SUPPLEMENTAL PHASE II ENVIRONMENTAL SITE ASSESSMENT

BUS MAINTENANCE FACILITY
4500 West Marginal Way SW
Seattle, Washington 98106

Prepared for:
City of Seattle
Finance and Administrative Services, Real Estate Services
Seattle, Washington 98101
Prepared by:
EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134

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ACRONYMS & ABBREVIATIONS

APS	Applied Professional Services
AST	Above-ground Storage Tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
EHSI	EHS-International, Inc.
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESL	Environmental Services Ltd.
FBI	Friedman & Bruya, Inc.
Holocene	Holocene Drilling, Inc.
LDW	Lower Duwamish Waterway
L	liter
MTCA	Model Toxics Control Act
mg/kg	milligrams per kilogram
mL	milliliter
PAH	Polyaromatic Hydrocarbons
PESCO	Pacific Environmental Services Company
PID	photoionization detector
PPM	Parts per million
REC	Recognized Environmental Condition
SIM	Selective Ion Monitoring
TPH	Total Petroleum Hydrocarbons
ug/L	micrograms per Liter
US	United States
USCS	Unified Soil Classification System
UST	underground storage tank
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
VCP	Voluntary Cleanup Program

1.0 INTRODUCTION

On behalf of the City of Seattle (client), EHS-International, Inc. (EHSI) completed a Supplemental Phase II Environmental Site Assessment (ESA) at the Bus Maintenance Facility located at 4500 West Marginal Way SW in Seattle, Washington (subject property; see Figure 1). The fieldwork for the Supplemental Phase II ESA took place on January 31, February 1, 2, and 7, 2017.

The subject property is comprised of one King County tax parcel (766670-3680) that encompasses an area of approximately 6.0 acres (Figure 2). The subject property is occupied by a bus maintenance facility. Structures on the property include a main building used for maintenance of vehicles, office space, and for storage (Figure 2), and a smaller shed used just for storage.

The subject property is bordered along the west side by West Marginal Way SW, on the east and south by Herring's House Park which is a tidal wetland embayment of the Lower Duwamish Waterway (LDW), and on the north by General Recycling of Washington (Terminal 105).

1.1 Background

Prior to beginning the Supplemental Phase II ESA project, EHSI completed a Phase I ESA (EHSI, 2015) that identified the following Recognized Environmental Conditions (RECs):

- Unresolved regulatory compliance regarding past cleanup actions at the subject property. The subject property was recently withdrawn from the Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) and its current regulatory status is unknown. Information gained from Ecology suggests that the subject property may be placed under an Agreed Order which would likely include all of the former Seaboard Lumber property.
- The material threat of a release from the past and current presence of underground hydraulic hoists within the main building
- The material threat of a release associated with observed staining of the concrete surface around the existing two motor fuel dispensers.
- The material threat of a release from an uncovered diesel fuel above-ground storage tank (AST) at the northwest corner of the subject property.
- The material threat of a release associated with poor housekeeping practices in the western service bays of the main building.
- Material threat of a release from improperly stored engine cores, axles, and other petroleum-containing automotive parts on the northwest corner of the subject property.

EHSI then conducted a Phase II ESA to evaluate the RECs identified in the Phase I (EHSI, 2016). The Phase II ESA findings are summarized below:

Diesel Fuel Dispenser Area

- Based upon the results of soil and groundwater sampling and testing at the subject property, a release associated with the diesel fuel dispenser at the bus wash on the southeast end of the main building has led to contamination of both soil and groundwater. The soil and groundwater contamination at the diesel dispenser may be the result of either surface spills penetrating the concrete slab junction or a leak from the dispenser piping. Additionally, a petroleum sheen was noted on the storm-water surface runoff from the dispenser area and into a storm-sewer catch basin near the two underground storage tanks (USTs). The extent of the release from the diesel dispenser is unknown.

Closest Location to Strip Drain and Sump/Eastern Maintenance of Main Building

- The groundwater at soil boring EP-12 is contaminated with both diesel and oil which may be associated with the adjacent strip drain and sump in the eastern repair bay of the subject building. The extent of the release from the strip drain and sump is unknown.
- Concentrations of total and dissolved arsenic exceeding the Model Toxics Control Act (MTCA) cleanup levels were detected in the groundwater sample at soil boring EP12. The groundwater sample collected at boring EP12 was a turbid grab sample and may not be representative of true groundwater conditions.

Storm Sewer Catch Basin/Northwest Corner of Site

- Concentrations of total lead exceeding MTCA cleanup levels was detected in the groundwater sample at soil boring EP7. The groundwater sample collected at boring EP7 was a turbid grab sample and may not be representative of true groundwater conditions.

Following issuance of EHSI's Phase II ESA, the City of Seattle provided EHSI with two additional reports by ERM-West, Inc. (ERM) that had not been provided previously. The reports included a Phase I ESA completed by dated September 2013 and a Baseline Environmental Assessment and Site-Wide Groundwater Assessment dated September 2013. Summaries of these reports are provided below:

ERM completed a Phase I ESA in September of 2013 that identified RECs for the subject property (ERM, 2013a):

- Historic contamination – The subject property is part of the Former Seaboard Lumber site that has a history of industrial activities since the early 1900s. Various reports documented the removal of USTs and the investigation and removal of lead, polyaromatic hydrocarbons (PAHs), and petroleum contamination in soil. The subject property received a determination of No Further Action from Ecology in 2012 related to contamination associated with USTs that were removed in 1988.
- Water conveyance systems – ERM noted that floor drains, trench drains, and underground piping that convey water and potentially oily fluids to the storm and sanitary sewer systems that could allow contaminants into subsurface soil, groundwater, and surface water through crack or other defects.

- Existing USTs and piping – Releases from the existing diesel and gasoline USTs, piping, and dispensers may have occurred from leaks and spills.
- LDW Superfund Site – Two of the former property owners, Evergreen Trails, Inc. and PACCAR, Inc., along with a former tenant, Northwest Container Services, Inc. are listed as General Notice Letter Entity Recipients relating to the LDW Superfund Site by the US Environmental Protection Agency (EPA). ERM stated that the owner/operator of the subject property may be a potentially liable party for portions of the environmental investigation, cleanup, and/or natural resource damages associated with the LDW Superfund site.

ERM completed a Baseline Environmental Assessment and Site-Wide Groundwater Assessment in September of 2013 (ERM, 2013b). The study documented the following:

- ERM assessed the large oil/water separator on the southern portion of the subject property for cracks, holes, or other evidence of potential leakage into surrounding soil and groundwater. Following pumping and cleaning, the oil/water separator was noted to be in good condition with no defects observed.
- ERM assessed subsurface soil quality in the vicinity of the two on-site USTs. None of the soil samples collected in the vicinity of the USTs contained concentrations of petroleum contaminants of concern above the selected preliminary screening levels.
- ERM evaluated soil quality in the vicinity of the former remedial excavations. None of the soil samples collected from the vicinity of the former remedial excavations contained the contaminants of concern above the preliminary screening levels.
- ERM assessed the environmental quality of groundwater migrating onto the subject property. The groundwater sample collected from well MW-2 situated along the western portion of the subject property did not contain contaminant concentrations exceeding the preliminary screening levels.
- ERM evaluated groundwater quality migrating off the subject property. The groundwater samples collected from the monitoring wells along the down-gradient property line did not contain contaminant concentrations exceeding the preliminary screening levels with the exception of vanadium at well MW-1 and MW-3. Vanadium was not detected in the up-gradient well MW-2. The source of the vanadium was unknown.
- ERM evaluated the potential for the subject property to “recontaminate” sediment in the LDW via groundwater migration. Based on the data developed in their study, ERM concluded that the subject property had a low potential to “recontaminate” the LDW via groundwater discharge because none of the groundwater samples from the down-gradient wells contained the contaminants of concern exceeding the preliminary screening levels.
- ERM documented a groundwater flow direction towards the east/southeast where it likely discharged to the LDW and the intertidal basin in Herring’s House Park. ERM noted a hydraulic gradient of 0.014 foot/foot. ERM described the observed hydraulic conductivity as highly variable.

1.2 Detailed Scope of Work

EHSI prepared a detailed scope of work in a proposal to the client dated January 25, 2016 based upon the results of the Phase II ESA. The scope of work actions presented in the proposal are listed below:

- Conduct sampling and testing of soil and groundwater around the perimeter of the main building.
- Conduct sampling and testing of soil and groundwater surrounding the existing diesel and gasoline USTs.
- Install nine groundwater monitoring wells across the subject property to evaluate groundwater conditions at the following locations: (1) at the catch basin at the northwest corner of the site where lead was detected earlier, (2) at the south side of the east maintenance bay where diesel to oil-range Total Petroleum Hydrocarbons (TPH) and arsenic were detected, (3) surrounding the diesel motor fuel dispenser where TPH was detected, (4) along the southeast side of the main building, and (5) along the western side of the site.
- Conduct a tidal study to assess tidal influences on groundwater levels at the subject property.
- Complete an Engineer's Estimate of potential cleanup costs to be forwarded under separate cover to this report.

The client amended the scope of work by requesting the following actions:

- Sample and test the fluid contents of the smaller oil/water separator at the northeast corner of the subject property.
- Conduct an evaluation of both the above-ground and underground petroleum storage tanks and the oil/water separator at the northeast corner of the site. The report of the condition of these features will be provided to the client under separate cover.
- Resample well EMW03 for diesel- to oil-range TPH.

1.3 Scope of Work Deviations

The main building is heated with a waste oil-fired hot water boiler. The boiler supplies hot water to an in-floor radiant heat system. Given the potential for striking an unlocated hot water line in the building floor, no soil borings were advanced within the main building footprint.

2.0 SITE HYDROGEOLOGY

The mapped material in this portion of King County is peat (Quaternary). The peat consists of buried organic matter consisting of plants and wood debris (Troost, 2005). Environmental Services Ltd. (ESL) drilled and installed six groundwater monitoring wells on the subject property in 1992 (ESL, 1992). ESL encountered clayey silt, sand, and wood debris in their borings. Groundwater within the on-site wells was measured at approximately five feet below ground surface (bgs). ESL measured a groundwater flow direction to the northeast at high tide and southeast at low tide. ESL noted that the unconfined aquifer beneath the subject property had intermediate to high hydraulic conductivity.

ERM measured groundwater elevations in five monitoring wells in 2013 and generated a flow map of the subject property. ERM noted a groundwater flow towards the east and southeast in their 2013 study (ERM, 2013b).

For this study, EHSI installed nine groundwater monitoring wells, EMW-1 through EMW09, across the subject property. In general, groundwater flow across the site is to the east towards the Herring's House Park (Figure 3) tidal wetland and the LDW. There appears to be a variation in flow in the southeast portion of the site with a groundwater mound at EMW08 and a low area near EMW04 and EMW05, resulting in a component of flow in this area to the northwest. The groundwater flow analysis was based on measurements from wells EMW01 through EMW09 and three widely-spaced points in the Herring's House Park tidal wetland with an average tidal height for that day. The groundwater elevations are shown on Table 3.

EHSI also conducted an 8-hour tidal study on February 13, 2017 by measuring hourly groundwater elevations at wells EMW02, EMW04, and EMW07. The greatest groundwater elevation change of 0.10 feet during the tidal cycle appeared to be at monitoring well EMW07 on the eastern portion of the site. No change in groundwater elevation was observed at well EMW02 along the western portion of the subject property. The 0.10 elevation difference observed at well EMW07 and the 0.08 difference observed at well EMW04 are not expected to have a significant effect on the overall flow pattern across the site. The 8-hour groundwater elevations are shown on Chart 1 in Appendix C.

3.0 FIELD INVESTIGATION

3.1 AST, UST, and Oil/Water Separator Evaluation

Pacific Environmental Services Company (PESCO) completed an evaluation of the above-ground storage tank (AST) system, the underground storage tank (UST) system, and the oil/water separator at the northeast corner of the subject property in March 2017 (PESCO, 2017).

In their evaluation of the AST system, PESCO noted that the concrete containment area around the ASTs was tight-lined to a shut-off valve then to a storm drain manhole. PESCO noted that there was no indication that the outfall drain line was connected to the on-site oil/water separator.

PESCO observed that the oil-water separator at the northeast corner of the subject property is steel-lined with all welded seams appearing intact. The structural integrity of the oil/water separator appeared to be in good condition. The oil/water separator was pumped of remaining fluids and cleaned. PESCO noted that the oil/water separator was connected to the neighboring wash bay.

PESCO conducted tightness testing of the USTs and product lines that indicated that the tanks and lines were tight. An evaluation of the line leak detectors indicated that the gasoline line leak detector failed. PESCO noted that the automatic leak detection system was only partially operable and was obsolete. PESCO noted that the existing drain valves on both the gasoline and diesel buckets need replacement.

A copy of the PESCO report will be forwarded to the client under separate cover.

3.2 Utility and Ground-Penetrating Radar Locate Survey

On January 31, 2017, EHSI met Applied Professional Services, Inc. (APS) to locate and mark conductible utilities at the subject property prior to drilling. The utility clearance survey did not identify buried utilities at the proposed soil boring locations.

On February 1, 2017, EHSI met APS to locate the positions and extent of the oil/water separator and associated piping at the northeast corner of the subject property. APS scanned the oil/water separator area with ground-penetrating radar (GPR). The scan of the oil/water separator indicated the limits of the vault which were marked on the ground. The scan also disclosed the locations of buried storm-water sewer piping along the southeast property boundary.

3.3 Soil Borings

Six borings (EP13 through EP18) were drilled on January 31, 2017 by Holocene Drilling, Inc. using a direct-push probe drill rig. Groundwater monitoring wells EMW01 through EMW09 were drilled and installed on February 1 and 2, 2017. The boring and well locations are shown on Figure 3. The borings were drilled to depths of 8 to 10 feet bgs. Soil samples were collected at various intervals from each boring and logged by a licensed geologist, who assigned a Unified Soil Classification System (USCS) group symbol to each soil sample description. Each sample interval was field-screened using a photoionization detector (PID) and checked for odor, staining, and hydrocarbon sheen. Soil descriptions are included in the boring logs provided in Appendix A and the well logs in Appendix B.

The soil boring locations are shown on Figures 3 and 4 and are detailed below:

- EP13 was advanced at the west side of the diesel UST.
- EP14 was advanced near the storm-water catch basin by the USTs.
- EP15 was advanced next to the south side of the service bay on the northwestern end of the main building.
- EP16 was advanced along the northeast side of the western service bay on the northwestern end of the main building.
- EP17 was advanced along the northeast side of the eastern service bay on the northwestern end of the main building.
- EP18 was advanced along the northeastern side of the service bay on the southeastern end of the main building.

The monitoring well locations are shown on Figures 3 and 4 and are detailed below:

- EMW01 was advanced at the northwest part of the property near the catch basin and boring EP7.
- EMW-02 was advanced along the western portion of the property.
- EMW03 was advanced near the diesel fuel dispenser and boring EP3.
- EMW04 was advanced along the northwest side of the bus wash bay on the southeastern end of the main building.
- EMW05 was advanced along the southeast side of the service bay on the southeastern part of the main building and next to boring EP12.
- EMW06 was advanced to the south of the diesel fuel dispenser.
- EMW07 was advanced to the east of the diesel fuel dispenser and bus wash bay.
- EMW08 was advance adjacent to the southeast of the bus wash bay of the main building.
- EMW09 was installed near the northwest corner of the main building and next to the small oil/water separator.

Holocene completed groundwater monitoring wells EMW01 through EMW09 in accordance with Ecology well installation guidelines. The 2-inch inside diameter wells were installed to 12 feet bgs except for well

EMW09 which was installed to 15 feet bgs. Holocene installed wells EMW01 through EMW08 with the lower 10 feet of 0.010-inch slotted schedule 40 PVC bedded in Colorado silica sand with an upper two feet of blank PVC casing sealed by two feet of concrete. Holocene installed well EMW09 with the lower 10 feet of 0.010-inch slotted schedule 40 PVC bedded in Colorado silica sand with an upper five feet of blank PVC casing sealed by three feet of hydrated bentonite. Each well was finished with a lockable flush-mount steel monument set in approximately 2 feet of concrete. Well construction details are presented on the well logs, Appendix B.

3.4 Soil Sampling

Soil samples were collected at 5- to 6-foot intervals from soil borings EP13 through EP18 and well borings EMW01 through EMW09. The glassware for each soil sample consisted of United States (US) Environmental Protection Agency (EPA) Method 5035 Volatile Organic Compound (VOC) sampling kits and four-ounce glassware provided by the laboratory.

A list of soil samples, locations, and depths, is presented in Table 1.

3.5 Groundwater Sampling

EHSI collected groundwater samples from each borehole using a temporary sampling point. Groundwater samples were collected from the temporary sampling point using a peristaltic pump and disposable polyethylene tubing.

For the permanent monitoring wells, prior to sampling, each well was purged until measured groundwater quality parameters had stabilized. Following purging, groundwater samples were collected from the wells using a peristaltic pump with disposable plastic tubing. Four 40 milliliter (mL) Volatile Organic Analysis (VOA) vials and a 500 mL amber bottle were filled from each boring and well. Two 350 mL polyethylene bottles were also filled at borings EP13, EP14, EP15, EP16, EP18, and wells EMW01, EMW02, EMW05, EMW08, and EMW09. Monitoring well EMW03 was resampled on March 17, 2017 to verify the earlier results from that well. A list of groundwater samples locations is presented in Table 2.

3.6 Oil/Water Separator Sampling

To profile the liquid contents and assess a possible source of contamination at well EMW09, EHSI collected a water sample from the oil/water separator on the northeast corner of the site using a disposable plastic bailer. Four 40 mL VOA vials, a 500 mL amber bottle, two 1 L amber bottles, and one 350 mL polyethylene bottle was filled from the oil/water separator. The sample was collected before PESCO completed the oil/water separator pumping and cleaning.

3.7 Sampling Documentation

EHSI documented all field activities associated with soil and groundwater sampling. Documentation included a comprehensive discussion of field observations, such as field parameter measurements, and documentation of any problems encountered. All sample containers were labeled with the following information:

- EHSI project identification number;
- Sample date;
- Sampler’s name; and
- Sample identification number.

Each soil sample collected was given a unique identification number as described below:

> Soil boring/sample depth: For example, sample EP13-5 is a sample collected from soil boring EP13 (EP13) at the sample interval depth of 5.0 feet bgs.

Each groundwater grab sample collected was given a unique identification number as described below:

> Boring number/sample media: For example, sample EP13-GW is the groundwater (GW) sample collected from boring EP13.

Each groundwater well sample collected was given a unique identification number as described below:

> Well number/sequential sample number: For example, sample EMW01-01 is collected from well EMW01 (EWM01) and is the first sample from that well (01).
>
> Groundwater sample UST-01 was collected from the groundwater monitoring well installed in the backfill at the south end of the UST cluster (UST) and is the first sample (01) at that location.
>
> Groundwater sample UST-02 was collected from the groundwater monitoring well installed in the backfill at the north end of the UST cluster (UST) and is the first sample (01) at that location.

In addition, the sample chain-of-custody forms were completed with EHSI project identification number, the sampler’s name, date, and sample identification codes, number of containers, and date and time the sample was collected. The chain-of-custody form was included with samples transported to the analytical laboratory.

3.8 Decontamination Procedures and Waste Management

All non-disposable sampling equipment was decontaminated prior to and after each sampling operation. The specific steps used for decontamination of the equipment are:

- Rinse and pre-clean equipment in potable water;
- Wash and scrub equipment with non-phosphate based detergent and potable water;
- Rinse with potable water;
- Rinse in deionized water; and
- Air-dry and store in clean plastic bags (or Visqueen sheet) between samplings.

Investigation-derived wastes (IDW), such as drill cuttings and decontamination water, were stored temporarily on the subject property in US Department of Transportation-approved, 20-gallon and 55-gallon drums, pending the receipt of laboratory analytical results.

3.9 Sample Handling and Shipping

EHSI field personnel checked all sample containers for completeness and cap tightness. The sealed sample containers were then placed upright in a cooler and chilled with Blue Ice. The sample cooler was then placed in a field vehicle to await transportation to the analytical laboratory. All samples collected were transported, under chain-of-custody protocols to the Friedman and Bruya, Inc. (FBI) Seattle, Washington laboratory for analyses.

3.10 Laboratory Analyses

EHSI selected 12 soil and groundwater samples for laboratory analysis. FBI analyzed the soil and groundwater samples for gasoline-range TPH using Northwest Method NWTPH-Gx, and for diesel- to oil-range TPH by Northwest Method NWTPH-Dx. Soil samples also were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by either EPA Method 8021B or volatile organic compounds (VOCs) by EPA Method 8260C. Select soil and groundwater samples were analyzed for polyaromatic hydrocarbons (PAH) by EPA Method 8270C Selective Ion Monitoring (SIM).

Groundwater samples from three of the borings and two of the monitoring wells were also analyzed for total and dissolved MTCA 5 metals (arsenic, cadmium, chromium, lead, and mercury) by EPA Method 200.8. FBI filtered the dissolved metals samples in the laboratory to remove suspended solids greater than 0.45 micrometers in diameter.

Groundwater samples from wells EMW03 and EMW09 were analyzed for monitored natural attenuation (MNA) parameters including methane, ethane, ethene, iron manganese, ferrous iron, total organic carbon, alkalinity (as CaCO3), chloride, sulfate, nitrate, sulfite, and pH. This sampling and testing was done to provide information for evaluating cleanup action approaches.

Sample OWS-01 from the oil/water separator was analyzed for VOCs by EPA Method 8260C, for gasoline-range TPH using Northwest Method NWTPH-Gx, for diesel- to oil-range TPH by Northwest Method NWTPH-Dx, PAHs by EPA Method 8270C SIM, polychlorinated biphenyls (PCBs) by EPA Test Method 8082, and MTCA 5 metals.

Soil and groundwater samples from boring/wells EP15, EP16, EP17, EP18, EMW01, EMW05, EMW08, and EMW09 were analyzed for PCBs by EPA Test Method 8082 by EPA Method 200.8.

4.0 INVESTIGATION RESULTS

4.1 Field Observations

With the exception of boring EMW09, no outward indications of contamination, such as elevated PID readings, unusual odors, or soil discoloration, were observed in the soil samples collected from the other soil borings. The soil samples from boring EMW09 at depths between approximately 6 feet and 15 feet bgs had a gray color and strong petroleum odors. PID readings were 0.0 parts per million (ppm) for the recovered soil samples from all boring locations except for boring EMW09 which had a PID readings ranging between 3.5 and 60 parts per million (PPM).

4.2 Soil Conditions

The subject property is underlain by varying depths of sand with minor gravel fill material overlying native alluvium consisting of sand, silty sand, and silt. Details on the shallow subsurface geology and sampling are documented on the boring logs in Appendix A and well logs in Appendix B.

4.3 Groundwater Conditions

Groundwater was encountered at depths ranging between approximately 2 to 5 feet bgs at the time of drilling. The groundwater samples had apparent moderate turbidity.

4.4 Analytical Results

4.4.1 Soil

In the absence of any outward indications of contamination, EHSI prioritized analysis of soil samples collected from just above the apparent groundwater table, which ranged from 2 to 10 feet bgs. The soil analytical results are summarized below:

- Sample EP16-5 returned results of 78 mg/kg diesel-range TPH, 380 mg/kg oil-range TPH, 8.28 mg/kg chromium, 3.12 mg/kg arsenic, 58.6 mg/kg lead, 0.330mg/kg acenaphthalene, 0.24 mg/kg phenanthrene, 2.4 mg/kg fluoranthene, 2.8 mg/kg pyrene, 2.2 mg/kg benz(a)anthracene, 2.2 mg/kg chrysene, 2.8 mg/kg benzo(a)pyrene, 2.9 mg/kg benzo(b)fluoranthene, 1.0 mg/kg benzo(k)fluoranthene, 1.4 mg/kg indeno(1,2,3-cd)pyrene, 0.31 mg/kg dibenz(a,h)anthracene, 1.2 benzo(g,h,i)perylene and 0.15 mg/kg naphthalene.
- Sample EP18-5 returned a result of 1,400 mg/kg diesel-range TPH, 5.67 mg/kg chromium, 1.07 mg/kg arsenic, and 3.6 mg/kg lead.
- Sample EMW01-5 returned results of 61.8 mg/kg lead, 0.029 mg/kg Fluoranthene, 0.036 mg.kg pyrene, 0.017 mg/kg benz(a)anthracene, 0.020 mg/kg chrysene, 0.019 mg/kg benzo(a)pyrene, 0.026 mg/kg benzo(b)fluoranthene, 0.016 mg/kg indeno(1,2,3-cd)pyrene, and 0.016 mg/kg benzo(g,h,i)perylene.
- Sample EMW05-8 returned results of 4.38 mg/kg arsenic, 0.22 mg/kg fluoranthene, 0.35 mg/kg pyrene, 0.15 mg/kg benz(a)anthracene, 0.16 mg/kg chrysene, 0.14 mg/kg benzo(a)pyrene, 0.17 mg/kg benzo(b)fluoranthene, 0.20 mg/kg phenanthrene, and 0.24 mg/kg aroclor 1260 (PCB).
- Sample EMW08-5 returned results of 8.95 mg/kg chromium, 3.31 mg/kg arsenic, 37 mg/kg lead, 0.032 mg/kg phenanthrene, 0.10 mg/kg fluoranthene, 0.14 mg.kg pyrene, 0.08 mg/kg benz(a)anthracene, 0.11 mg/kg chrysene, 0.10 mg/kg benzo(a)pyrene, 0.13 mg/kg benzo(b)fluoranthene, 0.043 mg/kg benzo(k)fluoranthene, 0.056 mg/kg indeno(1,2,3-cd)pyrene, 0.017 mg/kg dibenz(a,h)anthracene, and 0.054 mg/kg benzo(g,h,i)perylene.
- Sample EMW09-12 returned results of 24 mg/kg gasoline-range TPH, 270 mg/kg diesel-range TPH, 6.69 mg/kg chromium, 1.3 mg/kg lead, and 0.010 mg/kg pyrene.
- Sample EMW09-6 returned results of 210 mg/kg gasoline-range TPH, 810 mg/kg diesel-range TPH, 0.03 mg/kg ethylbenzene, and 0.07 mg/kg total xylenes.

Summaries of the soil analytical data are presented in Tables 4, 6, 8, 11, 13 and 15. The analytical laboratory report is provided in Appendix D.

4.4.2 Groundwater

Groundwater samples were collected from the soil borings using temporary sampling points that resulted in moderately turbid samples. The turbidity of a sample can sometimes result in overstated analyte concentrations, especially when metals are concerned. The samples collected from the newly-installed monitoring wells are considered representative of groundwater conditions. The groundwater analytical results are summarized below:

- Gasoline-range TPH was detected in sample EP18-GW at a concentration of 190 µg/L and in sample EMW09-01 at a concentration of 180 µg/L. Gasoline-range TPH was not detected in the other groundwater samples.
- Concentrations of diesel-range TPH ranged from non-detect to 6,600 µg/L.
- The initial sample, EMW03-01, from well EMW03 returned a result of 140 µg/L diesel-range TPH and the resampled one, EMW03-02, returned a result of 130 µg/L diesel-range TPH.
- Concentrations of oil-range TPH ranged from non-detect to 1,200 µg/L.
- VOC compounds, including BTEX, were not detected in any of the groundwater samples except for sample EMW09-01 which had a concentration of 2.1 µg/L 1,2,4-trimethylbenzene.
- Concentrations of total arsenic in ranged from 2.01 µg/L to 12.5 µg/L;
- Concentrations of dissolved arsenic ranged from non-detect to 5.96 µg/L;
- Concentrations of total chromium ranged from non-detect to 3.91 µg/L;
- Concentrations of dissolved chromium ranged from non-detect to 1.32 µg/L;
- Concentrations of total lead ranged between non-detect to 3.46 µg/L;
- PCBs were not present above the laboratory method detection limits.
- Concentrations of PAH compounds ranged from non-detect to 7.8 µg/L;
- Concentrations of SVOCs were not detected in any of the groundwater samples except for sample EP18-GW which contained 0.61 µg/L dibenzofuran, 5.3 µg/L carbazole, 13 µg/L of 2-methylnaphthalene and 8.7 µg/L of 1-methylnaphthalene and sample EMW09-01 which contained 0.52 µg/L 2-methylnaphthalene and 1.3 µg/L1-methylnaphthalene.
- MNA parameter analyses from wells EMW03 and EMW09 returned results of 20 µg/L and 450 µg/L methane, 5,110 µg/L and 1,170 µg/L iron, 223 µg/L and 965 µg/L manganese, 6.5 mg/L and 3.77 mg/L ferrous iron, 7.48 mg/L and 30.30 mg/L total organic carbon, 165 mg/L and 240 mg/L alkalinity, 4,890 mg/L and 661 mg/L chloride, 554 mg/L and 107 mg/L sulfate, 220 mg/L sulfite, no detectable concentrations of ethane, ethene, and nitrate. Both samples had a pH of 7.2.

Summaries of the groundwater analytical data are presented in Tables 5, 7, 9, 10, 12, 14, 16, 17 18, 19, 20, 21, 22, 23, and 24. Copies of the analytical reports are included in Appendix D.

4.4.3 Oil/Water Separator

- The water sample OWS-01 collected from the oil/water separator at the northeast corner of the site returned results of 14,000 µg/L diesel-range TPH, 16,000 µg/L oil-range TPH, 6.88 µg/L lead, 4.33 µg/L chromium, no VOCs above the detection limits, SVOCs ranging from non-detect to 210 µg/L, PAH compounds ranging from non-detect to 0.50 µg/L, and no detectable PCBs.

5.0 DATA QUALIFICATION

FBI produced five case narratives, one for samples received on January 31, 2017, one for samples received on February 1, one for February 2, one for February 7, and one for February 10, 2017. Information contained in the case narratives and input from EHSI on data quality is presented below.

- The NWTPH-Dx analysis of sample EP2-GW was analyzed outside of the holding time. EHSI qualified the data with an “E” for an estimated value.

- The laboratory flagged the dissolved metals results for groundwater analytical results 'f', indicating that "The sample was laboratory filtered prior to analysis." These samples were stored and transported on ice, but were not fully stabilized with acid preservative until after filtering at the laboratory.
- The 8270D calibration standard did not pass for 2-fluorophenol, 2,4,6-tribromophenol, and terphenyl-d14 in sample EP15-6.
- The 8270D diethyl phthalate laboratory control sample duplicate exceeded the acceptance criteria. Diethyl phthalate was not detected in the samples and therefore the data was acceptable.
- The 8270D benzoic acid calibration standard did not pass the acceptance criteria. The data was flagged with "ca."
- The 8270D sample EP16-5 was diluted due to matrix effect. The reporting limits were raised accordingly.
- Several 8260 compounds in the matrix spike, laboratory control sample, and laboratory control sample duplicate exceeded the acceptance criteria. The compounds were not detected; therefore, the data is acceptable.
- 1,1,2,2-Tetrachloroethane failed below the acceptance criteria in the 8260C matrix spike. The laboratory control sample passed the acceptance criteria, therefore the results were likely due to matrix effect.
- One duplicate groundwater sample (EMW09-01 Dup.) was analyzed for VOCs, for quality assurance/quality control purposes. 1,2,4-trimethylbenzene was detected in both the original sample and the duplicate sample at concentrations of 1.9 µg/L and 2.1 µg/L respectively. The reportable percent difference between the two samples was 2%.
- The laboratory flagged several of the TPH soil and groundwater analytical results 'X', indicating that "The sample chromatographic pattern does not resemble the fuel standard used for quantitation."

Based on the data quality review presented above, EHSI judged all of the data to be acceptable for use in the Supplemental Phase II ESA.

6.0 REGULATORY REVIEW

6.1 Upland Sites Adjacent to the LDW

The regulatory environment of the LDW is complex, with multiple agencies responsible for remediation and compliance of soil, groundwater, sediment, and stormwater. In 2001, the LDW Superfund Site was listed on the National Priorities List. The LDW Superfund Site consists of the northern 5 miles of the Duwamish River to the southern end of Harbor Island and includes both the waterway and the adjacent upland sources. The Environmental Protection Agency (EPA) has been designated as the lead agency for cleanup of the waterway (defined as the LDW sediments and bank sediments below the top of bank), and Ecology has been designated as the lead agency for upland source control investigations and cleanups. Ecology is also responsible for stormwater compliance. Besides the EPA and Ecology, other stakeholders in the LDW Superfund Site include local tribes, potentially responsible parties or potentially liable parties (PRPs or PLPs, including current and former property owners), local city and county governments, and insurers. Given the large number of stakeholders, cleanups near the LDW receive considerable scrutiny, leading to a more complex cleanup process. For example, Ecology has prepared preliminary cleanup levels for upland source control investigations, and Ecology and EPA have continued to modify surface water quality screening levels (Ecology) and water quality standards (EPA). Given its proximity to the LDW and location within the larger LDW Superfund site, the subject property may become subject to regulatory oversight in the future which would likely entail the use of screening levels specifically developed for upland sites along the LDW. For reference, these LDW screening levels are included in Appendix E.

6.2 Regulatory Cleanup Levels

- The MTCA Method B Surface Water cleanup values were used because at the point of discharge, the groundwater must meet the applicable surface water quality standards. The section of the LDW next to the subject property is considered saline by Ecology and therefore the Method B surface water values for protection of marine aquatic life (WAC 173-201A-260) or protection of human health were used. The most restrictive Method B value between protection of marine aquatic life or protection of human health was used. The MTCA Method B Surface Water cleanup levels were used for the VOCs, PAH compounds, metals, and PCBs contaminants of concern where available. If MTCA Method B Surface Water cleanup levels were not available for particular chemical of concern, then the MTCA Method A or Method B Groundwater cleanup value was used. The groundwater in the vicinity of the subject property is not considered a potable source for human consumption due to salinity and that domestic water is provided to the area of the subject property by the City of Seattle. The subject property petroleum compound levels were compared to the MTCA Method A values because those values are not included in the MTCA Method B Surface Water tables. The detected concentrations of arsenic are above the MTCA Method B Surface Water values, but are within typical background concentrations for western Washington.
- The water sample from the oil/water separator, OWS-01, was not compared to the MTCA cleanup levels because it discharges to the sanitary sewer and not the LDW.
- The soil data were compared to either MTCA Method A or B cleanup levels for direct contact.

The following exceedances of the MTCA Cleanup Levels were documented in the following areas of the subject property:

Eastern Maintenance Bays of Main Building

- The concentration of 210 mg/kg gasoline-range TPH detected in soil sample EMW09-6 exceeds the MTCA Method A Soil Cleanup Level of 100 mg/kg.
- The concentrations of diesel-range TPH (6,600 µg/L) and oil-range TPH (1,200 µg/L) detected in groundwater sample EMW09-01 exceed the MTCA Method A Groundwater Cleanup Level of 500 µg/L.
- The concentrations of diesel-range TPH and oil-range TPH of 280 µg/L and 490 µg/L respectively detected in groundwater sample EMW05-01 exceed the combined MTCA Method A Groundwater Cleanup Level of 500 µg/L.
- The concentration of benzo(a)anthracene at 0.13 µg/L and benzo(b)fluoranthene at 0.15 µg/L in groundwater sample EMW05-01 exceeded the MTCA Method B Groundwater Cleanup Level of 0.12 µg/L. The groundwater sample EMW05-01 exceeds the MTCA Method B Surface water cleanup level of 0.0296 µg/L for benzo(a)pyrene.

- The concentrations of cPAH compounds in soil sample EMW05-8 exceeded the MTCA Method A Soil Cleanup Level of 0.1 mg/kg.
- The concentrations of diesel-range TPH (1,100 µg/L) and oil-range TPH (270 µg/L) at boring EP18 exceeded the MTCA Method A Combined Groundwater Cleanup Level of 500 µg/L.
- The concentration of 1-methylnaphthalene of 8.7 µg/L in groundwater at boring EP18 exceeded the MTCA Method B Cleanup Level of 1.51 µg/L.

Western Maintenance Bay of Main Building

- The concentrations of cPAH compounds in soil sample EP16-5 exceeded the MTCA Method A Soil Cleanup Level of 0.10 mg/kg.

There were detections of arsenic above the MTCA Method A Cleanup Level in groundwater at sample locations EP16, EMW08, and EMW09. However, the detected concentrations of arsenic are typical of background levels for groundwater in western Washington.

Ecology conducted a study in 2010 where they evaluated the MTCA Method A Cleanup Level and background arsenic concentrations. Ecology looked at arsenic data state-wide and found background arsenic concentrations ranged from 0.2 ug/L to 310 ug/L, with an arithmetic mean of 6.1 ug/L. Ecology also determined that background arsenic concentrations were higher in Western Washington as compared to Eastern Washington with concentrations exceeding 25 ug/L in 12 counties, including King. Ecology concluded that raising the arsenic cleanup level to 10 ug/L may be justified based on their study (Ecology 2010). Given this opinion from Ecology, it appears that the detected concentrations of arsenic in groundwater at the subject property may be a background condition and therefore a cleanup action with regards to this contaminant is not warranted.

7.0 CONCLUSIONS

EHSI offers the following conclusions and data gaps based upon the information presented in this report.

7.1 Conclusions

- The results of sampling and testing of the subject property has confirmed contamination of both soil and groundwater by petroleum next to the oil/water separator at the northeast corner of the subject property. An evaluation of the condition of the oil/water separator indicates that the tank is in very good condition. Given the very good condition of the oil/water separator, it appears unlikely that it is the source of contamination discovered at EMW09. The source of contamination at EMW09 may be from operations within the adjoining bus wash bay and/or nearby service bays. The extent of the contamination surrounding the oil/water separator is unknown. The groundwater flow at this portion of the property is towards the east and the adjoining Herring's House Park and contaminants may have migrated off-site in that direction.
- Diesel-range TPH and 1-methylnaphthalene was present in groundwater above cleanup levels in boring EP18 located at the north end of the maintenance bays of the eastern part of the main building. Both diesel and oil-range TPH and PAH compounds were present above cleanup levels in groundwater from well EMW05 at the south end of the maintenance bay of the eastern part of

the main building. The presence of TPH, SVOC, and PAH groundwater contamination in these areas appear likely the result of spills and/or other releases in the eastern maintenance bays.

- Concentrations of carcinogenic PAH compounds were documented at various locations around the Main Building. The carcinogenic PAH compounds are consistent with contaminants that were historically present on the subject property and were subject to earlier cleanup actions. It appears likely that these contaminants may be remnants left over from the historical cleanup action in 1996. The extent of PAH contamination is not defined.
- Representative groundwater samples obtained from well EMW01 at the northwest corner of the site were below the MTCA Cleanup Level for lead. These results indicate that the lead-contaminated groundwater previously noted at boring EP7 was likely a result of turbidity in the grab sample and conditions are compliant at that location.
- The soil and groundwater samples collected around the existing USTs are compliant with MTCA Cleanup Levels. The results from this area are consistent with previous sampling and testing by EHSI and ERM. The results of the sampling and testing from the UST cluster indicate that no releases have occurred from the tanks.
- No diesel-range TPH was detected above MTCA Cleanup Levels in soil and groundwater surrounding the diesel fuel dispenser at well borings EMW03, EMW04, EMW06, and EMW07. EHSI’s previous Phase II study documented 9,700 µg/L diesel-range TPH from a groundwater grab sample at boring EP3 located next to the dispenser which contrasts with the 130 µg/L and 140 µg/L concentrations obtained from well EMW03. The higher concentration of diesel-range TPH detected in the grab sample from boring EP3 may possibly be the result of a suspended colloidal mixture of soil grains with attached hydrocarbons and closer proximity to the dispenser. The soil sample from EP3 at eight feet bgs contained 13,000 mg/kg diesel-range TPH and 950 mg/kg oil-range TPH. The soil results along with field indications, including elevated PID readings, strong petroleum odors, and soil staining, present multiple lines of evidence that soil immediately next to and likely beneath the dispenser is contaminated and that cleanup is warranted at this location. Tightness testing of the diesel product line indicated that the line is “tight” (PESCO, 2017) which suggests that the diesel-range TPH in the soil and/or groundwater at this location is likely the result of spills.

7.2 Data Gaps

- The in-floor heating system of the main building limited advancing borings within the structure. Given this limitation, subsurface environmental conditions beneath the building are considered a data gap.

8.0 REFERENCES

Ecology. 2010. Draft Revisions to Method A Groundwater Cleanup Levels. June 2010.

EHSI, 2015. Phase I Environmental Site Assessment, Bus Maintenance Facility, 4500 West Marginal Way SW, Seattle, Washington. August, 2015.

EHSI, 2016. Phase II Environmental Site Assessment, Bus Maintenance Facility, 4500 West Marginal Way SW, Seattle, Washington. December 2016 (Revised January 2017).

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9.0 SIGNATURES

This Supplemental Phase II ESA Report was prepared by the undersigned.

