	*625*	*NA*	*83.9*	*30-120*			
Surrogate: Terphenyl-d14	*642*			ng/L	*625*	*NA*	*103*	*40-140*			

Laboratory Control Sample (B3K0311-BS1) Prepared: 11/16/13 Analyzed: 11/18/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	367	50	4.9	ng/L	500	NA	73.3	40-100	NA	NA	
Acenaphthene	465	20	5.0	ng/L	500	NA	93.0	40-110	NA	NA	
Acenaphthylene	528	20	4.6	ng/L	500	NA	106	40-110	NA	NA	
Anthracene	464	20	5.7	ng/L	500	NA	92.8	50-110	NA	NA	
Benz(a)anthracene	489	20	1.6	ng/L	500	NA	97.7	80-120	NA	NA	
Benzo(a)pyrene	512	20	1.0	ng/L	500	NA	102	65-130	NA	NA	
Benzo(b&j)fluoranthenes	896	20	1.7	ng/L	1000	NA	89.6	80-130	NA	NA	
Benzo(g,h,i)perylene	544	20	1.9	ng/L	500	NA	109	75-130	NA	NA	
Benzo(k)fluoranthene	577	20	3.3	ng/L	500	NA	115	85-130	NA	NA	
Chrysene	548	20	1.5	ng/L	500	NA	110	80-120	NA	NA	
Dibenz(a,h)anthracene	518	20	1.5	ng/L	500	NA	104	70-130	NA	NA	
Fluoranthene	484	20	4.0	ng/L	500	NA	96.8	75-110	NA	NA	
Fluorene	439	20	6.2	ng/L	500	NA	87.8	50-110	NA	NA	
Indeno(1,2,3-cd)pyrene	540	20	1.9	ng/L	500	NA	108	70-140	NA	NA	
Naphthalene	362	50	4.5	ng/L	500	NA	72.4	40-100	NA	NA	
Phenanthrene	451	20	6.6	ng/L	500	NA	90.3	60-105	NA	NA	
Pyrene	499	20	4.1	ng/L	500	NA	99.9	80-120	NA	NA	
Surrogate: 2-Fluorobiphenyl	*499*			ng/L	*625*	*NA*	*79.9*	*30-120*			
Surrogate: Nitrobenzene-d5	*506*			ng/L	*625*	*NA*	*80.9*	*30-120*			

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Polyaromatic Hydrocarbons by Selected Ion Monitoring - Quality Control

Batch B3K0311 - EPA 3510C

Laboratory Control Sample (B3K0311-BS1) Prepared: 11/16/13 Analyzed: 11/18/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*641*			ng/L	*625*	*NA*	*103*	*40-140*			

Laboratory Control Sample Duplicate (B3K0311-BSD1) Prepared: 11/16/13 Analyzed: 11/18/13

Analyte	Result	MRL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Methylnaphthalene	358	50	4.9	ng/L	500	NA	71.5	40-100	2.50	20	
Acenaphthene	463	20	5.0	ng/L	500	NA	92.5	40-110	0.464	20	
Acenaphthylene	524	20	4.6	ng/L	500	NA	105	40-110	0.678	20	
Anthracene	449	20	5.7	ng/L	500	NA	89.8	50-110	3.34	20	
Benz(a)anthracene	485	20	1.6	ng/L	500	NA	97.0	80-120	0.746	20	
Benzo(a)pyrene	499	20	1.0	ng/L	500	NA	99.8	65-130	2.58	20	
Benzo(b&j)fluoranthenes	902	20	1.7	ng/L	1000	NA	90.2	80-130	0.593	20	
Benzo(g,h,i)perylene	543	20	1.9	ng/L	500	NA	109	75-130	0.0883	20	
Benzo(k)fluoranthene	588	20	3.3	ng/L	500	NA	118	85-130	1.91	20	
Chrysene	550	20	1.5	ng/L	500	NA	110	80-120	0.195	20	
Dibenz(a,h)anthracene	523	20	1.5	ng/L	500	NA	105	70-130	0.928	20	
Fluoranthene	480	20	4.0	ng/L	500	NA	96.0	75-110	0.791	20	
Fluorene	426	20	6.2	ng/L	500	NA	85.3	50-110	2.91	20	
Indeno(1,2,3-cd)pyrene	547	20	1.9	ng/L	500	NA	109	70-140	1.43	20	
Naphthalene	356	50	4.5	ng/L	500	NA	71.1	40-100	1.81	20	
Phenanthrene	445	20	6.6	ng/L	500	NA	89.0	60-105	1.46	20	
Pyrene	509	20	4.1	ng/L	500	NA	102	80-120	1.85	20	
Surrogate: 2-Fluorobiphenyl	*489*			ng/L	*625*	*NA*	*78.3*	*30-120*			
Surrogate: Nitrobenzene-d5	*502*			ng/L	*625*	*NA*	*80.3*	*30-120*			
Surrogate: Terphenyl-d14	*657*			ng/L	*625*	*NA*	*105*	*40-140*			

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1306477

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23690B77.00 2013 010
Project Name: SLRIOT
Sample Origination State MN (use two letter postal state abbreviation)
COC Number: № 41306

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO_3); Total Metals (HNO_3); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H_2SO_4) #4 SLRIOT 17 PAHs. Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.)

COC 1 of 1

	Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Total Number Of Containers
1.	S6-PW-03	2	2	ft	11/14/2013	1230	X		X			2
2.	~~S6-PW~~											
3.	S7-PW-04	1.5	1.5	ft	11/14/2013	1300	X		X			2
4.												
5.												
6.												
7.												
8.												
9.												
10.												

Project Manager: GMP
Project QC Contact:
Sampled by: KM
Laboratory: Braun

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
	(Y) N	11/14/13	1500		11/15/13	1004
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: _____ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

0.6°C +ICE +TB

H:\RLG\STD\FORMS\Chain Of Custody Form 2006 RLG Rev. 09/01/09

Appendix B

Photo Locations Photo Log

Photo Location Photographs – SLRIDT, 11/08/2013

Location 1, North end of Stryker Bay, 150^{0}

Location 1, North end of Stryker Bay, 225^{0}

Location 2, Central east shoreline of Stryker Bay, 150^0

Location 2, Central east shoreline of Stryker Bay, 220^0

Location 3, Point at south end of Stryker Bay, 30^0

Location 3, Point at south end of Stryker Bay, 330^0

Location 4, South end of the 59th Ave. W. Peninsula, 255^0

Location 4, South end of the 59th Ave. W. Peninsula, 330^0

Location 5, Southeast shore of the 59th Ave. W. Peninsula, 165^0

Location 5, Southeast shore of the 59th Ave. W. Peninsula, 240^0

Location 6, South end of dock wall along slip 6/CAD, 50^0

Location 6, South end of dock wall along slip 6/CAD, 120^0

Location 7, South end of dock wall along slip 6/CAD, 145^0

Location 7, South end of dock wall along slip 6/CAD, 215^0

Location 8, Central dock wall along slip 6/CAD, 50^0

Location 8, Central dock wall along slip 6/CAD, 130^0

Location 9, Central dock wall along slip 6/CAD, 145^0

Location 9, Central dock wall along slip 6/CAD, 215^0

Location 10, North end of Slip 6/CAD, 55^{0}

Location 10, North end of Slip 6/CAD, 125^{0}

Location 11, North end of Slip 6/CAD, 140^0

Location 11, North end of Slip 6/CAD, 215^0

Location 12, North end of the 54th Ave. W. Peninsula, 170^0

Location 12, North end of the 54th Ave. W. Peninsula, 170^0

Location 13, Adjacent to the North Wetlands, 50^{0}

Location 13, Adjacent to the North Wetlands, 50^{0}

Location 14, Northcentral area of the 54th Ave. W. Peninsula, 145^{0}

Location 14, Northcentral area of the 54th Ave. W. Peninsula, 215^{0}

Location 15, South central area of the 54th Ave. W. Peninsula, 190^0

Location 15, South central area of the 54th Ave. W. Peninsula, 260^0

Location 16, Top of hill at the south end of the 54th Ave. W. Peninsula, 50^0

Location 16, Top of hill at the south end of the 54th Ave. W. Peninsula, 125^0

Location 17, Southwest corner of the 54th Ave. W. Peninsula, 190^0

Location 17, Southwest corner of the 54th Ave. W. Peninsula, 260^0

Location 18, Southwest corner of the 54th Ave. W. Peninsula, 100^0

Location 18, Southwest corner of the 54th Ave. W. Peninsula, 170^0

Location 19, Western shore of Slip 7, 35^0

Location 19, Western shore of Slip 7, 320^0

Location 20, Western shore of Slip 7, north of location 19, 35^0

Location 20, Western shore of Slip 7, north of location 19, 320^0

Location 21, At culvert crossing at the north end of Slip 7, 190^{0}