2562
JASON CASS

Jason Cass 4/12/17

Jason Cass
Washington Licensed Geologist; License 2562

Date

4-12-

Kurt Easthouse, L.G.
Washington Licensed Geologist; License 0929

Date

0929
Kurt Allen Easthouse

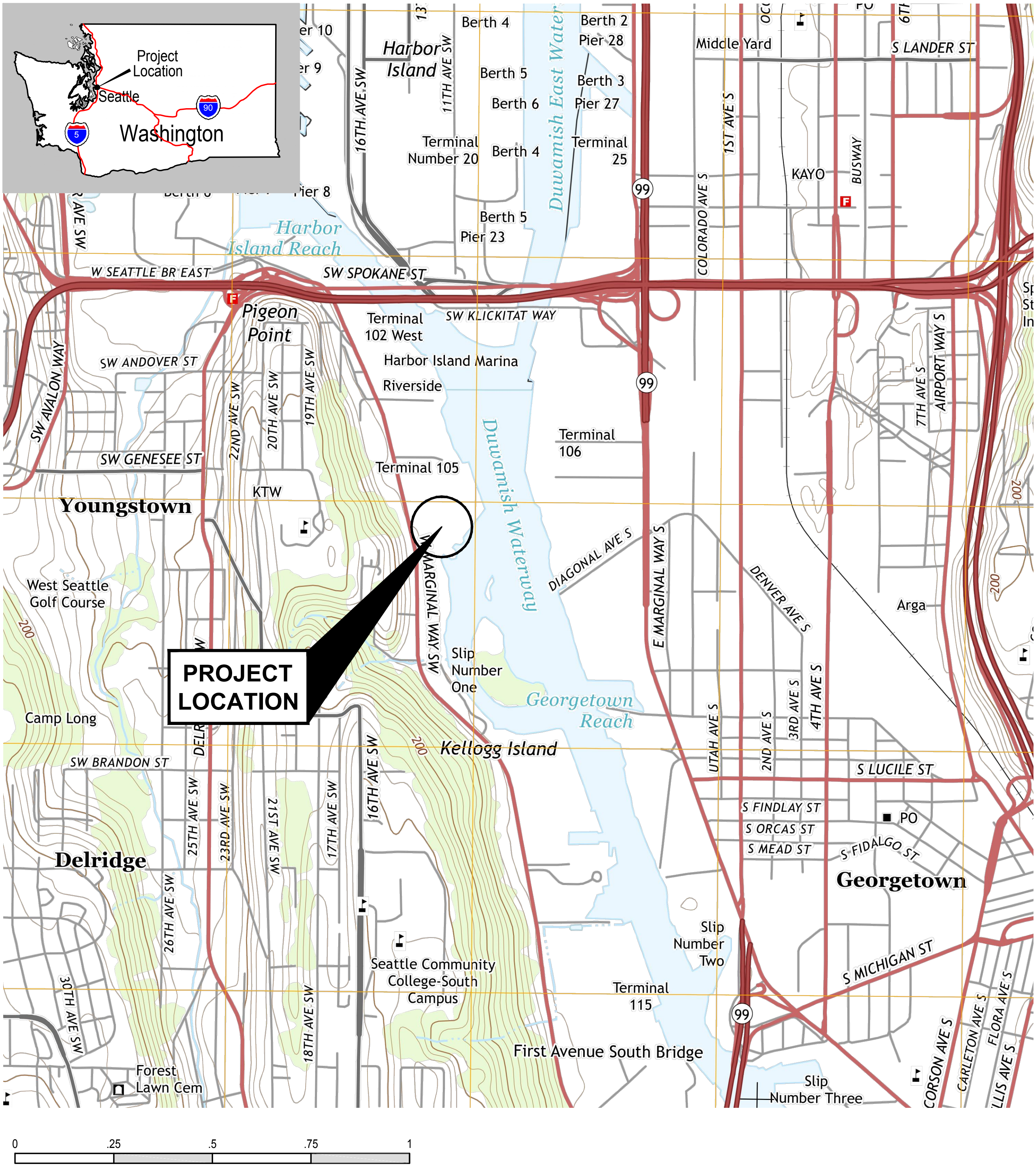
10.0 PROJECT LIMITATIONS

The conclusions presented in report are professional opinions based upon our visual observations and physical testing. This report is intended exclusively for the purpose outline herein and at the site location and project indicated. This report is for the sole use of our client, City of Seattle. Opinions and conclusions presented herein apply to site conditions existing at the time of execution of our Supplemental Phase II ESA do not necessarily apply to future changes or other prior conditions at the site of which EHSI is not aware and has not had the opportunity to evaluate. The scope of services performed in execution of this Phase II ESA may not be appropriate to satisfy the needs of other users, and any use or re-use of the document or the findings, conclusions, or recommendations presented is at the sole risk of the said user.

EHSI's objective is to perform our work with care, exercising the customary thoroughness and competence of environmental consulting professionals in the relevant disciplines. Furthermore, we carried out our services in accordance with the standard for professional services by a consulting firm at the time those services were rendered. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liability on a particular site. Therefore, EHSI cannot act as insures and cannot "certify or underwrite" that a site is totally free of environmental liability. In addition, no expressed or implied representation or warranty is included or intended in our report except that our work was performed within the limits prescribed by our client, and with the customary thoroughness and competence of our profession.

FIGURES

IMAGE REF: USGS 1983



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NORTH

SHEET/FIGURE	PROJECT MANAGER:	K. EASTHOUSE	4500 W MARGINAL WAY SW SEATTLE, WA VICINITY MAP	**ehsi** EHS-International, Inc. 1011 SW Klickitat Way, Suite 104 Seattle, Washington 98134 Ph: 206.381.1128 Fax: 206.254.4279
1	EHSI PROJECT #:	10737c-05		
	PREPARED BY:	F. DIMALANTA		
	ISSUE DATE:	03/31/17		
	SCALE:	SHOWN		

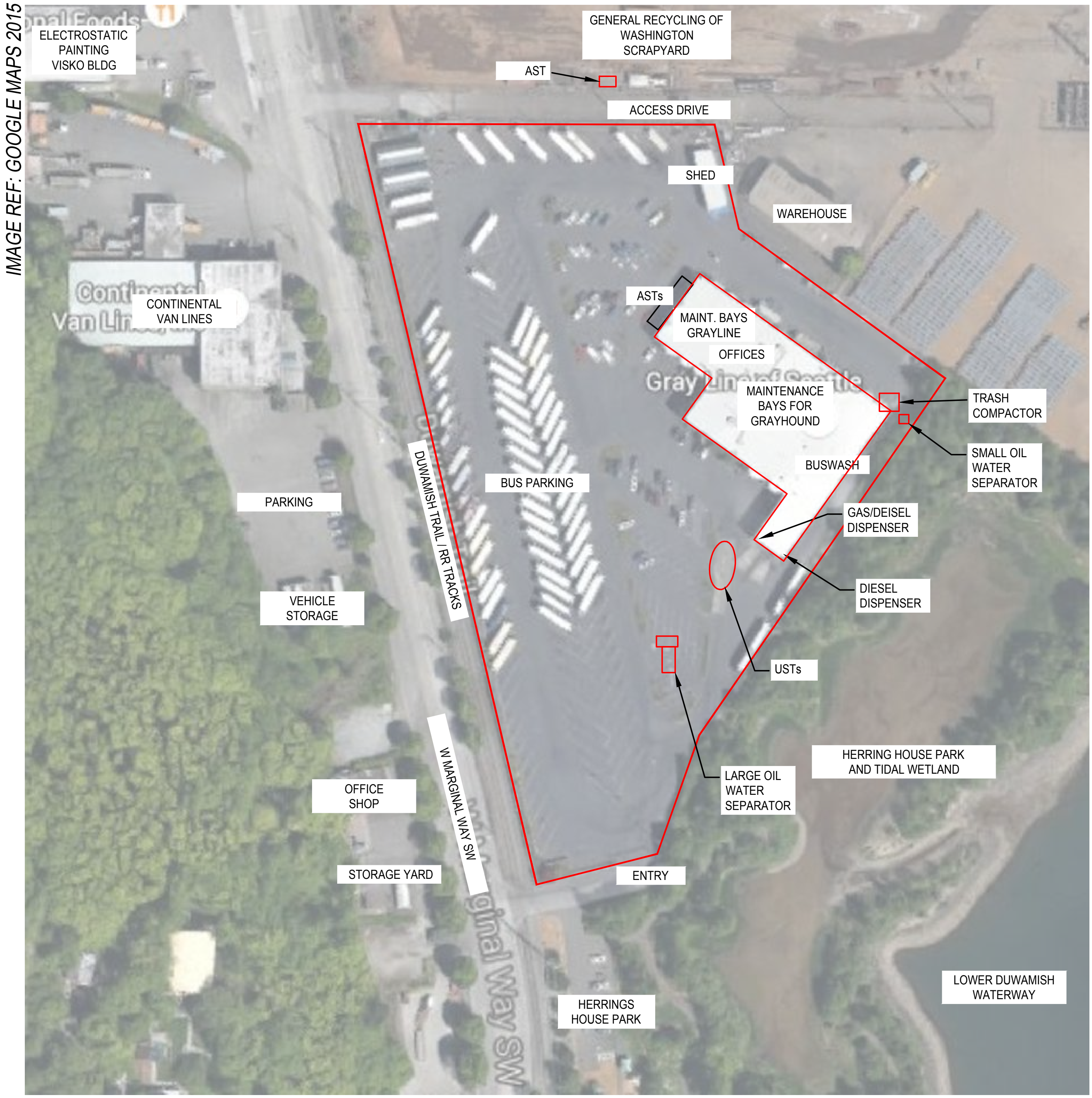

IMAGE REF: GOOGLE MAPS 2015

LEGEND

🟥 SUBJECT PROPERTY

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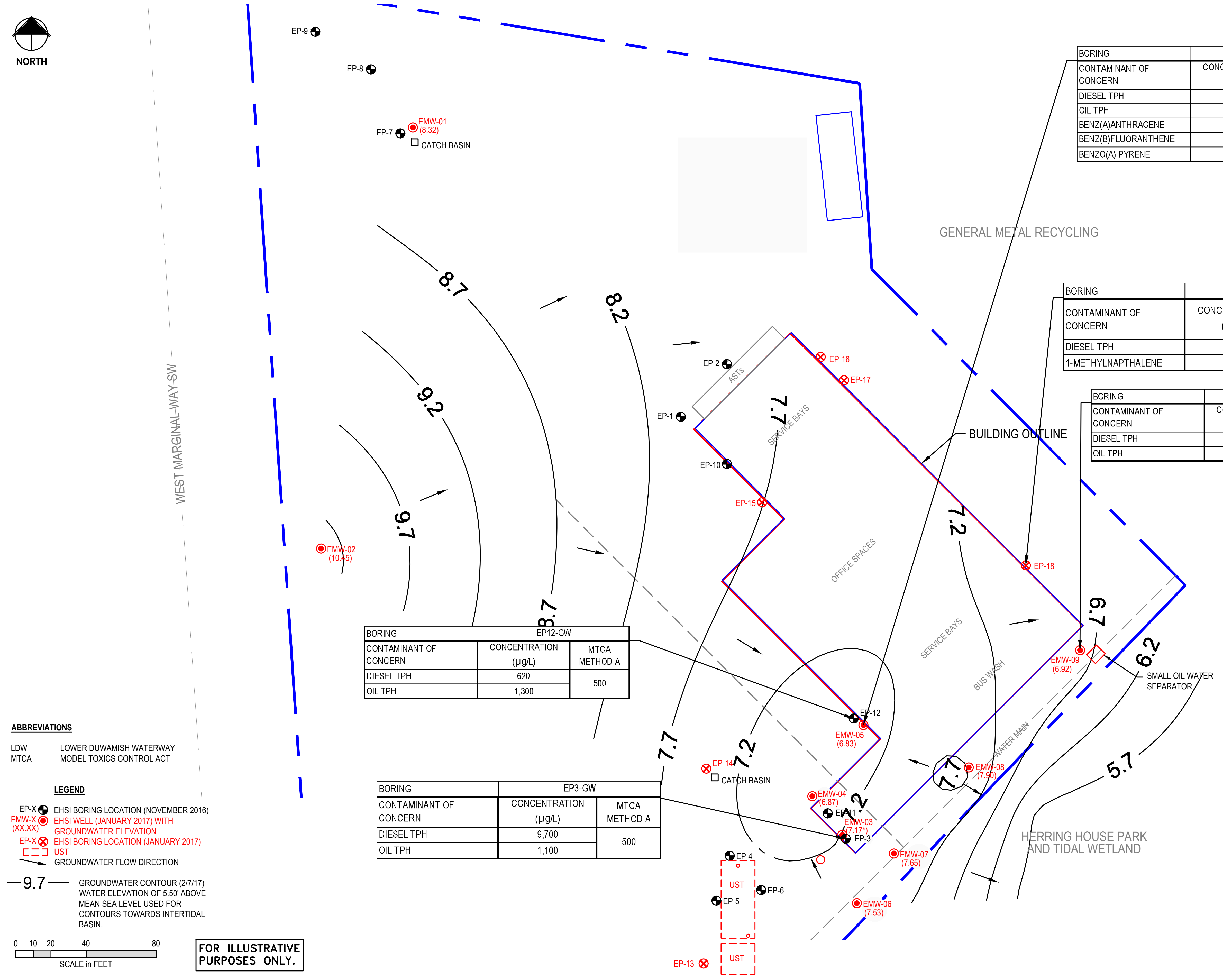
NORTH

SHEET/FIGURE 2	PROJECT MANAGER:	K. EASTHOUSE
	EHSI PROJECT #:	10737c-05
	PREPARED BY:	F. DIMALANTA
	ISSUE DATE:	03/31/17
	SCALE:	NTS

4500 W MARGINAL WAY SW
SEATTLE, WA

SITE PLAN

ehsi
EHS-International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279



BORING	EMW05-01		
CONTAMINANT OF CONCERN	CONCENTRATION (µg/L)	MTCA METHOD A	MTCA METHOD B SURFACEWATER
DIESEL TPH	280	500	NS
OIL TPH	490		
BENZ(A)ANTHRACENE	0.13	0.12	0.296
BENZ(B)FLUORANTHENE	0.15	0.12	0.296
BENZO(A) PYRENE	0.067	0.10	0.0296

BORING	EP18-GW	
CONTAMINANT OF CONCERN	CONCENTRATION (µg/L)	MTCA METHOD A OR B
DIESEL TPH	1,100	500
1-METHYLNAPTHALENE	8.7	1.51

BORING	EMW09-01	
CONTAMINANT OF CONCERN	CONCENTRATION (µg/L)	MTCA METHOD A
DIESEL TPH	6,600	500
OIL TPH	1,200	

BORING	EP12-GW	
CONTAMINANT OF CONCERN	CONCENTRATION (µg/L)	MTCA METHOD A
DIESEL TPH	620	500
OIL TPH	1,300	

BORING	EP3-GW	
CONTAMINANT OF CONCERN	CONCENTRATION (µg/L)	MTCA METHOD A
DIESEL TPH	9,700	500
OIL TPH	1,100	

ABBREVIATIONS

LDW	LOWER DUWAMISH WATERWAY
MTCA	MODEL TOXICS CONTROL ACT

LEGEND

EP-X ◐	EHSI BORING LOCATION (NOVEMBER 2016)
EMW-X ◉ (XX.XX)	EHSI WELL (JANUARY 2017) WITH GROUNDWATER ELEVATION
EP-X ⊗	EHSI BORING LOCATION (JANUARY 2017)
⊏ ⊐	UST
→	GROUNDWATER FLOW DIRECTION
—9.7—	GROUNDWATER CONTOUR (2/7/17) WATER ELEVATION OF 5.50' ABOVE MEAN SEA LEVEL USED FOR CONTOURS TOWARDS INTERTIDAL BASIN.

0 10 20 40 80
SCALE in FEET

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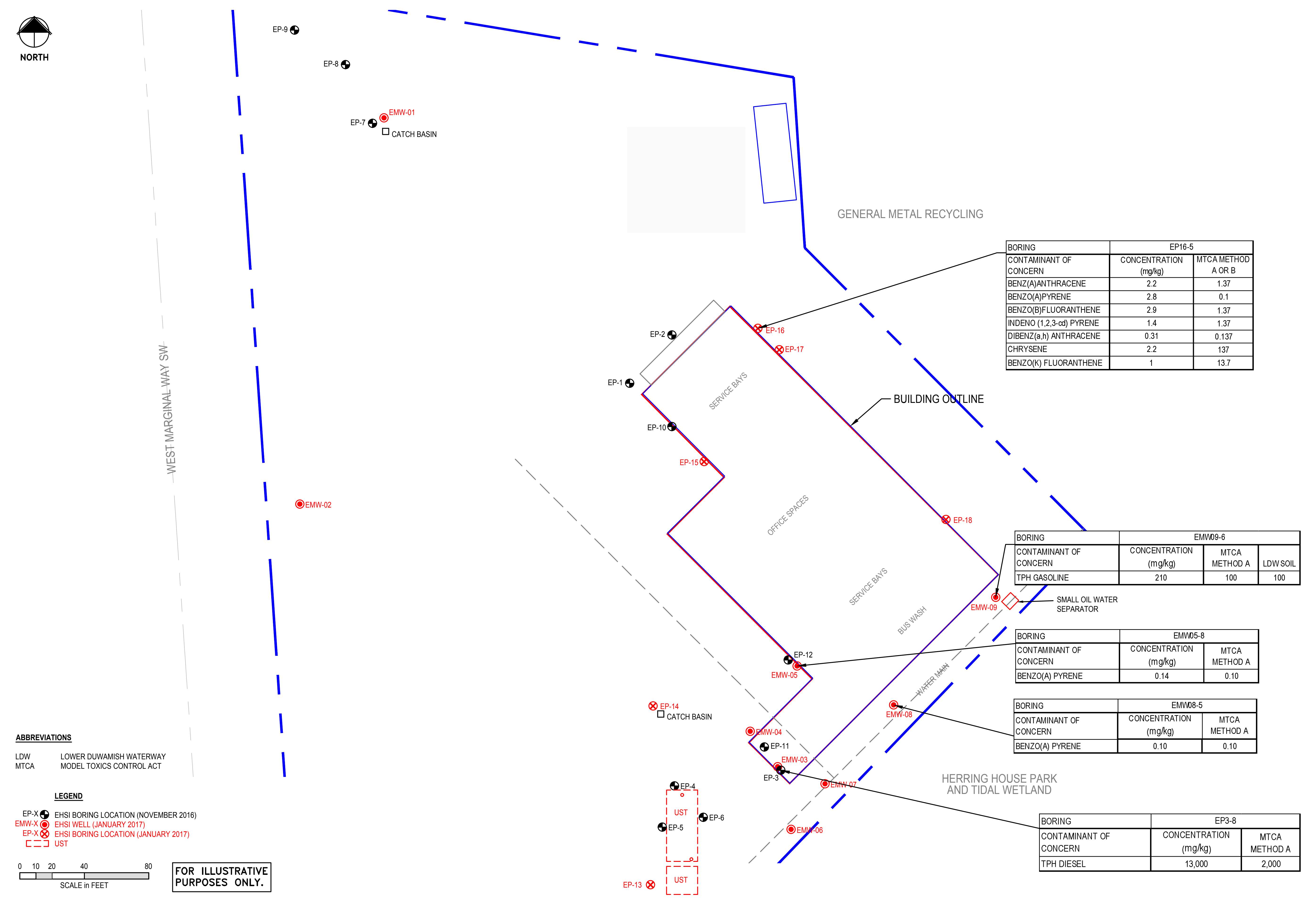
EHS-International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

4500 W MARGINAL WAY SW
SEATTLE, WA

PROJECT MANAGER: K. EASTHOUSE
INSPECTORS:
SURVEY DATE:
EHSI PROJECT #: 10737c-05
DRAWN BY: F. DIMALANTA
SCALE: SHOWN
ISSUE DATE: 03/27/17

GROUNDWATER DATA ABOVE MTCA

SHEET/FIGURE
3



BORING	EP16-5	
CONTAMINANT OF CONCERN	CONCENTRATION (mg/kg)	MTCA METHOD A OR B
BENZ(A)ANTHRACENE	2.2	1.37
BENZO(A)PYRENE	2.8	0.1
BENZO(B)FLUORANTHENE	2.9	1.37
INDENO (1,2,3-cd) PYRENE	1.4	1.37
DIBENZ(a,h) ANTHRACENE	0.31	0.137
CHRYSENE	2.2	137
BENZO(K) FLUORANTHENE	1	13.7

BORING	EMW09-6		
CONTAMINANT OF CONCERN	CONCENTRATION (mg/kg)	MTCA METHOD A	LDW SOIL
TPH GASOLINE	210	100	100

BORING	EMW05-8	
CONTAMINANT OF CONCERN	CONCENTRATION (mg/kg)	MTCA METHOD A
BENZO(A) PYRENE	0.14	0.10

BORING	EMW08-5	
CONTAMINANT OF CONCERN	CONCENTRATION (mg/kg)	MTCA METHOD A
BENZO(A) PYRENE	0.10	0.10

BORING	EP3-8	
CONTAMINANT OF CONCERN	CONCENTRATION (mg/kg)	MTCA METHOD A
TPH DIESEL	13,000	2,000

ABBREVIATIONS

LDW	LOWER DUWAMISH WATERWAY
MTCA	MODEL TOXICS CONTROL ACT

LEGEND

EP-X ⊕	EHSI BORING LOCATION (NOVEMBER 2016)
EMW-X ◉	EHSI WELL (JANUARY 2017)
EP-X ⊗	EHSI BORING LOCATION (JANUARY 2017)
⊏⊐	UST

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ehsi
EHS-International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

4500 W MARGINAL WAY SW
SEATTLE, WA

PROJECT MANAGER: K. EASTHOUSE
INSPECTORS:
SURVEY DATE:
EHSI PROJECT #: 10737c-05
DRAWN BY: F. DIMALANTA
SCALE: SHOWN
ISSUE DATE: 03/27/17

SOIL DATA
ABOVE MTCA

SHEET/FIGURE

4

TABLES

TABLE 1: SOIL SAMPLE SOURCE INFORMATION

SOIL SAMPLE IDENTIFICATION	SAMPLE LOCATION AND DEPTH
EP13-6	Boring EP13 at 6’ BGS (west side of diesel UST).
EP14-5	Boring EP14 at 5’ BGS (northwest side of catch basin).
EP15-6	Boring EP15 at 6’ BGS (south side of west maintenance bay).
EP16-5	Boring EP16 at 5’ BGS (north side of west maintenance bay).
EP17-6	Boring EP17 at 6’ BGS (north side of west maintenance bay).
EP18-5	Boring EP18 at 5’ BGS (north side of east maintenance bay).
EMW01-5	Well boring EMW01 at 5’ BGS (next to catch basin at NWC of site).
EMW03-5	Well boring EMW03 at 5’ BGS (next to diesel dispenser).
EMW03-7	Well boring EMW03 at 7’ BGS (next to diesel dispenser).
EMW03-10	Well boring EMW03 at 10’ BGS (next to diesel dispenser).
EMW04-5	Well boring EMW04 at 5’ BGS (northwest of diesel dispenser).
EMW04-6	Well boring EMW04 at 6’ BGS (northwest of diesel dispenser).
EMW04-10	Well boring EMW04 at 10’ BGS (northwest of diesel dispenser).
EMW05-8	Well boring EMW05 at 8’ BGS (south side of east maintance bay).
EMW06-5	Well boring EMW06 at 5’ BGS (south of diesel dispenser).
EMW06-6	Well boring EMW06 at 6’ BGS (south of diesel dispenser).
EMW06-10	Well boring EMW06 at 10’ BGS (south of diesel dispenser).
EMW07-3	Well boring EMW07 at 3’ BGS (east of diesel dispenser).
EMW07-5	Well boring EMW07 at 5’ BGS (east of diesel dispenser).
EMW07-10	Well boring EMW07 at 10’ BGS (east of diesel dispenser).
EMW08-5	Well boring EMW05 at 5’ BGS (east of bus wash).
EMW09-6	Well boring EMW09 at 6’ BGS (west side of NE oil/water separator).
EMW09-12	Well boring EMW09 at 12’ BGS (west side of NE oil/water separator).
EMW09-15	Well boring EMW09 at 15’ BGS (west side of NE oil/water separator).
EMW09-20	Well boring EMW09 at 20’ BGS (west side of NE oil/water separator).

TABLE 2: GROUNDWATER SAMPLE SOURCE INFORMATION	
GROUNDWATER SAMPLE IDENTIFICATION	**SAMPLE LOCATION**
EP13-GW	Boring EP13, near west side of diesel UST.
EP14-GW	Boring EP14, next to catch basin by USTs.
EP15-GW	Boring EP15, south side of west maintenance bay.
EP16-GW	Boring EP16, north side of west maintenance bay.
EP17-GW	Boring EP17, north side of west maintenance bay.
EP18-GW	Boring EP18, north side of east maintenance bay.
EMW01-01	Well EMW01, next to catch basin at northwest portion of site.
EMW02-01	Well EMW02, along west side of site.
EMW03-01	Well EMW03, next to diesel dispenser.
EMW04-01	Well EMW-04, northwest of diesel dispenser.
EMW05-01	Well EMW05, south side of east maintance bay.
EMW06-01.	Well EMW06, south of diesel dispenser.
EMW07-01	Well EMW07, east of diesel dispenser.
EMW08-01	Well EMW08, east of bus wash.
EMW09-01	Well EMW09, next to northeast oil/water separator.
EMW09-01 Dup.	Duplicate sample of EMW09-01.

TABLE 3: MONITORING WELL WATER LEVEL MEASUREMENTS

7-Feb-17

MONITORING WELL	TOP OF CASING ELEVATION (Feet)	STATIC WATER LEVEL (Feet Below TOC1)	GROUNDWATER ELEVATION
EMW01	11.54	3.22	8.32
EMW02	12.30	1.85	10.45
EMW03	12.09	4.92	7.17
EMW04	11.98	5.11	6.87
EMW05	12.06	5.23	6.83
EMW06	12.14	4.61	7.53
EMW07	11.98	4.33	7.65
EMW08	11.42	3.52	7.90
EMW09	12.11	5.19	6.92

Explanation:
Static water level measured in feet below top of casing.

Table 4: Total Petroleum Hydrocarbons
Soil Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Gasoline Range	Diesel Range	Motor Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
EP13-6	1/31/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
EP14-5	1/31/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
EP15-6	1/31/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
EP16-5	1/31/2017	<2	**78 x**	**380**	<0.02	<0.02	<0.02	<0.06
EP17-6	1/31/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
EP18-5	1/31/2017	<2	**1,400**	<250	<0.02	<0.02	<0.02	<0.06
EMW03-5	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW03-7	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW03-10	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW04-5	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW04-6	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW04-10	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW05-8	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW06-5	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW06-6	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW06-10	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW07-3	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW07-5	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW07-10	2/2/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW08-5	2/2/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
MTCA Cleanup Levels:								
Soil, Method A		30* / 100	2,000.00	2,000.00	0.03	7.00	6.00	9.00
Soil, Method B, Cancer		NS	NS	NS	18.20	NS	NS	NS
Soil, Method B, Non-cancer		NS	NS	NS	320.00	6,400.00	8,000.00	16,000.00

Table 4: Total Petroleum Hydrocarbons
Soil Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date**	**Gasoline Range**	**Diesel Range**	**Motor Oil Range**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**
EMW09-6	2/2/2017	**210**	**810**	<250	<0.02	<0.02	**0.033**	**0.071**
EMW09-12	2/2/2017	**24**	**270**	<250	<0.02	<0.02	<0.02	<0.06
EMW09-15	2/2/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
EMW09-20	2/2/2017	<2	<50	<250	<0.02	<0.02	<0.02	<0.06
MTCA Cleanup Levels:								
Soil, Method A		30/ 100	2,000	2,000	0.03	7	6	9
Soil, Method B, Cancer		NS	NS	NS	18.20	NS	NS	NS
Soil, Method B, Non-cancer		NS	NS	NS	320.00	6,400.00	8,000.00	16,000.00

Notes:
(I): Sampling results compared to MTCA Method A and Method B cleanup levels.
Concentrations are reported in mg/kg (ppm)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
NS - No Standard
N/T: Not Tested

Table 5: Total Petroleum Hydrocarbons
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Gasoline Range	Diesel Range	Motor Oil Range	Benzene	Toluene	Ethyl benzene	Total Xylenes
EP13-GW	1/31/2017	<100	**140 x**	<250	<1	<1	<1	<3
EP14-GW	1/31/2017	<100	**150 x**	<250	<1	<1	<1	<3
EP15-GW	1/31/2017	<100	**180 x**	**270 x**	<1	<1	<1	<3
EP16-GW	1/31/2017	<100	**120 x**	<250	<1	<1	<1	<3
EP18-GW	1/31/2017	**190**	**1,100 x**	**270 x**	<1	<1	<1	<3
OWS-01	3/17/2017	<500	**14,000 x**	**16,000**	<1.7	<5	<5	<15
MTCA Cleanup Levels:								
Groundwater, Method A		800/ 1000	500.00	500.00	5.00	1,000.00	700.00	1,000.00
Groundwater, Method B, Cancer		NS	NS	NS	0.795	NS	NS	NS
Groundwater, Method B, Non-cancer		NS	NS	NS	32.00	640.00	800.00	1,600.00
Surface Water, Method B, Cancer		NS	NS	NS	22.70	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	1,990.00	18,900.00	6,820.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method and Method B Cleanup Levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
N/T: Not Tested
NS - No Standard
Samples analyzed by Friedman & Bruya, Inc.

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Dichloro difluoro methane	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichloro fluoro methane	Acetone
EP15-6	1/31/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
EP16-5	1/31/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
EP17-6	1/31/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
EP18-6	1/31/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
EMW08-5	2/2/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
EMW09-12	2/2/2017	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Non-cancer		16,000.00	NS	240.00	112.00	NS	24,000.00	72,000.00

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	1, 1-Dichloro ethene	Hexane	Methylene Chloride	Methyl t-butyl Ether (MTBE)	Trans-1,2-Dichloroethene	1,1-Dichloro ethane	2,2-Dichloropropane
EP15-6	1/31/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
EP16-5	1/31/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
EP17-6	1/31/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
EP18-6	1/31/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
EMW08-5	2/2/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
EMW09-12	2/2/2017	<0.05	<0.25	<0.5	<0.05	<0.05	<0.05	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	0.02	0.10	NS	NS	NS
Soil, Method B, Cancer		NS	NS	500.00	556.00	NS	175.00	NS
Soil, Method B, Non-cancer		4,000.00	4,800.00	480.00	NS	1,600.00	16,000.00	NS

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane	Carbon Tetrachloride	1,1-Dichloro propane	1,2-Dichloroethane	Trichloroethene
EP15-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
EP16-5	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
EP17-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
EP18-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
EMW08-5	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
EMW09-12	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	2.00	NS	NS	NS	0.03
Soil, Method B, Cancer		NS	32.30	NS	14.30	27.80	NS	12.00
Soil, Method B, Non-cancer		160.00	800.00	160,000.00	320.00	7,200.00	480.00	40.00

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	1,2-Dichloro propane	Dibromo methane	Bromodichlorom ethane	cis-1,3-Dichloro propane	Trans-1,3-Dichloro propane	1,1,2-Trichloroethane	Tetrachloro ethane
EP15-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
EP16-5	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
EP17-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
EP18-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
EMW08-5	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
EMW09-12	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.025
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	0.05
Soil, Method B, Cancer		27.80	NS	16.10	10.00	10.00	17.50	476.00
Soil, Method B, Non-cancer		7,200.00	800.00	1,600.00	2,400.00	2,400.00	320.00	480.00

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	1,3-Dichloropropane	Dibromochloromethane	1,2-Dibromoethane	Chlorobenzene	1,1,1,2-Tetrachloroethane	Styrene	Bromoform
EP15-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP16-5	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP17-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP18-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW08-5	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW09-12	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	0.005	NS	NS	NS	NS
Soil, Method B, Cancer		NS	11.90	0.50	NS	38.50	NS	127.00
Soil, Method B, Non-cancer		NS	1,600.00	720.00	1,600.00	2,400.00	16,000.00	1,600.00

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Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Isopropyl benzene	1,2,3 Trichloro propane	Bromobenzene	1,1,2,2-Tetrachloro ethane	n-Propylbenzene	2-Chlorotoluene	4-Chlorotoluene
EP15-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP16-5	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP17-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP18-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW08-5	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW09-12	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	0.03	NS	5.0	NS	NS	NS
Soil, Method B, Non-cancer		8,000.00	320.00	NS	2,400.00	8,000.00	1,600.00	NS

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	1,3,5-Trimethyl benzene	tert-Butyl benzene	1,2,4-Trimethyl benzene	sec-Butylbenzene	1,3-Dichloro benzene	Isopropyl toluene	1,4-Dichlorobenzene
EP15-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP16-5	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP17-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EP18-6	1/31/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW08-5	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EMW09-12	2/2/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	NS	NS	NS	NS	NS	185.00
Soil, Method B, Non-cancer		800.00	8,000.00	NS	8,000.00	NS	NS	5,600.00

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	1,2-Dichloro benzene	n-Butylbenzene	1,2-Dibromo-3-Chloropropane	1,2,4-Trichloro benzene	Hexachloro-1,3-butadiene	Naphthalene	1,2,3-Trichlorobenzene
EP15-6	1/31/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
EP16-5	1/31/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
EP17-6	1/31/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
EP18-6	1/31/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
EMW08-5	2/2/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
EMW09-12	2/2/2017	<0.05	<0.05	<0.5	<0.25	<0.25	<0.05	<0.25
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	5.00	NS
Soil, Method B, Cancer		NS	NS	1.25	NS	12.80	NS	NS
Soil, Method B, Non-cancer		7,200.00	4,000.00	16.00	7,200.00	80.00	1,600.00	NS

Table 6: Volatile Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	2-Butanone (MEK)	4-Methyl-2-pentanone	2-Hexanone
EP15-6	1/31/2017	<0.5	<0.5	<0.5
EP16-5	1/31/2017	<0.5	<0.5	<0.5
EP17-6	1/31/2017	<0.5	<0.5	<0.5
EP18-6	1/31/2017	<0.5	<0.5	<0.5
EMW08-5	2/2/2017	<0.5	<0.5	<0.5
EMW09-12	2/2/2017	<0.5	<0.5	<0.5

MTCA Cleanup Levels:

Soil, Method A	NS	NS	NS
Soil, Method B, Cancer	48,000.00	6,400.00	NS
Soil, Method B, Non-cancer	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and Method B cleanup levels.
Concentrations are reported in mg/kg (ppm)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Dup: Duplicate
N/T: Not Tested
NS: No Standard
Samples analyzed by Friedman & Bruya, Inc.

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Dichloro difluoro methane	Chloro methane	Vinyl chloride	Bromo methane	Chloroethane	Trichloro fluoro methane	Acetone
EP15-GW	1/31/2017	<1	<10	<0.2	<1	<1	<1	<10
EP16-GW	1/31/2017	<1	<10	<0.2	<1	<1	<1	<10
EP17-GW	1/31/2017	<1	<10	<0.2	<1	<1	<1	<10
EP18-GW	1/31/2017	<1	<10	<0.2	<1	<1	<1	<10
OWS-01	3/17/2017	<5	<50	<1	<5	<5	<5	<50
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	0.20	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	Ecology Guidance	NS	NS	NS	NS
Groundwater, Method B, Non cancer		1,600.00	NS	24.00	11.20	NS	2,400.00	7,200.00
Surface Water, Method B, Cancer		NS	27.50	Ecology Guidance	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	13,600.00	6,480.00	955.00	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	1, 1-Dichloro ethene	Hexane	Methylene Chloride	Methyl t-butyl Ether (MTBE)	Trans-1,2-Dichloro ethene	1,1-Dichloro ethane
EP15-GW	1/31/2017	<1	<1	<5	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<5	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<5	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<5	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<25	<5	<5	<5
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	5.00	20.00	NS	NS
Groundwater, Method B, Cancer		NS	NS	21.88	24.31	NS	7.68
Groundwater, Method B, Non cancer		400.00	480.00	48.00	NS	160.00	1,600.00
Surface Water, Method B, Cancer		NS	NS	3,600.00	NS	NS	NS
Surface Water, Method B, Non-cancer		23,100.00	NS	17,300.00	NS	32,400.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	2,2-Dichloro propane	cis-1,2-Dichloro ethene	Chloroform	2-Butanone (MEK)	1,2-Dichloro ethane (EDC)	1,1,1-Trichloro ethane	1,1-Dichloro propene
EP15-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<5	<50	<5	<5	<5
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	5.00	200.00	NS
Groundwater, Method B, Cancer		NS	NS	1.41	NS	0.48	NS	NS
Groundwater, Method B, Non cancer		NS	16.00	80.00	4,800.00	48.00	16,000.00	NS
Surface Water, Method B, Cancer		NS	NS	55.00	NS	59.40	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	6,820.00	NS	13,000.00	926,000.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Carbontetra chloride	Trichloro ethene	1,2-Dichloro propane	Bromo dichloro methane	Dibromo methane	4-Methyl-2-pentanone
EP15-GW	1/31/2017	<1	<1	<1	<1	<1	<10
EP16-GW	1/31/2017	<1	<1	<1	<1	<1	<10
EP17-GW	1/31/2017	<1	<1	<1	<1	<1	<10
EP18-GW	1/31/2017	<1	<1	<1	<1	<1	<10
OWS-01	3/17/2017	<5	<5	<5	<5	<5	<50

MTCA Cleanup Levels:

Groundwater, Method A	NS	5.00	NS	NS	NS	NS
Groundwater, Method B, Cancer	0.63	0.54	1.22	0.71	NS	NS
Groundwater, Method B, Non cancer	32.00	4.00	720.00	160.00	80.00	640.00
Surface Water, Method B, Cancer	4.87	12.80	43.90	27.50	NS	NS
Surface Water, Method B, Non-cancer	546.00	118.00	56,900.00	13,600.00	955.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	cis-1,3-Dichloro propene	trans-1,3-Dichloro propene	1,1,2-Trichloro ethane	2-Hexanone	1,3-Dichloro propane	Tetrachloro ethene	Dibromo chloro methane
EP15-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<1	<10	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<5	<50	<5	<5	<5
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	5.00	NS
Groundwater, Method B, Cancer		0.44	0.44	0.77	NS	NS	20.83	0.52
Groundwater, Method B, Non cancer		240.00	240.00	32.00	NS	NS	48.00	160.00
Surface Water, Method B, Cancer		34.10	34.10	25.30	NS	NS	99.60	20.30
Surface Water, Method B, Non-cancer		40,900.00	40,900.00	2,300.00	NS	NS	502.00	13,600.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	1,2-Dibromo ethane (EDB)	Chloro benzene	1,1,1,2-Tetra chloro ethane	Styrene	Isopropyl benzene	Bromoform
EP15-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<1	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<5	<5	<5	<5

MTCA Cleanup Levels:

Groundwater, Method A	0.01	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer	0.02	NS	1.68	NS	NS	5.54
Groundwater, Method B, Non cancer	72.00	160.00	240.00	1,600.00	800.00	160.00
Surface Water, Method B, Cancer	NS	NS	NS	NS	NS	21.60
Surface Water, Method B, Non-cancer	NS	5,190.00	NS	NS	NS	13,600.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	n-Propyl benzene	Bromo benzene	1,3,5-Trimethyl benzene	1,1,2,2-Tetrachloro ethane	1,2,3-Trichloro propane	2-Chloro toluene	4-Chloro toluene
EP15-GW	1/31/2017	<1	<1	<1	<1	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<1	<1	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<1	<1	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<1	<1	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<5	<5	<5	<5	<5
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	0.22	0.00	NS	NS
Groundwater, Method B, Non cancer		800.00	NS	80.00	160.00	32.00	160.00	NS
Surface Water, Method B, Cancer		NS	NS	NS	6.48	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	10,400.00	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

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Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	tert-Butyl benzene	1,2,4-Trimethyl benzene	sec-Butyl benzene	Isopropyl toluene	1,3-Dichloro benzene	1,4-Dichloro benzene
EP15-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<1	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<1	<1	<1	<1
OWS-01	3/17/2017	<5	<5	<5	<5	<5	<5

MTCA Cleanup Levels:

Groundwater, Method A	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer	NS	NS	NS	NS	NS	8.10
Groundwater, Method B, Non cancer	800.00	NS	800.00	NS	NS	560.00
Surface Water, Method B, Cancer	NS	NS	NS	NS	NS	21.40
Surface Water, Method B, Non-cancer	NS	NS	NS	NS	NS	3,240.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS	NS	NS	NS	NS

Table 7: Volatile Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	1,2-Dichloro benzene	n-Butyl benzene	1,2-Dibromo-3-chloro propane	1,2,4-Trichloro benzene	Hexachloro-1, 3-butadiene	Naphthalene	1,2,3-Trichloro benzene
EP15-GW	1/31/2017	<1	<1	<10	<2	<1	<1	<1
EP16-GW	1/31/2017	<1	<1	<10	<2	<1	<1	<1
EP17-GW	1/31/2017	<1	<1	<10	<2	<1	<1	<1
EP18-GW	1/31/2017	<1	<1	<10	<2	<1	**100**	<1
OWS-01	3/17/2017	<5	<5	<50	<5	<5	<5	<5
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	160.00	NS
Groundwater, Method B, Cancer		NS	NS	0.05	1.51	0.56	NS	NS
Groundwater, Method B, Non cancer		720.00	400.00	1.60	80.00	8.00	160.00	NS
Surface Water, Method B, Cancer		NS	NS	NS	2.03	29.70	NS	NS
Surface Water, Method B, Non-cancer		4,170.00	NS	NS	236.00	92.60	4,710.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and Method B Cleanup Levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
NT - Not Tested
NS: No Standard
Samples analyzed by Friedman & Bruya, Inc.

Table 8: Total Metals
Soil Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury
EP13-6	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	**7.07**	N/T
EP14-5	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	**5.94**	N/T
EP15-6	1/31/2017	**8.10**	**1.50**	N/T	N/T	<1	N/T	**5.75**	<1
EP16-5	1/31/2017	**8.28**	**3.12**	N/T	N/T	<1	N/T	**58.6**	<1
EP17-6	1/31/2017	**5.39**	<1	N/T	N/T	<1	N/T	**1.07**	<1
EP18-5	1/31/2017	**5.67**	**1.07**	N/T	N/T	<1	N/T	**3.60**	<1
EMW01-5	2/1/2017	N/T	N/T	N/T	N/T	N/T	N/T	**61.8**	N/T
EMW05-8	2/1/2017	N/T	**4.38**	N/T	N/T	N/T	N/T	N/T	N/T
EMW08-5	2/2/2017	**8.95**	**3.31**	N/T	N/T	<1	N/T	**37.0**	<1
EMW09-12	2/2/2017	**6.69**	<1	N/T	N/T	<1	N/T	**1.30**	<1
MTCA Cleanup Levels:									
Soil, Method A		19 Cr VI/ 2,000 Cr III	20	NS	NS	2	NS	250	2
Soil, Method B, Cancer		NS	0.667	NS	NS	NS	NS	NS	NS
Soil, Method B, Non-cancer		240 Cr VI / 120,000 Cr III	24.00	400.00	400.00	80.00	16,000	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and Method B cleanup levels.
Concentrations are reported in mg/kg (ppm)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
N/T: Not Tested
NS: No Standard
*: Sample analyzed for Total Mercury by EPA Method 1631E

Table 9: Total Metals
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury
EP13-GW	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EP14-GW	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EP15-GW	1/31/2017	<1	**2.01**	N/T	N/T	<1	N/T	<1	<1
EP16-GW	1/31/2017	<1	**12.5**	N/T	N/T	<1	N/T	<1	<1
EP18-GW	1/31/2017	**3.91**	**3.02**	N/T	N/T	<1	N/T	**1.25**	<1
OWS-01	3/17/2017	**4.33**	<1	N/T	N/T	<1	N/T	**6.88**	<1
MTCA Cleanup Levels:									
Groundwater, Method A		50.00	5.00	NS	NS	5.00	NS	15	2.00
Groundwater, Method B, Cancer		NS	0.06	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		24,000 Cr III	4.80	80.00	80.00	8.00	3,200.00	NS	NS
Surface Water, Method B, Cancer		NS	0.0982	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	17.70	2,700.00	25,900.00	40.50	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	36.00	71.00	1.90	9.30	NS	8.10	0.025

Notes:
(I): Sampling results compared to MTCA Method A and B Cleanup Levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
NT - Not Tested
NS: No Standard

Table 10: Dissolved Metals
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury
EP13-GW	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EP14-GW	1/31/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EP15-GW	1/31/2017	<1	<1	N/T	N/T	<1	N/T	<1	<1
EP16-GW	1/31/2017	<1	**5.96**	N/T	N/T	<1	N/T	<1	<1
EP18-GW	1/31/2017	**1.32**	**1.66**	N/T	N/T	<1	N/T	<1	<1
MTCA Cleanup Levels:									
Groundwater, Method A		50	5	NS	NS	5	NS	15	2
Groundwater, Method B, Cancer		NS	0.06	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		24,000 Cr III	4.80	80.00	80.00	8.00	3,200.00	NS	NS
Surface Water, Method B, Cancer		NS	0.0982	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	17.70	2,700.00	25,900.00	40.50	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	36.00	71.00	1.90	9.30	NS	8.10	0.025

Notes:

(I): Sampling results compared to MTCA Method A and B Cleanup Levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

Samples analyzed by Friedman & Bruya, Inc.