Location 21, At culvert crossing at the north end of Slip 7, 190^{0}

Location 22, North end of Slip 7 at dock wall, 145^0

Location 22, North end of Slip 7 at dock wall, 215^0

Location 23, Slip 7, central, along the eastern dock wall, 145^0

Location 23, Slip 7, central, along the eastern dock wall, 215^0

Location 24, Slip 7, central, along the eastern dock wall, 235^0

Location 24, Slip 7, central, along the eastern dock wall, 330^0

Location 25, South end of the Slip 7 dock wall, 145^0

Location 25, South end of the Slip 7 dock wall, 215^0

Location 26, Southernmost end of the Slip 7 dock wall, 235^0

Location 26, Southernmost end of the Slip 7 dock wall, 330^0

Appendix C

Inspection Report Form

SLRIDT SITE INSPECTION REPORT
UPLAND CAP AREAS

Inspector(s): (1) Kinnan Stauber (KMS2) Company: Barr Engineering
(2) _____

Date of Inspection: 11/18/2013 Time of Inspection: 11 am to 3:30 pm

Weather: Calm, cloudy

Temperature: 33 °F Humidity: _____% Wind: calm

Stryker Bay East Shoreline (SB-7)

	Completed By (Initials)	Yes	No	Not Inspected
1. Above average surface water elevation?	KMS2		X	
2. Cap intact and free of erosion?	KMS2		X	
3. Cap near French drain free of erosion?	KMS2		X	
4. Cap protective of environment?	KMS2	X		
5. Cap free of surface water ponding?	KMS2	X		
6. Vegetation cover intact?	KMS2	X		
7. Cap free of animal burrows?	KMS2	X		
8. Cap free of tar deposits?	KMS2	X		

Comments: Very little vegetation between the edge of water and the upland edge of the cap. Erosion from base of the hill extending to the water's edge.

Slip 6 (CAD) East Shoreline

	Completed By (Initials)	Yes	No	Not Inspected
1. Above average surface water elevation?	KMS2		X	
2. Cap intact and free of erosion?	KMS2	X		
3. Cobble at south end protective of Cap?	KMS2	X		
4. Cap protective of environment?	KMS2	X		
5. Cap free of surface water ponding?	KMS2	X		
6. Vegetation cover intact?	KMS2	X		
7. Cap free of animal burrows?	KMS2	X		
8. Cap free of tar deposit?	KMS2	X		
9. CAD dock wall (west side) intact?	KMS2	X		

Comments: Vegetative cover is sparse, only 10-20% in some areas. 80% of inspection trasect is visibile rows of small grass.

Slip 7 Mudflats (SL7-5/10)

	Completed By (Initials)	Yes	No	Not Inspected
1. Above average surface water elevation?	KMS2		X	
2. Cap intact and free of erosion?	KMS2		X	
3. Cobble along shoreline protective of cap?	KMS2	X		
4. Cap protective of environment?	KMS2	X		
5. Cap free of surface water ponding?	KMS2		X	
6. Culvert at north end free of debris?	KMS2	X*		
7. Vegetation cover intact?	KMS2	X*		
8. Cap free of animal burrows?	KMS2	X		
9. Cap free of tar deposits?	KMS2	X		
10. Pore water monitoring equipment intact?	KMS2	X		
11. Slip 7 dock wall (east side) intact?	KMS2	X*		

Comments: Phragmites at the north end of Slip 7.
The south end has bare ground behind the rock edge. It appears to get inundated and/or wave washed.

11. Slip 7 dock wall mostly intact. There is erosion of material on the landward side, creating holes behind the dock wall.

6. Culvert opening is underwater. Flow is visible.

7. Except for roads. There is less vegetative cover close to the shoreline - within about 20 feet.

Transect 5 (east shore of CAD) - About 75% vegetative cover, 25% bare gravel
Silt fences are down, and in the water. 95% bare at the base of the
birches. (limestone)

Transect 4 (south end of 54th Peninsula) - Tire ruts at the south end, very wet. Garbage left, including beer cans, 1 gallon container of oil (removed).

Phragmites was found near photo location 17 at the shoreline, at the north edge of the southern wetland, and extensively north of the culvert crossing.

Appendix D

Additional Site Photos

Appendix D – Additional Site Photos

Photo 1 – Stryker Bay, East shore, near inspection transect, showing erosion from hillside

Photo2 – Stryker Bay, East shore, east of photo 1, showing hillside erosion

Photo 3 – Stryker Bay, East shore, southeast of photo 2, showing hillside erosion and tracks

Photo 4 – Stryker Bay, View south to the point, erosional ridges evident

Photo 5 – Southern extent of 54th Avenue West Peninsula – ponding and tire tracks

Photo 6 - Southern extent of 54th Avenue West Peninsula – ponding and tire tracks

Photo 7 – *Phragmites australis*, north end of Slip 7


Photo 8 – View north in Slip 7 – towards *Phragmites* area

Photo 9 – Eastern shore of CAD, example of silt fence conditions

Photo 10, Stryker Bay vegetation plot invasive plants; tansy, sweet clover, reed canary grass

Appendix E

Vegetation Survey Site Photos

Photo 1 – Slip 7, view to the north

Photo 2 – Slip 7, western shoreline

Photo 3 – Slip 6, north end, view north

Photo 4 – Slip 6, middle, view southeast

Photo 5 – Slip 6, south end, view southeast

Photo 6 – 59th Avenue West Peninsula, south end, view north

Photo 7 – Stryker Bay, north end, view east

Photo 8 – Stryker Bay, south end, west shore, view southwest

Photo 9 – Kingsbury Bay, south end, view north

Photo 10 – Kingsbury Bay, north end, view west

Photo 11 – Tallas Island, upstream end, view west

Photo 12 – Tallas Island, upstream end, view east

Upland Vegetation Locations

Photo 13 – 54-UV-01, view south

Photo14 – 54-UV-01, view east

Photo 15 – 54-UV-02, view south

Photo16 – 54-UV-02, ground cover detail

Photo17 – 54-UV-03, view west

Photo 18 – 54-UV-03, view south

Photo 19 – 54-UV-04, view east

Photo 20 – 54-UV-04, Plant detail: white sweet clover, swamp milkweed

Photo 21 – 59-UV-01, view northwest, beach and transition

Photo 22 – 59-UV-01, view northwest, up slope

Photo 23 – 59-UV-02, view west, note fencing

Appendix F

Upland Plant Synopsis by Site

Upland Plant List 2013

Scientific	**Common**
Trifolium hybridum	Alsike clover
Beckmannia syzigachne	American slough grass
Alisma subcordatum	American water plantain
Abies balsamea	Balsam fir
Populus balsamifera (H)	Balsam poplar
Carex comosa	Bearded sedge
Carex bebbii	Bebb's sedge
Agrostis striata (stolonifera?)	Bent grass
Lotus corniculatus	bird's foot trefoil
Medicago lupulina	black medic
Rudbeckia hirta	Black-eyed susan
Verbena hastata	blue vervain
Calamagrostis canadensis	Bluejoint grass
Plantago major	broadleaf plantain
Solidago canadensis	Canada goldenrod
Juncus canadensis	Canada rush
Elymus canadensis	Canada wild rye
Typha angustifolia	cattail
Potentilla	cinquefoil
Ambrosia artemisifolia	common ragweed
Tanacetum vulgare	common tansy
Phleum pratense	Common Timothy
Ribes	Currant
Scirpus atrovirens	Dark-green bulrush
Sagittaria latifolia	Duck potato
Mentha arvensis	Field mint
Euthamia graminifolia	Flat-top goldentop
Poa palustris	Fowl blue-grass
Glyceria striata	Fowl manna grass
Carex vulpinoides	Fox sedge
Hordeum jubatum	Foxtail barley
Sparganium eurycarpum	giant bur-reed
Solidago gigantea	Giant goldenrod
Scirpus acutus	Hardstem bulrush
Viburnum trilobum (H)	High-bush cranberry
Verbena stricta	Hoary verbena
Carex lacustris	Lake sedge
Potentilla palustris	Marsh cinquefoil
Mentha arvensis	mint
Mimulus ringens	Monkey flower
Typha angustifolia	Narrow-leaved cattail
Lycopus unifloris	Northern water horehound
Sium suave	parsnip
Juncus tenuis	Path rush
Carex scoparia	Pointed broom sedge
Lythrum salicaria	Purple loosestrife
Antennaria sp.	pussy toes
Salix discolor	Pussy willow
Populus tremuloides	Quaking aspen
Ambrosia artemisifolia	Ragweed
Trifolium praetense	red clover
Rubus ideaeus	Red raspberry
Cornus sericea	Red-osier dogwood
Phalarus arundinacea	Reed canary grass
Leerisa oryzoides	Rice cut-grass
Scirpus fluviatilis	river bulrush
Agrostis scabra	Rough Bent grass
Elymus sp.	Rye
Salix interior (H)	Sandbar willow
Juncus effusus	Soft rush
Schoenoplectus tabernaemon	softstem bulrush
Alnus incana ssp. *rugosa*	speckled alder
Eleocharis obtusa	spikerush
Eupatorium maculatum	Spotted joe pye-weed
Agrostis stolonifera	Spreading bent grass
Hypericum majus	St. John's wort
Asclepias incarnata	Swamp milkweed
Fragaria vesca	thin-leaved wild strawberry
Impatiens capensis	Touch-me-not
Carex stricta	Tussock sedge
Thuja occidentalis	white cedar heb.
Picea glauca (H)	White spruce
Melilotus alba	white sweet clover
Monarda fistulosa	wild bergamot
Monarda fistulosa	wild bergamot
Scirpus cyperinus	Woolgrass
Melilotus officianalis	Yellow sweet clover