N/T - Not tested

NS: No Standard

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Phenol	Bis(2-Chloro ethyl) ether	2-Chloro phenol	1,3-Dichloro benzene	1,4-Dichloro benzene	1,2-Dichloro benzene	Benzyl Alcohol
EP15-6 (d x 5)	1/31/2017	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5
EP16-5 (d x 50)	1/31/2017	<5	<0.5	<5	<0.5	<0.5	<0.5	<5
EP17-6 (d x 5)	1/31/2017	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5
EMW01-5 (d x 5)	2/1/2017	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5
EMW05-8 (d x 50)	2/1/2017	<5	<0.5	<5	<0.5	<0.5	<0.5	<5
EMW08-5	2/2/2017	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5
EMW09-12	2/2/2017	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5

MTCA Cleanup Levels:

Soil, Method A	NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer	NS	0.909	NS	NS	185.00	NS	NS
Soil, Method B, Non-cancer	24,000.00	NS	400.00	NS	5,600.00	7,200.00	8,000.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Bis(2-chloro isopropyl) ether	2-Methyl phenol	Hexachloro ethane	N-Nitroso-di-n-propyl amine	3-Methyl phenol + 4-Methyl phenol	Nitro benzene	Isophorone
EP15-6 (d x 5)	1/31/2017	<0.05	<0.5	<0.05	<0.05	<1	<0.05	<0.05
EP16-5 (d x 50)	1/31/2017	<0.5	<5	<0.5	<0.5	<10	<0.5	<0.5
EP17-6 (d x 5)	1/31/2017	<0.05	<0.5	<0.05	<0.05	<1	<0.05	<0.05
EMW01-5 (d x 5)	2/1/2017	<0.05	<0.5	<0.05	<0.05	<1	<0.05	<0.05
EMW05-8 (d x 50)	2/1/2017	<5	<5	<0.5	<0.5	<10	<0.5	<0.5
EMW08-5	2/2/2017	<0.05	<0.5	<0.05	<0.05	<1	<0.05	<0.05
EMW09-12	2/2/2017	<0.05	<0.5	<0.05	<0.05	<1	<0.05	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	NS	25.00	0.1428	NS	NS	1,050.00
Soil, Method B, Non-cancer		NS	4,000.00	56.00	NS	4,000.00	160.00	16,000.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	2-Nitro phenol	2,4-Dimethyl phenol	Benzoic Acid	Bis (2-chloro ethoxy) methane	2,4-Dichloro phenol	1,2,4-Trichloro benzene	Hexachloro butadiene
EP15-6 (d x 5)	1/31/2017	<0.5	<0.5	<2.5	<0.05	<0.5	<0.05	<0.05
EP16-5 (d x 50)	1/31/2017	<5	<5	<25	<0.5	<5	<0.5	<0.5
EP17-6 (d x 5)	1/31/2017	<0.5	<0.5	<2.5	<0.05	<0.5	<0.05	<0.05
EMW01-5 (d x 5)	2/1/2017	<0.5	<0.5	<2.5	<0.05	<0.5	<0.05	<0.05
EMW05-8 (d x 50)	2/1/2017	<5	<5	<25	<0.5	<5	<0.5	<0.5
EMW08-5	2/2/2017	<0.5	<0.5	<2.5	<0.05	<0.5	<0.05	<0.05
EMW09-12	2/2/2017	<0.5	<0.5	<2.5	<0.05	<0.5	<0.05	<0.05

MTCA Cleanup Levels:

Soil, Method A	NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer	NS	NS	NS	NS	NS	34.50	12.80
Soil, Method B, Non-cancer	NS	1,600.00	320,000.00	NS	240.00	800.00	80.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	4-Chloro aniline	4-Chloro-3-methyl phenol	2-Methyl naphthalene	1-Methyl naphthalene	Hexachloro cyclo pentadiene	2,4,6-Trichlorophenol	2,4,5-Trichloro phenol
EP15-6 (d x 5)	1/31/2017	<5	<0.5	<0.05	<0.05	<0.15	<0.5	<0.5
EP16-5 (d x 50)	1/31/2017	<50	<5	<0.5	<0.5	<1.5	<5	<5
EP17-6 (d x 5)	1/31/2017	<5	<0.5	<0.05	<0.05	<0.15	<0.5	<0.5
EMW01-5 (d x 5)	2/1/2017	<5	<0.5	<0.05	<0.05	<0.15	<0.5	<0.5
EMW05-8 (d x 50)	2/1/2017	<50	<5	<0.5	<0.5	<1.5	<5	<5
EMW08-5	2/2/2017	<5	<0.5	<0.05	<0.05	<0.15	<0.5	<0.5
EMW09-12	2/2/2017	<5	<0.5	<0.05	<0.05	<0.15	<0.5	<0.5
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		5.00	NS	NS	34.50	NS	90.90	NS
Soil, Method B, Non-cancer		320.00	NS	320.00	5,600.00	480.00	80.00	8,000.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	2-Chloro naphthalene	2-Nitro aniline	Dimethyl phthalate	2,6-Dinitro toluene	3-Nitro aniline	2,4-Dinitro phenol	Dibenzo furan
EP15-6 (d x 5)	1/31/2017	<0.05	<0.25	<0.5	<0.25	<5	<1.5	<0.05
EP16-5 (d x 50)	1/31/2017	<0.5	<2.5	<5	<2.5	<50	<15	<0.5
EP17-6 (d x 5)	1/31/2017	<0.05	<0.25	<0.5	<0.25	<5	<1.5	<0.05
EMW01-5 (d x 5)	2/1/2017	<0.05	<0.25	<0.5	<0.25	<5	<1.5	<0.05
EMW05-8 (d x 50)	2/1/2017	<0.5	<2.5	<5	<2.5	<50	<15	<0.5
EMW08-5	2/2/2017	<0.05	<0.25	<0.5	<0.25	<5	<1.5	<0.05
EMW09-12	2/2/2017	<0.05	<0.25	<0.5	<0.25	<5	<1.5	<0.05
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	NS	NS	0.667	NS	NS	NS
Soil, Method B, Non-cancer		6,400.00	800.00	NS	24.00	NS	160.00	80.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	2,4-Dinitro toluene	4-Nitro phenol	Diethyl phthalate	4-Chlorophenyl phenyl ether	N-Nitro sodiphenyl amine	4-Nitro aniline	4,6-Dinitro-2-methyl phenol
EP15-6 (d x 5)	1/31/2017	<0.25	<1.5	<0.5	<0.05	<0.05	<5	<1.5
EP16-5 (d x 50)	1/31/2017	<2.5	<15	<5	<0.5	<0.5	<50	<15
EP17-6 (d x 5)	1/31/2017	<0.25	<1.5	<0.5	<0.05	<0.05	<5	<1.5
EMW01-5 (d x 5)	2/1/2017	<0.25	<1.5	<0.5	<0.05	<0.05	<5	<1.5
EMW05-8 (d x 50)	2/1/2017	<2.5	<15	<5	<0.5	<0.5	<50	<15
EMW08-5	2/2/2017	<0.25	<1.5	<0.5	<0.05	<0.05	<5	<1.5
EMW09-12	2/2/2017	<0.25	<1.5	<0.5	<0.05	<0.05	<5	<1.5
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		3.23	NS	NS	NS	204.00	NS	NS
Soil, Method B, Non-cancer		160.00	NS	64,000.00	NS	NS	NS	NS

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	4-Bromophenyl phenyl ether	Hexachloro benzene	Pentachloro phenol	Carbazole	Di-n-butyl phthalate	Benzyl butyl phthalate	Bis(2-ethylhexyl) phthalate
EP15-6 (d x 5)	1/31/2017	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.8
EP16-5 (d x 50)	1/31/2017	<0.5	<0.5	<5	<5	<5	<5	<8
EP17-6 (d x 5)	1/31/2017	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.8
EMW01-5 (d x 5)	2/1/2017	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.8
EMW05-8 (d x 50)	2/1/2017	<0.5	<0.5	<5	<5	<5	<5	<8
EMW08-5	2/2/2017	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.8
EMW09-12	2/2/2017	<0.05	<0.05	<0.5	<0.5	<0.5	<0.5	<0.8

MTCA Cleanup Levels:

	4-Bromophenyl phenyl ether	Hexachloro benzene	Pentachloro phenol	Carbazole	Di-n-butyl phthalate	Benzyl butyl phthalate	Bis(2-ethylhexyl) phthalate
Soil, Method A	NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer	NS	0.625	2.50	NS	NS	526.00	71.40
Soil, Method B, Non-cancer	NS	64.00	400.00	NS	8,000.00	16,000.00	1,600.00

Table 11: Semivolatile Organic Compounds
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Di-n-octyl phthalate
EP15-6 (d x 5)	1/31/2017	<0.5
EP16-5 (d x 50)	1/31/2017	<5
EP17-6 (d x 5)	1/31/2017	<0.5
EMW01-5 (d x 5)	2/1/2017	<0.5
EMW05-8 (d x 50)	2/1/2017	<5
EMW08-5	2/2/2017	<0.5
EMW09-12	2/2/2017	<0.5

MTCA Cleanup Levels:

Soil, Method A	NS
Soil, Method B, Cancer	NS
Soil, Method B, Non-cancer	800.00

Notes:

(I): Sampling results compared to MTCA Method A and Method B cleanup levels.

Concentrations are reported in mg/kg (ppm)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

NS: No Standard

dx10 Sample was analyzed with a 10x dilution factor.

J: Estimated value, see data validation report in Appendix I for details

N/T - Not Tested

Samples analyzed by EPA Method 8270D by Friedman and Bruya, Inc.

Table 12: Semivolatile Organic Compounds Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date**	**Phenol**	**Bis(2-Chloro ethyl) ether**	**2-Chloro phenol**	**1,3-Dichloro benzene**	**1,4-Dichloro benzene**	**1,2-Dichloro benzene**	**Benzyl Alcohol**
EP15-GW	1/31/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
EP16-GW	1/31/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
EP18-GW	1/31/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
OWS-01	3/17/2017	**6.4**	<0.2	<2	<0.2	<0.2	<0.2	**53 ve**
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.0398	NS	NS	8.10	NS	NS
Groundwater, Method B, Non-cancer		2,400.00	NS	40.00	NS	560.00	720.00	800.00
Surface Water, Method B, Cancer		NS	0.854	NS	NS	21.40	NS	NS
Surface Water, Method B, Non-cancer		556,000.00	NS	99.70	NS	3,240.00	4,170.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date**	**Bis(2-chloro isopropyl) ether**	**2-Methyl phenol**	**Hexachloro ethane**	**N-Nitroso-di-n-propyl amine**	**3-Methyl phenol + 4-Methyl phenol**	**Nitro benzene**	**Isophorone**
EP15-GW	1/31/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
EP16-GW	1/31/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
EP18-GW	1/31/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
OWS-01	3/17/2017	<0.2	<2	<0.2	<0.2	**10**	<0.2	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	1.09	0.0125	NS	NS	46.1
Groundwater, Method B, Non-cancer		NS	400.00	5.60	NS	400.00	16.00	1,600.00
Surface Water, Method B, Cancer		NS	NS	1.86	0.842	NS	NS	1,550.00
Surface Water, Method B, Non-cancer		NS	NS	20.90	NS	NS	179.00	118,000.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	2-Nitro phenol	2,4-Dimethyl phenol	Benzoic Acid	Bis (2-chloro ethoxy) methane	2,4-Dichloro phenol	1,2,4-Trichloro benzene	Hexachloro butadiene
EP15-GW	1/31/2017	<2	<2	<10 ca	<0.2	<2	<0.2	<0.2
EP16-GW	1/31/2017	<2	<2	<10 ca	<0.2	<2	<0.2	<0.2
EP18-GW	1/31/2017	<2	<2	<10 ca	<0.2	<2	<0.2	<0.2
OWS-01	3/17/2017	<2	**5.8**	**210 ve**	<0.2	<2	<0.2	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	1.51	0.561
Groundwater, Method B, Non-cancer		NS	160.00	64,000.00	NS	24.00	80.00	8.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	2.03	29.70
Surface Water, Method B, Non-cancer		NS	552.00	NS	NS	190.00	236.00	926.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	4-Chloro aniline	4-Chloro-3-methyl phenol	2-Methyl naphthalene	1-Methyl naphthalene	Hexachloro cyclo pentadiene	2,4,6-Trichlorophenol	2,4,5-Trichloro phenol
EP15-GW	1/31/2017	<20	<2	<0.2	<0.2	<0.6	<2	<2
EP16-GW	1/31/2017	<20	<2	<0.2	<0.2	<0.6	<2	<2
EP18-GW	1/31/2017	<20	<2	13	**8.7**	<0.6	<2	<2
OWS-01	3/17/2017	<20	<2	**0.73**	**0.52**	<0.6	<2	<2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		0.219	NS	NS	1.51	NS	3.98	NS
Groundwater, Method B, Non-cancer		32.00	NS	32.00	560.00	48.00	8.00	800.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	3.93	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	NS	3,620.00	17.30	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date**	**2-Chloro naphthalene**	**2-Nitro aniline**	**Dimethyl phthalate**	**2,6-Dinitro toluene**	**3-Nitro aniline**	**2,4-Dinitro phenol**	**Dibenzo furan**
EP15-GW	1/31/2017	<0.2	<1	<2	<1	<20	<6	<0.2
EP16-GW	1/31/2017	<0.2	<1	<2	<1	<20	<6	<0.2
EP18-GW	1/31/2017	<0.2	<1	<2	<1	<20	<6	**0.61**
OWS-01	3/17/2017	<0.2	<1	<2	<1	<20	<6	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	0.0583	NS	NS	NS
Groundwater, Method B, Non-cancer		640.00	160.00	NS	4.80	NS	32.00	16.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		1,040.00	NS	NS	NS	NS	3,460.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	2,4-Dinitro toluene	4-Nitro phenol	Diethyl phthalate	4-Chlorophenyl phenyl ether	N-Nitro sodiphenyl amine	4-Nitro aniline	4,6-Dinitro-2-methyl phenol
EP15-GW	1/31/2017	<1	<6	<2	<0.2	<0.2	<20	<6
EP16-GW	1/31/2017	<1	<6	<2	<0.2	<0.2	<20	<6
EP18-GW	1/31/2017	<1	<6	<2	<0.2	<0.2	<20	<6
OWS-01	3/17/2017	<1	<6	<2	<0.2	<0.2	<20	<6
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		0.282	NS	NS	NS	17.90	NS	NS
Groundwater, Method B, Non-cancer		32.00	NS	12,800.00	NS	NS	NS	NS
Surface Water, Method B, Cancer		5.50	NS	NS	NS	9.45	NS	NS
Surface Water, Method B, Non-cancer		1,360.00	NS	28,400.00	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	4-Bromophenyl phenyl ether	Hexachloro benzene	Pentachloro phenol	Carbazole	Di-n-butyl phthalate	Benzyl butyl phthalate	Bis(2-ethylhexyl) phthalate
EP15-GW	1/31/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
EP16-GW	1/31/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
EP18-GW	1/31/2017	<0.2	<0.2	<2	**5.3**	<2	<2	<3.2
OWS-01	3/17/2017	<0.2	<0.2	<2	<2	<2	<2	**21**
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.0547	0.22	NS	NS	45.10	6.25
Groundwater, Method B, Non-cancer		NS	12.80	80.00	NS	1,600.00	3,200.00	320.00
Surface Water, Method B, Cancer		NS	0.000466	1.47	NS	NS	NS	3.56
Surface Water, Method B, Non-cancer		NS	0.238	1,180.00	NS	2,910.00	NS	399.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	7.90	NS	NS	NS	NS

Table 12: Semivolatile Organic Compounds
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Di-n-octyl phthalate
EP15-GW	1/31/2017	<2
EP16-GW	1/31/2017	<2
EP18-GW	1/31/2017	<2
OWS-01	3/17/2017	<2 J

MTCA Cleanup Levels:

Groundwater, Method A	NS
Groundwater, Method B, Cancer	NS
Groundwater, Method B, Non-cancer	160.00
Surface Water, Method B, Cancer	NS
Surface Water, Method B, Non-cancer	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS

Notes:

(I): Sampling results compared to MTCA Method A and B Cleanup Levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

NS: No Standard

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

ca: The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

N/T - Not tested.

Samples analyzed by EPA Method 8270D by Friedman & Bruya, Inc.

Table 13: Semivolatile Organic Compounds (PAHs via SIM)
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
EP15-6 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.012**
EP16-5 (d x 50)	1/31/2017	**0.15**	**0.33**	<0.1	<0.1	**0.24**	<0.1	**2.4**
EP16-10 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EP17-6 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EP18-5 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EMW01-5 (d x 5)	2/1/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.029**
EMW05-8 (d x 50)	2/1/2017	<0.01	<0.01	<0.01	<0.01	**0.20**	<0.01	**0.22**
EMW05-8 Dup. (d x 50)	2/1/2017	<0.01	<0.01	<0.01	<0.01	**0.13**	<0.01	**0.18**
EMW08-5 (d x 5)	2/2/2017	<0.01	<0.01	<0.01	<0.01	**0.032**	<0.01	**0.10**
EMW09-12 (d x 5)	2/2/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MTCA Cleanup Levels:								
Soil, Method A		5.00	NS	NS	NS	NS	NS	NS
Soil, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Soil, Method B, Non-cancer		1,600.00	NS	4,800.00	3,200.00	NS	24,000.00	3,200.00

Table 13: Semivolatile Organic Compounds (PAHs via SIM)
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Pyrene	Benz(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno (1,2,3-cd) pyrene
EP15-6 (d x 5)	1/31/2017	**0.011**	<0.01	**0.013**	<0.01	**0.016**	<0.01	<0.01
EP16-5 (d x 50)	1/31/2017	**2.8**	**2.2**	**2.2**	**2.8**	**2.9**	**1.0**	**1.4**
EP16-10 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EP17-6 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EP18-5 (d x 5)	1/31/2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EMW01-5 (d x 5)	2/1/2017	**0.036**	**0.017**	**0.020**	**0.019**	**0.026**	<0.01	**0.016**
EMW05-8 (d x 50)	2/1/2017	**0.35**	**0.15**	**0.16**	**0.14**	**0.17**	<0.1	<0.1
EMW05-8 Dup. (d x 50)	2/1/2017	**0.27**	**0.11**	**0.13**	**0.11**	**0.14**	<0.1	<0.1
EMW08-5 (d x 5)	2/2/2017	**0.14**	**0.080**	**0.11**	**0.10**	**0.13**	**0.043**	**0.056**
EMW09-12 (d x 5)	2/2/2017	**0.010**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MTCA Cleanup Levels:								
Soil, Method A		NS	NS	NS	0.10	NS	NS	NS
Soil, Method B, Cancer		NS	1.37	137	0.137	1.37	13.7	1.37
Soil, Method B, Non-cancer		2,400.00	NS	NS	NS	NS	NS	NS

Table 13: Semivolatile Organic Compounds (PAHs via SIM)
Soil Sampling Results (I)

Bus Maintenance Facility , Project #10737c
Seattle, Washington

Sample Number	Date	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene
EP15-6 (d x 5)	1/31/2017	<0.01	<0.01
EP16-5 (d x 50)	1/31/2017	**0.31**	**1.2**
EP16-10 (d x 5)	1/31/2017	<0.01	<0.01
EP17-6 (d x 5)	1/31/2017	<0.01	<0.01
EP18-5 (d x 5)	1/31/2017	<0.01	<0.01
EMW01-5 (d x 5)	2/1/2017	<0.01	**0.016**
EMW05-8 (d x 50)	2/1/2017	<0.1	<0.1
EMW05-8 Dup. (d x 50)	2/1/2017	<0.1	<0.1
EMW08-5 (d x 5)	2/2/2017	**0.017**	**0.054**
EMW09-12 (d x 5)	2/2/2017	<0.01	<0.01

MTCA Cleanup Levels:

	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene
Soil, Method A	NS	NS
Soil, Method B, Cancer	0.137	NS
Soil, Method B, Non-cancer	NS	NS

Notes:

(I): Sampling results compared to MTCA Method A and B cleanup levels.

Concentrations are reported in mg/kg (ppm)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

d x ##: Dilution Factor

NS: No Standard

N/T - Not Tested

Samples analyzed by EPA Method 8270D SIM Friedman & Bruya, Inc.

Table 14: Semivolatile Organic Compounds (PAHs via SIM)
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date**	**Naphthalene**	**Acenaphthylene**	**Acenaphthene**	**Fluorene**	**Phenanthrene**	**Anthracene**	**Fluoranthene**
EP15-GW	1/31/2017	**0.071**	<0.03	<0.03	**0.035**	**0.046**	<0.03	<0.03
EP16-GW	1/31/2017	**0.058**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EP18-GW	1/31/2017	**110**	<0.03	**24**	**3.1**	**3.8**	<0.03	<0.03
OWS-01	3/17/2017	**0.12**	<0.03	<0.03	**0.14**	**0.24**	<0.03	**0.049**
OWS-01 (d x 10)	3/17/2017	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
MTCA Cleanup Levels:								
Groundwater, Method A		160.00	NS	NS	NS	NS	4,800.00	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		160.00	NS	960.00	640.00	NS	NS	640.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		4,710.00	NS	648.00	3,460.00	NS	25,900.00	86.40
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 14: Semivolatile Organic Compounds (PAHs via SIM)
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Pyrene	Benz(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno (1,2,3-cd) pyrene
EP15-GW	1/31/2017	**0.037**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EP16-GW	1/31/2017	**0.046**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EP18-GW	1/31/2017	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
OWS-01	3/17/2017	**0.50**	<0.03	**0.040**	<0.03 J	<0.03 J	<0.03 J	<0.03 J
OWS-01 (d x 10)	3/17/2017	**0.49**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	0.10	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.12	12.00	NS	0.12	1.20	0.12
Groundwater, Method B, Non-cancer		480.00	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Cancer		NS	0.296	29.60	0.0296	0.296	2.96	NS
Surface Water, Method B, Non-cancer		2,590.00	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 14: Semivolatile Organic Compounds (PAHs via SIM)
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene
EP15-GW	1/31/2017	<0.03	<0.03
EP16-GW	1/31/2017	<0.03	<0.03
EP18-GW	1/31/2017	<0.03	<0.03
OWS-01	3/17/2017	<0.03 J	<0.03 J
OWS-01 (d x 10)	3/17/2017	<0.3	<0.3

MTCA Cleanup Levels:

	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene
Groundwater, Method A	NS	NS
Groundwater, Method B, Cancer	0.01	NS
Groundwater, Method B, Non-cancer	NS	NS
Surface Water, Method B, Cancer	NS	NS
Surface Water, Method B, Non-cancer	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS

Notes:

(I): Sampling results compared to MTCA Method A and B Cleanup Levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

N/T Not Tested.

d x ##: Dilution Factor

NS: No Standard

J - The internal standard is reported below the lowest calibration standard. The value reported is an estimate.

Samples analyzed by EPA Method 8270D SIM by Friedman & Bruya, Inc.

Table 15: Polychlorinated Biphenyls
Soil Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
EP15-6 (d x 50)	1/31/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP16-5 (d x 50)	1/31/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP17-6 (d x 50)	1/31/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP18-5 (d x 50)	1/31/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EMW01-5 (d x 50)	2/1/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EMW05-8 (d x 50)	2/1/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EMW08-5 (d x 50)	2/2/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**0.24**
EMW09-12	2/2/2017	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MTCA Cleanup Levels: Unrestricted Land Use								
Soil, Method A		1	1	1	1	1	1	1
Soil, Method B, Cancer		NS	NS	14.3	NS	NS	0.5	0.5
Soil, Method B, Non-cancer		NS	NS	5.6	NS	NS	1.60	NS

Notes:
(I): Sampling results compared to MTCA Method A cleanup levels. If Method A cleanup levels were not available, data was compared to MTCA Method B cleanup levels
d x ##: Dilution Factor
Concentrations are reported in mg/kg (ppm)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
NS: No Standard

Table 16: Polychlorinated Biphenyls
Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
EP15-GW	1/31/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EP16-GW	1/31/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EP18-GW	1/31/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
OWS-01	3/17/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MTCA Cleanup Levels:								
Groundwater, Method A		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Groundwater, Method B, Cancer		NS	NS	1.25	NS	NS	0.0438	0.0438
Groundwater, Method B, Non cancer		NS	NS	1.12	NS	NS	0.32	NS
Surface Water, Method B, Cancer		NS	NS	0.00299	NS	NS	0.000105	0.0982
Surface Water, Method B, Non-cancer		NS	NS	0.00585	NS	NS	0.00167	17.70
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and B Cleanup Levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
Samples Analyzed by EPA Method 8082A
N/T Not Tested.
NS: No Standard

Table 17: Total Petroleum Hydrocarbons
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Gasoline Range	Diesel Range	Motor Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
EMW03-01	2/7/2017	N/T	**140 x**	<250	N/T	N/T	N/T	N/T
EMW03-02	3/17/2017	N/T	**130 x**	<250	N/T	N/T	N/T	N/T
EMW04-01	2/7/2017	N/T	**55 x**	<250	N/T	N/T	N/T	N/T
EMW05-01	2/7/2017	N/T	**280 x**	**490 x**	N/T	N/T	N/T	N/T
EMW06-01	2/7/2017	N/T	<50	<250	N/T	N/T	N/T	N/T
EMW07-01	2/7/2017	N/T	**60 x**	<250	N/T	N/T	N/T	N/T
EMW08-01	2/7/2017	<100	<50	<250	<0.35	<1	<1	<3
EMW09-01	2/7/2017	**180**	**6,600**	**1,200 x**	<0.35	<1	<1	<3
UST-01	2/10/2017	<100	<50	<250	<0.35	<1	<1	<3
UST-02	2/10/2017	<100	<50	<250	<0.35	<1	<1	<3
MTCA Cleanup Levels: Unrestricted Land Use								
Groundwater, Method A		800^ / 1000	500.00	500.00	5.00	1,000.00	700.00	1,000.00
Groundwater, Method B, Cancer		NS	NS	NS	0.795	NS	NS	NS
Groundwater, Method B, Non-cancer		NS	NS	NS	32.00	640.00	800.00	1,600.00
Surface Water, Method B, Cancer		NS	NS	NS	22.70	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	1,990.00	18,900.00	6,820.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and B Cleanup Levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
N/T: Not Tested
NS: No Standard
Samples analyzed by Friedman & Bruya, Inc.
x: The sample chromatographic pattern does not resemble the fuel standard used for quantification

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)
Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Dichloro difluoro methane	Chloro methane	Vinyl chloride	Bromo methane	Chloro ethane	Trichloro fluoro methane
EMW08-01	2/7/2017	<1	<10	<0.2	<1	<1	<1
EMW09-01	2/7/2017	<1	<10	<0.2	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<1	<10	<0.2	<1	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	0.20	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		1,600.00	NS	24.00	11.20	NS	2,400.00
Surface Water, Method B, Cancer		NS	27.50	Ecology Guidance	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	13,600.00	6,480.00	955.00	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Acetone	1, 1-Dichloro ethene	Hexane	Methylene Chloride	Methyl t-butyl Ether (MTBE)	Trans-1,2-Dichloro ethene
EMW08-01	2/7/2017	<10	<1	<1	<5	<1	<1
EMW09-01	2/7/2017	<10	<1	<1	<5	<1	<1
EMW09-01 Dup.	2/7/2017	<10	<1	<1	<5	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	5.00	20.00	NS
Groundwater, Method B, Cancer		NS	NS	NS	21.88	24.31	NS
Groundwater, Method B, Non-cancer		7,200.00	400.00	480.00	48.00	NS	16.00
Surface Water, Method B, Cancer		NS	NS	NS	3,600.00	NS	NS
Surface Water, Method B, Non-cancer		NS	23,100.00	NS	17,300.00	NS	32,400.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)
Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	1,1-Dichloro ethane	2,2-Dichloro propane	cis-1,2-Dichloro ethene	Chloroform	2-Butanone (MEK)	1,2-Dichloro ethane (EDC)
EMW08-01	2/7/2017	<1	<1	<1	<1	<10	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<10	<1
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<10	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	NS	NS	5.00
Groundwater, Method B, Cancer		7.68	NS	NS	1.41	NS	0.48
Groundwater, Method B, Non-cancer		1,600.00	NS	16.00	80.00	4,800.00	48.00
Surface Water, Method B, Cancer		NS	NS	NS	55.00	NS	59.40
Surface Water, Method B, Non-cancer		NS	NS	NS	6,820.00	NS	13,000.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)
Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	1,1,1-Trichloro ethane	1,1-Dichloro propene	Carbontetra chloride	Trichloro ethene	1,2-Dichloro propane	Bromo dichloro methane
EMW08-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		200.00	NS	NS	5.00	NS	NS
Groundwater, Method B, Cancer		NS	NS	0.625	0.54	1.22	0.706
Groundwater, Method B, Non-cancer		16,000.00	NS	32.00	4.00	720.00	160.00
Surface Water, Method B, Cancer		NS	NS	4.87	12.80	43.90	27.50
Surface Water, Method B, Non-cancer		926,000.00	NS	546.00	118.00	56,900.00	13,600.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Dibromo methane	4-Methyl-2-pentanone	cis-1,3-Dichloro propene	trans-1,3-Dichloro propene	1,1,2-Trichloro ethane	2-Hexanone
EMW08-01	2/7/2017	<1	<10	<1	<1	<1	<10
EMW09-01	2/7/2017	<1	<10	<1	<1	<1	<10
EMW09-01 Dup.	2/7/2017	<1	<10	<1	<1	<1	<10
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	0.438	0.438	0.768	NS
Groundwater, Method B, Non-cancer		80.00	640.00	240.00	240.00	32.00	NS
Surface Water, Method B, Cancer		NS	NS	34.10	34.10	25.30	NS
Surface Water, Method B, Non-cancer		955.00	NS	40,900.00	40,900.00	2,300.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	1,3-Dichloro propane	Tetrachloro ethene	Dibromo chloro methane	1,2-Dibromo ethane (EDB)	Chloro benzene	1,1,1,2-Tetra chloro ethane
EMW08-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	5.00	NS	0.01	NS	NS
Groundwater, Method B, Cancer		NS	20.83	0.521	0.0219	NS	1.68
Groundwater, Method B, Non-cancer		NS	48.00	160.00	72.00	160.00	240.00
Surface Water, Method B, Cancer		NS	99.60	20.30	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	502.00	13,600.00	NS	5,190.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

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Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Styrene	Isopropyl benzene	Bromoform	n-Propyl benzene	Bromo benzene	1,3,5-Trimethyl benzene
EMW08-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	5.54	NS	NS	NS
Groundwater, Method B, Non-cancer		1,600.00	800.00	160.00	800.00	NS	80.00
Surface Water, Method B, Cancer		NS	NS	21.60	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	13,600.00	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	1,1,2,2-Tetrachloro ethane	1,2,3-Trichloro propane	2-Chloro toluene	4-Chloro toluene	tert-Butyl benzene	1,2,4-Trimethyl benzene
EMW08-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<1	**1.9**
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<1	**2.1**
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		0.219	0.00146	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		160.00	32.00	160.00	NS	800.00	NS
Surface Water, Method B, Cancer		6.48	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		10,400.00	NS	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)
Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	sec-Butyl benzene	p-Isopropyl toluene	1,3-Dichloro benzene	1,4-Dichloro benzene	1,2-Dichloro benzene	n-Butyl benzene
EMW08-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01	2/7/2017	<1	<1	<1	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<1	<1	<1	<1	<1	<1
MTCA Cleanup Levels:							
Groundwater, Method A		NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	8.10	NS	NS
Groundwater, Method B, Non-cancer		800.00	NS	NS	560.00	720.00	400.00
Surface Water, Method B, Cancer		NS	NS	NS	21.40	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	3,240.00	4,170.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS

Table 18: Volatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	1,2-Dibromo-3-chloro propane	1,2,4-Trichloro benzene	Hexachloro butadiene	Naph thalene	1,2,3-Trichloro benzene
EMW08-01	2/7/2017	<10	<1	<1	<1	<1
EMW09-01	2/7/2017	<10	<1	<1	<1	<1
EMW09-01 Dup.	2/7/2017	<10	<1	<1	<1	<1

MTCA Cleanup Levels:

Groundwater, Method A	NS	NS	NS	160.00	NS
Groundwater, Method B, Cancer	0.0547	1.51	0.561	NS	NS
Groundwater, Method B, Non-cancer	1.60	80.00	8.00	160.00	NS
Surface Water, Method B, Cancer	NS	2.03	29.70	NS	NS
Surface Water, Method B, Non-cancer	NS	236.00	92.60	4,710.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS	NS	NS	NS

Notes:

(I): Sampling results compared to MTCA Method A and B cleanup levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

N/T: Not Tested

NS: No Standard

Table 19: Monitored Natural Attenuation Parameters and pH Groundwater Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Methane (µg/L)	Ethane (µg/L)	Ethene (µg/L)	Iron (µg/L)	Manganese (µg/L)	Ferrous Iron (mg/l)	Total Organic Carbon (mg/l)	Alkalinity (as CaCO3) (mg/l)	Chloride (mg/l)	Sulfate (mg/l)	Nitrate (mg/l)	Sulfite (mg/l)	pH *
EMW03-01	2/7/2017	**20**	<10	<10	**5,110**	**223**	**6.5**	**7.48**	**165**	**4,890**	**554**	<5	**220**	**7.2**
EMW09-01	2/7/2017	**450**	<10	<10	**1170**	**965**	**3.77**	**30.30**	**240**	**661**	**107**	<2.50	N/T	**7.2**
MTCA Cleanup Levels:														
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		NS	NS	NS	11,200	2,240	NS	NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
RCRA Hazardous Waste Characterization														
RCRA Hazardous Waste		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	≤2 or ≥12.5

Notes:

Samples analyzed by Friedman & Bruya, Inc. and AmTest Laboratories

*Sample result for pH compared to RCRA Hazardous Waste Characterization standards
(I): Sampling results compared to MTCA Method A and B cleanup levels.

Detections are **bolded**. Exceedances of MTCA/ RCRA Hazardous Waste Characterization are **bolded** and shaded.

NS: No Standard

N/A: Not Applicable

N/T: Not Tested

Table 20: Dissolved Metals
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury
EMW01-01	2/7/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EMW02-01	2/7/2017	N/T	<1	N/T	N/T	N/T	N/T	<1	N/T
EMW05-01	2/7/2017	N/T	**4.97**	N/T	N/T	N/T	N/T	N/T	N/T
EMW08-01	2/7/2017	**1.59**	**5.89**	N/T	N/T	<1	N/T	<1	<1
EMW09-01	2/7/2017	**1.39**	**2.92**	N/T	N/T	<1	N/T	<1	<1
MTCA Cleanup Levels:									
Groundwater, Method A		50	5	NS	NS	5	NS	15	2
Groundwater, Method B, Cancer		NS	0.06	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		24,000 Cr III	4.80	80.00	80.00	8.00	3,200.00	NS	NS
Surface Water, Method B, Cancer		NS	0.0982	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	17.70	2,700.00	25,900.00	40.50	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	36.00	71.00	1.90	9.30	NS	8.10	0.025

Notes:

(I): Sampling results compared to MTCA Method A and B Cleanup Levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

Samples analyzed by Friedman & Bruya, Inc.

All samples filtered prior to analysis

N/T: Not Tested

NS: No Standard

Table 21: Total Metals
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury
EMW01-01	2/7/2017	N/T	N/T	N/T	N/T	N/T	N/T	<1	N/T
EMW02-02	2/7/2017	N/T	<1	N/T	N/T	N/T	N/T	<1	N/T
EMW05-01	2/7/2017	N/T	**4.89**	N/T	N/T	N/T	N/T	N/T	N/T
EMW08-01	2/7/2017	**1.52**	**6.61**	N/T	N/T	<1	N/T	<1	<1
EMW09-01	2/7/2017	**3.78**	**5.13**	N/T	N/T	<1	N/T	**3.46**	<1
MTCA Cleanup Levels: Unrestricted Land Use									
Groundwater, Method A		50	5	NS	NS	5	NS	15	2
Groundwater, Method B, Cancer		NS	0.06	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		24,000 Cr III	4.80	80.00	80.00	8.00	3,200.00	NS	NS
Surface Water, Method B, Cancer		NS	0.0982	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		NS	17.70	2,700.00	25,900.00	40.50	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	36.00	71.00	1.90	9.30	NS	8.10	0.025

Notes:

(I): Sampling results compared to MTCA Method A and B Cleanup Levels.

Concentrations are reported in µg/L (ppb)

Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.

Samples analyzed by Friedman & Bruya, Inc.

N/T Not Tested

NS: No Standard

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Phenol	Bis(2-Chloro ethyl) ether	2-Chloro phenol	1,3-Dichloro benzene	1,4-Dichloro benzene	1,2-Dichloro benzene	Benzyl Alcohol
EMW01-01	2/7/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
EMW05-01	2/7/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
EMW08-01	2/7/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
EMW09-01	2/7/2017	<2	<0.2	<2	<0.2	<0.2	<0.2	<2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.0398	NS	NS	8.10	NS	NS
Groundwater, Method B, Non-cancer		2,400.00	NS	40.00	NS	560.00	720.00	800.00
Surface Water, Method B, Cancer		NS	0.854	NS	NS	21.40	NS	NS
Surface Water, Method B, Non-cancer		556,000.00	NS	99.70	NS	3,240.00	4,170.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Bis(2-chloro isopropyl) ether	2-Methyl phenol	Hexachloro ethane	N-Nitroso-di-n-propyl amine	3-Methyl phenol + 4-Methyl phenol	Nitro benzene	Isophorone
EMW01-01	2/7/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
EMW05-01	2/7/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
EMW08-01	2/7/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
EMW09-01	2/7/2017	<0.2	<2	<0.2	<0.2	<4	<0.2	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	1.09	0.0125	NS	NS	46.1
Groundwater, Method B, Non-cancer		NS	400.00	5.60	NS	400.00	16.00	1,600.00
Surface Water, Method B, Cancer		NS	NS	1.86	0.842	NS	NS	1,550.00
Surface Water, Method B, Non-cancer		NS	NS	20.90	NS	NS	179.00	118,000.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	2-Nitro phenol	2,4-Dimethyl phenol	Benzoic Acid	Bis (2-chloro ethoxy) methane	2,4-Dichloro phenol	1,2,4-Trichloro benzene	Hexachloro butadiene
EMW01-01	2/7/2017	<2	<2	<10	<0.2	<2	<0.2	<0.2
EMW05-01	2/7/2017	<2	<2	<10	<0.2	<2	<0.2	<0.2
EMW08-01	2/7/2017	<2	<2	<10	<0.2	<2	<0.2	<0.2
EMW09-01	2/7/2017	<2	<2	<10	<0.2	<2	<0.2	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	1.51	0.561
Groundwater, Method B, Non-cancer		NS	160.00	64,000.00	NS	24.00	80.00	8.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	2.03	29.70
Surface Water, Method B, Non-cancer		NS	552.00	NS	NS	190.00	236.00	926.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	4-Chloro aniline	4-Chloro-3-methyl phenol	2-Methyl naphthalene*	1-Methyl naphthalene	Hexachloro cyclo pentadiene	2,4,6-Trichlorophenol	2,4,5-Trichloro phenol
EMW01-01	2/7/2017	<20	<2	<0.2	<0.2	<0.6	<2	<2
EMW05-01	2/7/2017	<20	<2	<0.2	<0.2	<0.6	<2	<2
EMW08-01	2/7/2017	<20	<2	<0.2	<0.2	<0.6	<2	<2
EMW09-01	2/7/2017	<20	<2	**0.52**	**1.3**	<0.6	<2	<2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		0.219	NS	NS	1.51	NS	3.98	NS
Groundwater, Method B, Non-cancer		32.00	NS	32.00	560.00	48.00	8.00	800.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	3.93	NS
Surface Water, Method B, Non-cancer		NS	NS	NS	NS	3,620.00	17.30	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	2-Chloro naphthalene	2-Nitro aniline	Dimethyl phthalate	2,6-Dinitro toluene	3-Nitro aniline	2,4-Dinitro phenol	Dibenzo furan
EMW01-01	2/7/2017	<0.2	<1	<2	<1	<20	<6	<0.2
EMW05-01	2/7/2017	<0.2	<1	<2	<1	<20	<6	<0.2
EMW08-01	2/7/2017	<0.2	<1	<2	<1	<20	<6	<0.2
EMW09-01	2/7/2017	<0.2	<1	<2	<1	<20	<6	<0.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	NS	NS	0.0583	NS	NS	NS
Groundwater, Method B, Non-cancer		640.00	160.00	NS	4.80	NS	32.00	16.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		1,040.00	NS	NS	NS	NS	3,460.00	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	2,4-Dinitro toluene	4-Nitro phenol	Diethyl phthalate	4-Chlorophenyl phenyl ether	N-Nitro sodiphenyl amine	4-Nitro aniline	4,6-Dinitro-2-methyl phenol
EMW01-01	2/7/2017	<1	<6	<2	<0.2	<0.2	<20	<6
EMW05-01	2/7/2017	<1	<6	<2	<0.2	<0.2	<20	<6
EMW08-01	2/7/2017	<1	<6	<2	<0.2	<0.2	<20	<6
EMW09-01	2/7/2017	<1	<6	<2	<0.2	<0.2	<20	<6
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		0.282	NS	NS	NS	17.90	NS	NS
Groundwater, Method B, Non-cancer		32.00	NS	12,800.00	NS	NS	NS	NS
Surface Water, Method B, Cancer		5.50	NS	NS	NS	9.45	NS	NS
Surface Water, Method B, Non-cancer		1,360.00	NS	28,400.00	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	4-Bromophenyl phenyl ether	Hexachloro benzene	Pentachloro phenol	Carbazole	Di-n-butyl phthalate	Benzyl butyl phthalate	Bis(2-ethylhexyl) phthalate
EMW01-01	2/7/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
EMW05-01	2/7/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
EMW08-01	2/7/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
EMW09-01	2/7/2017	<0.2	<0.2	<2	<2	<2	<2	<3.2
MTCA Cleanup Levels:								
Groundwater, Method A		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.0547	0.22	NS	NS	45.10	6.25
Groundwater, Method B, Non-cancer		NS	12.80	80.00	NS	1,600.00	3,200.00	320.00
Surface Water, Method B, Cancer		NS	0.000466	1.47	NS	NS	NS	3.56
Surface Water, Method B, Non-cancer		NS	0.238	1,180.00	NS	2,910.00	NS	399.00
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	7.90	NS	NS	NS	NS

Table 22 Semivolatile Organic Compounds
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	**Date / Quarter**	**Di-n-octyl phthalate**
EMW01-01	2/7/2017	<2
EMW05-01	2/7/2017	<2
EMW08-01	2/7/2017	<2
EMW09-01	2/7/2017	<2

MTCA Cleanup Levels:

Groundwater, Method A	NS
Groundwater, Method B, Cancer	NS
Groundwater, Method B, Non-cancer	160.00
Surface Water, Method B, Cancer	NS
Surface Water, Method B, Non-cancer	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS

Notes:

(I): Sampling results compared to MTCA Method A and B cleanup levels.
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
* - Samples were compared to LDW cleanup level of 64 µg/L (ppb) for 2-Methylnaphthalene, as it was the only detected VOC
N/T - Not Tested.
NS: No Standard
Samples analyzed by EPA Method 8270D by Friedman & Bruya, Inc.