Site: 54-UV-01

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: Loamy sand

Percent absolute vegetated cover: 107%

Note: No inundation.

Common Name	Scientific Name	% cover	Cover class[1]
softstem bulrush	*Schoenoplectus tabernaemontani*	35	3
Canadian rush	*Juncus canadensis*	30	3
Narrow-leaf cattail	*Typha angustifolia*	20	2
Lesser poverty rush	*Juncus tenuis*	5	1
Purple loosestrife	*Lythrum salicaria*	3	1
Monkey flower	*Mimulus ringens*	2	1
Tussock sedge	*Carex stricta*	1	1
Balsam poplar	*Populus balsamifera (H)*	1	1
Fox sedge	*Carex vulpinoides*	1	1
Woolgrass	*Scirpus cyperinus*	1	1
Giant goldenrod	*Solidago gigantea*	1	1
St. John's wort	*Hypericum majus*	1	1
Reed canary grass	*Phalarus arundinacea*	1	1
Rice cut-grass	*Leerisa oryzoides*	1	1
Spreading bent grass	*Agrostis stolonifera*	1	1
Spotted joe pye-weed	*Eupatorium maculatum*	1	1
Pussy willow	*Salix discolor*	1	1
Southern water-plantain	*Alisma subcordatum*	1	1
		107	

[1] Based on Daubenmire cover classes (1959):

1 = 0-5% areal cover

2 = 5-25% areal cover

3 = 25-50% areal cover

4 = 50-75% areal cover

5 = 75-95% areal cover

6 = 95-100% areal cover

Site: 54-UV-02

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: Gravelly sand

Percent absolute vegetated cover: 90%

Note: Point was located within deer exclusion area, fencing down, area accessible.

Common Name	Scientific Name	% cover	Cover class[1]
common tansy	*Tanacetum vulgare*	*20*	2
Alsike clover	*Trifolium hybridum*	*20*	2
bird's foot trefoil	*Lotus corniculatus*	*15*	2
black-eyed susan	*Rudbeckia hirta*	*10*	2
Canada wild rye	*Elymus canadensis*	*10*	2
Ox-eye daisy	*Chrysanthemum leucanthemum*	*10*	2
White sweet clover	*Melilotus alba*	*1*	1
red clover	*Trifolium praetense*	*1*	1
wild bergamot	*Monarda fistulosa*	*1*	1
Foxtail barley	*Hordeum jubatum*	*1*	1
Yarrow	*Achillea millefolium*	*1*	1
Balsam fir	*Abies balsamea*	*dead*	
		90	

[1] Based on Daubenmire cover classes (1959):

1 = 0-5% areal cover

2 = 5-25% areal cover

3 = 25-50% areal cover

4 = 50-75% areal cover

5 = 75-95% areal cover

6 = 95-100% areal cover

Site: 54-UV-03

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: Loamy sand

Percent absolute vegetated cover: 85%

Note:

Common Name	Scientific Name	% cover	Cover class[1]
blue vervain	*Verbena hastata*	10	2
Lesser poverty rush	*Juncus tenuis*	10	2
Fowl blue-grass	*Poa palustris*	10	2
Northern water horehound	*Lycopus unifloris*	10	2
Fox sedge	*Carex vulpinoides*	10	2
Reed canary grass	*Phalarus arundinacea*	10	2
bird's foot trefoil	*Lotus corniculatus*	5	2
Creeping bent-grass	*Agrostis stolonifera*	3	1
Bluejoint grass	*Calamagrostis canadensis*	3	1
Pointed broom sedge	*Carex scoparia*	3	1
Foxtail barley	*Hordeum jubatum*	2	1
Canada rush	*Juncus canadensis*	2	1
Narrow-leaved cattail	*Typha angustifolia*	1	1
St. John's wort	*Hypericum majus*	1	1
Pussy willow	*Salix discolor*	1	1
rush	*Juncus brevicaudatis*	1	1
Balsam poplar	*Populus balsamifera (H)*	1	1
Monkey flower	*Mimulus ringens*	1	1
Lake sedge	*Carex lacustris*	1	1
		85	

[1] Based on Daubenmire cover classes (1959):

1 = 0-5% areal cover

2 = 5-25% areal cover

3 = 25-50% areal cover

4 = 50-75% areal cover

5 = 75-95% areal cover

6 = 95-100% areal cover

Site: 54-UV-04

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: Loam

Percent absolute vegetated cover: 92%

Note: wet meadow

Common Name	Scientific Name	% cover	Cover class[1]
Fowl blue grass	*Poa paolustris*	20	2
Canada wild rye	*Elymus canadensis*	10	2
Reed canary grass	*Phalarus arundinacea*	10	2
Northern water horehound	*Lycopus uniflorus*	10	2
Blue joint	*Calamagrostis canadensis*	5	2
Lamp rush	*Juncus effusus*	5	2
slender rush	*Juncus tenuis*	5	2
Pointed broom sedge	*Carex scoparia*	5	2
blue vervain	*Verbena hastata*	1	1
wild bergamot	*Monarda fistulosa*	1	1
Giant goldenrod	*Solidago gigantea*	1	1
Field mint	*Mentha arvensis*	1	1
Swamp milkweed	*Asclepias incarnata*	1	1
Flat-top goldentop	*Euthamia graminifolia*	1	1
Rough bent grass	*Agrostis scabra*	1	1
Canadian rush	*Juncus canadensis*	1	1
bird's foot trefoil	*Lotus corniculatus*	1	1
white sweet clover	*Melilotus alba*	1	1
Balsam poplar	*Populus balsamifera (H)*	1	1
Dark-green bulrush	*Scirpus atrovirens*	1	1
Bearded sedge	*Carex comosa*	1	1
Black-eyed susan	*Rudbeckia hirta*	1	1
Porcupine sedge	*Carex hystericina*	1	1
Fox sedge	*Carex vulpinoidea*	1	1
Foxtail barley	*Hordeum jubatum*	1	1
Golden alexander	*Zizia auria*	1	1
Alsike	*Trifolium hybridum*	1	1
Pussy willow	*Salix discolor*	1	1
St. John's Wort	*Hypericum majus*	1	1
Wool-grass	*Scirpus cyperinus*	1	1
		92	

[1] Based on Daubenmire cover classes (1959):

Site: 59-UV-01

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: Sand and gravel

Percent absolute vegetated cover: beach side 34%, hill side 146%

Note: at edge of gravel beach, plot half beach, half wetland hillside

Common Name	Scientific Name	%cover	Cover class[1]
beach side of plot			
bladder campion	*Silene conica*	20	2
common tansy	*Tanacetum vulgare*	5	2
balsam poplar	*Populus balsamifera*	3	1
white sweet clover	*Melilotus alba*	3	1
Bird's foot trefoil	*Lotus corniculatus*	1	1
Artemisia	*Artemisia absinthium*	1	1
Ragweed	*Ambrosia artemisifolia*	1	1
hill side of plot			
speckled alder	*Alnus incana* ssp. *rugosa*	30	3
Canada goldenrod	*Solidago canadensis*	30	3
Giant goldenrod	*Solidago gigantea*	20	2
common tansy	*Tanacetum vulgare*	20	2
reed canarygrass	*Phalaris arundinacea*	15	2
red-osier dogwood	*Cornus sericea*	10	2
Touch-me-not	*Impatiens capensis*	5	2
Narrow-leaved cattail	*Typha angustifolia*	3	1
Lake sedge	*Carex lacustris*	3	1
Blue-joint grass	*Calamagrostis canadensis*	2	1
catnip	*Nepeta cataria*	2	1
Black bulrush	*Scirpus atrovirens*	2	1
Red raspberry	*Rubus ideaeus*	1	1
Currant	*Ribes*	0.1	1
Canada thistle	*Cirsium arvensis*	1	1
Sandbar willow	*Salix interior*	1	1
		145.1	

[1] Based on Daubenmire cover classes (1959):

1 = 0-5% areal cover

2 = 5-25% areal cover

3 = 25-50% areal cover

4 = 50-75% areal cover

5 = 75-95% areal cover

6 = 95-100% areal cover

Site: 59-UV-02

Surveyors: KMS2 and KSW

Date: 7/26/13

Soil substrate: sand and gravel

Percent absolute vegetated cover: 88%

Note: Point was in the road. Shifted point 10 feet west to be within vegetation.

Common Name	**Scientific Name**	**% cover**	**Cover class[1]**
common tansy	*Tanacetum vlugare*	35	3
Black-eyed susan	*Rudbeckia hirta*	20	2
Bird's foot trefoil	*Lotus corniculatus*	20	2
Oswego tea	*Monarda fistulosa*	2	1
ox-eye daisy	*Chrysanthemum leucanthemum*	2	1
Yarrow	*Achillea millefolium*	2	1
Spotted knapweed	*Centauria maculosa*	1	1
Giant goldenrod	*Solidago gigantea*	1	1
Rough Bent grass	*Agrostis scabra*	1	1
Nodding Wild Rye	*Elymus canadensis*	1	1
Foxtail barley	*Hordeum jubatum*	1	1
Canada goldenrod	*Solidago canadensis*	1	1
Alsike clover	*Trifolium hybridum*	0.5	1
thin-leaved wild strawberry	*Fragaria vesca*	0.2	1
cinquefoil	*Potentilla*	0.1	1
		87.8	

[1] Based on Daubenmire cover classes (1959):

1 = 0-5% areal cover

2 = 5-25% areal cover

3 = 25-50% areal cover

4 = 50-75% areal cover

5 = 75-95% areal cover

6 = 95-100% areal cover

Appendix G

Aquatic Plant Synopsis for All Locations

SLRIDT Vegetation by Location - 2013

Scientific	**Common**	Tallas Island		Kingsbury Bay		Stryker Bay		Slip 6		Slip 7	
		occurs *	#locations	occurs *	#locations	occurs *	#locations	occurs *	#locations	occurs *	#locations
Algae	filamentous algae										
Ceratophyllum demersum	Coontail	1	3	1	3	1	1	1	1		
Chara		1	2			1	2				
Elodea canadensis	Canada waterweed										
Najas flexilis	bushy naiad	1	5	1	1			1	1		
Nuphar variegata	Bullhead pond lily	1	2	1	2						
Nymphaea odorata	white water lily	1	11	1	5	1	7	1	11	1	3
Myriophyllum sibericum	northern watermilfoil	1	1								
Potamogeton epihydrous	Ribbon-leaf pondweed	1	5			1	3	1	1		
Potamogeton foliosis	Leafy pondweed										
Potamogeton natans	Floating leaf pondweed										
Potamogeton nodosus	long leaf pondweed	1	4								
Potamogeton pectinatus (Stuc	Sago pondweed										
Potamogeton pusillus	Slender pondweed										
Potamogeton richardsonii	Clasping-leaf pondweed	1	8	1	2			1	1		
Potamogeton vaseyii	Vasey's pondweed	1	2								
Potamogeton zosteriformis	flatstem pondweed										
Sagittaria cuneata	Arum-leaf arrowhead										
Sparganium americanum	American bur-reed										
Sparganium emersum	Dwarf bur-reed										
Sparganium eurycarpum	Broad-fruit bur-reed	1	1								
Sparganium fluctuans	Floating leaf bur reed	1	3								
Spirodella polyrhiza	Greater duckweed										
Vallisneria americana	Wild celery/eel-grass	1	13	1	5	1	3	1	2		
Zizania aquatica	Wild rice										
Total # of species		13	60	6	18	5	16	6	17	1	3
	(*) 1 INDICATES PRESENCE										