Table 23: Semivolatile Organic Compounds (PAHs via SIM)
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene
EMW01-01	2/7/2017	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EMW05-01	2/7/2017	**0.23**	<0.03	**7.8**	**0.31**	**0.25**	**0.077**	**0.22**
EMW08-01	2/7/2017	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EMW09-01	2/7/2017	**0.79**	**0.061**	**0.50**	**0.32**	<0.03	<0.03	**0.052**
MTCA Cleanup Levels: Unrestricted Land Use								
Groundwater, Method A		160.00	NS	NS	NS	NS	4,800.00	NS
Groundwater, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Groundwater, Method B, Non-cancer		160.00	NS	960.00	640.00	NS	NS	640.00
Surface Water, Method B, Cancer		NS	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Non-cancer		4,710.00	NS	648.00	3,460.00	NS	25,900.00	86.40
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 23: Semivolatile Organic Compounds (PAHs via SIM) Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Pyrene	Benz(a) anthracene	Chrysene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno (1,2,3-cd) pyrene
EMW01-01	2/7/2017	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EMW05-01	2/7/2017	**0.46**	**0.13**	**0.20**	**0.067**	**0.15**	**0.043**	<0.03
EMW08-01	2/7/2017	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EMW09-01	2/7/2017	**0.13**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
MTCA Cleanup Levels: Unrestricted Land Use								
Groundwater, Method A		NS	NS	NS	0.10	NS	NS	NS
Groundwater, Method B, Cancer		NS	0.12	12.00	NS	0.12	1.20	0.12
Groundwater, Method B, Non-cancer		480.00	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Cancer		NS	0.296	29.60	0.0296	0.296	2.96	NS
Surface Water, Method B, Non-cancer		2,590.00	NS	NS	NS	NS	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Table 23: Semivolatile Organic Compounds (PAHs via SIM)
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date / Quarter	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene
EMW01-01	2/7/2017	<0.03	<0.03
EMW05-01	2/7/2017	<0.03	**0.031**
EMW08-01	2/7/2017	<0.03	<0.03
EMW09-01	2/7/2017	<0.03	<0.03

MTCA Cleanup Levels: Unrestricted Land Use

Groundwater, Method A	NS	NS
Groundwater, Method B, Cancer	0.01	NS
Groundwater, Method B, Non-cancer	NS	NS
Surface Water, Method B, Cancer	NS	NS
Surface Water, Method B, Non-cancer	NS	NS
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and B cleanup levels
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
NS: No Standard
Samples analyzed by EPA Method 8270D SIM by Friedman & Bruya, Inc.

Table 24: Polychlorinated Biphenyls
Groundwater Monitoring Well Sampling Results (I)

Bus Maintenance Facility, Project #10737c
Seattle, Washington

Sample Number	Date	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
EMW05-01	2/7/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EMW08-01	2/7/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EMW09-01	2/7/2017	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MTCA Cleanup Levels:								
Groundwater, Method A		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Groundwater, Method B, Cancer		NS	NS	1.25	NS	NS	0.0438	0.0438
Groundwater, Method B, Non cancer		NS	NS	1.12	NS	NS	0.32	NS
Surface Water, Method B, Cancer		NS	NS	0.00299	NS	NS	0.000105	0.0982
Surface Water, Method B, Non-cancer		NS	NS	0.00585	NS	NS	0.00167	17.70
Surface Water, Method B, Aquatic Life Marine/Chronic WAC 173-201A		NS	NS	NS	NS	NS	NS	NS

Notes:
(I): Sampling results compared to MTCA Method A and B cleanup levels
Concentrations are reported in µg/L (ppb)
Detections are **bolded**. Exceedances of MTCA are **bolded** and shaded.
Samples analyzed by Friedman & Bruya, Inc.
Samples Analyzed by EPA Method 8082A
NS: No Standard

APPENDIX A
BORING LOGS

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **West side of USTs**

BOREHOLE ID: **EP13**

DRILLING CONTRACTOR: **Holocene**

CORE SIZE: **2"**

HAMMER DATA:

DRILLING EQUIPMENT: **Direct-push Probe**

GROUND SURFACE ELEV.:

BOREHOLE BACKFILL: **Bentonite**

DRILLING METHOD: **Track rig**

TOTAL DEPTH: **10'**

DEPTH TO WATER: **6.5'**

LOGGED BY: **JSC**

SAMPLING METHOD: **Continuous**

DATE STARTED: **1/31/2017**

DATE COMPLETED: **1/31/2017**

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Asphalt				
5		SM	Silty fine sand with minor gravel, mottled gray and brown color, moist, no odor. (fill)	EP13-5	0.0		
	▽	SP/ML	Layered silt and fine to medium sand, brown and gray, very moist, no odor. (alluvium)	EP13-6	0.0		
10		SP	Fine to medium sand, black, wet. (alluvium)	EP13-10	0.0		

NOTES:

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **Next to catch basin by USTs**

BOREHOLE ID: **EP14**

DRILLING CONTRACTOR: **Holocene**

CORE SIZE: **2"**

HAMMER DATA:

DRILLING EQUIPMENT: **Direct-push Probe**

GROUND SURFACE ELEV.:

BOREHOLE BACKFILL: **Bentonite**

DRILLING METHOD: **Track rig**

TOTAL DEPTH: **10'**

DEPTH TO WATER: **5.0'**

LOGGED BY: **JSC**

SAMPLING METHOD: **Continuous**

DATE STARTED: **1/31/2017**

DATE COMPLETED: **1/31/2017**

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Asphalt				
5	▽	SP	Medium sand, brown, wet, no odor. (fill)	EP14-5	0.0		
		ML	Silt, gray, wet, no odor. (alluvium)		0.0		
10		SP	Fine sand, black, wet. (alluvium)	EP14-10	0.0		

NOTES:

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **South of bay door on west end of bld.**

BOREHOLE ID: **EP15**

DRILLING CONTRACTOR: **Holocene**

CORE SIZE: **2"**

HAMMER DATA:

DRILLING EQUIPMENT: **Direct-push Probe**

GROUND SURFACE ELEV.:

BOREHOLE BACKFILL: **Bentonite**

DRILLING METHOD: **Track rig**

TOTAL DEPTH: **10'**

DEPTH TO WATER: **6.5'**

LOGGED BY: **JSC**

SAMPLING METHOD: **Continuous**

DATE STARTED: **1/31/2017**

DATE COMPLETED: **1/31/2017**

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Concrete				
5		SP	Medium sand with minor coarse gravel, black and white, dry, no odor. (fill)	EP15-5	0.0		
	▽	SW	Fine to coarse sand, brown, very moist, no odor. (fill)	EP15-6	0.0		
10		SP	Fine sand, black, wet. (alluvium)	EP15-10	0.0		

NOTES:

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**	PROJECT NUMBER: **10737c-02**	
LOCATION: **North side bay on west end of main building.**	BOREHOLE ID: **EP16**	
DRILLING CONTRACTOR: **Holocene**	CORE SIZE: **2"**	HAMMER DATA:
DRILLING EQUIPMENT: **Direct-push Probe**	GROUND SURFACE ELEV.:	BOREHOLE BACKFILL: **Bentonite**
DRILLING METHOD: **Track rig**	TOTAL DEPTH: **10'**	DEPTH TO WATER: **5.0'**
SAMPLING METHOD: **Continuous**	DATE STARTED: **1/31/2017**	DATE COMPLETED: **1/31/2017**

LOGGED BY:
JSC

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Concrete				
5	▽	SP	Fine to medium sand, brown, moist, no odor. (fill)	EP16-5	0.0		
10		OH	Organic silt, gray, wet, no odor. (alluvium)	EP16-10	0.0		

NOTES:

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **North side of repair bay at west building end.**

BOREHOLE ID: **EP17**

DRILLING CONTRACTOR: **Holocene**

CORE SIZE: **2"**

HAMMER DATA:

DRILLING EQUIPMENT: **Direct-push Probe**

GROUND SURFACE ELEV.:

BOREHOLE BACKFILL: **Bentonite**

DRILLING METHOD: **Track rig**

TOTAL DEPTH: **10'**

DEPTH TO WATER: **6.5'**

LOGGED BY: **JSC**

SAMPLING METHOD: **Continuous**

DATE STARTED: **1/31/2017**

DATE COMPLETED: **1/31/2017**

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Concrete				
5		SP/GP	Medium sand and gravel, black, moist, no odor. (fill)	EP17-5	0.2		
	▽	SP/GP	Medium sand and gravel, black, very moist, no odor. (fill)	EP17-6	0.9		
10		OH	Organic silt, gray, wet, no odor. (alluvium)	EP17-10	0.0		

NOTES:

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **North side of repair bay at east building end.**

BOREHOLE ID: **EP18**

DRILLING CONTRACTOR: **Holocene**

CORE SIZE: **2"**

HAMMER DATA:

DRILLING EQUIPMENT: **Direct-push Probe**

GROUND SURFACE ELEV.:

BOREHOLE BACKFILL: **Bentonite**

DRILLING METHOD: **Track rig**

TOTAL DEPTH: **15'**

DEPTH TO WATER: **6.5'**

LOGGED BY: **JSC**

SAMPLING METHOD: **Continuous**

DATE STARTED: **1/31/2017**

DATE COMPLETED: **1/31/2017**

Depth (feet)	Groundwater Depth	USCS	Lithologic / Soil Description	Sample ID	PID Reading (ppm)	Blows / foot	% Recovery
0			Concrete				
			Wood chunk				
5		SP	Medium sand, black, very moist, no odor. (fill)	EP18-5	0.0		
	▽	SP	Medium sand, black, very moist, no odor. (fill)	EP18-6	0.9		
10		MH	Silt, gray-brown, wet, no odor. (alluvium)	EP18-10	0.0		
15		SP	Fine to medium sand, black, wet, no odor. (alluvium)	EP18-15	0.0		

NOTES:

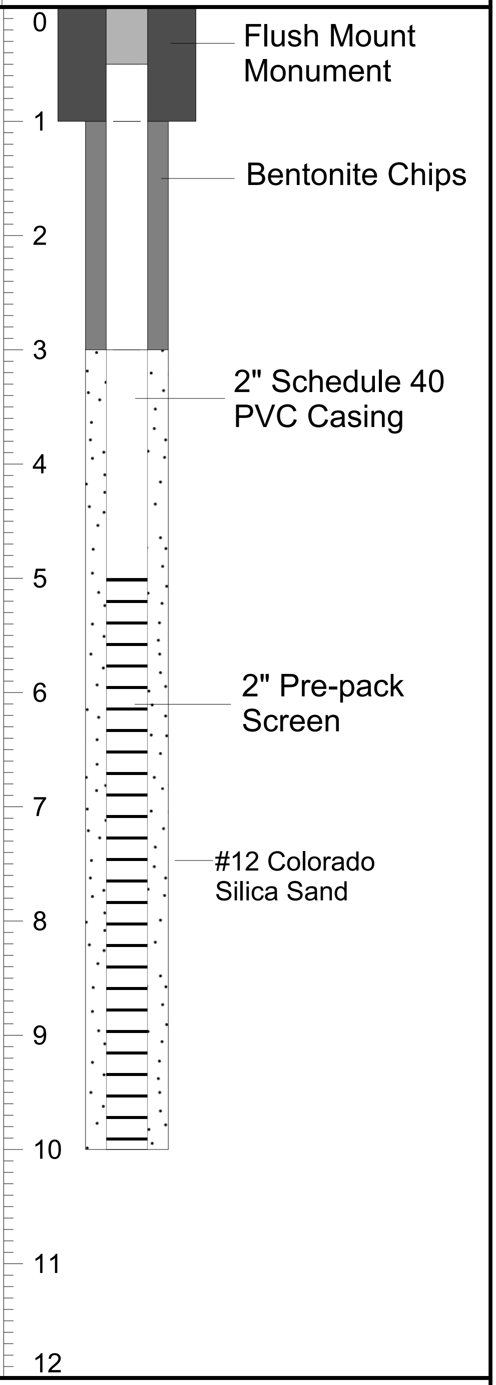
APPENDIX B
WELL LOGS

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**
PROJECT NUMBER: **10737c-02**
LOCATION: **Catch basin at NWC of site.**
WELL ID: **EMW01**
DRILLING CONTRACTOR: **Holocene**
NORTHING:
EASTING:
DRILLING EQUIPMENT: **Track rig**
GROUNDWATER ELEV.:
TOC ELEVATION:
DRILLING METHOD: **Probe**
TOTAL DEPTH: **10.20'**
DEPTH TO WATER: **3.22'**
LOGGED BY: **JSC**
SAMPLING METHOD: **None**
DATE STARTED: **02/01/17**
DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2					
3	▼				
4					
5		SP	Fine to medium sand, dark gray, moist, no odor. (fill)	EMW01-5	0
6	▽				
7		GP	3" layer of medium gravel, gray, wet. (fill)		
8		SM	Silty fine sand with silt layers, gray, wet, no odor. (alluvium)		
9					
10		ML	Silt, black, wet, no odor. (alluvium)	EMW01-10	0
11					
12					

Well Installation Data



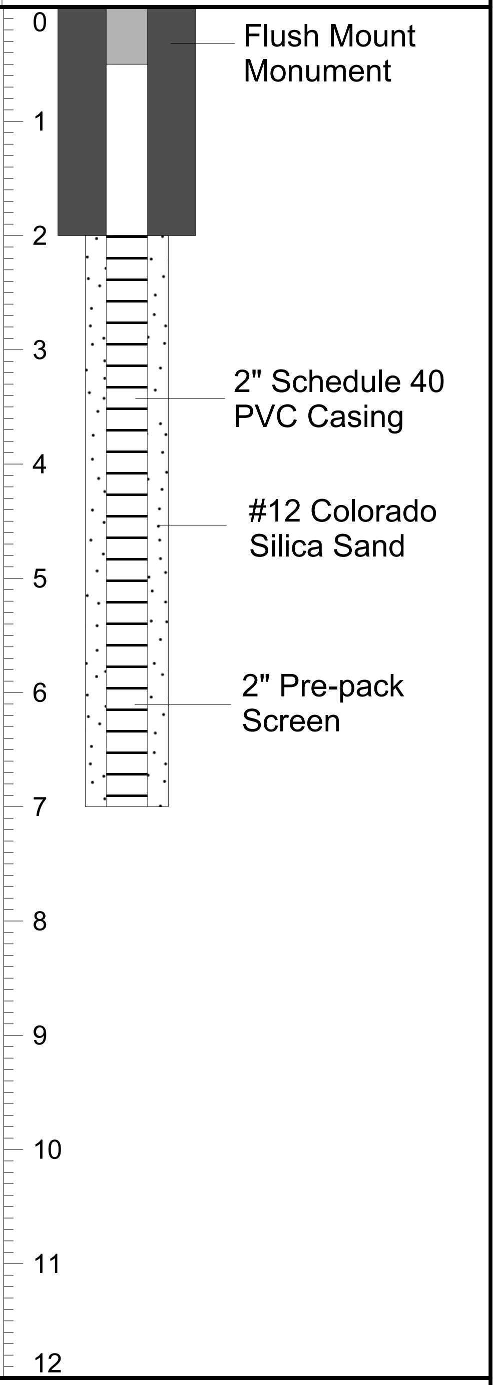
NOTES:
▽ Groundwater observed at time of drilling.
▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**
PROJECT NUMBER: **10737c-02**
LOCATION: **Middle of west side of site.**
WELL ID: **EMW02**
DRILLING CONTRACTOR: **Holocene**
NORTHING:
EASTING:
DRILLING EQUIPMENT: **Track rig**
GROUNDWATER ELEV.:
TOC ELEVATION:
DRILLING METHOD: **Probe**
TOTAL DEPTH: **6.93'**
DEPTH TO WATER: **1.85'**
LOGGED BY: **JSC**
SAMPLING METHOD: **None**
DATE STARTED: **02/01/17**
DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2	▼				
3	▽				
4					
5		SP	Fine to medium sand, black, wet, no odor. (fill)		
6					
7		SM	Silty fine sand, black, wet, no odor. (fill)		
8		OL	Organic silt, black, wet, no odor. (alluvium)		
9					
10		SM	Silty fine sand, black, wet, no odor. (alluvium)		
11					
12					

Well Installation Data



NOTES:
▽ Groundwater observed at time of drilling.
▼ Measured Water Level: February 7, 2017

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Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **Next to diesel dispenser**

WELL ID: **EMW03**

DRILLING CONTRACTOR: **Holocene**

NORTHING:

EASTING:

DRILLING EQUIPMENT: **Track rig**

GROUNDWATER ELEV.:

TOC ELEVATION:

DRILLING METHOD: **Probe**

TOTAL DEPTH: **6.93'**

DEPTH TO WATER: **4.92'**

LOGGED BY: **JSC**

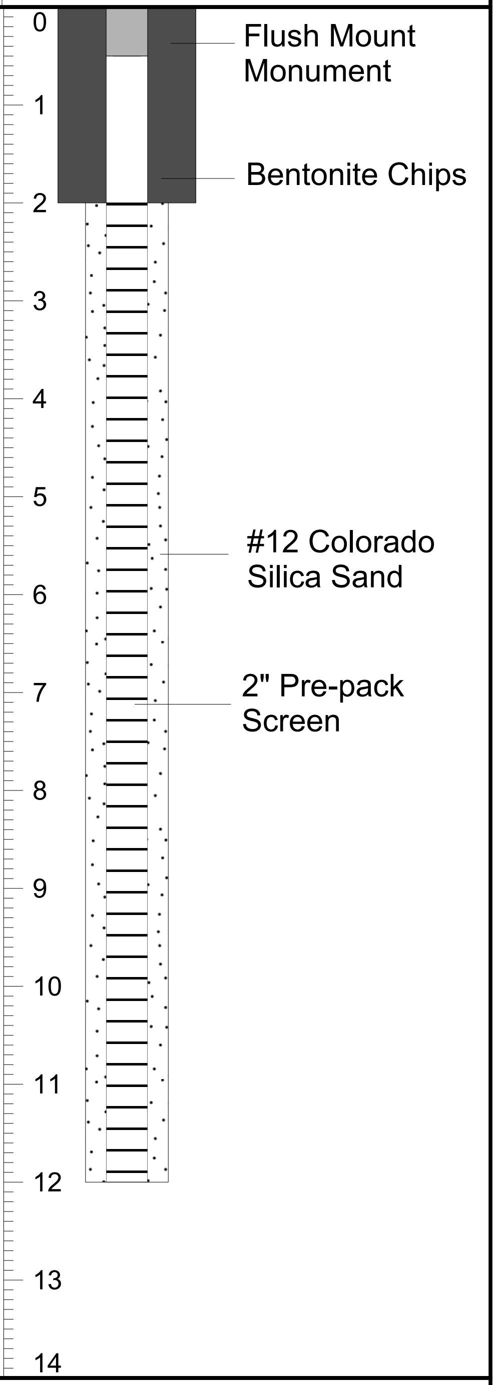
SAMPLING METHOD: **None**

DATE STARTED: **02/01/17**

DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
1			Concrete		
5	▼	SP	Fine to medium sand, dark gray, moist, no odor. (fill)	EMW03-5	0
7	▽	GP	Fine gravel, gray, moist, no odor. (fill)	EMW03-7	0.3
10		SM	Silty fine sand, black, wet, no odor. (alluvium)	EMW03-10	0

Well Installation Data



NOTES:

▽ Groundwater observed at time of drilling.

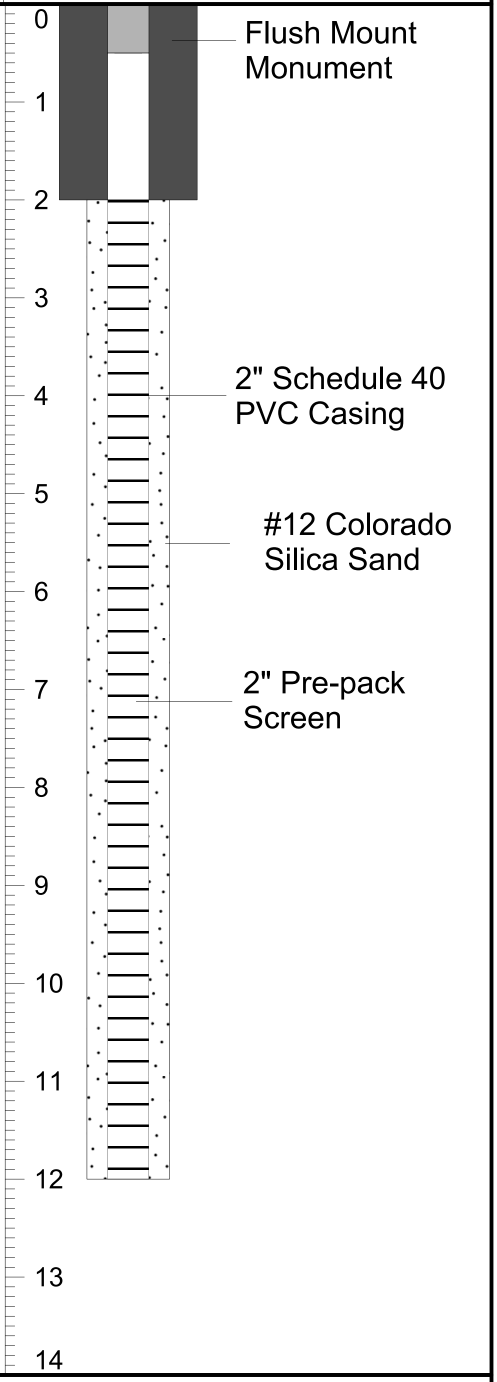
▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**
PROJECT NUMBER: **10737c-02**
LOCATION: **West of dispensers**
WELL ID: **EMW04**
DRILLING CONTRACTOR: **Holocene**
NORTHING:
EASTING:
DRILLING EQUIPMENT: **Track rig**
GROUNDWATER ELEV.:
TOC ELEVATION:
DRILLING METHOD: **Probe**
TOTAL DEPTH: **11.73'**
DEPTH TO WATER: **5.11'**
LOGGED BY: **JSC**
SAMPLING METHOD: **Continuous**
DATE STARTED: **02/01/17**
DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2					
3					
4					
5	▼	SP	Fine to medium sand, dark gray, moist, no odor. (fill)	EMW04-5	0
6	▽	SP/GP	Fine gravel and fine to medium sand, gray, very moist, no odor. (fill)	EMW04-6	0
7		SM	Silty fine sand, black, wet, no odor. (alluvium)		
8					
9		OH	Organic silt, gray, wet, no odor. (alluvium)		
10		SP	Fine to medium sand, black, wet, no odor. (alluvium)	EMW04-10	0
11					
12					
13					
14					

Well Installation Data



NOTES: ▽ Groundwater observed at time of drilling. ▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **South side of east bay door.**

WELL ID: **EMW05**

DRILLING CONTRACTOR: **Holocene**

NORTHING:

EASTING:

DRILLING EQUIPMENT: **Track rig**

GROUNDWATER ELEV.:

TOC ELEVATION:

DRILLING METHOD: **Probe**

TOTAL DEPTH: **11.70'**

DEPTH TO WATER: **5.23'**

LOGGED BY: **JSC**

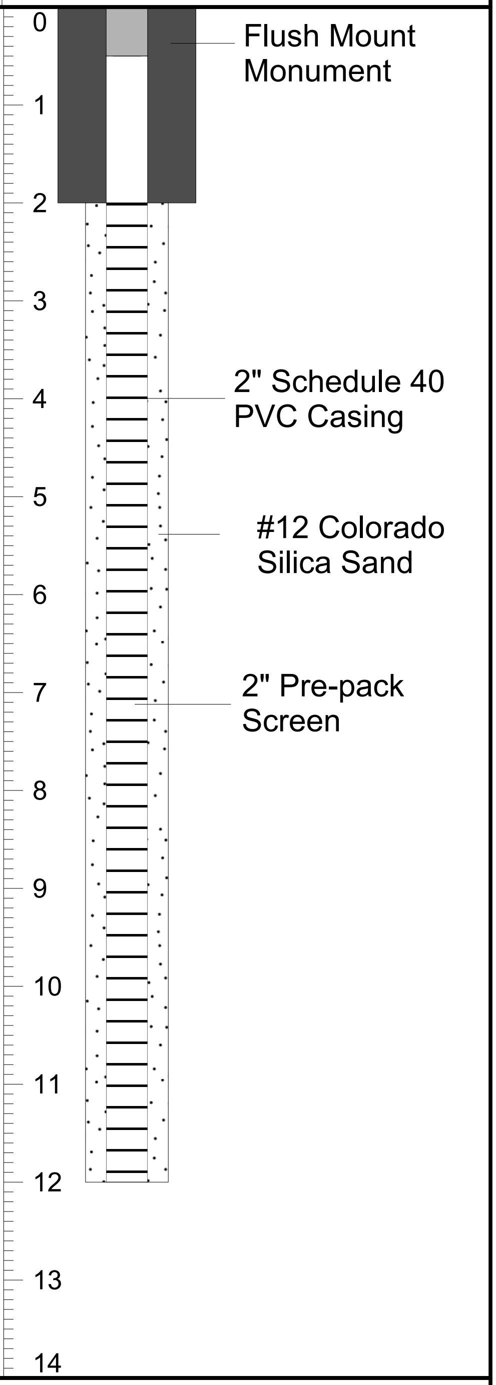
SAMPLING METHOD: **Continuous**

DATE STARTED: **02/01/17**

DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0					
1			Concrete		
2					
3					
4					
5	▼	SM	Silty fine sand with minor gravel, brown, moist, no odor. (fill)	EMW05-5	0
6				EMW05-8	0
7	▽				
8		SP/GP	Fine sand and fine gravel, black, wet, no odor. (fill)		
9					
10		SP/GP	Fine sand and fine gravel, black, wet, no odor. (fill)	EMW05-10	0
11					
12					
13					
14					

Well Installation Data



NOTES:

▽ Groundwater observed at time of drilling.

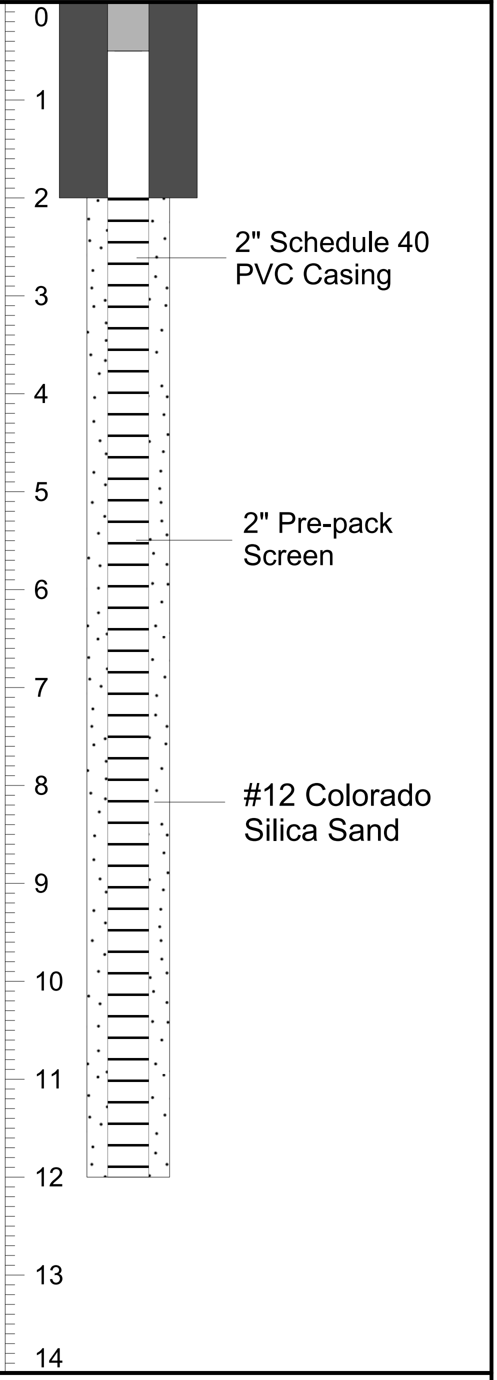
▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**
PROJECT NUMBER: **10737c-02**
LOCATION: **Southeast of dispensers.**
WELL ID: **EMW06**
DRILLING CONTRACTOR: **Holocene**
NORTHING:
EASTING:
DRILLING EQUIPMENT: **Track rig**
GROUNDWATER ELEV.:
TOC ELEVATION:
DRILLING METHOD: **Probe**
TOTAL DEPTH: **11.73'**
DEPTH TO WATER: **4.61'**
LOGGED BY: **JSC**
SAMPLING METHOD: **Continuous**
DATE STARTED: **02/01/17**
DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2					
3					
4					
	▼				
5		SP	Fine to medium sand, dark gray, moist, no odor. (fill)	EMW06-5	0
	▽				
6		SM	Silty fine sand, dark gray, wet, no odor. (fill)	EMW06-6	0
7					
8					
9					
10		OH	Organic silt, dark gray, wet, no odor. (alluvium)	EMW06-10	0
11					
12					
13					
14					

Well Installation Data



NOTES:
▽ Groundwater observed at time of drilling.
▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **East of dispensers.**

WELL ID: **EMW07**

DRILLING CONTRACTOR: **Holocene**

NORTHING:

EASTING:

DRILLING EQUIPMENT: **Track rig**

GROUNDWATER ELEV.:

TOC ELEVATION:

DRILLING METHOD: **Probe**

TOTAL DEPTH: **11.67'**

DEPTH TO WATER: **4.33'**

LOGGED BY: **JSC**

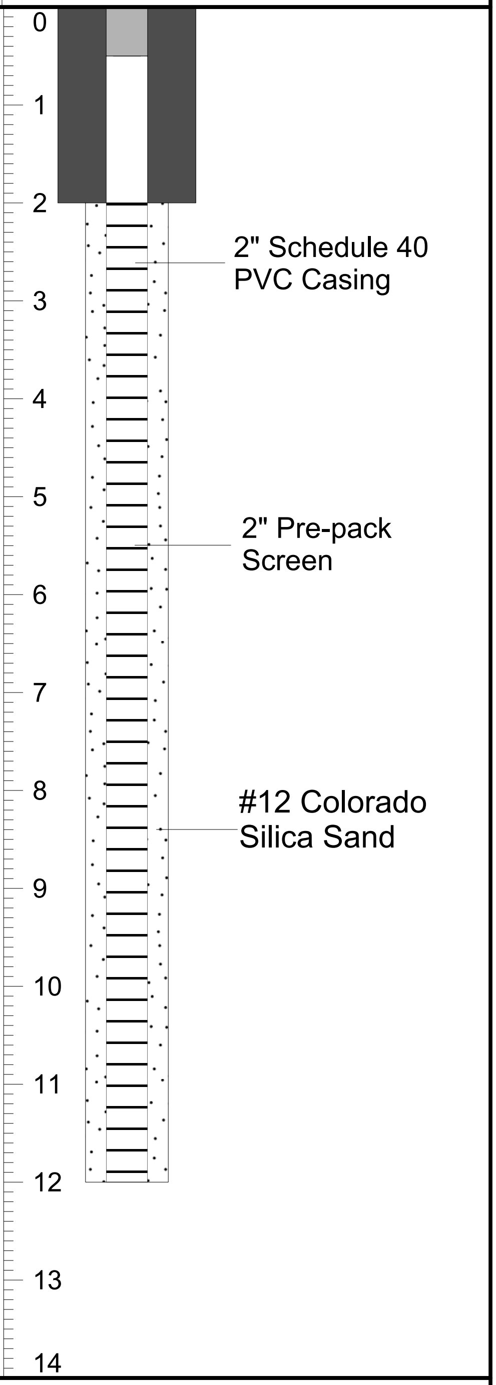
SAMPLING METHOD: **Continuous**

DATE STARTED: **02/01/17**

DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2					
3		SP	Fine to medium sand, dark brown, very moist, no odor. (fill)		
4	▼				
5	▽	SP	Fine to mediuim sand, dark brown, very moist, no odor. (fill)	EMW07-3	0
6				EMW07-5	0
7					
8					
9					
10		SM	Silty fine sand with organic matter, dark gray, wet, no odor. (alluvium)	EMW07-10	0
11					
12					
13					
14					

Well Installation Data



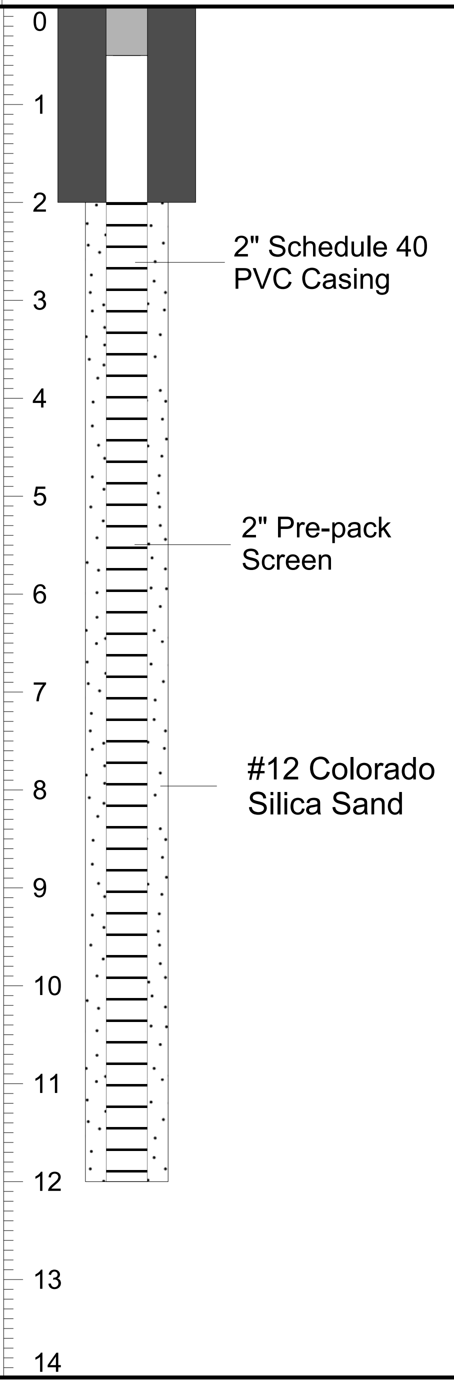
NOTES:
▽ Groundwater observed at time of drilling.
▼ Measured Water Level: February 7, 2017

EHS-International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**
PROJECT NUMBER: **10737c-02**
LOCATION: **Southeast side of bus wash.**
WELL ID: **EMW08**
DRILLING CONTRACTOR: **Holocene**
NORTHING:
EASTING:
DRILLING EQUIPMENT: **Track rig**
GROUNDWATER ELEV.:
TOC ELEVATION:
DRILLING METHOD: **Probe**
TOTAL DEPTH: **11.65'**
DEPTH TO WATER: **3.52'**
LOGGED BY: **JSC**
SAMPLING METHOD: **Continuous**
DATE STARTED: **02/01/17**
DATE COMPLETED: **02/01/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
1					
2					
3	▼				
4					
5	▽	SM/GP	Silty sand with minor gravel, brown, very moist, no odor. (fill)	EMW08-5	0.3
6					
7		OH	Organic silt, gray, wet, no odor. (alluvium)		
8					
9					
10		SM	Silty fine sand, black, wet, no odor. (alluvium)	EMW08-10	0
11					
12					
13					
14					

Well Installation Data



NOTES:
▽ Groundwater observed at time of drilling.
▼ Measured Water Level: February 7, 2017

EHS–International, Inc.
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT: **Bus Maintenance Facility**

PROJECT NUMBER: **10737c-02**

LOCATION: **Next to oil/water separator at NEC of site.**

WELL ID: **EMW09**

DRILLING CONTRACTOR: **Holocene**

NORTHING:

EASTING:

DRILLING EQUIPMENT: **Track rig**

GROUNDWATER ELEV.:

TOC ELEVATION:

DRILLING METHOD: **Probe**

TOTAL DEPTH: **15.05'**

DEPTH TO WATER: **5.19'**

LOGGED BY: **JSC**

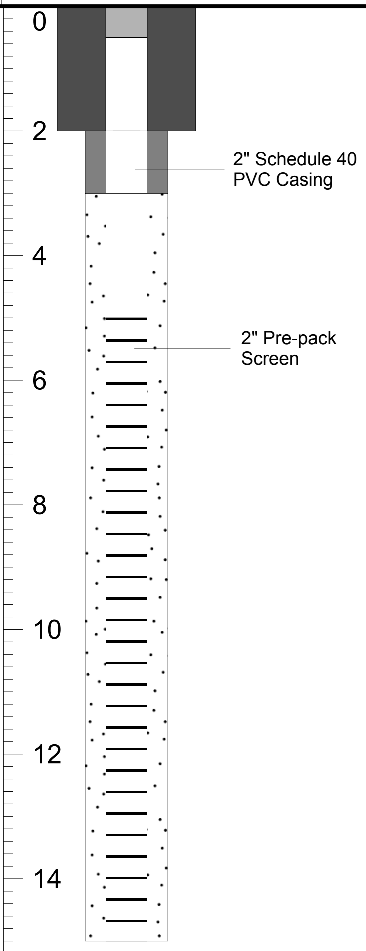
SAMPLING METHOD: **Continuous**

DATE STARTED: **02/02/17**

DATE COMPLETED: **02/02/17**

Depth (feet)	Groundwater Depth	USCS	Soil / Lithologic Description	Sample ID	PID Reading (ppm)
0			Asphalt		
2					
4					
	▼				
6		SM	Silty sand, black, moist, strong petroleum odor, odor. (fill)	EMW09-6	35
8		OH	Organic silt, brown, moist, moderate petroleum odor. (alluvium)		
10	▽				
12		SP	Fine to medium sand, black, wet, strong petroleum odor. (alluvium)	EMW09-12	60
14					
		SP	Fine to medium sand, black, wet, strong petroleum odor. (alluvium)	EMW09-15	22.5
16					
18					
20		SP	Fine to medium sand, black, wet, no odor. (alluvium)	EMW09-20	3.5
22					

Well Installation Data



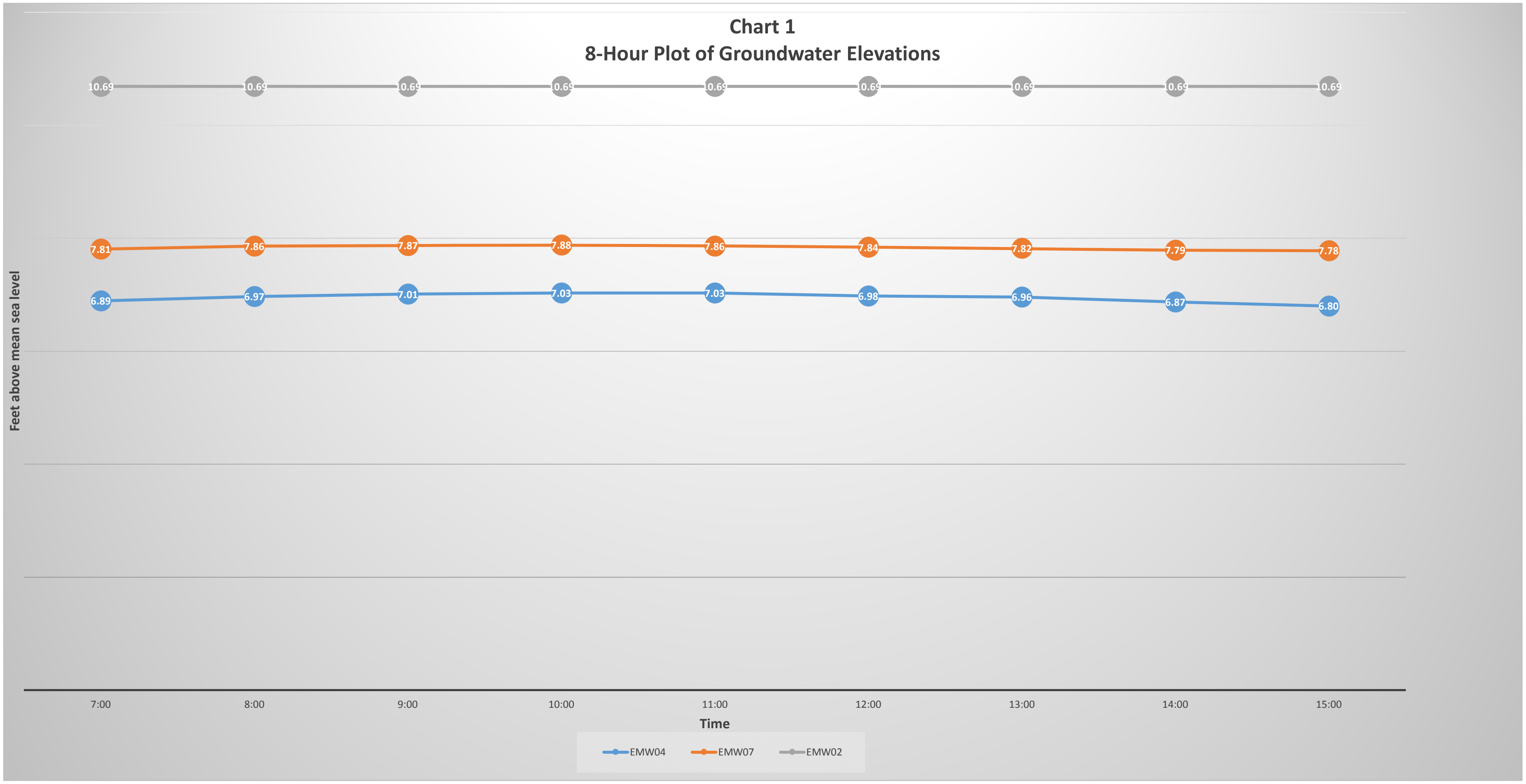
NOTES:

▽ Groundwater observed at time of drilling.