Appendix H

Acronym List

APPENDIX H

LIST OF ACRONYMS

BAZ - Bio-Active Zone

COC - Contaminants of Concern

EM - Environmental Media

EC - Environmental Contractor

FCVs - Final Chronic Values

GPS - Global Positioning System

IZ - Isolation Zone

LTM&M - Long Term Monitoring and Maintenance

LV - *Lumbriculus variegatus*

MNDNR - Minnesota Department of Natural Resources

MPCA - Minnesota Pollution Control Agency

MSL - Mean Sea Level

PAHs - Polycyclic Aromatic Hydrocarbons

PMCS - Performance Monitoring Compliance Standards

PRAOs - Post-Remedial Action Objectives

QA - Quality Assurance

QC - Quality Control

RAs - Response Actions

RAOs - Response Action Objectives

RD/RAP - Remedial Design/Response Action Plan

RP - Responsible Party

RPs - Responsible Parties

ROD - Record of Decision

SAV – Submerged Aquatic Vegetation

SedOU - Sediment Operable Unit

SLRIDT - St. Louis River/Interlake/Duluth Tar CERCLA Site

SOP – Standard Operation Procedure

TICMP - Tallas Island Compensatory Mitigation Project

Appendix I

Sampling Point Depths

SLRIDT Vegetation Monitoring 2013 - Measured water depth and number of plant species observed at each sample point (depth in feet)

Tallas Island**	# plant species	feet
TI-AV-01-S	5	3.5
TI-AV-01-C*		
TI-AV-01-N	0	7
TI-AV-02-S	4	2.9
TI-AV-02-C	3	6.9
TI-AV-02-N	9	2.3
TI-AV-03-S	5	3
TI-AV-03-C*		
TI-AV-03-N	3	2.5
TI-AV-04-S	4	2.7
TI-AV-04-N	0	3.3
TI-AV-05-S	4	1.2
TI-AV-05-C	0	5.8
TI-AV-05-N	0	0.5
TI-AV-06-C	3	3
TI-AV-07-S	2	3.2
TI-AV-07-N	0	2.9
TI-AV-08-S*		
TI-AV-08-C	1	5.8
TI-AV-09-S	7	2
TI-AV-09-C	4	5.5
TI-AV-09-N	0	3.5
TI-AV-10-S	2	7
TI-AV-10-C*		
TI-AV-10-N	3	3.8

Stryker Bay	# plant species	feet
SB-AV-01-W	1	4.9
SB-AV-01-C	1	4
SB-AV-01-E	5	1.9
SB-AV-02-W	0	4.2
SB-AV-02-C	1	4.5
SB-AV-02-E	2	2.8
SB-AV-03-W	1	4.5
SB-AV-03-C	0	5.8
SB-AV-03-E	1	3
SB-AV-04-W	0	6.9
SB-AV-04-C	0	6.7
SB-AV-04-E	3	2.5
SB-AV-05-W	1	4.5
SB-AV-05-C	0	6
SB-AV-05-E	0	4.2
SB-AV-06-W	1	4.5
SB-AV-06-C	0	4.2
SB-AV-06-E	1	4.5

Slip 6	# plant species	feet
S6-AV-01-W	0	7
S6-AV-01-C	0	5
S6-AV-01-E	1	3.8
S6-AV-02-W	0	4
S6-AV-02-C	0	3.9
S6-AV-02-E	0	2.8
S6-AV-03-W	0	3.9
S6-AV-03-C	0	5.2
S6-AV-03-E	0	5
S6-AV-04-W	1	4
S6-AV-04-C	0	5.5
S6-AV-04-E	1	4.5
S6-AV-05-W	1	3.5
S6-AV-05-C	1	4
S6-AV-05-E	2	3.5
S6-AV-06-W	2	3
S6-AV-06-C	0	3.5
S6-AV-06-E	5	2.8
S6-AV-07-W	1	3.5
S6-AV-07-C	1	3.8
S6-AV-07-E	1	3.9

Slip 7	# plant species	feet
S7-AV-01-W	0	5.5
S7-AV-01-C	0	10
S7-AV-01-E	0	10
S7-AV-02-W	1	5.25
S7-AV-02-C	0	10
S7-AV-02-E	0	10
S7-AV-03-W	2	5
S7-AV-03-C	0	10
S7-AV-03-E	0	10
S7-AV-04-W	1	2.25
S7-AV-04-C	0	10
S7-AV-04-E	0	10

Kingsbury Bay	# plant species	feet
KB-AV-01-W	8	1.8
KB-AV-01-C*		
KB-AV-01-E	7	3
KB-AV-02-W	7	4.2
KB-AV-02-C	0	3.3
KB-AV-02-E	4	4
KB-AV-03-W	4	4.3
KB-AV-03-C	3	4.7
KB-AV-03-E	3	4.5
KB-AV-04-W	3	5
KB-AV-04-C	3	5
KB-AV-04-E	0	4

*sampled in 2012, not sampled in 2013

**Tallas Island locations differentiated with cardinal directions in 2013