▼ Measured Water Level: February 7, 2017

APPENDIX C
CHART 8-HOUR TIDAL ELEVATIONS

EHSI
BUS MAINTENANCE FACILITY, SEATTLE, WASHINGTON
10737c



APPENDIX D
COPIES OF ANALYTICAL REPORTS

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 14, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on January 31, 2017 from the 10737f-01 Horizon Bus Line, F&BI 701377 project. There are 85 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Heather Binuya, Kurt Easthouse
EHS0214R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 31, 2017 by Friedman & Bruya, Inc. from the EHSI 10737f-01 Horizon Bus Line, F&BI 701377 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
701377 -01	EP13-5
701377 -02	EP13-6
701377 -03	EP13-10
701377 -04	EP13-GW
701377 -05	EP14-5
701377 -06	EP14-10
701377 -07	EP14-GW
701377 -08	EP15-5
701377 -09	EP15-6
701377 -10	EP15-10
701377 -11	EP15-GW
701377 -12	EP16-5
701377 -13	EP16-10
701377 -14	EP16-GW
701377 -15	EP17-5
701377 -16	EP17-6
701377 -17	EP17-10
701377 -18	EP17-GW
701377 -19	EP18-5
701377 -20	EP18-6
701377 -21	EP18-10
701377 -22	EP18-15
701377 -23	EP18-GW

The dissolved metals samples were filtered at Friedman and Bruya on February 2, 2017 at 13:37. The data were flagged accordingly.

The 8270D calibration standard did not pass for 2-fluorophenol, 2,4,6-tribromophenol, and terphenyl-d14 in sample EP15-6. The data were flagged accordingly.

The 8270D benzoic acid calibration standard did not pass the acceptance criteria. The data were flagged accordingly.

The 8270D diethyl phthalate laboratory control sample duplicate exceeded the acceptance criteria. Diethyl phthalate was not detected in the samples, therefore the data were acceptable.

CASE NARRATIVE (continued)

The 8270D sample EP16-5 was diluted due to matrix effect. The reporting limits were raised accordingly.

All other quality control requirements were acceptable.

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/03/17
Date Analyzed: 02/03/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
EP15-GW 701377-11	<100	86
EP16-GW 701377-14	<100	89
EP18-GW 701377-23	190	85
Method Blank 07-212 MB	<100	90

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/01/17
Date Analyzed: 02/01/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 58-139)
EP15-6 701377-09	<2	92
EP16-5 701377-12	<2	90
EP17-6 701377-16	<2	92
EP18-6 701377-20	<2	92
Method Blank 07-209 MB	<2	92

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/03/17
Date Analyzed: 02/03/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
EP13-GW 701377-04	<1	<1	<1	<3	<100	87
EP14-GW 701377-07	<1	<1	<1	<3	<100	89
Method Blank 07-212 MB	<1	<1	<1	<3	<100	88

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/01/17
Date Analyzed: 02/01/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
EP13-6 701377-02	<0.02	<0.02	<0.02	<0.06	<2	84
EP14-5 701377-05	<0.02	<0.02	<0.02	<0.06	<2	86
Method Blank 07-209 MB	<0.02	<0.02	<0.02	<0.06	<2	87

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/01/17
Date Analyzed: 02/01/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
EP13-GW 701377-04	140 x	<250	101
EP14-GW 701377-07	150 x	<250	104
EP15-GW 701377-11	180 x	270 x	103
EP16-GW 701377-14	120 x	<250	113
EP18-GW 701377-23	1,100 x	270 x	92
Method Blank 07-228 MB	<50	<250	115

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted: 02/01/17
Date Analyzed: 02/01/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 48-168)
EP13-6 701377-02	<50	<250	116
EP14-5 701377-05	<50	<250	127
EP15-6 701377-09	<50	<250	119
EP16-5 701377-12	78 x	380	120
EP17-6 701377-16	<50	<250	110
EP18-5 701377-19	1,400	<250	119
Method Blank 07-231 MB	<50	<250	125

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EP13-GW f	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-04
Date Analyzed:	02/03/17	Data File:	701377-04.073
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EP14-GW f	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-07
Date Analyzed:	02/03/17	Data File:	701377-07.074
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EP15-GW f	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-11
Date Analyzed:	02/03/17	Data File:	701377-11.075
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EP16-GW f	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-14
Date Analyzed:	02/03/17	Data File:	701377-14.078
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.96
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EP18-GW f	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-23
Date Analyzed:	02/03/17	Data File:	701377-23.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.66
Cadmium	<1
Chromium	1.32
Lead	<1
Mercury	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank f	Client:	EHSI
Date Received:	NA	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	I7-055 mb
Date Analyzed:	02/03/17	Data File:	I7-055 mb.071
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP13-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-04
Date Analyzed:	02/03/17	Data File:	701377-04.053
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP14-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-07
Date Analyzed:	02/03/17	Data File:	701377-07.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP15-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-11
Date Analyzed:	02/03/17	Data File:	701377-11.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.01
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP16-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-14
Date Analyzed:	02/03/17	Data File:	701377-14.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	12.5
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP18-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	701377-23
Date Analyzed:	02/03/17	Data File:	701377-23.059
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	3.02
Cadmium	<1
Chromium	3.91
Lead	1.25
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/02/17	Lab ID:	I7-054 mb
Date Analyzed:	02/03/17	Data File:	I7-054 mb.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP13-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-02
Date Analyzed:	02/01/17	Data File:	701377-02.036
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	7.07

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP14-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-05
Date Analyzed:	02/01/17	Data File:	701377-05.037
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	5.94

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP15-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-09
Date Analyzed:	02/01/17	Data File:	701377-09.038
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.50
Cadmium	<1
Chromium	8.10
Lead	5.75
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP16-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-12
Date Analyzed:	02/01/17	Data File:	701377-12.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.12
Cadmium	<1
Chromium	8.28
Lead	58.6
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP17-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-16
Date Analyzed:	02/01/17	Data File:	701377-16.042
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	5.39
Lead	1.07
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EP18-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-19
Date Analyzed:	02/01/17	Data File:	701377-19.043
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.07
Cadmium	<1
Chromium	5.67
Lead	3.60
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	I7-051 mb
Date Analyzed:	02/01/17	Data File:	I7-051 mb.025
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<5
Lead	<1
Mercury	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP15-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-11
Date Analyzed:	02/01/17	Data File:	020111.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP16-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-14
Date Analyzed:	02/01/17	Data File:	020112.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP17-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-18
Date Analyzed:	02/01/17	Data File:	020113.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP18-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-23
Date Analyzed:	02/01/17	Data File:	020114.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	100
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	07-0189 mb
Date Analyzed:	02/01/17	Data File:	020108.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	106	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP15-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-09
Date Analyzed:	02/02/17	Data File:	020135.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	62	142
Toluene-d8	105	55	145
4-Bromofluorobenzene	98	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP16-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-12
Date Analyzed:	02/02/17	Data File:	020136.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	106	55	145
4-Bromofluorobenzene	99	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP17-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-16
Date Analyzed:	02/02/17	Data File:	020137.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	105	55	145
4-Bromofluorobenzene	98	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EP18-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-20
Date Analyzed:	02/02/17	Data File:	020138.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	105	55	145
4-Bromofluorobenzene	99	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	07-0188 mb
Date Analyzed:	02/01/17	Data File:	020123.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	106	55	145
4-Bromofluorobenzene	99	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP15-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-09 1/5
Date Analyzed:	02/07/17	Data File:	020708.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	54	31	163
Benzo(a)anthracene-d12	62	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	0.012
Pyrene	0.011
Benz(a)anthracene	<0.01
Chrysene	0.013
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	0.016
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP16-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-12 1/50
Date Analyzed:	02/06/17	Data File:	020619.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	119 d	31	163
Benzo(a)anthracene-d12	152 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.15
Acenaphthylene	0.33
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.24
Anthracene	<0.1
Fluoranthene	2.4
Pyrene	2.8
Benz(a)anthracene	2.2
Chrysene	2.2
Benzo(a)pyrene	2.8
Benzo(b)fluoranthene	2.9
Benzo(k)fluoranthene	1.0
Indeno(1,2,3-cd)pyrene	1.4
Dibenz(a,h)anthracene	0.31
Benzo(g,h,i)perylene	1.2

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP16-10	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/09/17	Lab ID:	701377-13 1/5
Date Analyzed:	02/09/17	Data File:	020924.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	163
Benzo(a)anthracene-d12	95	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP17-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-16 1/5
Date Analyzed:	02/06/17	Data File:	020610.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	74	31	163
Benzo(a)anthracene-d12	82	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP18-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-19 1/5
Date Analyzed:	02/06/17	Data File:	020612.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	79	31	163
Benzo(a)anthracene-d12	89	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/09/17	Lab ID:	07-277 mb 1/5
Date Analyzed:	02/09/17	Data File:	020923.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	31	163
Benzo(a)anthracene-d12	100	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	07-247 mb 1/5
Date Analyzed:	02/06/17	Data File:	020607.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	31	163
Benzo(a)anthracene-d12	94	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP15-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-09 1/5
Date Analyzed:	02/07/17	Data File:	020706.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	110 ca	56	115
Phenol-d6	108	54	113
Nitrobenzene-d5	105	31	164
2-Fluorobiphenyl	106	47	133
2,4,6-Tribromophenol	107 ca	35	141
Terphenyl-d14	124 ca	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP16-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-12 1/50
Date Analyzed:	02/06/17	Data File:	020618.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	112 d	56	115
Phenol-d6	106 d	54	113
Nitrobenzene-d5	100 d	31	164
2-Fluorobiphenyl	107 d	47	133
2,4,6-Tribromophenol	93 d	35	141
Terphenyl-d14	123 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<5	Hexachlorocyclopentadiene	<1.5
Bis(2-chloroethyl) ether	<0.5	2,4,6-Trichlorophenol	<5
2-Chlorophenol	<5	2,4,5-Trichlorophenol	<5
1,3-Dichlorobenzene	<0.5	2-Chloronaphthalene	<0.5
1,4-Dichlorobenzene	<0.5	2-Nitroaniline	<2.5
1,2-Dichlorobenzene	<0.5	Dimethyl phthalate	<5
Benzyl alcohol	<5	2,6-Dinitrotoluene	<2.5
2,2'-Oxybis(1-chloropropane)	<0.5	3-Nitroaniline	<50
2-Methylphenol	<5	2,4-Dinitrophenol	<15
Hexachloroethane	<0.5	Dibenzofuran	<0.5
N-Nitroso-di-n-propylamine	<0.5	2,4-Dinitrotoluene	<2.5
3-Methylphenol + 4-Methylphenol	<10	4-Nitrophenol	<15
Nitrobenzene	<0.5	Diethyl phthalate	<5
Isophorone	<0.5	4-Chlorophenyl phenyl ether	<0.5
2-Nitrophenol	<5	N-Nitrosodiphenylamine	<0.5
2,4-Dimethylphenol	<5	4-Nitroaniline	<50
Benzoic acid	<25	4,6-Dinitro-2-methylphenol	<15
Bis(2-chloroethoxy)methane	<0.5	4-Bromophenyl phenyl ether	<0.5
2,4-Dichlorophenol	<5	Hexachlorobenzene	<0.5
1,2,4-Trichlorobenzene	<0.5	Pentachlorophenol	<5
Hexachlorobutadiene	<0.5	Carbazole	<5
4-Chloroaniline	<50	Di-n-butyl phthalate	<5
4-Chloro-3-methylphenol	<5	Benzyl butyl phthalate	<5
2-Methylnaphthalene	<0.5	Bis(2-ethylhexyl) phthalate	<8
1-Methylnaphthalene	<0.5	Di-n-octyl phthalate	<5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP17-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	701377-16 1/5
Date Analyzed:	02/06/17	Data File:	020608.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	113	56	115
Phenol-d6	108	54	113
Nitrobenzene-d5	110	31	164
2-Fluorobiphenyl	111	47	133
2,4,6-Tribromophenol	104	35	141
Terphenyl-d14	127	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/06/17	Lab ID:	07-248 mb
Date Analyzed:	02/06/17	Data File:	020605.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	99	56	115
Phenol-d6	95	54	113
Nitrobenzene-d5	95	31	164
2-Fluorobiphenyl	95	47	133
2,4,6-Tribromophenol	92	35	141
Terphenyl-d14	102	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	Hexachlorocyclopentadiene	<0.03
Bis(2-chloroethyl) ether	<0.01	2,4,6-Trichlorophenol	<0.1
2-Chlorophenol	<0.1	2,4,5-Trichlorophenol	<0.1
1,3-Dichlorobenzene	<0.01	2-Chloronaphthalene	<0.01
1,4-Dichlorobenzene	<0.01	2-Nitroaniline	<0.05
1,2-Dichlorobenzene	<0.01	Dimethyl phthalate	<0.1
Benzyl alcohol	<0.1	2,6-Dinitrotoluene	<0.05
2,2'-Oxybis(1-chloropropane)	<0.01	3-Nitroaniline	<1
2-Methylphenol	<0.1	2,4-Dinitrophenol	<0.3
Hexachloroethane	<0.01	Dibenzofuran	<0.01
N-Nitroso-di-n-propylamine	<0.01	2,4-Dinitrotoluene	<0.05
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitrophenol	<0.3
Nitrobenzene	<0.01	Diethyl phthalate	<0.1
Isophorone	<0.01	4-Chlorophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	N-Nitrosodiphenylamine	<0.01
2,4-Dimethylphenol	<0.1	4-Nitroaniline	<1
Benzoic acid	<0.5	4,6-Dinitro-2-methylphenol	<0.3
Bis(2-chloroethoxy)methane	<0.01	4-Bromophenyl phenyl ether	<0.01
2,4-Dichlorophenol	<0.1	Hexachlorobenzene	<0.01
1,2,4-Trichlorobenzene	<0.01	Pentachlorophenol	<0.1
Hexachlorobutadiene	<0.01	Carbazole	<0.1
4-Chloroaniline	<1	Di-n-butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benzyl butyl phthalate	<0.1
2-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
1-Methylnaphthalene	<0.01	Di-n-octyl phthalate	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP15-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-11
Date Analyzed:	02/02/17	Data File:	020207.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	31	160
Benzo(a)anthracene-d12	103	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.071
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	0.035
Phenanthrene	0.046
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	0.037
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP16-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-14
Date Analyzed:	02/02/17	Data File:	020218.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	31	160
Benzo(a)anthracene-d12	115	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.058
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	0.046
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EP18-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-23 1/10
Date Analyzed:	02/03/17	Data File:	020314.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	130 d	31	160
Benzo(a)anthracene-d12	118 d	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	110
Acenaphthylene	<0.3
Acenaphthene	24
Fluorene	3.1
Phenanthrene	3.8
Anthracene	<0.3
Fluoranthene	<0.3
Pyrene	<0.3
Benz(a)anthracene	<0.3
Chrysene	<0.3
Benzo(a)pyrene	<0.3
Benzo(b)fluoranthene	<0.3
Benzo(k)fluoranthene	<0.3
Indeno(1,2,3-cd)pyrene	<0.3
Dibenz(a,h)anthracene	<0.3
Benzo(g,h,i)perylene	<0.3

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	07-234 mb
Date Analyzed:	02/02/17	Data File:	020205.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	107	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP15-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-11
Date Analyzed:	02/02/17	Data File:	020206.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	83	32	162
Phenol-d6	56	10	170
Nitrobenzene-d5	114	50	150
2-Fluorobiphenyl	114	43	158
2,4,6-Tribromophenol	118	43	146
Terphenyl-d14	114	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10 ca	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP16-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-14
Date Analyzed:	02/02/17	Data File:	020207.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	76	32	162
Phenol-d6	50	10	170
Nitrobenzene-d5	110	50	150
2-Fluorobiphenyl	105	43	158
2,4,6-Tribromophenol	123	43	146
Terphenyl-d14	123	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10 ca	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EP18-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-23
Date Analyzed:	02/02/17	Data File:	020208.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	81	32	162
Phenol-d6	55	10	170
Nitrobenzene-d5	111	50	150
2-Fluorobiphenyl	65	43	158
2,4,6-Tribromophenol	88	43	146
Terphenyl-d14	101	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	0.61
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10 ca	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	5.3
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	13	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	8.7	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	07-233 mb
Date Analyzed:	02/02/17	Data File:	020205.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	70	32	162
Phenol-d6	46	10	170
Nitrobenzene-d5	109	50	150
2-Fluorobiphenyl	108	43	158
2,4,6-Tribromophenol	93	43	146
Terphenyl-d14	126	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10 ca	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP15-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-09 1/50
Date Analyzed:	02/01/17	Data File:	020120.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	70 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP16-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-12 1/50
Date Analyzed:	02/01/17	Data File:	020121.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP17-6	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-16 1/50
Date Analyzed:	02/01/17	Data File:	020122.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	70 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP18-5	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	701377-19 1/50
Date Analyzed:	02/02/17	Data File:	020123.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	65 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/01/17	Lab ID:	07-225 mb2 1/5
Date Analyzed:	02/01/17	Data File:	020119.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	72	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP15-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/03/17	Lab ID:	701377-11
Date Analyzed:	02/06/17	Data File:	020609.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	41	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP16-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/03/17	Lab ID:	701377-14
Date Analyzed:	02/06/17	Data File:	020610.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	49	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EP18-GW	Client:	EHSI
Date Received:	01/31/17	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/03/17	Lab ID:	701377-23
Date Analyzed:	02/06/17	Data File:	020611.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	56	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	10737f-01 Horizon Bus Line, F&BI 701377
Date Extracted:	02/03/17	Lab ID:	07-242 mb
Date Analyzed:	02/06/17	Data File:	020607.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 701377-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	102	72-122
Ethylbenzene	ug/L (ppb)	50	103	73-126
Xylenes	ug/L (ppb)	150	102	74-118
Gasoline	ug/L (ppb)	1,000	100	69-134

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 702006-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	88	66-121
Toluene	mg/kg (ppm)	0.5	89	72-128
Ethylbenzene	mg/kg (ppm)	0.5	93	69-132
Xylenes	mg/kg (ppm)	1.5	92	69-131
Gasoline	mg/kg (ppm)	20	100	61-153

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	103	103	61-133	0

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 701359-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	110	112	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	112	74-139

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 701377-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	114	114	70-130	0
Cadmium	ug/L (ppb)	5	<1	103	103	70-130	0
Chromium	ug/L (ppb)	20	<1	104	102	70-130	2
Lead	ug/L (ppb)	10	<1	94	93	70-130	1
Mercury	ug/L (ppb)	10	<1	101	102	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	103	85-115
Cadmium	ug/L (ppb)	5	105	85-115
Chromium	ug/L (ppb)	20	100	85-115
Lead	ug/L (ppb)	10	101	85-115
Mercury	ug/L (ppb)	10	106	85-115

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 701377-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	3.03	108	108	70-130	0
Cadmium	ug/L (ppb)	5	<1	89	87	70-130	2
Chromium	ug/L (ppb)	20	<1	102	102	70-130	0
Lead	ug/L (ppb)	10	<1	76	77	70-130	1
Mercury	ug/L (ppb)	10	<1	83	82	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	96	85-115
Cadmium	ug/L (ppb)	5	101	85-115
Chromium	ug/L (ppb)	20	96	85-115
Lead	ug/L (ppb)	10	96	85-115
Mercury	ug/L (ppb)	10	99	85-115

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 701240-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	3.56	99	106	70-130	7
Cadmium	mg/kg (ppm)	10	<1	101	101	70-130	0
Chromium	mg/kg (ppm)	50	11.4	101	103	70-130	2
Lead	mg/kg (ppm)	50	20.4	90 b	119 b	70-130	28 b
Mercury	mg/kg (ppm	10	<1	96	96	70-130	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	104	85-115
Cadmium	mg/kg (ppm)	10	107	85-115
Chromium	mg/kg (ppm)	50	110	85-115
Lead	mg/kg (ppm)	50	106	85-115
Mercury	mg/kg (ppm)	10	110	85-115

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702006-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	127	10-172
Chloromethane	ug/L (ppb)	50	<10	101	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	107	36-166
Bromomethane	ug/L (ppb)	50	<1	110	47-169
Chloroethane	ug/L (ppb)	50	<1	104	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	122	44-165
Acetone	ug/L (ppb)	250	<10	104	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Hexane	ug/L (ppb)	50	<1	102	52-150
Methylene chloride	ug/L (ppb)	50	<5	114	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	107	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	107	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	104	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	119	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	106	71-127
Chloroform	ug/L (ppb)	50	<1	110	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	102	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	114	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	118	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	106	69-133
Carbon tetrachloride	ug/L (ppb)	50	<1	122	56-152
Benzene	ug/L (ppb)	50	<0.35	101	76-125
Trichloroethene	ug/L (ppb)	50	<1	107	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	106	78-125
Bromodichloromethane	ug/L (ppb)	50	<1	123	61-150
Dibromomethane	ug/L (ppb)	50	<1	111	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	110	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	113	72-132
Toluene	ug/L (ppb)	50	<1	94	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	101	68-131
2-Hexanone	ug/L (ppb)	250	<10	89	10-185
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	102	10-226
Dibromochloromethane	ug/L (ppb)	50	<1	110	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	101	69-134
Chlorobenzene	ug/L (ppb)	50	<1	99	77-122
Ethylbenzene	ug/L (ppb)	50	<1	95	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	108	73-137
m,p-Xylene	ug/L (ppb)	100	<2	96	69-135
o-Xylene	ug/L (ppb)	50	<1	97	60-140
Styrene	ug/L (ppb)	50	<1	98	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	97	65-142
Bromoform	ug/L (ppb)	50	<1	108	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	90	58-144
Bromobenzene	ug/L (ppb)	50	<1	94	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	94	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	94	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	90	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	90	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	91	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	94	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	92	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	93	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	94	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	97	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	96	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	99	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	100	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	97	66-136
Hexachlorobutadiene	ug/L (ppb)	50	<1	106	60-143
Naphthalene	ug/L (ppb)	50	<1	96	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	99	69-148

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	131	134	25-158	2
Chloromethane	ug/L (ppb)	50	98	107	45-156	9
Vinyl chloride	ug/L (ppb)	50	106	113	50-154	6
Bromomethane	ug/L (ppb)	50	108	119	55-143	10
Chloroethane	ug/L (ppb)	50	104	111	58-146	7
Trichlorofluoromethane	ug/L (ppb)	250	124	126	50-150	2
Acetone	ug/L (ppb)	250	106	108	53-131	2
1,1-Dichloroethene	ug/L (ppb)	50	107	108	67-136	1
Hexane	ug/L (ppb)	50	102	103	57-137	1
Methylene chloride	ug/L (ppb)	50	117	117	39-148	0
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	107	108	64-147	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	110	111	68-128	1
1,1-Dichloroethane	ug/L (ppb)	50	106	107	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	117	123	55-143	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	108	109	80-123	1
Chloroform	ug/L (ppb)	50	111	113	80-121	2
2-Butanone (MEK)	ug/L (ppb)	250	104	104	57-149	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	115	116	73-132	1
1,1,1-Trichloroethane	ug/L (ppb)	50	120	121	83-130	1
1,1-Dichloropropene	ug/L (ppb)	50	109	109	77-129	0
Carbon tetrachloride	ug/L (ppb)	50	126	127	75-158	1
Benzene	ug/L (ppb)	50	104	104	69-134	0
Trichloroethene	ug/L (ppb)	50	110	111	80-120	1
1,2-Dichloropropane	ug/L (ppb)	50	109	110	77-123	1
Bromodichloromethane	ug/L (ppb)	50	128	128	81-133	0
Dibromomethane	ug/L (ppb)	50	114	113	82-125	1
4-Methyl-2-pentanone	ug/L (ppb)	250	112	111	65-138	1
cis-1,3-Dichloropropene	ug/L (ppb)	50	119	119	82-132	0
Toluene	ug/L (ppb)	50	95	96	72-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	112	114	80-136	2
1,1,2-Trichloroethane	ug/L (ppb)	50	102	103	75-124	1
2-Hexanone	ug/L (ppb)	250	88	90	60-136	2
1,3-Dichloropropane	ug/L (ppb)	50	99	100	76-126	1
Tetrachloroethene	ug/L (ppb)	50	105	106	76-121	1
Dibromochloromethane	ug/L (ppb)	50	117	118	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	104	103	82-125	1
Chlorobenzene	ug/L (ppb)	50	101	101	83-114	0
Ethylbenzene	ug/L (ppb)	50	98	98	77-124	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	110	111	84-127	1
m,p-Xylene	ug/L (ppb)	100	98	99	83-125	1
o-Xylene	ug/L (ppb)	50	98	101	81-121	3
Styrene	ug/L (ppb)	50	101	103	84-119	2
Isopropylbenzene	ug/L (ppb)	50	99	102	85-117	3
Bromoform	ug/L (ppb)	50	121	122	74-136	1
n-Propylbenzene	ug/L (ppb)	50	93	93	74-126	0
Bromobenzene	ug/L (ppb)	50	97	97	80-121	0
1,3,5-Trimethylbenzene	ug/L (ppb)	50	97	97	78-123	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	95	97	66-126	2
1,2,3-Trichloropropane	ug/L (ppb)	50	91	92	67-124	1
2-Chlorotoluene	ug/L (ppb)	50	93	93	77-127	0
4-Chlorotoluene	ug/L (ppb)	50	94	94	78-128	0
tert-Butylbenzene	ug/L (ppb)	50	97	96	80-123	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	95	95	79-122	0
sec-Butylbenzene	ug/L (ppb)	50	95	96	80-125	1
p-Isopropyltoluene	ug/L (ppb)	50	96	97	81-123	1
1,3-Dichlorobenzene	ug/L (ppb)	50	100	101	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	98	99	84-121	1
1,2-Dichlorobenzene	ug/L (ppb)	50	100	102	85-116	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	103	106	57-141	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	97	98	72-130	1
Hexachlorobutadiene	ug/L (ppb)	50	111	109	53-141	2
Naphthalene	ug/L (ppb)	50	96	99	64-133	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	99	102	65-136	3

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 701375-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	22	21	10-142	5
Chloromethane	mg/kg (ppm)	2.5	<0.5	50	50	10-126	0
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	51	50	10-138	2
Bromomethane	mg/kg (ppm)	2.5	<0.5	66	66	10-163	0
Chloroethane	mg/kg (ppm)	2.5	<0.5	62	60	10-176	3
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	63	62	10-176	2
Acetone	mg/kg (ppm)	12.5	<0.5	86	86	10-163	0
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	70	69	10-160	1
Hexane	mg/kg (ppm)	2.5	<0.25	46	42	10-137	9
Methylene chloride	mg/kg (ppm)	2.5	<0.5	90	92	10-156	2
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	89	90	21-145	1
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	80	83	14-137	4
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	84	85	19-140	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	94	92	10-158	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	88	89	25-135	1
Chloroform	mg/kg (ppm)	2.5	<0.05	92	93	21-145	1
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	87	86	19-147	1
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	96	96	12-160	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	94	93	10-156	1
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	84	83	17-140	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	94	94	9-164	0
Benzene	mg/kg (ppm)	2.5	<0.03	82	85	29-129	4
Trichloroethene	mg/kg (ppm)	2.5	<0.02	88	91	21-139	3
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	90	92	30-135	2
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	103	106	23-155	3
Dibromomethane	mg/kg (ppm)	2.5	<0.05	94	95	23-145	1
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	94	95	24-155	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	98	100	28-144	2
Toluene	mg/kg (ppm)	2.5	<0.05	78	80	35-130	3
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	95	95	26-149	0
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	87	89	10-205	2
2-Hexanone	mg/kg (ppm)	12.5	<0.5	76	77	15-166	1
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	84	86	31-137	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	85	87	20-133	2
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	96	97	28-150	1
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	86	89	28-142	3
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	86	88	32-129	2
Ethylbenzene	mg/kg (ppm)	2.5	0.18	73	76	32-137	4
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	94	94	31-143	0
m,p-Xylene	mg/kg (ppm)	5	0.65	66	69	34-136	4
o-Xylene	mg/kg (ppm)	2.5	0.18	75	78	33-134	4
Styrene	mg/kg (ppm)	2.5	<0.05	87	89	35-137	2
Isopropylbenzene	mg/kg (ppm)	2.5	0.065	83	85	31-142	2
Bromoform	mg/kg (ppm)	2.5	<0.05	96	97	21-156	1
n-Propylbenzene	mg/kg (ppm)	2.5	0.23	66	69	23-146	4
Bromobenzene	mg/kg (ppm)	2.5	<0.05	82	84	34-130	2
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	0.24	70	72	18-149	3
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	82	84	28-140	2
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	79	81	25-144	2
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	80	82	31-134	2
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	80	83	31-136	4
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	84	85	30-137	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	1.1	21 b	26 b	10-182	21 b
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	80	82	23-145	2
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	82	83	21-149	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	85	87	30-131	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	84	87	29-129	4
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	86	88	31-132	2
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	86	88	11-161	2
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	85	86	22-142	1
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	95	96	10-142	1
Naphthalene	mg/kg (ppm)	2.5	0.48	61	67	14-157	9
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	86	88	20-144	2

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	50	10-146
Chloromethane	mg/kg (ppm)	2.5	70	27-133
Vinyl chloride	mg/kg (ppm)	2.5	76	22-139
Bromomethane	mg/kg (ppm)	2.5	84	38-114
Chloroethane	mg/kg (ppm)	2.5	83	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	98	10-196
Acetone	mg/kg (ppm)	12.5	105	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	97	47-128
Hexane	mg/kg (ppm)	2.5	90	43-142
Methylene chloride	mg/kg (ppm)	2.5	113	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	105	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	103	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	103	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	109	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	106	72-113
Chloroform	mg/kg (ppm)	2.5	111	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	104	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	112	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	115	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	103	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	118	60-139
Benzene	mg/kg (ppm)	2.5	100	68-114
Trichloroethene	mg/kg (ppm)	2.5	107	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	105	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	121	72-130
Dibromomethane	mg/kg (ppm)	2.5	111	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	112	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	116	75-136
Toluene	mg/kg (ppm)	2.5	95	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	111	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	101	75-113
2-Hexanone	mg/kg (ppm)	12.5	89	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	100	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	103	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	114	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	102	74-132
Chlorobenzene	mg/kg (ppm)	2.5	101	76-111
Ethylbenzene	mg/kg (ppm)	2.5	97	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	107	69-135
m,p-Xylene	mg/kg (ppm)	5	98	78-122
o-Xylene	mg/kg (ppm)	2.5	97	77-124
Styrene	mg/kg (ppm)	2.5	99	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	98	76-127
Bromoform	mg/kg (ppm)	2.5	116	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	94	74-124
Bromobenzene	mg/kg (ppm)	2.5	99	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	98	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	96	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	92	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	94	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	95	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	97	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	95	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	96	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	97	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	100	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	98	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	100	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	101	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	99	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	111	50-153
Naphthalene	mg/kg (ppm)	2.5	96	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	101	63-138

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 701377-16 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	87	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	91	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	88	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	88	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	95	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	90	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	94	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	90	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	92	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	90	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	86	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	81	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	81	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	77	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	90	91	58-121	1
Acenaphthylene	mg/kg (ppm)	0.17	89	90	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	91	91	54-123	0
Fluorene	mg/kg (ppm)	0.17	93	94	56-127	1
Phenanthrene	mg/kg (ppm)	0.17	90	92	55-122	2
Anthracene	mg/kg (ppm)	0.17	85	88	50-120	3
Fluoranthene	mg/kg (ppm)	0.17	95	96	54-129	1
Pyrene	mg/kg (ppm)	0.17	92	91	53-127	1
Benz(a)anthracene	mg/kg (ppm)	0.17	94	95	51-115	1
Chrysene	mg/kg (ppm)	0.17	94	95	55-129	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	95	56-123	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	98	93	54-131	5
Benzo(a)pyrene	mg/kg (ppm)	0.17	83	84	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	75	80	49-148	6
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	76	81	50-141	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	74	78	52-131	5

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 701377-13 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	87	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	87	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	87	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	92	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	88	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	89	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	96	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	87	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	93	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	91	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	91	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	90	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	88	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	84	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	85	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	76	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	92	94	58-121	2
Acenaphthylene	mg/kg (ppm)	0.17	92	93	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	93	94	54-123	1
Fluorene	mg/kg (ppm)	0.17	97	98	56-127	1
Phenanthrene	mg/kg (ppm)	0.17	93	96	55-122	3
Anthracene	mg/kg (ppm)	0.17	93	94	50-120	1
Fluoranthene	mg/kg (ppm)	0.17	102	101	54-129	1
Pyrene	mg/kg (ppm)	0.17	87	92	53-127	6
Benz(a)anthracene	mg/kg (ppm)	0.17	94	97	51-115	3
Chrysene	mg/kg (ppm)	0.17	95	96	55-129	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	94	98	56-123	4
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	100	99	54-131	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	88	89	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	93	96	49-148	3
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	98	97	50-141	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	91	91	52-131	0

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 701377-19 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.33	<0.5	84	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	<0.05	84	50-150
2-Chlorophenol	mg/kg (ppm)	0.33	<0.5	87	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	87	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Benzyl alcohol	mg/kg (ppm)	0.33	<0.5	86	50-150
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	<0.05	82	50-150
2-Methylphenol	mg/kg (ppm)	0.33	<0.5	86	42-143
Hexachloroethane	mg/kg (ppm)	0.33	<0.05	88	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	<0.05	88	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	<1	86	10-250
Nitrobenzene	mg/kg (ppm)	0.33	<0.05	84	50-150
Isophorone	mg/kg (ppm)	0.33	<0.05	86	50-150
2-Nitrophenol	mg/kg (ppm)	0.33	<0.5	89	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.33	<0.5	83	16-163
Benzoic acid	mg/kg (ppm)	0.5	<2.5	61	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	<0.05	84	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.33	<0.5	89	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Chloroaniline	mg/kg (ppm)	0.66	<5	63	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	<0.5	92	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	<0.15	82	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	86	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	80	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.33	<0.05	80	50-150
2-Nitroaniline	mg/kg (ppm)	0.33	<0.25	82	50-150
Dimethyl phthalate	mg/kg (ppm)	0.33	<0.5	79	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	85	50-150
3-Nitroaniline	mg/kg (ppm)	0.66	<5	65	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.33	<1.5	35	10-162
Dibenzofuran	mg/kg (ppm)	0.33	<0.05	86	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	86	50-150
4-Nitrophenol	mg/kg (ppm)	0.33	<1.5	62	10-179
Diethyl phthalate	mg/kg (ppm)	0.33	<0.5	85	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	89	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Nitroaniline	mg/kg (ppm)	0.66	<5	72	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	<1.5	42	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	98	50-150
Hexachlorobenzene	mg/kg (ppm)	0.33	<0.05	89	50-150
Pentachlorophenol	mg/kg (ppm)	0.33	<0.5	82	12-160
Carbazole	mg/kg (ppm)	0.33	<0.5	93	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.33	<0.5	93	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.33	<0.5	101	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	<0.8	100	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.33	<0.5	93	54-161

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.33	92	93	51-119	1
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	91	91	60-112	0
2-Chlorophenol	mg/kg (ppm)	0.33	94	95	59-114	1
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	62-113	1
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	61-114	1
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	93	93	61-113	0
Benzyl alcohol	mg/kg (ppm)	0.33	97	96	50-119	1
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	89	88	59-113	1
2-Methylphenol	mg/kg (ppm)	0.33	95	92	58-115	3
Hexachloroethane	mg/kg (ppm)	0.33	94	94	63-114	0
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	97	94	62-114	3
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	95	93	54-120	2
Nitrobenzene	mg/kg (ppm)	0.33	93	95	59-114	2
Isophorone	mg/kg (ppm)	0.33	95	94	61-113	1
2-Nitrophenol	mg/kg (ppm)	0.33	96	99	59-114	3
2,4-Dimethylphenol	mg/kg (ppm)	0.33	88	84	54-107	5
Benzoic acid	mg/kg (ppm)	0.5	100	109	43-150	9
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	94	93	60-114	1
2,4-Dichlorophenol	mg/kg (ppm)	0.33	98	97	57-118	1
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	94	94	56-112	0
Hexachlorobutadiene	mg/kg (ppm)	0.33	93	95	60-116	2
4-Chloroaniline	mg/kg (ppm)	0.66	55	55	10-126	0
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	99	103	59-115	4
2-Methylnaphthalene	mg/kg (ppm)	0.33	98	100	60-115	2
1-Methylnaphthalene	mg/kg (ppm)	0.33	99	100	70-130	1
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	101	105	41-107	4
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	94	96	47-119	2
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	98	100	61-121	2
2-Chloronaphthalene	mg/kg (ppm)	0.33	93	93	58-114	0
2-Nitroaniline	mg/kg (ppm)	0.33	98	102	55-119	4
Dimethyl phthalate	mg/kg (ppm)	0.33	102	105	58-116	3
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	103	106	57-119	3
3-Nitroaniline	mg/kg (ppm)	0.66	70	71	10-143	1
2,4-Dinitrophenol	mg/kg (ppm)	0.33	83	94	40-122	12
Dibenzofuran	mg/kg (ppm)	0.33	96	98	56-115	2
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	100	107	53-126	7
4-Nitrophenol	mg/kg (ppm)	0.33	77	88	40-124	13
Diethyl phthalate	mg/kg (ppm)	0.33	102	106	57-116	4
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	96	98	54-119	2
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	94	89	54-113	5
4-Nitroaniline	mg/kg (ppm)	0.66	73	83	47-109	13
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	87	90	55-147	3
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	99	95	56-116	4
Hexachlorobenzene	mg/kg (ppm)	0.33	100	97	57-115	3
Pentachlorophenol	mg/kg (ppm)	0.33	89	95	45-123	7
Carbazole	mg/kg (ppm)	0.33	86	88	57-116	2
Di-n-butyl phthalate	mg/kg (ppm)	0.33	98	104	56-118	6
Benzyl butyl phthalate	mg/kg (ppm)	0.33	104	101	56-122	3
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	100	104	56-155	4
Di-n-octyl phthalate	mg/kg (ppm)	0.33	91	96	58-120	5

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	88	67-116	1
Acenaphthylene	ug/L (ppb)	1	88	92	65-119	4
Acenaphthene	ug/L (ppb)	1	88	90	66-118	2
Fluorene	ug/L (ppb)	1	87	90	64-125	3
Phenanthrene	ug/L (ppb)	1	88	89	67-120	1
Anthracene	ug/L (ppb)	1	88	91	65-122	3
Fluoranthene	ug/L (ppb)	1	86	90	65-127	5
Pyrene	ug/L (ppb)	1	103	95	62-130	8
Benz(a)anthracene	ug/L (ppb)	1	91	92	60-118	1
Chrysene	ug/L (ppb)	1	90	91	66-125	1
Benzo(b)fluoranthene	ug/L (ppb)	1	88	95	55-135	8
Benzo(k)fluoranthene	ug/L (ppb)	1	89	92	62-125	3
Benzo(a)pyrene	ug/L (ppb)	1	81	85	58-127	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	36-142	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	76	37-133	5
Benzo(g,h,i)perylene	ug/L (ppb)	1	76	78	34-135	3

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	ug/L (ppb)	10	45	49	10-84	9
Bis(2-chloroethyl) ether	ug/L (ppb)	10	100	101	52-113	1
2-Chlorophenol	ug/L (ppb)	10	96	101	50-110	5
1,3-Dichlorobenzene	ug/L (ppb)	10	99	102	45-109	3
1,4-Dichlorobenzene	ug/L (ppb)	10	99	101	44-118	2
1,2-Dichlorobenzene	ug/L (ppb)	10	99	102	46-116	3
Benzyl alcohol	ug/L (ppb)	10	85	91	42-100	7
2,2'-Oxybis(1-chloropropane)	ug/L (ppb)	10	98	98	51-124	0
2-Methylphenol	ug/L (ppb)	10	83	92	38-100	10
Hexachloroethane	ug/L (ppb)	10	100	103	42-117	3
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	96	100	48-124	4
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	77	85	40-105	10
Nitrobenzene	ug/L (ppb)	10	104	104	50-118	0
Isophorone	ug/L (ppb)	10	101	103	55-116	2
2-Nitrophenol	ug/L (ppb)	10	109	113	42-127	4
2,4-Dimethylphenol	ug/L (ppb)	10	73	78	11-135	7
Benzoic acid	ug/L (ppb)	65	37	41	10-110	10
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	99	101	55-115	2
2,4-Dichlorophenol	ug/L (ppb)	10	102	105	55-113	3
1,2,4-Trichlorobenzene	ug/L (ppb)	10	101	103	50-109	2
Hexachlorobutadiene	ug/L (ppb)	10	101	103	50-109	2
4-Chloroaniline	ug/L (ppb)	20	91	94	30-109	3
4-Chloro-3-methylphenol	ug/L (ppb)	10	103	107	54-114	4
2-Methylnaphthalene	ug/L (ppb)	10	103	105	53-113	2
1-Methylnaphthalene	ug/L (ppb)	10	104	106	70-130	2
Hexachlorocyclopentadiene	ug/L (ppb)	10	80	69	10-121	15
2,4,6-Trichlorophenol	ug/L (ppb)	10	102	103	46-114	1
2,4,5-Trichlorophenol	ug/L (ppb)	10	105	107	57-122	2
2-Chloronaphthalene	ug/L (ppb)	10	98	100	52-112	2
2-Nitroaniline	ug/L (ppb)	10	108	113	47-128	5
Dimethyl phthalate	ug/L (ppb)	10	111	116	55-116	4
2,6-Dinitrotoluene	ug/L (ppb)	10	113	118	49-126	4
3-Nitroaniline	ug/L (ppb)	20	100	103	21-125	3
2,4-Dinitrophenol	ug/L (ppb)	10	94	97	29-130	3
Dibenzofuran	ug/L (ppb)	10	103	106	53-113	3
2,4-Dinitrotoluene	ug/L (ppb)	10	111	119	48-129	7
4-Nitrophenol	ug/L (ppb)	10	45	47	10-80	4
Diethyl phthalate	ug/L (ppb)	10	112	119 vo	55-116	6
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	102	107	52-115	5
N-Nitrosodiphenylamine	ug/L (ppb)	10	103	104	51-112	1
4-Nitroaniline	ug/L (ppb)	20	104	103	42-115	1
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	99	102	40-128	3
4-Bromophenyl phenyl ether	ug/L (ppb)	10	105	106	53-114	1
Hexachlorobenzene	ug/L (ppb)	10	105	107	54-115	2
Pentachlorophenol	ug/L (ppb)	10	97	99	49-114	2
Carbazole	ug/L (ppb)	10	110	111	54-115	1
Di-n-butyl phthalate	ug/L (ppb)	10	112	114	54-115	2
Benzyl butyl phthalate	ug/L (ppb)	10	111	114	53-122	3
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	113	115	54-122	2
Di-n-octyl phthalate	ug/L (ppb)	10	97	101	50-131	4

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 701300-18 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	81	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	75	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	82	77	55-130	6
Aroclor 1260	mg/kg (ppm)	0.8	81	79	58-133	2

Date of Report: 02/14/17
Date Received: 01/31/17
Project: 10737f-01 Horizon Bus Line, F&BI 701377

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	71	68	37-136	4
Aroclor 1260	ug/L (ppb)	2.5	60	62	41-135	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

701377

SAMPLE CHAIN OF CUSTODY ME 01-31-17

WW3/VS3/BZ3/A05

Page # 1 of 3

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #101
City, State, ZIP Seattle, WA 98134
Phone (206) 381-1128 Email 425 246 3574

SAMPLERS (signature) Jason Cass

PROJECT NAME 10737f-01 Horizon Bus Line

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead (Pb)	Dissolved Pb	MTCA5 metals	8082 PCB	Notes
EP13-5	01	1/31/17	8:40	Soil	1												
EP13-6	02A-D		8:45		4		X	X	X				X				
EP13-10	03		8:50		1												
EP13-GW	04A-F		9:01	H2O	6		X	X	X				X	X			
EP14-5	05A-D		9:30	Soil	4		X	X	X				X				
EP14-10	06		9:35	Soil	1		~~X~~	~~X~~	~~X~~				~~X~~	~~X~~			Hold
EP14-GW	07A-F		9:36	H2O	6		X	X	X				X	X			
EP15-5	08		10:10	Soil	1												
EP15-6	09A-E		10:20		5		X	X		X	X	X			X	X	
EP15-10	10		10:25		1												

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	1/31/17	16:15
Received by:		A. Podnozova	F&BI	1/31/17	4:15PM
Relinquished by:					
Received by:			Samples received at 5 °C		

701377

SAMPLE CHAIN OF CUSTODY ME 01-31-17

VW3/VS3/BI3/

Page # 2 of 3/ADS

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone (206) 381-1129 Email

SAMPLERS (*signature*) Jason Cass

PROJECT NAME 10737-001 Horizon Bus Line

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead (Pb)	Dissolved Pb	MTCA 5 metals	8082 PCB	Dissolved MTCA 5 metals	Notes
EP15-GW	11A-R	1/31/17	10:30	H2O	9		X	X		X	X	X			X	X	X	⊛ - per JC 2/9/17 ME
EP16-5	12A-E		11:20	Soil	5		X	X		X	X	X			X	X		
EP16-10	13		11:25	Soil	1							⊛						Hold
EP16-GW	14A-I		11:35	H2O	9		X	X		X	X	X			X	X	X	
EP17-5	15		12:30	Soil	1													Hold
EP17-6	16A-E		12:30	Soil	5		X	X		X	X	X			X	X		
EP17-10	17		12:30	Soil	1													Hold
EP17-GW	18A-B		12:45	H2O	2					X								⊗ - per JC 2/1/17 ✱ - cancel per JC
EP18-5	19		13:27	Soil	1		⊗					⊗			⊗	⊗		changed B
EP18-6	20A-D		13:30	Soil	5		~~X~~	X		X		~~X~~			~~X~~	~~X~~		No 4oz jar

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	1/31/17	16:15
Received by:		A. Podnozova	FBI	1/31/17	4:15PM
Relinquished by:					
Received by:			Samples received at	5 °C	

701377

SAMPLE CHAIN OF CUSTODY

ME 01-31-17 VW3/ VS3/ BT3/ AD5

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone (206) 381-1128 Email

SAMPLERS (*signature*) Jason Cass

PROJECT NAME 10737-01 Horizon Bus Line

PO #

REMARKS

INVOICE TO

Page # 3 of 3

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	8082 PCB	MTCA 5 metals	Dissolved MTCA 5 metals		Notes
E18-10	21	1/31/17	13:35	Soil	1												Hold
EP18-15	22	↓	13:46	Soil	1												Hold
EP18-GW	23 A-I	↓	13:50	H2O	9		X	✓		✓	X	X	X	X	X		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	1/31/17	16:15
Received by:		A. Podnozova	F&BI	1/31/17	4:15PM
Relinquished by:					
Received by:			Samples received at 5 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 14, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on February 1, 2017 from the Horizon Bus Line, 10737f-01, F&BI 702015 project. There are 22 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Heather Binuya, Kurt Easthouse
EHS0214R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 1, 2017 by Friedman & Bruya, Inc. from the EHSI Horizon Bus Line, 10737f-01, F&BI 702015 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
702015 -01	EMW01-5
702015 -02	EMW01-10
702015 -03	EMW03-5
702015 -04	EMW03-7
702015 -05	EMW03-10
702015 -06	EMW04-5
702015 -07	EMW04-6
702015 -08	EMW04-10
702015 -09	EMW05-5
702015 -10	EMW05-8
702015 -11	EMW05-8 dup
702015 -12	EMW05-10
702015 -13	Trip Blank

All quality control requirements were acceptable.

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted: 02/02/17
Date Analyzed: 02/02/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 48-168)
EMW03-5 702015-03	<50	<250	95
EMW03-7 702015-04	<50	<250	96
EMW03-10 702015-05	<50	<250	89
EMW04-5 702015-06	<50	<250	93
EMW04-6 702015-07	<50	<250	95
EMW04-10 702015-08	<50	<250	84
EMW05-8 702015-10	<50	<250	97
Method Blank 07-237 MB	<50	<250	93

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW01-5	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	702015-01
Date Analyzed:	02/07/17	Data File:	702015-01.058
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	61.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW05-8	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	702015-10
Date Analyzed:	02/07/17	Data File:	702015-10.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.38

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	I7-058 mb
Date Analyzed:	02/07/17	Data File:	I7-058 mb.056
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW01-5	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	702015-01 1/5
Date Analyzed:	02/06/17	Data File:	020609.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	106	56	115
Phenol-d6	100	54	113
Nitrobenzene-d5	105	31	164
2-Fluorobiphenyl	104	47	133
2,4,6-Tribromophenol	96	35	141
Terphenyl-d14	109	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW05-8	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	702015-10 1/50
Date Analyzed:	02/06/17	Data File:	020616.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	90 d	56	115
Phenol-d6	94 d	54	113
Nitrobenzene-d5	89 d	31	164
2-Fluorobiphenyl	95 d	47	133
2,4,6-Tribromophenol	69 d	35	141
Terphenyl-d14	100 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<5	Hexachlorocyclopentadiene	<1.5
Bis(2-chloroethyl) ether	<0.5	2,4,6-Trichlorophenol	<5
2-Chlorophenol	<5	2,4,5-Trichlorophenol	<5
1,3-Dichlorobenzene	<0.5	2-Chloronaphthalene	<0.5
1,4-Dichlorobenzene	<0.5	2-Nitroaniline	<2.5
1,2-Dichlorobenzene	<0.5	Dimethyl phthalate	<5
Benzyl alcohol	<5	2,6-Dinitrotoluene	<2.5
2,2'-Oxybis(1-chloropropane)	<0.5	3-Nitroaniline	<50
2-Methylphenol	<5	2,4-Dinitrophenol	<15
Hexachloroethane	<0.5	Dibenzofuran	<0.5
N-Nitroso-di-n-propylamine	<0.5	2,4-Dinitrotoluene	<2.5
3-Methylphenol + 4-Methylphenol	<10	4-Nitrophenol	<15
Nitrobenzene	<0.5	Diethyl phthalate	<5
Isophorone	<0.5	4-Chlorophenyl phenyl ether	<0.5
2-Nitrophenol	<5	N-Nitrosodiphenylamine	<0.5
2,4-Dimethylphenol	<5	4-Nitroaniline	<50
Benzoic acid	<25	4,6-Dinitro-2-methylphenol	<15
Bis(2-chloroethoxy)methane	<0.5	4-Bromophenyl phenyl ether	<0.5
2,4-Dichlorophenol	<5	Hexachlorobenzene	<0.5
1,2,4-Trichlorobenzene	<0.5	Pentachlorophenol	<5
Hexachlorobutadiene	<0.5	Carbazole	<5
4-Chloroaniline	<50	Di-n-butyl phthalate	<5
4-Chloro-3-methylphenol	<5	Benzyl butyl phthalate	<5
2-Methylnaphthalene	<0.5	Bis(2-ethylhexyl) phthalate	<8
1-Methylnaphthalene	<0.5	Di-n-octyl phthalate	<5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	07-248 mb
Date Analyzed:	02/06/17	Data File:	020605.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	99	56	115
Phenol-d6	95	54	113
Nitrobenzene-d5	95	31	164
2-Fluorobiphenyl	95	47	133
2,4,6-Tribromophenol	92	35	141
Terphenyl-d14	102	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	Hexachlorocyclopentadiene	<0.03
Bis(2-chloroethyl) ether	<0.01	2,4,6-Trichlorophenol	<0.1
2-Chlorophenol	<0.1	2,4,5-Trichlorophenol	<0.1
1,3-Dichlorobenzene	<0.01	2-Chloronaphthalene	<0.01
1,4-Dichlorobenzene	<0.01	2-Nitroaniline	<0.05
1,2-Dichlorobenzene	<0.01	Dimethyl phthalate	<0.1
Benzyl alcohol	<0.1	2,6-Dinitrotoluene	<0.05
2,2'-Oxybis(1-chloropropane)	<0.01	3-Nitroaniline	<1
2-Methylphenol	<0.1	2,4-Dinitrophenol	<0.3
Hexachloroethane	<0.01	Dibenzofuran	<0.01
N-Nitroso-di-n-propylamine	<0.01	2,4-Dinitrotoluene	<0.05
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitrophenol	<0.3
Nitrobenzene	<0.01	Diethyl phthalate	<0.1
Isophorone	<0.01	4-Chlorophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	N-Nitrosodiphenylamine	<0.01
2,4-Dimethylphenol	<0.1	4-Nitroaniline	<1
Benzoic acid	<0.5	4,6-Dinitro-2-methylphenol	<0.3
Bis(2-chloroethoxy)methane	<0.01	4-Bromophenyl phenyl ether	<0.01
2,4-Dichlorophenol	<0.1	Hexachlorobenzene	<0.01
1,2,4-Trichlorobenzene	<0.01	Pentachlorophenol	<0.1
Hexachlorobutadiene	<0.01	Carbazole	<0.1
4-Chloroaniline	<1	Di-n-butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benzyl butyl phthalate	<0.1
2-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
1-Methylnaphthalene	<0.01	Di-n-octyl phthalate	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW01-5	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	702015-01 1/5
Date Analyzed:	02/06/17	Data File:	020613.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	31	163
Benzo(a)anthracene-d12	101	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	0.029
Pyrene	0.036
Benz(a)anthracene	0.017
Chrysene	0.020
Benzo(a)pyrene	0.019
Benzo(b)fluoranthene	0.026
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.016
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.016

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW05-8	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	702015-10 1/50
Date Analyzed:	02/06/17	Data File:	020617.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	121 d	31	163
Benzo(a)anthracene-d12	108 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.20
Anthracene	<0.1
Fluoranthene	0.22
Pyrene	0.35
Benz(a)anthracene	0.15
Chrysene	0.16
Benzo(a)pyrene	0.14
Benzo(b)fluoranthene	0.17
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW05-8 dup	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	702015-11 1/50
Date Analyzed:	02/06/17	Data File:	020618.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	135 d	31	163
Benzo(a)anthracene-d12	131 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.13
Anthracene	<0.1
Fluoranthene	0.18
Pyrene	0.27
Benz(a)anthracene	0.11
Chrysene	0.13
Benzo(a)pyrene	0.11
Benzo(b)fluoranthene	0.14
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/06/17	Lab ID:	07-247 mb 1/5
Date Analyzed:	02/06/17	Data File:	020607.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	31	163
Benzo(a)anthracene-d12	94	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW01-5	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	702015-01 1/50
Date Analyzed:	02/07/17	Data File:	020708.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW05-8	Client:	EHSI
Date Received:	02/01/17	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	702015-10 1/50
Date Analyzed:	02/07/17	Data File:	020710.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	85 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, 10737f-01, F&BI 702015
Date Extracted:	02/07/17	Lab ID:	07-250 mb 1/5
Date Analyzed:	02/07/17	Data File:	020707.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	89	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 702015-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	101	102	73-135	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	91	74-139

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 702015-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	2.11	100	98	70-130	2
Lead	mg/kg (ppm)	50	51.9	107 b	79 b	70-130	30 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	96	85-115
Lead	mg/kg (ppm)	50	104	85-115

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 701377-19 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.33	<0.5	84	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	<0.05	84	50-150
2-Chlorophenol	mg/kg (ppm)	0.33	<0.5	87	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	87	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Benzyl alcohol	mg/kg (ppm)	0.33	<0.5	86	50-150
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	<0.05	82	50-150
2-Methylphenol	mg/kg (ppm)	0.33	<0.5	86	42-143
Hexachloroethane	mg/kg (ppm)	0.33	<0.05	88	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	<0.05	88	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	<1	86	10-250
Nitrobenzene	mg/kg (ppm)	0.33	<0.05	84	50-150
Isophorone	mg/kg (ppm)	0.33	<0.05	86	50-150
2-Nitrophenol	mg/kg (ppm)	0.33	<0.5	89	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.33	<0.5	83	16-163
Benzoic acid	mg/kg (ppm)	0.5	<2.5	61	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	<0.05	84	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.33	<0.5	89	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Chloroaniline	mg/kg (ppm)	0.66	<5	63	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	<0.5	92	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	<0.15	82	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	86	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	80	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.33	<0.05	80	50-150
2-Nitroaniline	mg/kg (ppm)	0.33	<0.25	82	50-150
Dimethyl phthalate	mg/kg (ppm)	0.33	<0.5	79	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	85	50-150
3-Nitroaniline	mg/kg (ppm)	0.66	<5	65	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.33	<1.5	35	10-162
Dibenzofuran	mg/kg (ppm)	0.33	<0.05	86	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	86	50-150
4-Nitrophenol	mg/kg (ppm)	0.33	<1.5	62	10-179
Diethyl phthalate	mg/kg (ppm)	0.33	<0.5	85	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	89	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Nitroaniline	mg/kg (ppm)	0.66	<5	72	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	<1.5	42	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	98	50-150
Hexachlorobenzene	mg/kg (ppm)	0.33	<0.05	89	50-150
Pentachlorophenol	mg/kg (ppm)	0.33	<0.5	82	12-160
Carbazole	mg/kg (ppm)	0.33	<0.5	93	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.33	<0.5	93	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.33	<0.5	101	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	<0.8	100	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.33	<0.5	93	54-161

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.33	92	93	51-119	1
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	91	91	60-112	0
2-Chlorophenol	mg/kg (ppm)	0.33	94	95	59-114	1
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	62-113	1
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	61-114	1
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	93	93	61-113	0
Benzyl alcohol	mg/kg (ppm)	0.33	97	96	50-119	1
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	89	88	59-113	1
2-Methylphenol	mg/kg (ppm)	0.33	95	92	58-115	3
Hexachloroethane	mg/kg (ppm)	0.33	94	94	63-114	0
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	97	94	62-114	3
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	95	93	54-120	2
Nitrobenzene	mg/kg (ppm)	0.33	93	95	59-114	2
Isophorone	mg/kg (ppm)	0.33	95	94	61-113	1
2-Nitrophenol	mg/kg (ppm)	0.33	96	99	59-114	3
2,4-Dimethylphenol	mg/kg (ppm)	0.33	88	84	54-107	5
Benzoic acid	mg/kg (ppm)	0.5	100	109	43-150	9
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	94	93	60-114	1
2,4-Dichlorophenol	mg/kg (ppm)	0.33	98	97	57-118	1
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	94	94	56-112	0
Hexachlorobutadiene	mg/kg (ppm)	0.33	93	95	60-116	2
4-Chloroaniline	mg/kg (ppm)	0.66	55	55	10-126	0
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	99	103	59-115	4
2-Methylnaphthalene	mg/kg (ppm)	0.33	98	100	60-115	2
1-Methylnaphthalene	mg/kg (ppm)	0.33	99	100	70-130	1
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	101	105	41-107	4
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	94	96	47-119	2
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	98	100	61-121	2
2-Chloronaphthalene	mg/kg (ppm)	0.33	93	93	58-114	0
2-Nitroaniline	mg/kg (ppm)	0.33	98	102	55-119	4
Dimethyl phthalate	mg/kg (ppm)	0.33	102	105	58-116	3
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	103	106	57-119	3
3-Nitroaniline	mg/kg (ppm)	0.66	70	71	10-143	1
2,4-Dinitrophenol	mg/kg (ppm)	0.33	83	94	40-122	12
Dibenzofuran	mg/kg (ppm)	0.33	96	98	56-115	2
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	100	107	53-126	7
4-Nitrophenol	mg/kg (ppm)	0.33	77	88	40-124	13
Diethyl phthalate	mg/kg (ppm)	0.33	102	106	57-116	4
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	96	98	54-119	2
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	94	89	54-113	5
4-Nitroaniline	mg/kg (ppm)	0.66	73	83	47-109	13
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	87	90	55-147	3
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	99	95	56-116	4
Hexachlorobenzene	mg/kg (ppm)	0.33	100	97	57-115	3
Pentachlorophenol	mg/kg (ppm)	0.33	89	95	45-123	7
Carbazole	mg/kg (ppm)	0.33	86	88	57-116	2
Di-n-butyl phthalate	mg/kg (ppm)	0.33	98	104	56-118	6
Benzyl butyl phthalate	mg/kg (ppm)	0.33	104	101	56-122	3
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	100	104	56-155	4
Di-n-octyl phthalate	mg/kg (ppm)	0.33	91	96	58-120	5

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 701377-16 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	87	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	91	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	88	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	88	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	95	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	90	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	94	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	90	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	92	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	90	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	86	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	81	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	81	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	77	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	90	91	58-121	1
Acenaphthylene	mg/kg (ppm)	0.17	89	90	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	91	91	54-123	0
Fluorene	mg/kg (ppm)	0.17	93	94	56-127	1
Phenanthrene	mg/kg (ppm)	0.17	90	92	55-122	2
Anthracene	mg/kg (ppm)	0.17	85	88	50-120	3
Fluoranthene	mg/kg (ppm)	0.17	95	96	54-129	1
Pyrene	mg/kg (ppm)	0.17	92	91	53-127	1
Benz(a)anthracene	mg/kg (ppm)	0.17	94	95	51-115	1
Chrysene	mg/kg (ppm)	0.17	94	95	55-129	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	95	56-123	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	98	93	54-131	5
Benzo(a)pyrene	mg/kg (ppm)	0.17	83	84	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	75	80	49-148	6
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	76	81	50-141	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	74	78	52-131	5

Date of Report: 02/14/17
Date Received: 02/01/17
Project: Horizon Bus Line, 10737f-01, F&BI 702015

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 702015-01 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	88	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	83	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	84	81	55-130	4
Aroclor 1260	mg/kg (ppm)	0.8	83	82	58-133	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

702015

SAMPLE CHAIN OF CUSTODY

ME 02-01-17

BE3 / ~~VWT~~ VW1

Page # 1 of 2

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone (206)344-1128 Email

SAMPLERS (signature) Jason Cass

PROJECT NAME 10737f-01 Horizon Bus Line

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead	8082 PCB	Arsenic		Notes
EMW01-5	01	2/1/17	~~Soil~~ 9:05	Soil	1						X		X	X			
EMW01-10	02		9:10		1												Hold
EMW03-5	03		11:00		1		X										
EMW03-7	04		11:10		1		X										
EMW03-10	05		11:05		1		X										
EMW04-5	06		12:55		1		X										
EMW04-6	07		13:06		1		✓										
EMW04-10	08		13:03		1		X										
EMW05-5	09		13:44		1												Hold
EMW05-8	10		13:50		1		X				X	X		X	X		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	2/1/17	16:30
Received by:		HONG NGUYEN	FBI	✓	✓
Relinquished by:					
Received by:			Samples received at 5 °C		

702015

SAMPLE CHAIN OF CUSTODY ME 02-01-17

BE3 / VW / VW1

Page # 2 of 2

Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone (206) 381-1128 Email

SAMPLERS (*signature*) Jason Cass

PROJECT NAME 10737R-01 Horizon Bus Line

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead	8082 PCB	Arsenic		Notes
EMWDS-8 Dup.	11	2/1/17	13:50	Soil	1							X					
EMWDS-10	12	2/1/17	13:55	Soil	1												Hold
Trip Blank	13 A.B				2												added in lab

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	2/1/17	16:00
Received by:		HONG NGUYEN	FBI	✓	✓
Relinquished by:					
Received by:					

Samples received at 5 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 16, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on February 10, 2017 from the Horizon Bus Line, PO 10737c-02, F&BI 702171 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Heather Binuya, Kurt Easthouse
EHS0216R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 10, 2017 by Friedman & Bruya, Inc. from the EHSI Horizon Bus Line, PO 10737c-02, F&BI 702171 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
702171 -01	UST-01
702171 -02	UST-02

All quality control requirements were acceptable.

Date of Report: 02/16/17
Date Received: 02/10/17
Project: Horizon Bus Line, PO 10737c-02, F&BI 702171
Date Extracted: 02/14/17
Date Analyzed: 02/14/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
UST-01 702171-01	<1	<1	<1	<3	<100	80
UST-02 702171-02	<1	<1	<1	<3	<100	83
Method Blank 07-291 MB	<1	<1	<1	<3	<100	85

Date of Report: 02/16/17
Date Received: 02/10/17
Project: Horizon Bus Line, PO 10737c-02, F&BI 702171
Date Extracted: 02/10/17
Date Analyzed: 02/10/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
UST-01 702171-01	<50	<250	90
UST-02 702171-02	<50	<250	98
Method Blank 07-296 MB	<50	<250	92

Date of Report: 02/16/17
Date Received: 02/10/17
Project: Horizon Bus Line, PO 10737c-02, F&BI 702171

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 702171-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	107	65-118
Toluene	ug/L (ppb)	50	105	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	102	74-118
Gasoline	ug/L (ppb)	1,000	94	69-134

Date of Report: 02/16/17
Date Received: 02/10/17
Project: Horizon Bus Line, PO 10737c-02, F&BI 702171

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	104	102	58-134	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

702171

SAMPLE CHAIN OF CUSTODY ME 02/10/17 VW2/B03

Send Report To Jason Cass

Company EHSI

Address 1011 SW Klickitat Way, #104

City, State, ZIP Seattle, WA 98134

Phone # (206) 381-1128 Fax #

SAMPLERS (signature) Jason Cass

PROJECT NAME/NO.	PO #
Horizon Bus Line	10737c-02

REMARKS

Page # 1 of 1

TURNAROUND TIME

☑ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☑ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS						Notes
UST-01	01 A-D	2/10/17	8:40	H20	4	X	X	X									
UST-02	02 A-D	2/10/17	9:25	H20	4	X	X	X									

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	2/10/17	13:40
Received by:		Nhan Phan	FEBI	2/10/17	1340
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 10, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on February 2, 2017 from the Horizon Bus Line, PO 10737f-01, F&BI 702040 project. There are 30 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Heather Binuya, Kurt Easthouse
EHS0210R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 2, 2017 by Friedman & Bruya, Inc. from the EHSI Horizon Bus Line, PO 10737f-01, F&BI 702040 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
702040 -01	EMW06-5
702040 -02	EMW06-6
702040 -03	EMW06-10
702040 -04	EMW07-3
702040 -05	EMW07-5
702040 -06	EMW07-10
702040 -07	EMW08-5
702040 -08	EMW08-10
702040 -09	EMW09-6
702040 -10	EMW09-12
702040 -11	EMW09-15
702040 -12	EMW09-20

All quality control requirements were acceptable.

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040
Date Extracted: 02/08/17
Date Analyzed: 02/08/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 58-139)
EMW08-5 702040-07	<2	91
EMW09-12 702040-10	24	86
Method Blank 07-218 MB	<2	90

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040
Date Extracted: 02/08/17
Date Analyzed: 02/08/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
EMW09-6 702040-09	<0.02	<0.02	0.033	0.071	210	84
EMW09-15 702040-11	<0.02	<0.02	<0.02	<0.06	<2	89
EMW09-20 702040-12	<0.02	<0.02	<0.02	<0.06	<2	90
Method Blank 07-218 MB	<0.02	<0.02	<0.02	<0.06	<2	90

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040
Date Extracted: 02/03/17
Date Analyzed: 02/03/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 53-144)
EMW06-5 702040-01	<50	<250	107
EMW06-6 702040-02	<50	<250	105
EMW06-10 702040-03	<50	<250	111
EMW07-3 702040-04	<50	<250	92
EMW07-5 702040-05	<50	<250	118
EMW07-10 702040-06	<50	<250	109
EMW08-5 702040-07	<50	<250	98
EMW09-6 702040-09	810	<250	93
EMW09-12 702040-10	270	<250	91

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040
Date Extracted: 02/03/17
Date Analyzed: 02/03/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 53-144)
EMW09-15 702040-11	<50	<250	106
EMW09-20 702040-12	<50	<250	88
Method Blank 07-244 MB	<50	<250	120

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW08-5	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-07
Date Analyzed:	02/06/17	Data File:	702040-07.062
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.31
Cadmium	<1
Chromium	8.95
Lead	37.0
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW09-12	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-10
Date Analyzed:	02/06/17	Data File:	702040-10.063
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	6.69
Lead	1.30
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	I7-056 mb
Date Analyzed:	02/06/17	Data File:	I7-057 mb.042
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<5
Lead	<1
Mercury	<1

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW08-5	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-07 1/5
Date Analyzed:	02/06/17	Data File:	020613.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	96	56	115
Phenol-d6	91	54	113
Nitrobenzene-d5	92	31	164
2-Fluorobiphenyl	91	47	133
2,4,6-Tribromophenol	98	35	141
Terphenyl-d14	105	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW09-12	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-10 1/5
Date Analyzed:	02/07/17	Data File:	020705.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	106 ca	56	115
Phenol-d6	103	54	113
Nitrobenzene-d5	101	31	164
2-Fluorobiphenyl	100	47	133
2,4,6-Tribromophenol	111 ca	35	141
Terphenyl-d14	121 ca	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	07-248 mb
Date Analyzed:	02/06/17	Data File:	020605.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	99	56	115
Phenol-d6	95	54	113
Nitrobenzene-d5	95	31	164
2-Fluorobiphenyl	95	47	133
2,4,6-Tribromophenol	92	35	141
Terphenyl-d14	102	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	Hexachlorocyclopentadiene	<0.03
Bis(2-chloroethyl) ether	<0.01	2,4,6-Trichlorophenol	<0.1
2-Chlorophenol	<0.1	2,4,5-Trichlorophenol	<0.1
1,3-Dichlorobenzene	<0.01	2-Chloronaphthalene	<0.01
1,4-Dichlorobenzene	<0.01	2-Nitroaniline	<0.05
1,2-Dichlorobenzene	<0.01	Dimethyl phthalate	<0.1
Benzyl alcohol	<0.1	2,6-Dinitrotoluene	<0.05
2,2'-Oxybis(1-chloropropane)	<0.01	3-Nitroaniline	<1
2-Methylphenol	<0.1	2,4-Dinitrophenol	<0.3
Hexachloroethane	<0.01	Dibenzofuran	<0.01
N-Nitroso-di-n-propylamine	<0.01	2,4-Dinitrotoluene	<0.05
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitrophenol	<0.3
Nitrobenzene	<0.01	Diethyl phthalate	<0.1
Isophorone	<0.01	4-Chlorophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	N-Nitrosodiphenylamine	<0.01
2,4-Dimethylphenol	<0.1	4-Nitroaniline	<1
Benzoic acid	<0.5	4,6-Dinitro-2-methylphenol	<0.3
Bis(2-chloroethoxy)methane	<0.01	4-Bromophenyl phenyl ether	<0.01
2,4-Dichlorophenol	<0.1	Hexachlorobenzene	<0.01
1,2,4-Trichlorobenzene	<0.01	Pentachlorophenol	<0.1
Hexachlorobutadiene	<0.01	Carbazole	<0.1
4-Chloroaniline	<1	Di-n-butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benzyl butyl phthalate	<0.1
2-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
1-Methylnaphthalene	<0.01	Di-n-octyl phthalate	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW08-5	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-07 1/5
Date Analyzed:	02/06/17	Data File:	020614.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	81	31	163
Benzo(a)anthracene-d12	93	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.032
Anthracene	<0.01
Fluoranthene	0.10
Pyrene	0.14
Benz(a)anthracene	0.080
Chrysene	0.11
Benzo(a)pyrene	0.10
Benzo(b)fluoranthene	0.13
Benzo(k)fluoranthene	0.043
Indeno(1,2,3-cd)pyrene	0.056
Dibenz(a,h)anthracene	0.017
Benzo(g,h,i)perylene	0.054

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW09-12	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	702040-10 1/5
Date Analyzed:	02/07/17	Data File:	020707.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	73	31	163
Benzo(a)anthracene-d12	84	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	0.010
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/06/17	Lab ID:	07-247 mb 1/5
Date Analyzed:	02/06/17	Data File:	020607.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	31	163
Benzo(a)anthracene-d12	94	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EMW08-5	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/03/17	Lab ID:	702040-07
Date Analyzed:	02/03/17	Data File:	020311.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	62	142
Toluene-d8	105	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EMW09-12	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/03/17	Lab ID:	702040-10
Date Analyzed:	02/03/17	Data File:	020312.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	105	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/03/17	Lab ID:	07-0192 mb
Date Analyzed:	02/03/17	Data File:	020306.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	106	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW08-5	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/07/17	Lab ID:	702040-07 1/50
Date Analyzed:	02/07/17	Data File:	020718.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	85 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	0.24
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW09-12	Client:	EHSI
Date Received:	02/02/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/07/17	Lab ID:	702040-10 1/50
Date Analyzed:	02/07/17	Data File:	020719.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/07/17	Lab ID:	07-250 mb 1/5
Date Analyzed:	02/07/17	Data File:	020707.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	89	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 702107-02 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	101	66-121
Toluene	mg/kg (ppm)	0.5	104	72-128
Ethylbenzene	mg/kg (ppm)	0.5	105	69-132
Xylenes	mg/kg (ppm)	1.5	105	69-131
Gasoline	mg/kg (ppm)	20	95	61-153

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 701378-19 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	111	102	64-133	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	97	58-147

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 702032-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	3.01	83	90	70-130	8
Cadmium	mg/kg (ppm)	10	<1	91	98	70-130	7
Chromium	mg/kg (ppm)	50	8.72	92	98	70-130	6
Lead	mg/kg (ppm)	50	38.4	79	76	70-130	4
Mercury	mg/kg (ppm	10	<1	93	97	70-130	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	89	85-115
Cadmium	mg/kg (ppm)	10	97	85-115
Chromium	mg/kg (ppm)	50	103	85-115
Lead	mg/kg (ppm)	50	98	85-115
Mercury	mg/kg (ppm)	10	100	85-115

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 701377-19 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.33	<0.5	84	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	<0.05	84	50-150
2-Chlorophenol	mg/kg (ppm)	0.33	<0.5	87	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	87	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Benzyl alcohol	mg/kg (ppm)	0.33	<0.5	86	50-150
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	<0.05	82	50-150
2-Methylphenol	mg/kg (ppm)	0.33	<0.5	86	42-143
Hexachloroethane	mg/kg (ppm)	0.33	<0.05	88	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	<0.05	88	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	<1	86	10-250
Nitrobenzene	mg/kg (ppm)	0.33	<0.05	84	50-150
Isophorone	mg/kg (ppm)	0.33	<0.05	86	50-150
2-Nitrophenol	mg/kg (ppm)	0.33	<0.5	89	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.33	<0.5	83	16-163
Benzoic acid	mg/kg (ppm)	0.5	<2.5	61	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	<0.05	84	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.33	<0.5	89	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	<0.05	86	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Chloroaniline	mg/kg (ppm)	0.66	<5	63	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	<0.5	92	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.33	<0.05	94	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	<0.15	82	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	86	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	<0.5	80	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.33	<0.05	80	50-150
2-Nitroaniline	mg/kg (ppm)	0.33	<0.25	82	50-150
Dimethyl phthalate	mg/kg (ppm)	0.33	<0.5	79	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	85	50-150
3-Nitroaniline	mg/kg (ppm)	0.66	<5	65	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.33	<1.5	35	10-162
Dibenzofuran	mg/kg (ppm)	0.33	<0.05	86	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	<0.25	86	50-150
4-Nitrophenol	mg/kg (ppm)	0.33	<1.5	62	10-179
Diethyl phthalate	mg/kg (ppm)	0.33	<0.5	85	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	89	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	<0.05	86	50-150
4-Nitroaniline	mg/kg (ppm)	0.66	<5	72	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	<1.5	42	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	<0.05	98	50-150
Hexachlorobenzene	mg/kg (ppm)	0.33	<0.05	89	50-150
Pentachlorophenol	mg/kg (ppm)	0.33	<0.5	82	12-160
Carbazole	mg/kg (ppm)	0.33	<0.5	93	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.33	<0.5	93	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.33	<0.5	101	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	<0.8	100	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.33	<0.5	93	54-161

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Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.33	92	93	51-119	1
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	91	91	60-112	0
2-Chlorophenol	mg/kg (ppm)	0.33	94	95	59-114	1
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	62-113	1
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	92	93	61-114	1
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	93	93	61-113	0
Benzyl alcohol	mg/kg (ppm)	0.33	97	96	50-119	1
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	89	88	59-113	1
2-Methylphenol	mg/kg (ppm)	0.33	95	92	58-115	3
Hexachloroethane	mg/kg (ppm)	0.33	94	94	63-114	0
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	97	94	62-114	3
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	95	93	54-120	2
Nitrobenzene	mg/kg (ppm)	0.33	93	95	59-114	2
Isophorone	mg/kg (ppm)	0.33	95	94	61-113	1
2-Nitrophenol	mg/kg (ppm)	0.33	96	99	59-114	3
2,4-Dimethylphenol	mg/kg (ppm)	0.33	88	84	54-107	5
Benzoic acid	mg/kg (ppm)	0.5	100	109	43-150	9
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	94	93	60-114	1
2,4-Dichlorophenol	mg/kg (ppm)	0.33	98	97	57-118	1
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	94	94	56-112	0
Hexachlorobutadiene	mg/kg (ppm)	0.33	93	95	60-116	2
4-Chloroaniline	mg/kg (ppm)	0.66	55	55	10-126	0
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	99	103	59-115	4
2-Methylnaphthalene	mg/kg (ppm)	0.33	98	100	60-115	2
1-Methylnaphthalene	mg/kg (ppm)	0.33	99	100	70-130	1
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	101	105	41-107	4
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	94	96	47-119	2
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	98	100	61-121	2
2-Chloronaphthalene	mg/kg (ppm)	0.33	93	93	58-114	0
2-Nitroaniline	mg/kg (ppm)	0.33	98	102	55-119	4
Dimethyl phthalate	mg/kg (ppm)	0.33	102	105	58-116	3
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	103	106	57-119	3
3-Nitroaniline	mg/kg (ppm)	0.66	70	71	10-143	1
2,4-Dinitrophenol	mg/kg (ppm)	0.33	83	94	40-122	12
Dibenzofuran	mg/kg (ppm)	0.33	96	98	56-115	2
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	100	107	53-126	7
4-Nitrophenol	mg/kg (ppm)	0.33	77	88	40-124	13
Diethyl phthalate	mg/kg (ppm)	0.33	102	106	57-116	4
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	96	98	54-119	2
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	94	89	54-113	5
4-Nitroaniline	mg/kg(ppm)	0.66	73	83	47-109	13
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	87	90	55-147	3
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	99	95	56-116	4
Hexachlorobenzene	mg/kg (ppm)	0.33	100	97	57-115	3
Pentachlorophenol	mg/kg (ppm)	0.33	89	95	45-123	7
Carbazole	mg/kg (ppm)	0.33	86	88	57-116	2
Di-n-butyl phthalate	mg/kg (ppm)	0.33	98	104	56-118	6
Benzyl butyl phthalate	mg/kg (ppm)	0.33	104	101	56-122	3
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	100	104	56-155	4
Di-n-octyl phthalate	mg/kg (ppm)	0.33	91	96	58-120	5

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Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 701377-16 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	87	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	91	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	88	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	88	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	95	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	90	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	94	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	90	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	92	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	90	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	86	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	81	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	81	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	77	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	90	91	58-121	1
Acenaphthylene	mg/kg (ppm)	0.17	89	90	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	91	91	54-123	0
Fluorene	mg/kg (ppm)	0.17	93	94	56-127	1
Phenanthrene	mg/kg (ppm)	0.17	90	92	55-122	2
Anthracene	mg/kg (ppm)	0.17	85	88	50-120	3
Fluoranthene	mg/kg (ppm)	0.17	95	96	54-129	1
Pyrene	mg/kg (ppm)	0.17	92	91	53-127	1
Benz(a)anthracene	mg/kg (ppm)	0.17	94	95	51-115	1
Chrysene	mg/kg (ppm)	0.17	94	95	55-129	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	95	56-123	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	98	93	54-131	5
Benzo(a)pyrene	mg/kg (ppm)	0.17	83	84	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	75	80	49-148	6
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	76	81	50-141	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	74	78	52-131	5

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Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702067-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Ethanol	mg/kg (ppm)	125	<50	88	85	10-174	3
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	30	28	10-142	7
Chloromethane	mg/kg (ppm)	2.5	<0.5	58	56	10-126	4
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	58	58	10-138	0
Bromomethane	mg/kg (ppm)	2.5	<0.5	62	64	10-163	3
Chloroethane	mg/kg (ppm)	2.5	<0.5	64	63	10-176	2
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	72	71	10-176	1
2-Propanol	mg/kg (ppm)	12.5	<0.5	92	83	50-150	10
Acetone	mg/kg (ppm)	12.5	<0.5	86	84	10-163	2
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	79	75	10-160	5
Hexane	mg/kg (ppm)	2.5	<0.25	60	56	10-137	7
Methylene chloride	mg/kg (ppm)	2.5	<0.5	95	93	10-156	2
t-Butyl alcohol (TBA)	mg/kg (ppm)	125	<2.5	101	101	16-169	0
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	93	92	21-145	1
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	89	86	14-137	3
Diisopropyl ether (DIPE)	mg/kg (ppm)	2.5	<0.05	84	82	29-136	2
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	89	87	19-140	2
Ethyl t-butyl ether (ETBE)	mg/kg (ppm)	2.5	<0.05	99	96	27-141	3
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	92	91	10-158	1
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	93	90	25-135	3
Chloroform	mg/kg (ppm)	2.5	<0.05	95	95	21-145	0
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	90	92	19-147	2
t-Amyl methyl ether (TAME)	mg/kg (ppm)	2.5	<0.05	97	95	27-144	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	99	96	12-160	3
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	99	96	10-156	3
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	88	86	17-140	2
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	101	97	9-164	4
Benzene	mg/kg (ppm)	2.5	<0.03	88	86	29-129	2
Trichloroethene	mg/kg (ppm)	2.5	<0.02	95	92	21-139	3
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	94	93	30-135	1
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	107	105	23-155	2
Dibromomethane	mg/kg (ppm)	2.5	<0.05	97	97	23-145	0
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	98	98	24-155	0
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	102	100	28-144	2
Toluene	mg/kg (ppm)	2.5	<0.05	81	79	35-130	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	95	92	26-149	3
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	90	87	10-205	3
2-Hexanone	mg/kg (ppm)	12.5	<0.5	80	77	15-166	4
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	88	86	31-137	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	89	85	20-133	5
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	97	93	28-150	4
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	91	88	28-142	3
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	88	86	32-129	2
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	84	81	32-137	4
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	93	90	31-143	3
m,p-Xylene	mg/kg (ppm)	5	<0.1	85	82	34-136	4
o-Xylene	mg/kg (ppm)	2.5	<0.05	86	83	33-134	4
Styrene	mg/kg (ppm)	2.5	<0.05	88	85	35-137	3
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	86	83	31-142	4
Bromoform	mg/kg (ppm)	2.5	<0.05	95	90	21-156	5
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	83	80	23-146	4
Bromobenzene	mg/kg (ppm)	2.5	<0.05	87	84	34-130	4
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	84	83	18-149	1
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	84	81	28-140	4
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	84	80	25-144	5
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	79	31-134	5
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	81	31-136	2
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	84	82	30-137	2
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	83	80	10-182	4
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	83	81	23-145	2
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	84	81	21-149	4
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	87	84	30-131	4
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	86	83	29-129	4
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	87	85	31-132	2
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	87	82	11-161	6
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	85	83	22-142	2
Hexachlorobutadiene	mg/kg(ppm)	2.5	<0.25	94	92	10-142	2
Naphthalene	mg/kg (ppm)	2.5	<0.05	85	83	14-157	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	88	86	20-144	2

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Ethanol	mg/kg (ppm)	125	94	10-177
Dichlorodifluoromethane	mg/kg (ppm)	2.5	65	10-146
Chloromethane	mg/kg (ppm)	2.5	81	27-133
Vinyl chloride	mg/kg (ppm)	2.5	87	22-139
Bromomethane	mg/kg (ppm)	2.5	96	38-114
Chloroethane	mg/kg (ppm)	2.5	95	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	105	10-196
2-Propanol	mg/kg (ppm)	2.5	102	70-130
Acetone	mg/kg (ppm)	12.5	103	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	102	47-128
Hexane	mg/kg (ppm)	2.5	89	43-142
Methylene chloride	mg/kg (ppm)	2.5	121	42-132
t-Butyl alcohol (TBA)	mg/kg (ppm)	125	116	41-150
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	109	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	111	67-127
Diisopropyl ether (DIPE)	mg/kg (ppm)	2.5	99	69-115
1,1-Dichloroethane	mg/kg (ppm)	2.5	109	68-115
Ethyl t-butyl ether (ETBE)	mg/kg (ppm)	2.5	115	48-142
2,2-Dichloropropane	mg/kg (ppm)	2.5	117	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	110	72-113
Chloroform	mg/kg (ppm)	2.5	114	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	104	57-123
t-Amyl methyl ether (TAME)	mg/kg (ppm)	2.5	113	47-143
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	119	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	119	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	107	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	122	60-139
Benzene	mg/kg (ppm)	2.5	105	68-114
Trichloroethene	mg/kg (ppm)	2.5	113	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	110	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	126	72-130
Dibromomethane	mg/kg (ppm)	2.5	117	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	111	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	119	75-136
Toluene	mg/kg (ppm)	2.5	95	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	111	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	104	75-113
2-Hexanone	mg/kg (ppm)	12.5	88	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	100	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	104	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	113	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	104	74-132
Chlorobenzene	mg/kg (ppm)	2.5	103	76-111
Ethylbenzene	mg/kg (ppm)	2.5	98	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	108	69-135
m,p-Xylene	mg/kg (ppm)	5	99	78-122
o-Xylene	mg/kg (ppm)	2.5	101	77-124
Styrene	mg/kg (ppm)	2.5	102	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	101	76-127
Bromoform	mg/kg (ppm)	2.5	115	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	92	74-124
Bromobenzene	mg/kg (ppm)	2.5	98	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	98	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	94	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	92	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	93	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	94	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	98	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	94	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	95	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	96	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	99	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	98	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	100	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	101	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	97	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	108	50-153
Naphthalene	mg/kg (ppm)	2.5	97	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	100	63-138

Date of Report: 02/10/17
Date Received: 02/02/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702040

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 702015-01 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	88	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	83	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	84	81	55-130	4
Aroclor 1260	mg/kg (ppm)	0.8	83	82	58-133	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

702040

SAMPLE CHAIN OF CUSTODY

ME 02/02/17 803/VS1

Send Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone # (206) 381-1128 Fax #

SAMPLERS (*signature*) Jason Cass

PROJECT NAME/NO. Horizon Bus Line

PO # 10737-01

REMARKS

Page # 1 of 1

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	MTCA5 ~~RCRA-8~~ Metals	PAH	8082 PCB	Notes
EMW06-5		5	01	2/2/17	8:03	Soil	1	X								
EMW06-6		6	02		8:07		1	X								
EMW06-10		10	03		8:10		1	X								
EMW07-3		3	04		9:25		1	X								
EMW07-5		5	05		9:30		1	X								
EMW07-10		10	06		9:35		1	X								
EMW08-5		5	07 A-F		11:09		6	X	X		X	X	X	X	X	
EMW08-10		10	08		11:10		1									Hold
EMW09-6		6	09 A-E		12:35		6 ~~5~~ NP	X	X	X						
EMW09-12		12	10 A-F		12:50		6	X	X		X	X	X	X	X	
EMW09-15		15	11 A-E		12:55		5	X	X	X						
EMW09-20		20	12 A-E		13:05		5	X	X	X						

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Jason Cass	Jason Cass	EHSI	2/2/17	15:35
Received by:	Nhan Phan	FeBI	2/2/17	1535
Relinquished by:				
Received by:				

Samples received at 2 °C

FORMS\COC\SESGEMSR1.DOC (Revision 1)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 16, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the results from the testing of material submitted on February 7, 2017 from the Horizon Bus Line, PO 10737f-01, F&BI 702098 project. There are 49 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Heather Binuya, Kurt Easthouse
EHS0216R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 7, 2017 by Friedman & Bruya, Inc. from the EHSI Horizon Bus Line, PO 10737f-01, F&BI 702098 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
702098 -01	EMW01-01
702098 -02	EMW02-01
702098 -03	EMW03-01
702098 -04	EMW04-01
702098 -05	EMW05-01
702098 -06	EMW06-01
702098 -07	EMW07-01
702098 -08	EMW08-01
702098 -09	EMW09-01
702098 -10	EMW09-01 Dup
702098 -11	Trip Blank (1)
702098 -12	Trip Blank (2)

Samples EMW03-01 and EMW09-01 were sent to Fremont Analytical for sulfate, alkalinity, nitrate, and ferrous iron analyses. The report is enclosed.

The dissolved metals samples were filtered at Friedman and Bruya on February 9, 2017 at 13:49. The data were flagged accordingly.

All quality control requirements were acceptable.

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted: 02/09/17
Date Analyzed: 02/09/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
EMW08-01 702098-08	<100	82
EMW09-01 702098-09	180	83
Method Blank 07-219 MB	<100	80

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted: 02/08/17
Date Analyzed: 02/08/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
EMW03-01 702098-03	140 x	<250	98
EMW04-01 702098-04	55 x	<250	122
EMW05-01 702098-05	280 x	490 x	94
EMW06-01 702098-06	<50	<250	95
EMW07-01 702098-07	60 x	<250	101
EMW08-01 702098-08	<50	<250	98
EMW09-01 702098-09	6,600	1,200 x	83
Method Blank 07-276 MB	<50	<250	87

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW01-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-01
Date Analyzed:	02/10/17	Data File:	702098-01.039
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW02-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-02
Date Analyzed:	02/10/17	Data File:	702098-02.042
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW03-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-03
Date Analyzed:	02/10/17	Data File:	702098-03.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	223

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW05-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-05
Date Analyzed:	02/10/17	Data File:	702098-05.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.97

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW08-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-08
Date Analyzed:	02/10/17	Data File:	702098-08.059
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.89
Cadmium	<1
Chromium	1.59
Lead	<1
Mercury	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW09-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	702098-09
Date Analyzed:	02/10/17	Data File:	702098-09.063
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.92
Cadmium	<1
Chromium	1.39
Lead	<1
Manganese	965
Mercury	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank f	Client:	EHSI
Date Received:	NA	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/10/17	Lab ID:	I7-062 mb
Date Analyzed:	02/10/17	Data File:	I7-062 mb.037
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Manganese	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW01-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-01
Date Analyzed:	02/08/17	Data File:	702098-01.052
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW02-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-02
Date Analyzed:	02/08/17	Data File:	702098-02.053
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW05-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-05
Date Analyzed:	02/08/17	Data File:	702098-05.054
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.89

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW08-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-08
Date Analyzed:	02/08/17	Data File:	702098-08.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	6.61
Cadmium	<1
Chromium	1.52
Lead	<1
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-09
Date Analyzed:	02/08/17	Data File:	702098-09.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	5.13
Cadmium	<1
Chromium	3.78
Lead	3.46
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	EHSI
Date Received:	NA	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	I7-060 mb
Date Analyzed:	02/08/17	Data File:	I7-060 mb.036
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EMW08-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-08
Date Analyzed:	02/08/17	Data File:	020836.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-09
Date Analyzed:	02/08/17	Data File:	020837.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	1.9
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EMW09-01 Dup	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-10
Date Analyzed:	02/08/17	Data File:	020838.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	2.1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	07-0256 mb
Date Analyzed:	02/08/17	Data File:	020818.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<1
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<1	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<1	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<1	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW01-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-01
Date Analyzed:	02/10/17	Data File:	021010.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	63	32	162
Phenol-d6	41	10	170
Nitrobenzene-d5	106	50	150
2-Fluorobiphenyl	58	43	158
2,4,6-Tribromophenol	70	43	146
Terphenyl-d14	97	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW05-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-05
Date Analyzed:	02/10/17	Data File:	021011.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	73	32	162
Phenol-d6	48	10	170
Nitrobenzene-d5	113	50	150
2-Fluorobiphenyl	91	43	158
2,4,6-Tribromophenol	103	43	146
Terphenyl-d14	107	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	0.52	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW08-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-08
Date Analyzed:	02/10/17	Data File:	021012.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	76	32	162
Phenol-d6	49	10	170
Nitrobenzene-d5	114	50	150
2-Fluorobiphenyl	92	43	158
2,4,6-Tribromophenol	99	43	146
Terphenyl-d14	108	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-09
Date Analyzed:	02/10/17	Data File:	021013.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	67	32	162
Phenol-d6	46	10	170
Nitrobenzene-d5	115	50	150
2-Fluorobiphenyl	77	43	158
2,4,6-Tribromophenol	89	43	146
Terphenyl-d14	100	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	0.52	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	1.3	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	07-280 mb
Date Analyzed:	02/10/17	Data File:	021005.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	71	32	162
Phenol-d6	47	10	170
Nitrobenzene-d5	112	50	150
2-Fluorobiphenyl	94	43	158
2,4,6-Tribromophenol	73	43	146
Terphenyl-d14	107	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	Hexachlorocyclopentadiene	<0.6
Bis(2-chloroethyl) ether	<0.2	2,4,6-Trichlorophenol	<2
2-Chlorophenol	<2	2,4,5-Trichlorophenol	<2
1,3-Dichlorobenzene	<0.2	2-Chloronaphthalene	<0.2
1,4-Dichlorobenzene	<0.2	2-Nitroaniline	<1
1,2-Dichlorobenzene	<0.2	Dimethyl phthalate	<2
Benzyl alcohol	<2	2,6-Dinitrotoluene	<1
2,2'-Oxybis(1-chloropropane)	<0.2	3-Nitroaniline	<20
2-Methylphenol	<2	2,4-Dinitrophenol	<6
Hexachloroethane	<0.2	Dibenzofuran	<0.2
N-Nitroso-di-n-propylamine	<0.2	2,4-Dinitrotoluene	<1
3-Methylphenol + 4-Methylphenol	<4	4-Nitrophenol	<6
Nitrobenzene	<0.2	Diethyl phthalate	<2
Isophorone	<0.2	4-Chlorophenyl phenyl ether	<0.2
2-Nitrophenol	<2	N-Nitrosodiphenylamine	<0.2
2,4-Dimethylphenol	<2	4-Nitroaniline	<20
Benzoic acid	<10	4,6-Dinitro-2-methylphenol	<6
Bis(2-chloroethoxy)methane	<0.2	4-Bromophenyl phenyl ether	<0.2
2,4-Dichlorophenol	<2	Hexachlorobenzene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pentachlorophenol	<2
Hexachlorobutadiene	<0.2	Carbazole	<2
4-Chloroaniline	<20	Di-n-butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benzyl butyl phthalate	<2
2-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
1-Methylnaphthalene	<0.2	Di-n-octyl phthalate	<2

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW01-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-01
Date Analyzed:	02/09/17	Data File:	020918.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	31	160
Benzo(a)anthracene-d12	98	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW05-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-05
Date Analyzed:	02/10/17	Data File:	020935.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	112	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.23
Acenaphthylene	<0.03
Acenaphthene	7.8
Fluorene	0.31
Phenanthrene	0.25
Anthracene	0.077
Fluoranthene	0.22
Pyrene	0.46
Benz(a)anthracene	0.13
Chrysene	0.20
Benzo(a)pyrene	0.067
Benzo(b)fluoranthene	0.15
Benzo(k)fluoranthene	0.043
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	0.031

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW08-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-08
Date Analyzed:	02/10/17	Data File:	020933.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	31	160
Benzo(a)anthracene-d12	102	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-09
Date Analyzed:	02/10/17	Data File:	020934.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	31	160
Benzo(a)anthracene-d12	100	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.79
Acenaphthylene	0.061
Acenaphthene	0.50
Fluorene	0.32
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	0.052
Pyrene	0.13
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	07-281 mb
Date Analyzed:	02/09/17	Data File:	020905.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.03
Acenaphthylene	<0.03
Acenaphthene	<0.03
Fluorene	<0.03
Phenanthrene	<0.03
Anthracene	<0.03
Fluoranthene	<0.03
Pyrene	<0.03
Benz(a)anthracene	<0.03
Chrysene	<0.03
Benzo(a)pyrene	<0.03
Benzo(b)fluoranthene	<0.03
Benzo(k)fluoranthene	<0.03
Indeno(1,2,3-cd)pyrene	<0.03
Dibenz(a,h)anthracene	<0.03
Benzo(g,h,i)perylene	<0.03

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	EMW03-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/13/17	Lab ID:	702098-03
Date Analyzed:	02/13/17	Data File:	006F0601.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	20
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/13/17	Lab ID:	702098-09
Date Analyzed:	02/13/17	Data File:	007F0701.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	450
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/13/17	Lab ID:	07-0265 mb
Date Analyzed:	02/13/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW01-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-01
Date Analyzed:	02/10/17	Data File:	021005.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW05-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-05
Date Analyzed:	02/10/17	Data File:	021006.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	70	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW08-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-08
Date Analyzed:	02/10/17	Data File:	021007.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	63	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	EMW09-01	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	702098-09
Date Analyzed:	02/10/17	Data File:	021008.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	48	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted:	02/08/17	Lab ID:	07-283 mb
Date Analyzed:	02/09/17	Data File:	020907.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	62	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1
Aroclor 1262	<0.1
Aroclor 1268	<0.1

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 702095-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	93	70-119

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	94	63-142	7

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 702098-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	1.80	109	108	70-130	1
Cadmium	ug/L (ppb)	5	<1	104	104	70-130	0
Chromium	ug/L (ppb)	20	<1	99	98	70-130	1
Lead	ug/L (ppb)	10	<1	103	104	70-130	1
Manganese	ug/L (ppb)	20	191	81	88	70-130	8
Mercury	ug/L (ppb)	10	<1	100	101	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	95	85-115
Cadmium	ug/L (ppb)	5	99	85-115
Chromium	ug/L (ppb)	20	98	85-115
Lead	ug/L (ppb)	10	100	85-115
Manganese	ug/L (ppb)	20	97	85-115
Mercury	ug/L (ppb)	10	96	85-115

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 702103-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	2.04	110	112	70-130	2
Cadmium	ug/L (ppb)	5	<1	106	106	70-130	0
Chromium	ug/L (ppb)	20	1.61	102	100	70-130	2
Lead	ug/L (ppb)	10	1.07	95	95	70-130	0
Mercury	ug/L (ppb)	10	<1	104	105	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	100	85-115
Cadmium	ug/L (ppb)	5	104	85-115
Chromium	ug/L (ppb)	20	104	85-115
Lead	ug/L (ppb)	10	100	85-115
Mercury	ug/L (ppb)	10	108	85-115

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702098-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	130	10-172
Chloromethane	ug/L (ppb)	50	<10	97	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	107	36-166
Bromomethane	ug/L (ppb)	50	<1	121	47-169
Chloroethane	ug/L (ppb)	50	<1	107	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	115	44-165
Acetone	ug/L (ppb)	250	<10	83	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	100	60-136
Hexane	ug/L (ppb)	50	<1	84	52-150
Methylene chloride	ug/L (ppb)	50	<5	110	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	91	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	71-127
Chloroform	ug/L (ppb)	50	<1	104	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	88	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	106	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	112	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	98	69-133
Carbon tetrachloride	ug/L (ppb)	50	<1	111	56-152
Benzene	ug/L (ppb)	50	<0.35	96	76-125
Trichloroethene	ug/L (ppb)	50	<1	101	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	100	78-125
Bromodichloromethane	ug/L (ppb)	50	<1	118	61-150
Dibromomethane	ug/L (ppb)	50	<1	105	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	106	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	106	72-132
Toluene	ug/L (ppb)	50	<1	96	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	104	68-131
2-Hexanone	ug/L (ppb)	250	<10	89	10-185
1,3-Dichloropropane	ug/L (ppb)	50	<1	102	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	105	10-226
Dibromochloromethane	ug/L (ppb)	50	<1	116	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	105	69-134
Chlorobenzene	ug/L (ppb)	50	<1	103	77-122
Ethylbenzene	ug/L (ppb)	50	<1	98	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	109	73-137
m,p-Xylene	ug/L (ppb)	100	<2	99	69-135
o-Xylene	ug/L (ppb)	50	<1	100	60-140
Styrene	ug/L (ppb)	50	<1	102	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	101	65-142
Bromoform	ug/L (ppb)	50	<1	117	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	92	58-144
Bromobenzene	ug/L (ppb)	50	<1	100	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	97	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	95	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	90	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	93	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	94	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	96	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	2.1	94	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	93	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	94	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	102	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	100	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	103	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	102	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	100	66-136
Hexachlorobutadiene	ug/L (ppb)	50	<1	100	60-143
Naphthalene	ug/L (ppb)	50	<1	101	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	104	69-148

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	101	98	25-158	3
Chloromethane	ug/L (ppb)	50	83	89	45-156	7
Vinyl chloride	ug/L (ppb)	50	93	94	50-154	1
Bromomethane	ug/L (ppb)	50	95	102	55-143	7
Chloroethane	ug/L (ppb)	50	97	96	58-146	1
Trichlorofluoromethane	ug/L (ppb)	250	112	111	50-150	1
Acetone	ug/L (ppb)	250	93	94	53-131	1
1,1-Dichloroethene	ug/L (ppb)	50	97	96	67-136	1
Hexane	ug/L (ppb)	50	86	82	57-137	5
Methylene chloride	ug/L (ppb)	50	108	107	39-148	1
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	100	98	64-147	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	101	100	68-128	1
1,1-Dichloroethane	ug/L (ppb)	50	96	96	79-121	0
2,2-Dichloropropane	ug/L (ppb)	50	112	107	55-143	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	100	99	80-123	1
Chloroform	ug/L (ppb)	50	102	102	80-121	0
2-Butanone (MEK)	ug/L (ppb)	250	93	97	57-149	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	105	106	73-132	1
1,1,1-Trichloroethane	ug/L (ppb)	50	112	110	83-130	2
1,1-Dichloropropene	ug/L (ppb)	50	98	98	77-129	0
Carbon tetrachloride	ug/L (ppb)	50	116	114	75-158	2
Benzene	ug/L (ppb)	50	94	94	69-134	0
Trichloroethene	ug/L (ppb)	50	102	102	80-120	0
1,2-Dichloropropane	ug/L (ppb)	50	98	98	77-123	0
Bromodichloromethane	ug/L (ppb)	50	114	116	81-133	2
Dibromomethane	ug/L (ppb)	50	101	103	82-125	2
4-Methyl-2-pentanone	ug/L (ppb)	250	100	104	65-138	4
cis-1,3-Dichloropropene	ug/L (ppb)	50	105	107	82-132	2
Toluene	ug/L (ppb)	50	95	95	72-122	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	111	112	80-136	1
1,1,2-Trichloroethane	ug/L (ppb)	50	101	103	75-124	2
2-Hexanone	ug/L (ppb)	250	86	87	60-136	1
1,3-Dichloropropane	ug/L (ppb)	50	98	100	76-126	2
Tetrachloroethene	ug/L (ppb)	50	105	105	76-121	0
Dibromochloromethane	ug/L (ppb)	50	117	119	84-133	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	103	104	82-125	1
Chlorobenzene	ug/L (ppb)	50	102	101	83-114	1
Ethylbenzene	ug/L (ppb)	50	97	97	77-124	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	111	111	84-127	0
m,p-Xylene	ug/L (ppb)	100	98	98	83-125	0
o-Xylene	ug/L (ppb)	50	99	99	81-121	0
Styrene	ug/L (ppb)	50	101	101	84-119	0
Isopropylbenzene	ug/L (ppb)	50	100	101	85-117	1
Bromoform	ug/L (ppb)	50	122	123	74-136	1
n-Propylbenzene	ug/L (ppb)	50	93	93	74-126	0
Bromobenzene	ug/L (ppb)	50	99	99	80-121	0
1,3,5-Trimethylbenzene	ug/L (ppb)	50	98	98	78-123	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	95	97	66-126	2
1,2,3-Trichloropropane	ug/L (ppb)	50	93	94	67-124	1
2-Chlorotoluene	ug/L (ppb)	50	94	94	77-127	0
4-Chlorotoluene	ug/L (ppb)	50	94	95	78-128	1
tert-Butylbenzene	ug/L (ppb)	50	98	98	80-123	0
1,2,4-Trimethylbenzene	ug/L (ppb)	50	95	96	79-122	1
sec-Butylbenzene	ug/L (ppb)	50	95	96	80-125	1
p-Isopropyltoluene	ug/L (ppb)	50	97	97	81-123	0
1,3-Dichlorobenzene	ug/L (ppb)	50	100	101	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	99	100	84-121	1
1,2-Dichlorobenzene	ug/L (ppb)	50	101	103	85-116	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	104	106	57-141	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	99	99	72-130	0
Hexachlorobutadiene	ug/L (ppb)	50	107	108	53-141	1
Naphthalene	ug/L (ppb)	50	99	100	64-133	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	102	102	65-136	0

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	ug/L (ppb)	10	48	50	10-84	4
Bis(2-chloroethyl) ether	ug/L (ppb)	10	98	100	52-113	2
2-Chlorophenol	ug/L (ppb)	10	99	99	50-110	0
1,3-Dichlorobenzene	ug/L (ppb)	10	96	98	45-109	2
1,4-Dichlorobenzene	ug/L (ppb)	10	96	97	44-118	1
1,2-Dichlorobenzene	ug/L (ppb)	10	97	98	46-116	1
Benzyl alcohol	ug/L (ppb)	10	93	94	42-100	1
2,2'-Oxybis(1-chloropropane)	ug/L (ppb)	10	99	102	51-124	3
2-Methylphenol	ug/L (ppb)	10	83	87	38-100	5
Hexachloroethane	ug/L (ppb)	10	99	102	42-117	3
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	106	109	48-124	3
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	83	88	40-105	6
Nitrobenzene	ug/L (ppb)	10	105	108	50-118	3
Isophorone	ug/L (ppb)	10	104	108	55-116	4
2-Nitrophenol	ug/L (ppb)	10	113	118	42-127	4
2,4-Dimethylphenol	ug/L (ppb)	10	44	46	11-135	4
Benzoic acid	ug/L (ppb)	65	40	43	10-110	7
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	100	103	55-115	3
2,4-Dichlorophenol	ug/L (ppb)	10	105	108	55-113	3
1,2,4-Trichlorobenzene	ug/L (ppb)	10	97	98	50-109	1
Hexachlorobutadiene	ug/L (ppb)	10	96	97	50-109	1
4-Chloroaniline	ug/L (ppb)	20	89	91	30-109	2
4-Chloro-3-methylphenol	ug/L (ppb)	10	102	106	54-114	4
2-Methylnaphthalene	ug/L (ppb)	10	101	104	53-113	3
1-Methylnaphthalene	ug/L (ppb)	10	101	103	70-130	2
Hexachlorocyclopentadiene	ug/L (ppb)	10	69	68	10-121	1
2,4,6-Trichlorophenol	ug/L (ppb)	10	91	98	46-114	7
2,4,5-Trichlorophenol	ug/L (ppb)	10	93	99	57-122	6
2-Chloronaphthalene	ug/L (ppb)	10	85	88	52-112	3
2-Nitroaniline	ug/L (ppb)	10	90	94	47-128	4
Dimethyl phthalate	ug/L (ppb)	10	96	98	55-116	2
2,6-Dinitrotoluene	ug/L (ppb)	10	96	100	49-126	4
3-Nitroaniline	ug/L (ppb)	20	85	89	21-125	5
2,4-Dinitrophenol	ug/L (ppb)	10	88	101	29-130	14
Dibenzofuran	ug/L (ppb)	10	85	89	53-113	5
2,4-Dinitrotoluene	ug/L (ppb)	10	86	91	48-129	6
4-Nitrophenol	ug/L (ppb)	10	45	47	10-80	4
Diethyl phthalate	ug/L (ppb)	10	97	100	55-116	3
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	85	89	52-115	5
N-Nitrosodiphenylamine	ug/L (ppb)	10	99	103	51-112	4
4-Nitroaniline	ug/L (ppb)	20	86	92	42-115	7
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	102	113	40-128	10
4-Bromophenyl phenyl ether	ug/L (ppb)	10	98	102	53-114	4
Hexachlorobenzene	ug/L (ppb)	10	95	99	54-115	4
Pentachlorophenol	ug/L (ppb)	10	101	113	49-114	11
Carbazole	ug/L (ppb)	10	100	106	54-115	6
Di-n-butyl phthalate	ug/L (ppb)	10	110	118 vo	54-115	7
Benzyl butyl phthalate	ug/L (ppb)	10	100	106	53-122	6
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	96	114	54-122	17
Di-n-octyl phthalate	ug/L (ppb)	10	110	119	50-131	8

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	93	92	67-116	1
Acenaphthylene	ug/L (ppb)	1	92	93	65-119	1
Acenaphthene	ug/L (ppb)	1	92	93	66-118	1
Fluorene	ug/L (ppb)	1	95	97	64-125	2
Phenanthrene	ug/L (ppb)	1	93	95	67-120	2
Anthracene	ug/L (ppb)	1	93	97	65-122	4
Fluoranthene	ug/L (ppb)	1	95	102	65-127	7
Pyrene	ug/L (ppb)	1	92	85	62-130	8
Benz(a)anthracene	ug/L (ppb)	1	94	96	60-118	2
Chrysene	ug/L (ppb)	1	92	95	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	91	92	55-135	1
Benzo(k)fluoranthene	ug/L (ppb)	1	94	92	62-125	2
Benzo(a)pyrene	ug/L (ppb)	1	90	91	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	86	90	36-142	5
Dibenz(a,h)anthracene	ug/L (ppb)	1	73	82	37-133	12
Benzo(g,h,i)perylene	ug/L (ppb)	1	76	83	34-135	9

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 702098-09 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	450	470	4
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	63	63	50-150	0
Ethane	ug/L (ppb)	110	58	57	50-150	2
Ethene	ug/L (ppb)	102	79	77	50-150	3

Date of Report: 02/16/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	66	77	37-136	15
Aroclor 1260	ug/L (ppb)	2.5	67	77	41-135	14

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Fremont Analytical
3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 702098
Work Order Number: 1702067

February 13, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 2/8/2017 for the analyses presented in the following report.

Ferrous Iron by SM3500-Fe B

Ion Chromatography by EPA Method 300.0

Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT: Friedman & Bruya
Project: 702098
Work Order: 1702067

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1702067-001	EMW03-01	02/07/2017 12:30 PM	02/08/2017 11:07 AM
1702067-002	EMW09-01	02/07/2017 4:55 PM	02/08/2017 11:07 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1702067**

Date: **2/13/2017**

CLIENT: Friedman & Bruya

Project: 702098

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Client: Friedman & Bruya
Project: 702098
Lab ID: 1702067-001
Client Sample ID: **EMW03-01**

Collection Date: 2/7/2017 12:30:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R34371		Analyst: KT
Nitrate (as N)	ND	5.00	D	mg/L	50	2/8/2017 2:28:00 PM
Sulfate	554	15.0	D	mg/L	50	2/8/2017 2:28:00 PM
NOTES: Diluted due to matrix.						
Total Alkalinity by SM 2320B				Batch ID: R34360		Analyst: KT
Alkalinity, Total (As CaCO3)	165	2.50		mg/L	1	2/9/2017 1:25:00 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R34335		Analyst: KT
Ferrous Iron	6.50	0.500	D	mg/L	10	2/8/2017 12:18:00 PM

Analytical Report

Work Order: **1702067**
Date Reported: **2/13/2017**

Client: Friedman & Bruya

Project: 702098

Lab ID: 1702067-002

Client Sample ID: **EMW09-01**

Collection Date: 2/7/2017 4:55:00 PM

Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R34371		Analyst: KT
Nitrate (as N)	ND	2.50	D	mg/L	25	2/8/2017 2:38:00 PM
Sulfate	107	30.0	D	mg/L	100	2/8/2017 3:20:00 PM
NOTES: Diluted due to matrix.						
Total Alkalinity by SM 2320B				Batch ID: R34360		Analyst: KT
Alkalinity, Total (As CaCO3)	240	2.50		mg/L	1	2/9/2017 1:30:00 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R34335		Analyst: KT
Ferrous Iron	3.77	0.250	D	mg/L	5	2/8/2017 12:19:00 PM

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ferrous Iron by SM3500-Fe B

Sample ID **MB-R34335** SampType: **MBLK** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **MBLKW** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655036**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	ND	0.0500									

Sample ID **LCS-R34335** SampType: **LCS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **LCSW** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655037**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	0.950	0.0500	1.000	0	95.0	90	110				

Sample ID **1702067-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655040**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	3.65	0.250						3.765	3.17	20	D

Sample ID **1702067-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655041**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	8.40	0.250	5.000	3.765	92.7	85	115				D

Sample ID **1702067-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655042**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	8.48	0.250	5.000	3.765	94.3	85	115	8.401	0.973	20	D

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-R34371** SampType: **MBLK** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **MBLKW** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655944**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID **LCS-R34371** SampType: **LCS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **LCSW** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655945**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	1.46	0.100	1.500	0	97.4	90	110				
Sulfate	7.35	0.300	7.500	0	98.0	90	110				

Sample ID **1702034-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.100						0		20	
Sulfate	3.68	0.300						3.721	1.22	20	

Sample ID **1702034-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	1.52	0.100	1.500	0.05700	97.8	80	120				
Sulfate	11.6	0.300	7.500	3.721	105	80	120				

Sample ID **1702034-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	1.51	0.100	1.500	0.05700	97.1	80	120	1.524	0.691	20	

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1702034-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	11.4	0.300	7.500	3.721	103	80	120	11.61	1.46	20	

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID	**MB-R34360**	SampType:	**MBLK**		Units:	**mg/L**		Prep Date:	**2/9/2017**		RunNo:	**34360**		
Client ID:	**MBLKW**	Batch ID:	**R34360**					Analysis Date:	**2/9/2017**		SeqNo:	**655765**		

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID	**LCS-R34360**	SampType:	**LCS**		Units:	**mg/L**		Prep Date:	**2/9/2017**		RunNo:	**34360**		
Client ID:	**LCSW**	Batch ID:	**R34360**					Analysis Date:	**2/9/2017**		SeqNo:	**655767**		

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID	**1702022-017BDUP**	SampType:	**DUP**		Units:	**mg/L**		Prep Date:	**2/9/2017**		RunNo:	**34360**		
Client ID:	**BATCH**	Batch ID:	**R34360**					Analysis Date:	**2/9/2017**		SeqNo:	**655769**		

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	91.0	2.50						89.00	2.22	20	

Fremont Analytical

Sample Log-In Check List

Client Name: **FB**

Logged by: **Erica Silva**

Work Order Number: **1702067**

Date Received: **2/8/2017 11:07:00 AM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In

3. Coolers are present? Yes ☐ No ☑ NA ☐

Samples received at appropriate temperature

4. Shipping container/cooler in good condition? Yes ☑ No ☐
5. Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) Yes ☐ No ☑ Not Required ☐
6. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
7. Were all items received at a temperature of >0°C to 10.0°C* Yes ☑ No ☐ NA ☐
8. Sample(s) in proper container(s)? Yes ☑ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
10. Are samples properly preserved? Yes ☑ No ☐
11. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☑
13. Did all samples containers arrive in good condition(unbroken)? Yes ☑ No ☐
14. Does paperwork match bottle labels? Yes ☑ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
16. Is it clear what analyses were requested? Yes ☑ No ☐
17. Were all holding times able to be met? Yes ☑ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: 　Date:

By Whom: 　Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	2.8

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1702067

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 702098	PO # E-474.
REMARKS Please Email Results	

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Ferrous Fe 2+ Iron			Notes
EMW03-01		2/7/17	~~1144~~ 1230 mj	water					X	X	X		X			
EMW09-01		↓	1655	↓					X	X	X		X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	2/8/17	0920
Received by:	Brianna Barnes	FAI	2/8/17	1107
Relinquished by:				
Received by:				

702098

SAMPLE CHAIN OF CUSTODY

ME 02/07/17 AI5/VW4/B05

Send Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone # (206) 381-1128 Fax #

SAMPLERS (signature) Jason Cass

PROJECT NAME/NO. ~~10737-03~~ Horizon Bus Line ~~Edmonds Bus Barn~~

PO # 10737-01

REMARKS
MNA = Nitrate, Ferrous Iron, Dissolved Mn, Sulfide, Methane, Alkalinity per JC 2/7/17 m.

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	PAH	Lead (total)	Arsenic	8082 PCB	Dissolved Pb	Dissolved As	MNA	MTCA 5 Total	MTCA 5 Dissolved
EMW01-01	01 A-D	2/7/17	11:00	H2O	4					X		X		X	X				
EMW02-01	02 A-B		11:44		2							X	X		X	X			
EMW03-01	03 A-G		12:30		7	X											X		
EMW04-01	04 A		13:10		1	X													
EMW05-01	05 A-D		13:55		4	X				X	X		X	X		X			
EMW06-01	06		15:15		1	X													
EMW07-01	07		15:30		1	X													
EMW08-01	08 A-I		16:10		9	X	X		X	X	X			X				X	X
EMW09-01	09 A-P		16:55		16	X	X		X	X	X			X			X	X	X
EMW09-01 Dup.	10 A-D		16:55		4				X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Jason Cass	Jason Cass	EHSI	2/7/17	18:55
Received by:	Eric Young	FB	2/7/17	1855
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Samples received at 4 °C

702098

SAMPLE CHAIN OF CUSTODY

ME 02/07/17 AIS/VW4/B05

Report To
Company EHSI
Address
City, State, ZIP
Phone Email

SAMPLERS (*signature*)

PROJECT NAME

PO #

REMARKS
cc generated at lab (NP) 2/7

INVOICE TO

Page # of

TURNAROUND TIME
☐ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
Trip Blank (1)	11 A-B	–	–	Water	3												
Trip Blank (2)	12 A-B	–	–	|	3												

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:					
Received by:		Nhan Phan	FeBI	2/7/17	1655
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

March 2, 2017

Jason Cass, Project Manager
EHSI
1011 SW Klickitat Way, Suite 104
Seattle, WA 98134

Dear Mr Cass:

Included are the additional results from the testing of material submitted on February 7, 2017 from the Horizon Bus Line, PO 10737f-01, F&BI 702098 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Stephanie Bolton
EHS0302R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 7, 2017 by Friedman & Bruya, Inc. from the EHSI Horizon Bus Line, PO 10737f-01, F&BI 702098 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	EHSI
702098 -01	EMW01-01
702098 -02	EMW02-01
702098 -03	EMW03-01
702098 -04	EMW04-01
702098 -05	EMW05-01
702098 -06	EMW06-01
702098 -07	EMW07-01
702098 -08	EMW08-01
702098 -09	EMW09-01
702098 -10	EMW09-01 Dup
702098 -11	Trip Blank (1)
702098 -12	Trip Blank (2)

Samples EMW03-01 and EMW09-01 were sent to Fremont Analytical for chloride and TOC analyses. The report is enclosed.

The dissolved metals samples were filtered at Friedman and Bruya on February 9, 2017 at 13:49. The data were flagged accordingly.

All quality control requirements were acceptable.

Date of Report: 03/02/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098
Date Extracted: NA
Date Analyzed: 02/20/17

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH	Date Analyzed	Time Analyzed
EMW03-01 702098-03	7.2	02/20/17	16:24
EMW09-01 702098-09	7.2	02/20/17	16:27

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW03-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/10/17	Lab ID:	702098-03
Date Analyzed:	02/10/17	Data File:	702098-03.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	5,110

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EMW09-01 f	Client:	EHSI
Date Received:	02/07/17	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/10/17	Lab ID:	702098-09
Date Analyzed:	02/10/17	Data File:	702098-09.063
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,170

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank f	Client:	EHSI
Date Received:	Not Applicable	Project:	Horizon Bus Line, PO 10737f-01
Date Extracted:	02/10/17	Lab ID:	I7-062 mb
Date Analyzed:	02/10/17	Data File:	I7-062 mb.037
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50

Date of Report: 03/02/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS
FROM THE ANALYSIS OF WATER SAMPLES
FOR pH BY METHOD 9040C

Laboratory Code: 702098-09 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	7.2	7.1	2	0-20

Date of Report: 03/02/17
Date Received: 02/07/17
Project: Horizon Bus Line, PO 10737f-01, F&BI 702098

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 702098-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	5,560	0 b	61 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	96	85-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Fremont Analytical
3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 702098
Work Order Number: 1702067

February 28, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 2/8/2017 for the analyses presented in the following report.

Ferrous Iron by SM3500-Fe B
Ion Chromatography by EPA Method 300.0
Total Alkalinity by SM 2320B
Total Organic Carbon by SM 5310C

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Michael C. Ridgeway

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L2371, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT: Friedman & Bruya
Project: 702098
Work Order: 1702067

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1702067-001	EMW03-01	02/07/2017 12:30 PM	02/08/2017 11:07 AM
1702067-002	EMW09-01	02/07/2017 4:55 PM	02/08/2017 11:07 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1702067**

Date: **2/28/2017**

CLIENT: Friedman & Bruya

Project: 702098

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers & Acronyms

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Client: Friedman & Bruya

Project: 702098

Lab ID: 1702067-001

Client Sample ID: **EMW03-01**

Collection Date: 2/7/2017 12:30:00 PM

Matrix: Water

Ion Chromatography by EPA Method 300.0

Batch ID: R34702 Analyst: KT

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Chloride	4,890	200	D	mg/L	2000	2/28/2017 4:13:00 PM
Nitrate (as N)	ND	5.00	D	mg/L	50	2/8/2017 2:28:00 PM
Sulfate	554	15.0	D	mg/L	50	2/8/2017 2:28:00 PM

NOTES:
Diluted due to matrix.

Total Organic Carbon by SM 5310C

Batch ID: R34643 Analyst: KT

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Organic Carbon	7.48	5.00	DH	mg/L	10	2/22/2017 11:59:51 AM

NOTES:
Diluted due to matrix.

Total Alkalinity by SM 2320B

Batch ID: R34360 Analyst: KT

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Alkalinity, Total (As CaCO3)	165	2.50		mg/L	1	2/9/2017 1:25:00 PM

Ferrous Iron by SM3500-Fe B

Batch ID: R34335 Analyst: KT

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ferrous Iron	6.50	0.500	D	mg/L	10	2/8/2017 12:18:00 PM

Client: Friedman & Bruya
Project: 702098
Lab ID: 1702067-002
Client Sample ID: **EMW09-01**

Collection Date: 2/7/2017 4:55:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R34371		Analyst: KT
Chloride	661	10.0	D	mg/L	100	2/8/2017 3:20:00 PM
Nitrate (as N)	ND	2.50	D	mg/L	25	2/8/2017 2:38:00 PM
Sulfate	107	30.0	D	mg/L	100	2/8/2017 3:20:00 PM
NOTES: Diluted due to matrix.						
Total Organic Carbon by SM 5310C				Batch ID: R34643		Analyst: KT
Total Organic Carbon	30.3	5.00	DH	mg/L	10	2/22/2017 12:23:14 PM
Total Alkalinity by SM 2320B				Batch ID: R34360		Analyst: KT
Alkalinity, Total (As CaCO3)	240	2.50		mg/L	1	2/9/2017 1:30:00 PM
Ferrous Iron by SM3500-Fe B				Batch ID: R34335		Analyst: KT
Ferrous Iron	3.77	0.250	D	mg/L	5	2/8/2017 12:19:00 PM

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ferrous Iron by SM3500-Fe B

Sample ID **MB-R34335** SampType: **MBLK** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **MBLKW** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655036**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	ND	0.0500									

Sample ID **LCS-R34335** SampType: **LCS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **LCSW** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655037**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	0.950	0.0500	1.000	0	95.0	90	110				

Sample ID **1702067-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655040**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	3.65	0.250						3.765	3.17	20	D

Sample ID **1702067-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655041**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	8.40	0.250	5.000	3.765	92.7	85	115				D

Sample ID **1702067-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34335**
Client ID: **EMW09-01** Batch ID: **R34335** Analysis Date: **2/8/2017** SeqNo: **655042**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ferrous Iron	8.48	0.250	5.000	3.765	94.3	85	115	8.401	0.973	20	D

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-R34702** SampType: **MBLK** Units: **mg/L** Prep Date: **2/28/2017** RunNo: **34702**
Client ID: **MBLKW** Batch ID: **R34702** Analysis Date: **2/28/2017** SeqNo: **662740**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									

Sample ID **LCS-R34702** SampType: **LCS** Units: **mg/L** Prep Date: **2/28/2017** RunNo: **34702**
Client ID: **LCSW** Batch ID: **R34702** Analysis Date: **2/28/2017** SeqNo: **662741**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.41	0.100	1.500	0	94.2	90	110				

Sample ID **1702254-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/28/2017** RunNo: **34702**
Client ID: **BATCH** Batch ID: **R34702** Analysis Date: **2/28/2017** SeqNo: **662744**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	93.4	2.50						93.59	0.211	20	D

Sample ID **1702254-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **2/28/2017** RunNo: **34702**
Client ID: **BATCH** Batch ID: **R34702** Analysis Date: **2/28/2017** SeqNo: **662745**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	133	2.50	37.50	93.59	105	80	120				D

Sample ID **1702254-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/28/2017** RunNo: **34702**
Client ID: **BATCH** Batch ID: **R34702** Analysis Date: **2/28/2017** SeqNo: **662746**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	132	2.50	37.50	93.59	104	80	120	132.9	0.343	20	D

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-R34371** SampType: **MBLK** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **MBLKW** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655944**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID **LCS-R34371** SampType: **LCS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **LCSW** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655945**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.48	0.100	1.500	0	98.5	90	110				
Nitrate (as N)	1.46	0.100	1.500	0	97.4	90	110				
Sulfate	7.35	0.300	7.500	0	98.0	90	110				

Sample ID **1702034-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	3.70	0.100						3.717	0.375	20	
Nitrate (as N)	ND	0.100						0		20	
Sulfate	3.68	0.300						3.721	1.22	20	

Sample ID **1702034-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.14	0.100	1.500	3.717	94.6	80	120				
Nitrate (as N)	1.52	0.100	1.500	0.05700	97.8	80	120				
Sulfate	11.6	0.300	7.500	3.721	105	80	120				

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1702034-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/8/2017** RunNo: **34371**
Client ID: **BATCH** Batch ID: **R34371** Analysis Date: **2/8/2017** SeqNo: **655954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.21	0.100	1.500	3.717	99.2	80	120	5.136	1.34	20	
Nitrate (as N)	1.51	0.100	1.500	0.05700	97.1	80	120	1.524	0.691	20	
Sulfate	11.4	0.300	7.500	3.721	103	80	120	11.61	1.46	20	

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID **MB-R34360** SampType: **MBLK** Units: **mg/L** Prep Date: **2/9/2017** RunNo: **34360**
Client ID: **MBLKW** Batch ID: **R34360** Analysis Date: **2/9/2017** SeqNo: **655765**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID **LCS-R34360** SampType: **LCS** Units: **mg/L** Prep Date: **2/9/2017** RunNo: **34360**
Client ID: **LCSW** Batch ID: **R34360** Analysis Date: **2/9/2017** SeqNo: **655767**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID **1702022-017BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/9/2017** RunNo: **34360**
Client ID: **BATCH** Batch ID: **R34360** Analysis Date: **2/9/2017** SeqNo: **655769**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	91.0	2.50						89.00	2.22	20	

Work Order: 1702067
CLIENT: Friedman & Bruya
Project: 702098

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID **MB-R34643** SampType: **MBLK** Units: **mg/L** Prep Date: **2/22/2017** RunNo: **34643**
Client ID: **MBLKW** Batch ID: **R34643** Analysis Date: **2/22/2017** SeqNo: **661292**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.500									

Sample ID **LCS-R34643** SampType: **LCS** Units: **mg/L** Prep Date: **2/22/2017** RunNo: **34643**
Client ID: **LCSW** Batch ID: **R34643** Analysis Date: **2/22/2017** SeqNo: **661293**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	5.02	0.500	5.000	0	100	80	120				

Sample ID **1702067-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **2/22/2017** RunNo: **34643**
Client ID: **EMW09-01** Batch ID: **R34643** Analysis Date: **2/22/2017** SeqNo: **661297**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	28.8	5.00						30.27	4.98	20	DH

Sample ID **1702067-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **2/22/2017** RunNo: **34643**
Client ID: **EMW09-01** Batch ID: **R34643** Analysis Date: **2/22/2017** SeqNo: **661298**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	78.6	5.00	50.00	30.27	96.6	70	130				DH

Sample ID **1702067-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **2/22/2017** RunNo: **34643**
Client ID: **EMW09-01** Batch ID: **R34643** Analysis Date: **2/22/2017** SeqNo: **661299**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	78.8	5.00	50.00	30.27	97.0	70	130	78.57	0.254	30	DH

Fremont Analytical

Sample Log-In Check List

Client Name: **FB**
Work Order Number: **1702067**
Logged by: **Erica Silva**
Date Received: **2/8/2017 11:07:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		Samples received at appropriate temperature		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: ______ Date ______
By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ______
Client Instructions: ______

19. Additional remarks:

Item Information

Item #	Temp °C
Sample	2.8

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1702067

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
702098	E-474.

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Ferrous Fe^{2+} Iron			Notes
EMW03-01		2/7/17	~~1144~~ 1230	water					X	X	X		X			
EMW09-01		↓	1655	↓					X	X	X		X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	2/8/17	0920
Received by:	Brianna Barnes	FAI	2/8/17	1107
Relinquished by:				
Received by:				

1702067

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
702098	E-474.

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Ferrous Fe^{2+} Iron	Chloride	TOC	Notes
EMW03-01		2/7/17	~~1144~~ 1230	water					X	X	X		X	⊗	⊗	⊗ Add per M.E. 2/20/17 cw
EMW09-01		↓	1655	↓					X	X	X		X	⊗	⊗	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	2/8/17	0920
Received by:	Brianna Barnes	FAI	2/8/17	1107
Relinquished by:				
Received by:				

702098

SAMPLE CHAIN OF CUSTODY

ME 02/07/17 AI5/VW4/B05

Send Report To Jason Cass
Company EHSI
Address 1011 SW Klickitat Way, #104
City, State, ZIP Seattle, WA 98134
Phone # (206) 381-1128 Fax #

SAMPLERS (signature) Jason Cass
PROJECT NAME/NO. ~~10737-03~~ Horizon Bus Lin ~~Edmonds Bus Barn~~
PO # 10737-01
REMARKS Fe, PH, TOC, Chloride added per JC 2/10 MK
MNA = Nitrate, Ferrous Iron, Dissolved Mn, Sulfate, Methane, Alkalinity per JC 2/7/17 ms.

Page # 1 of 1
TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	PAH	Lead (total)	Arsenic	8082 PCB	Dissolved Pb	Dissolved As	MNA	MTCA 5 Total	MTCA 5 Dissolved	
EMW01-01	01 A-D	2/7/17	11:00	H2O	4					X		X		X	X					
EMW02-01	02 A-B		11:44		2							X	X		X	X				
EMW03-01	03 A-G		12:30		7	X											X			
EMW04-01	04 ~~A~~		13:10		1	X														
EMW05-01	05 A-D		13:55		4	X				X	X		X	X		X				
EMW06-01	06		15:15		1	X														
EMW07-01	07		15:30		1	X														
EMW08-01	08 A-I		16:10		9	X	X		X	X	X			X				X	X	
EMW09-01	09 A-P		16:55		16	X	X		X	X	X			X			X	X	X	
EMW09-01 DUP.	10 A-D		16:55		4	~~X~~	~~X~~		X											

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044
FORMS\COC\COC.DOC

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jason Cass	Jason Cass	EHSI	2/7/17	18:55
Received by:		Eric Young	FB	2/7/17	1855
Relinquished by:					
Received by:					

Samples received at 4 °C

702098

SAMPLE CHAIN OF CUSTODY

ME 02/07/17 AIS/VW4/BOS

Report To

Company EHSI

Address

City, State, ZIP

Phone Email

SAMPLERS (*signature*)

PROJECT NAME	PO #

REMARKS	INVOICE TO
cx generated at lab (NP) 2/7	

Page # of

TURNAROUND TIME
☐ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
Trip Blank(1)	11 A-B	–	–	Water	3												
Trip Blank(2)	12 A-B	–	–	|	3												

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:					
Received by:		Nhan Phan	FeBI	2/7/17	1655
Relinquished by:					
Received by:					

APPENDIX E
LDW PROVISIONAL CLEANUP VALUES

DEPARTMENT OF
ECOLOGY
State of Washington

Date: November 23, 2015; (Revised March 1, 2016)

To: Bob Warren, Section Manager TCP – NWRO

Through: Jeff Johnston, Manager
Information and Policy Section
Toxics Cleanup Program

From: Pete Kmet, Senior Engineer PKmet
Policy and Technical Support Unit

Subject: Groundwater cleanup levels for upland sites along the Lower Duwamish Waterway

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Background and Scope

This memorandum has been prepared at the request of TCP's Northwest Regional Office. It is intended to provide technical support for the development of groundwater cleanup levels for upland cleanup sites in the vicinity of the Lower Duwamish Waterway cleanup site in King County, Washington (Figure 1). The memorandum describes the process under the Model Toxics Control Act (MTCA) for determining these values and provides preliminary recommendations. Actual cleanup levels at individual sites will depend on additional site-specific factors that are described later in this memo.

The recommendations in this memorandum are applicable to upland sites where monitoring shows upland contamination is either entering or likely to enter the Duwamish River through the groundwater. *It is not intended to be used to establish discharge limits for permitted or unpermitted discharges nor water quality criteria for the Duwamish River and other surface waters within this area. Those limits and criteria must be established under water quality law.*

This memo was prepared by Pete Kmet with assistance from Arthur Buchan (ecologic and groundwater concentrations protective of sediment) and Jim White (human health concentrations). Questions regarding this memo can be directed to any of these staff.

What the MTCA Rule Requires

In general, WAC 173-340-720 requires that groundwater cleanup levels be set at concentrations that protect for drinking water beneficial uses, unless the groundwater qualifies as nonpotable. A determination of whether the groundwater qualifies as nonpotable must be made on a site-specific basis, based on the criteria in WAC 173-340-720(2). This memo does not address which upland sites within the vicinity of the Lower Duwamish Waterway qualify for a nonpotable groundwater cleanup level.

If a site is determined to have nonpotable groundwater, then WAC 173-340-720(6) provides two options: either use potable groundwater cleanup levels anyway using one of the methods specified in WAC 173-340-720; or, develop nonpotable groundwater cleanup levels using a site-specific risk assessment.

WAC 173-340-720 also requires groundwater cleanup levels to be protective of surface water beneficial uses unless it can be demonstrated that the hazardous substances in the groundwater are not likely to reach surface water. [1] The exposure pathway of concern is the discharge of contaminated groundwater into the surface water and the protection of aquatic organisms living in that surface water and sediment, and persons that consume those organisms. Exposure can occur directly through migration and seepage of the groundwater into the surface water and sorption onto the sediments, or indirectly through groundwater intercepted by ditches, foundation drains, temporary construction dewatering systems, utility corridors, and stormwater systems (including stormwater pipes, which typically are not water-tight), that then drain to surface water. This pathway is the focus of this memorandum.

For the groundwater to surface water exposure pathway, WAC 173-340-720 requires that the methods specified in WAC 173-340-730 for establishing surface water cleanup levels be used to develop groundwater cleanup levels protective of surface water. [2]

In general, WAC 173-340-730 requires surface water cleanup levels to be protective of aquatic organisms and persons that consume these organisms. More specifically, it requires surface water cleanup levels to be at least as stringent as: [3]

- Applicable state and federal laws;
- Concentrations protective of wildlife, fish and other aquatic life;
- Concentrations protective of human health (such as through consumption of fish and shellfish); and
- Drinking water, for surface waters classified as suitable for domestic water supply under WAC 173-201A (Washington State surface water quality standards).

Table 602 in WAC 173-201A does not list domestic water use as a beneficial use for the lower 11 miles of the Duwamish River. Therefore, for the purposes of this memo, it is presumed that groundwater cleanup levels protective of surface water for sites within the Lower Duwamish Waterway will not need to address drinking water use. This may not be the case if contaminants from the upland site are discharging to a freshwater tributary to this water body or the groundwater is otherwise determined to be potable (such as because of the need to protect a lower drinking water aquifer).

In addition, both WAC 173-340-720(1)(c) and 730(1)(d) require cleanup levels that would not directly or indirectly cause violations of cleanup standards in other media, including the sediment cleanup standards. And, if a conditional point of compliance is used, WAC 173-340-720(8)(d) requires groundwater discharges not result in violations of sediment cleanup levels published in WAC 173-204.

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[1] For example, WAC 173-340-720(6)(c)(i)(E) (site specific risk assessment for nonpotable groundwater) states in part “The (groundwater) cleanup levels will not exceed the surface water cleanup levels derived under WAC 173-340-730 … unless it can be demonstrated that the hazardous substances are not likely to reach surface water.” Similar language is found in Method A, Method B, and Method C groundwater cleanup levels based on drinking water beneficial use.

[2] For example, see WAC 173-340-720(6)(c)(i)(E) for non-potable groundwater cleanup levels. Similar language is found in the subsections describing Method A, B, and C groundwater cleanup levels for potable groundwater.

[3] For example, see WAC 173-730(3)(b)(i)–(iv). Similar language is found in the subsections describing Method A and Method C surface water cleanup levels.

WAC 173-201A-260(3)(e) requires that marine water criteria be applied where the vertically averaged daily maximum salinity values are greater than one part per thousand (ten parts per thousand for bacteria).[4] Water Quality Program staff have indicated that the Lower Duwamish Waterway study area of the Duwamish River shown in Figure 1 has been designated as marine water under WAC 173-201A. Thus, for the purposes of this memo, the surface water quality criteria are assumed to be based on the marine water quality criteria.

Table 1 presents contaminant concentrations in groundwater-discharging-to-surface-water that are anticipated, based on the above conceptual framework, to be protective of marine aquatic organisms (including benthic organisms) and persons consuming those organisms, for twenty-nine (29) individual hazardous substances and mixtures. These substances were identified by the Lower Duwamish Waterway Team as the most likely contaminants to be found at upland sites in the Lower Duwamish Waterway. The policy and scientific rationale used to determine the values in Table 1 are described in more detail in the table notes and subsequent text.

Note that these values have not been adjusted for the practical quantitation limits and natural background concentrations for groundwater as required by WAC 173-340-730(5)(c) when establishing cleanup standards, should that be necessary. Also, if multiple chemicals with similar toxic effects on human health are present at a site, under WAC 173-340-730(5)(b), these concentrations may need to be further adjusted so that the additive risk does not exceed the acceptable thresholds in the rule (hazard index ≤ 1 and cancer risk $\leq 1 \times 10^{-5}$). These adjustments will need to be made on a site-specific basis. An adjustment for additive risk is not needed for contaminants with cleanup levels controlled by protection of the environment (wildlife, fish and other aquatic life). Rather, if multiple chemicals are present, it may be appropriate to otherwise account for additive environmental effects by, for example, conducting bioassays with the groundwater and sediments contaminated by the groundwater to determine if the combined effect is an environmental concern.

It should also be noted that these values only address the groundwater-to-surface-water exposure pathway. Under WAC 173-340-720(6), if a nonpotable groundwater cleanup level is established using a site-specific risk assessment, then other potential exposure pathways should be evaluated to determine if they might require a more stringent cleanup level. In particular, some values in Table 1 exceed recommended groundwater vapor intrusion screening levels for volatile contaminants (see Cleanup Levels and Risk Calculation [CLARC] Database, available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx). Other potential exposure pathways that should be evaluated in a site-specific risk assessment (in addition to surface water) include worker and resident contact with groundwater within excavations or ditches, and worker and resident direct contact with soils in contact with groundwater, either in an excavation, or brought to the ground surface where contact can occur. Given the stringency of many of the surface water standards, it is unlikely pathways other than vapor intrusion could control cleanup levels but they could be relevant for evaluating remedies using partial cleanup and containment.

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[4] One part per thousand equals 1,000 mg/L; 10 parts per thousand equals 10,000 mg/L.

Figure 1: Area of the Lower Duwamish Waterway addressed by this memo (Source: EPA, November, 2014)

Table 1: Toxic contaminant concentrations anticipated to be protective of human health and aquatic life for groundwater discharging to marine surface water in the Lower Duwamish Waterway. (1)

Parameter	CAS Number	Human Health (µg/L) (2)	Aquatic Life (µg/L) (3)	Protect Sediment (µg/L) (4)	Recommended Value (µg/L) (5)
METALS					
Arsenic, inorganic	7440-38-2	0.14	36	236 / 222	0.14
Barium	7440-39-3	(no value)	200		200
Cadmium	7440-43-9	8.8	8.8	698 / 1.2	1.2
Chromium (III)	16065-83-1	67,308	27.4	260 / 0.1	0.1
Chromium (VI)	18540-29-9	50	50		50
Copper	7440-50-8	3.1	3.1	17,254 / 14	3.1
Lead	7439-92-1	8.1	8.1	45 / 19	8.1
Mercury	7439-97-6	0.025	0.025	7.8 / 2.0	0.025
Silver	7440-22-4	1.9	1.9 acute	685 / 55	1.9 (acute)
Zinc	7440-66-6	81	81	6,549 / 773	81
ORGANICS					
Benzene	71-43-2	58	80		58
Bis(2-ethylhexyl)phthalate	117-81-7	0.37	360	0.42	0.37
Butyl benzyl phthalate	85-68-7	0.10	3.4	0.36	0.1
Carcinogenic PAHs (Total)		0.00013 (6)	(see note 7)	0.0049 (8)	0.00013
Benzo(a)anthracene	56-55-3	0.0013	0.012	0.31	0.0013
Benzo(a)pyrene	50-32-8	0.00013	0.022	0.10	0.00013
Benzo(b)fluoranthene	205-99-2	0.0013	0.017		0.0013
Benzo(k)fluoranthene	207-08-9	0.013	0.017		0.013
Chrysene	218-01-9	0.031	0.07	0.28	0.031
Dibenzo(a,h)anthracene	53-70-3	0.00013	0.0014	0.0068	0.00013
Indeno(1,2,3-cd)pyrene	193-39-5	0.0013	0.0027	0.0099	0.0013
Dioxin/Furans (Total)		5.10E-09 (9)	(see note 10)	(see note 11)	5.10E-09
Dioxin - 2,3,7,8 TCDD	1746-01-6	5.10E-09	1.20E-05	4.23E-07	5.10E-09
Napthalene	91-20-3	1,368	1.4	81	1.4
PCBs (Total) (see note 12)	1336-36-3	6.40E-05	0.03	0.00013 – 0.093	6.40E-05
Pentachlorophenol	87-86-5	0.04	7.9	30 / 43	0.04
Tributyltin	56-35-9	0.0074	0.0074		0.0074
Trichloroethylene	79-01-6	7.0	194		7.0
Vinyl Chloride	75-01-4	1.6	210		1.6

Notes to Table 1:

(1) The values in this table consider neither adjustments for human exposure to multiple contaminants with similar toxic effects under WAC 173-340-730(5)(a), nor adjustments for groundwater practical quantitation limits or groundwater natural background under WAC 173-340-730(5)(c). These adjustments may need to be made on a site-specific basis. For example, the surface water criterion for arsenic is well below typical natural background groundwater concentrations and will need to be adjusted upward accordingly. These values also do not consider other potential exposure pathways, such as vapor intrusion, which will need to be considered on a site-specific basis.

(2) See the Appendix for a description of basis for these values and related calculations. Several of these values are Applicable or Relevant and Appropriate Requirements (ARARs) that are based on protection of aquatic life but also meet the MTCA human health risk standards. The values for chromium III and naphthalene are calculated modified Method B values using a fish consumption rate of 97.5 g/day. (Notes to Table 1 continue on the next page)

(3) See Table 5 for the basis for these values. These values are anticipated to be protective of not only aquatic life but also marine mammals and wildlife.

(4) See Table A-8 for the basis for these values. Values were calculated only for those substances for which EPA has established a sediment cleanup level in the November, 2014 Record of Decision (ROD). The first values for the metals and pentachlorophenol were calculated assuming a groundwater pH of 6.8; the second values were calculated for a pH of 8.0 (marine water). Since the valence state of chromium was not identified in the ROD, chromium III was assumed for that sediment calculation. See the discussion of sediment cleanup levels later in this memo for additional information.

(5) This is the lowest value of the three exposure pathways evaluated in this memo.

(6) To determine compliance for human health for total carcinogenic polycyclic aromatic hydrocarbons (cPAHs), two standards must be met:

- Under the National Recommended Water Quality Criteria and the National Toxics Rule, on which the values for the individual cPAHs are based,[5] the human health standard for each individual cPAH must be met, and;
- Under the MTCA rule, the <u>total</u> cPAH must be met using the cleanup level for benzo(a)pyrene as the reference chemical and the toxicity equivalency factor (TEF) approach described in WAC 173-340-708(8)(e).

(7) There is no numeric value for environmental effects for total cPAHs. The aquatic toxicity value must be met for each individual cPAH.

(8) Use the TEF approach described in WAC 173-340-708(8)(e) to determine compliance with this value.

(9) To determine compliance for human health for dioxins, two standards must be met:

- Under the National Recommended Water Quality Criteria, the human health standard for 2,3,7,8 TCDD must be met, and:
- Under the MTCA rule, the <u>total</u> dioxin/furan mixture value must be met using the cleanup level for 2,3,7,8 TCDD as the reference chemical and the TEF approach described in WAC 173-340-708(8)(d).

(10) There is no numeric value for environmental effects for total dioxins/furans. The human health toxicity value is expected to be protective of aquatic life.

(11) Use the value for 2,3,7,8 TCDD as the reference chemical and the TEF approach described in WAC 173-340-708(8)(d) and CLARC to determine compliance.

(12) Under the National Recommended Water Quality Criteria, which this value is based on, "total PCBs" is defined as the sum of all congener or all isomer or homolog or Aroclor analyses. The analytical method for determining compliance (i.e. measuring Aroclors or congeners) will need to be established on a site-specific basis. Note that there is no need to establish separate cleanup levels for individual Aroclors, as the total PCB value is more stringent. The range for protection of sediment is the range of values calculated for the Aroclors 1016, 1254, and 1260 (see Table A-8), which were identified by the Lower Duwamish Waterway Team as contaminants of concern.

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[5] The value for chrysene is from the National Toxics Rule; the values for all other cPAHs are based on the National Recommended Water Quality Criteria.

Beneficial Uses

Under WAC 173-340-730(1), surface water cleanup levels must be set at concentrations that are protective of the beneficial uses identified under WAC 173-201A. Beneficial uses for the Lower Duwamish Waterway are described in Table 2, which requires some explanation. WAC 173-201A-602 lists the applicable uses for the lower 11 miles of the Duwamish River, which is classified as a "good" quality freshwater. However, the Lower Duwamish Waterway section of that 11-mile segment is saline due to tidal action. According to Water Quality Program, a marine category comparable to the river's freshwater category, or "good" quality, should be used in this situation.[6] The beneficial uses for "good" quality marine waters are listed in the second column in Table 2 and are the applicable uses for the Lower Duwamish Waterway.

The water quality criteria for conventional pollutants for the beneficial uses detailed in Table 2 are provided in Table 3. Although the focus of this memo is on marine waters, both freshwater and marine criteria have been provided, should they be needed for other purposes. *The second column in Table 3 are the applicable criteria for the marine waters in the Lower Duwamish Waterway.*

The relevance of these conventional water quality criteria to groundwater-discharging-to-surface-water are as follows:

- **Temperature:** Elevated groundwater temperatures are typically not a function of the level of contamination. If there is an active warm water discharge, or if in-situ natural reactions or treatment creates an exothermic reaction, this could be a site-specific issue.
- **Dissolved Oxygen:** Groundwater is typically naturally below the surface water quality criteria for dissolved oxygen, so it isn't practical to apply the dissolved oxygen criteria to groundwater.
- **Total Dissolved Gas:** Total dissolved gas is a parameter of concern with supersaturated dam overflows and is unlikely to be a concern at contaminated sites.
- **pH:** The pH of the groundwater can be affected by the chemical properties of the waste materials such as the high pH in leachate from cement kiln dust. pH can also be affected by biological degradation (typically resulting in slightly acidic conditions) and chemical processes within the soil and groundwater. As such, pH is a relevant parameter to consider on a site-specific basis.
- **Turbidity:** Turbidity in groundwater is primarily a function of the type of formation in which a monitoring well is screened, well development, and the well construction, not the level of site contamination.
- **Bacterial Contamination:** Bacterial contamination, typically the result of sewage or animal waste, is not expected to be a contaminant of concern in groundwater at upland cleanup sites within the Lower Duwamish Waterway.
- **Aesthetic Values:** Impairment of aesthetic values are those that offend the senses of sight, smell, touch, or taste of the water, typically caused by excessive nutrients from sewage or animal waste. Excessive nutrients in groundwater are not expected to be an issue at upland cleanup sites. However, impairment of aesthetic values caused by releases of toxic substances, such as petroleum, may need to be addressed on a site-specific basis.

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[6] Based on Water Quality Program Guidance, available here: http://partnerweb/sites/WQ/pwg/permitGuidance/Application of WQ Criteria in Brackish Waters-June 2015.pdf

Table 2: Beneficial uses for the Lower Duwamish Waterway.

Lower 11 miles Duwamish River (WAC 173-201A-602)	Comparable Marine Use Category Lower Duwamish Waterway (WAC 173-201A-612)
Aquatic life uses Rearing/Migration only	**Good quality aquatic life uses:** Salmonid migration and rearing; Other fish migration, rearing, and spawning; Clam, oyster and mussel rearing and spawning; Crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning
Shellfish Harvesting Not applicable	**Shellfish Harvesting** Shellfish harvesting
Recreational Uses: Secondary contact recreation	**Recreational Uses:** Secondary contact recreation
Water Supply Uses Industrial water Agricultural water Stock water	**Water Supply Uses** Not applicable
Miscellaneous Uses: Wildlife habitat Harvesting Commerce/Navigation Boating Aesthetics	**Miscellaneous Uses:** Wildlife habitat Harvesting Commerce/Navigation Boating Aesthetics

Table 3: Water quality criteria for conventional pollutants for the Lower Duwamish Waterway.

Parameter	Duwamish River (good quality freshwater) WAC 173-201A-200	Lower Duwamish Waterway (good quality marine water) WAC 173-201A-210
Temperature	17.5°C (63.5°F)	19°C (66.2°F)
Dissolved Oxygen	6.5 mg/L	5.0 mg/L
Total Dissolved Gas	≤ 110% of saturation	*No criteria*
Turbidity	≤ 10 NTU over background when background is 50 NTU or less; 20% increase in turbidity when background is > 50 NTU	≤ 10 NTU over background when background is 50 NTU or less; 20% increase in turbidity when background is > 50 NTU
pH	6.5 to 8.5 with a human caused variation of less than 0.2 units	7.0 to 8.5 with a human caused variation of less than 0.2 units
Secondary contact recreation (enterococci organisms)	Geometric mean ≤ 200 colonies/100 mL plus < 10% of all samples exceeding 400 colonies/100mL	Geometric mean ≤ 70 colonies/100 mL plus ≤ 10% of all samples exceeding 208 colonies/100mL
Aesthetics (WAC 173-201A-260)	Does not offend sight, smell, touch or taste	Does not offend sight, smell, touch or taste

Thus, for the water quality criteria for conventional pollutants, only pH and aesthetic impacts will likely need to be considered when setting groundwater cleanup levels on a site-specific basis.

However, the remainder of these criteria have been provided in Table 3 for general reference should these be issues at a site or need to be addressed for another exposure pathway, such as surface water runoff.

MTCA Methods for Establishing Cleanup Levels

For toxics substances, the same beneficial uses in Table 2 must be protected when establishing cleanup levels under MTCA. Within this framework, WAC 173-340-730 provides three methods for establishing surface water cleanup levels–Method A, Method B, and Method C. It is recommended that Method B be used because:

- Method A for surface water is intended for simple sites. The Lower Duwamish Waterway has multiple sites, many contaminants (some of which do not have ARARs) and complex exposure pathways. Method A is not suitable for these types of sites.
- Method C is intended for sites where there is less exposure to residual contamination, such as for workers at industrial property. For surface water this is incorporated into the Method C calculation by the use of a lower fish diet fraction (Method C assumes 0.2 or 20% of fish and shellfish consumed is from the site). Use of a lower fish diet fraction is not appropriate in the Lower Duwamish Waterway, where higher than normal exposure is expected due to fish and shellfish harvesting by tribal and Asian Pacific Islander populations that frequent this area.[7] For this reason, Method C is not suitable for sites where the groundwater cleanup levels are based on protection of surface water in the Lower Duwamish Waterway. It should be noted that even if a site could qualify for Method C, the cleanup levels for many chemicals would be the same as for Method B because many of the cleanup levels under Method C would be based on the same applicable state and federal laws (ARARs) and aquatic toxicity information as Method B.[8]
- Method B is intended for all other sites. Thus, Method B has been used to establish the values recommended in this memo.

Under Method B, WAC 173-340-730(3)(b) requires surface water cleanup levels to be at least as stringent as all of the following:

- Concentrations established under applicable state and federal laws (ARARs) including:
    - Water quality criteria published in the water quality standards for surface waters of the state of Washington, WAC 173-201A;
    - Water quality criteria based on the protection of aquatic organisms (acute and chronic criteria) and human health published under section 304 of the Clean Water Act *unless it can be demonstrated that such criteria are not relevant and appropriate for a specific surface water body or hazardous substance*; [9] and

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[7] Record of Decision, Lower Duwamish Waterway Superfund Site, USEPA, November, 2014.

[8] WAC 173-340-706 also allows the use of Method C where a site specific demonstration can be made that there are significant limitations preventing achieving Methods A and B cleanup levels (area background, greater overall threat, or technically impossible to achieve). However, these factors cannot override the need for the cleanup levels to be protective of human health.

[9] These are now called National Recommended Water Quality Criteria and were last updated in June of 2015. An example of these criteria that are not relevant and appropriate to the LDW is those parts of the criteria based on

    - National Toxics Rule (40 C.F.R. Part 131).

  Note: Where an ARAR exceeds a noncancer hazard quotient of one (1) or a carcinogenic risk of 1×10^{-5}, WAC 173-34-730(5)(b) requires the ARAR to be adjusted downward so these risk thresholds are met.
- For substances for which environmental effects-based concentrations have not been established under applicable state or federal laws, concentrations that are estimated to result in no adverse effects on the protection and propagation of wildlife, fish, and other aquatic life.
- For substances for which sufficiently protective, health-based criteria or standards have not been established under state and federal laws, concentrations that protect human health as determined using the formulae in the rule.
- Potable water cleanup levels, for surface waters classified as suitable for use as a domestic water supply under WAC 173-201A. As noted earlier, it is assumed this is not a relevant surface water exposure pathway along the Lower Duwamish Waterway. (However, it may still be relevant for groundwater at some sites within this area.)

Developing Concentrations Protective of Human Health

When developing concentrations protective of human health under MTCA, a key decision criterion for whether an ARAR can be used to establish a cleanup level is whether the ARAR is considered “sufficiently protective”. The MTCA rule does not explicitly define this phrase, but WAC 173-340-730(5)(b) requires cleanup levels for individual substances based on ARARs to meet a hazard quotient ≤ 1 and a carcinogenic risk $\leq 1 \times 10^{-5}$. So it is logical to conclude that these same risk levels can be used to interpret this phrase.

As noted earlier, the MTCA rule identifies the following sources of ARARs for marine waters:

- Water quality standards for surface waters of the state of Washington, WAC 173-201A;
- Water quality criteria published under Section 304 of the Clean Water Act (National Recommended Water Quality Criteria, with values for several substances most recently updated in June 2015);[10] and
- National Toxics Rule (40 C.F.R. Part 131, adopted in 1992).

The available ARARs are summarized in Table 4. Where these standards are based on protection of human health, they are based on a hazard quotient of 1 and a cancer risk of 1×10^{-6}. Although these criteria meet the acceptable levels of risk under MTCA on their face, many of these standards use different fish consumption rates, toxicity factors, and bioconcentration/ bioaccumulation assumptions than are used in MTCA. In addition, several of these standards are based on protection of aquatic life, not human health.

Furthermore, in the Lower Duwamish Waterway both Ecology and EPA have acknowledged that a higher level of exposure is expected due to fish harvesting by tribal and Asian Pacific Islander populations that frequent this area. For example, in the Lower Duwamish Waterway Record of

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drinking water exposure, since the Lower Duwamish Waterway is a marine water and use as a drinking water supply is not a beneficial use of this water body.

[10] It should be noted that Ecology’s Water Quality Program has not adopted the National Recommended Water Quality Criteria as surface water standards in Washington State. However, these Criteria are relevant and appropriate *by rule* under MTCA, and thus are included for the Lower Duwamish Waterway.

Decision (USEPA, 2014), which Ecology concurred with, EPA used a fish consumption rate of 97.5 grams/day to develop sediment cleanup levels.

For these reasons, the Method B equations were used to back-calculate the level of human health risk posed by the most stringent of these ARARs to determine if they were "sufficiently protective" under MTCA. For completeness, this was done using both the Standard Method B equations which use a fish consumption rate of 54 grams/day (and a fish diet fraction of 0.5), and Modified Method B using a fish consumption rate of 97.5 grams/day (and a fish diet fraction of 1). See the Appendix for a description of the procedure used and related calculations.

The conclusion of these calculations is that the most stringent ARAR for each chemical falls within the acceptable level of risk under MTCA, and thus is considered "sufficiently protective" of human health. This is the case using both the Standard Method B assumptions and the higher fish consumption rate under Modified Method B. Accordingly, that ARAR was used as the basis for nearly all the values recommended for protection of human health in Table 1. The only two not based on an ARAR are the values for chromium III and naphthalene, which are based on modified Method B (calculated using a fish consumption rate of 97.5 g/day from the ROD), since no ARAR is available for these chemicals.

Developing Concentrations Protective of the Environment

Development of concentrations protective of organisms that live in the marine environment is more straight-forward, since no analysis for acceptable risk is necessary. Consistent with the above discussion, the following procedure was used to derive surface water concentrations protective of the environment. The results of this procedure are summarized in Table 5 and provide the basis for the recommendations in Table 1 for the values protective of aquatic life.

- ***Check to see if a chemical has one or more ARARs based on protection of aquatic life:*** Select the lowest of these values.
- ***If a chemical does not have an ARAR, consult the literature:*** Consult available references to determine concentrations protective of wildlife, fish, and other aquatic life. Select the lowest peer-reviewed value. For the Lower Duwamish Waterway, the following references were consulted to find a no-effects level: [11]
    - **Oak Ridge National Laboratory (ORNL):** These are screening ecological benchmarks from the Oak Ridge National Laboratory - Risk Assessment Information System (University of Tennessee, 2013). These values were used to identify chemical concentrations that are at or below effects thresholds for a range of aquatic organisms. The lowest of the screening benchmarks (acute or chronic) for a marine surface water was considered.
    - **NOAA Screening Quick Reference Tables (SQuiRTs):** These are screening ecological benchmarks from SQuiRTs (NOAA, 2008). This database uses current USEPA information from the National Recommended Water Quality Criteria, generally followed by Tier II Secondary Acute Values or available standards and guidelines from other regulatory agencies. The lowest of the screening benchmarks (acute or chronic) for a marine surface water was considered.

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[11] This review was conducted in June, 2015. If significant time passes before cleanup levels are established at a site, it may be appropriate to check these sources for updates.

    - **Other published peer-reviewed literature:** *Ecotoxicological Environmental Risk Limits for Total Petroleum Hydrocarbons on the Basis of Internal Lipid Concentrations – Environmental Toxicology and Chemistry* (Verbruggen et al., 2008), and *Euro Chlor Risk Assessment for the Marine Environment OSPARCOM Region – North Sea – Environmental Monitoring and Assessment* (De Rooij et al., 2004), were considered as applicable literature to be included in this review.
    - **EcoTox (USEPA):** The EcoTox database provides single chemical toxicity information for aquatic and terrestrial life (USEPA, 2015). No observed effects concentration (NOEC) and no observable effects level (NOEL) endpoints were queried for salt water for barium.
- ***If no ARARs or literature values are available, use bioassays to determine a concentration that will result in no adverse effects on wildlife, fish and aquatic life:*** WAC 173-340-730(3)(b)(ii) authorizes the use of whole effluent toxicity testing (WET testing) using the protocols described in WAC 173-205 to make this demonstration for fish and aquatic life. Either ARARs or literature values were found for all chemicals, therefore this step should not be necessary. However, it may be appropriate to conduct such testing to override literature values or to test for additive effects of chemical mixtures, like petroleum.[12]

Protection of Sediment

As noted earlier, both WAC 173-340-720(1)(c) and 173-340-730(1)(d) require cleanup levels that do not directly or indirectly cause violations of cleanup standards in other media, including sediment cleanup standards. Furthermore, if a conditional point of compliance is used, WAC 173-340-720(8)(d) requires groundwater discharges not result in violations of sediment cleanup levels published in WAC 173-204.[13]

EPA identified sediment cleanup level concentrations in its 2014 Record of Decision. Those values are compiled in Table 6. When establishing groundwater cleanup levels protective of surface water, it is necessary to check to determine if there is a potential for contaminants in the groundwater that enters surface water to be absorbed onto sediment in the Lower Duwamish Waterway at concentrations that would violate these sediment cleanup levels.

One way to evaluate this exposure pathway is to rearrange the 3-phase model in WAC 173-340-747(4) to determine what groundwater concentration has the potential to cause an exceedance of these sediment cleanup levels. The derivation of this formula and a summary of the calculations are described in the Appendix.

When using this model, it is assumed the contaminants in the groundwater would end up in the sediment pore water at that same concentration as in the groundwater, are in chemical equilibrium with the sediments, are present as individual chemicals (not as a mixture), and are fully bioavailable. These are likely conservative assumptions (that is, overestimates sediment concentrations).

Another limitation is that the soil organic carbon-water partitioning coefficients (Koc) used in these calculations are based on fresh water, not marine water. The high concentrations of salts in marine water vs. freshwater could affect the absorption of these chemicals onto sediment.

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[12] While bioassays can be used to override literature values, they cannot be used to override ARARs.

[13] WAC 173-340-720(8)(d) uses the term “sediment quality values”. This terminology was changed to “sediment cleanup levels”, the term used here, in the revisions to WAC 173-240 adopted in February, 2013.

Several researchers have found that the presence of salinity can increase the sorption of hydrophobic organic chemicals but it is unclear how significant this is at this site.[14]

We also know that marine water typically has a higher pH than freshwater. For example, a review of available information during the 2001 MTCA rulemaking concluded that the pH of groundwater in Washington State is typically slightly acidic (<7). However, surface water measurements taken in the Lower Duwamish Waterway were found to have an average pH of 7.4, with the highest reading of 8.0 (seawater typically has a pH of 8.1–8.2).[15]

While the sorption of non-ionic organic contaminants is not expected to be sensitive to pH, it is known that the pH of water can significantly affect the solubility and sorption of metals and pentachlorophenol onto soil and sediment.[16] To account for this effect, the calculation was conducted for metals and pentachlorophenol using distribution coefficients (Kds) at both pH 6.8 (the pH used to develop the Kds in Table 747-3 in the MTCA rule) and pH 8 (for marine waters). The most stringent resulting pore water concentration for each contaminant was then compared to concentrations based on protection of aquatic life and humans consuming aquatic organisms. This simulates a scenario where these contaminants dissolved in groundwater are sorbed onto sediment as the lower pH groundwater mixes with the higher pH marine surface water contained within the pore space in the sediment.

Note that the valence state of chromium in the sediment was not identified in the ROD. However, the sediment cleanup level for chromium in WAC 173-204-562, which this calculation is based on, is for total chromium. Since chromium III is typically the valence state for chromium in a reducing environment, such as that for sediment, the Kds for chromium III were used in the calculations.

The results of these calculations are summarized in Table A-8 in the Appendix and are the basis for the recommendations in Table 1 for protection of sediment. With the above limitations, these values represent groundwater concentrations that should not cause the sediment to exceed EPA's sediment cleanup levels. These tables include calculations for only those substances for which EPA has set sediment cleanup levels.

In comparing these calculated pore water values to the concentrations based on protection of aquatic life and humans consuming aquatic organisms, only cadmium and chromium III had a lower pore water concentration for the sediment pathway, and this only occurred when a Kd at a pH of 8 was used. For the remainder of the contaminants of concern identified in EPA's Record of Decision for the Lower Duwamish Waterway, the concentrations protective of sediment do not appear to be a controlling exposure pathway within the range of pH examined.

While pH should be a good indicator of the sorption potential of cadmium and chromium as the groundwater transitions into marine water, given the complexity of the geochemical processes occurring in this zone, using pH as an indicator may overestimate the sorption of these metals. Because of the difference this pathway makes in the groundwater cleanup level for these two contaminants, at sources where either of these contaminants are a concern, additional research and investigation may be worthwhile. This could include a more thorough review of the literature, use of a different model, measurements of relevant geochemical parameters,

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[14] See for example, Turner and Rawling (2001) and You, Jia and Pan (2010).

[15] Sources: WAC 173-340, 2001 Concise Explanatory Statement and "Rising Acidity in the Ocean: The Other CO2 Problem", Scientific American, September 1, 2008. 58 pH measurements from Ecology's EIM system for in the Lower Duwamish Waterway at the 1st Avenue Bridge between 2004 and 2008 were an average of 7.4, median of 7.4, with the lowest value of 7.0 and the highest value of 8.0 (Personal communication, Richard Thomas, NWRO).

[16] Soil Screening Guidance: Technical Background Document, EPA/540/R-95/12B, USEPA, May, 1998.

measurement of pore water and soil/sediment concentrations within this transition zone (including valence-speciation), and sediment bioassays, to confirm or eliminate this as an exposure pathway of concern for a particular source.

Compliance Monitoring

It should be noted that the approach taken in this memo evaluates each chemical individually. Where there are multiple contaminants present, they could act antagonistically or synergistically to decrease or increase the effects on aquatic life and bioaccumulation in higher trophic organisms. For this reason, it is recommended that sediment bioassays be conducted to measure the combined toxic effects, and measurement of actual bioaccumulation in the species present in the Lower Duwamish Waterway be part of the long term compliance monitoring plan for this site.

Table 4: Applicable, relevant and appropriate surface water quality standards under WAC 173-340-730 for toxic substances in marine waters

Substance	CAS Number	ARARs (all values µg/L)					Most Stringent ARAR (µg/L)
		Human Health		Aquatic Life			
		40 CFR 131.36 NTR	Section 304 NRWQC	40 CFR 131.36 NTR	WAC 173-201A	Section 304 NRWQC	
Arsenic, inorganic	7440-38-2	0.14 (c)	0.14 (c)	36	36	36	0.14
Barium	7440-39-3						
Cadmium	7440-43-9			9.3	9.3	8.8	8.8
Chromium (III)	16065-83-1						
Chromium (VI)	18540-29-9			50	50	50	50
Copper	7440-50-8			2.4*	3.1	3.1	3.1
Lead	7439-92-1			8.1	8.1	8.1	8.1
Mercury	7439-97-6	0.15		0.025	0.025	0.94	0.025
Silver	7440-22-4			1.9 (acute)	1.9 (acute)	1.9 (acute)	1.9
Zinc	7440-66-6		26,000	81	81	81	81
Benzene	71-43-2	71 (c)	16-58 (c)**				58
Bis(2-ethylhexyl)phthalate	117-81-7	5.9 (c)	0.37 (c)				0.37
Butyl benzyl phthalate	85-68-7		0.10 (c)				0.10
Total cPAHs							
Benzo(a)anthracene	56-55-3	0.031 (c)	0.0013 (c)				0.0013
Benzo(a)pyrene	50-32-8	0.031 (c)	0.00013 (c)				0.00013
Benzo(b)fluoranthene	205-99-2	0.031 (c)	0.0013 (c)				0.0013
Benzo(k)fluoranthene	207-08-9	0.031 (c)	0.013 (c)				0.013
Chrysene	218-01-9	0.031 (c)	0.13 (c)				0.031
Dibenzo(a,h)anthracene	53-70-3	0.031 (c)	0.00013 (c)				0.00013
Indeno(1,2,3-cd)pyrene	193-39-5	0.031 (c)	0.0013 (c)				0.0013
2,3,7,8 TCDD	1746-01-6	1.40E-08 (c)	5.10E-09 (c)				5.10E-09
Napthalene	91-20-3						
PCBs (total)***	1336-36-3	0.00017 (c)	0.000064 (c)		0.03	0.03	0.000064
Aroclor 1016	12674-11-2			0.03			0.03
Aroclor 1254	11097-69-1			0.03			0.03
Aroclor 1260	11096-82-5			0.03			0.03
Pentachlorophenol	87-86-5	8.2 (c)	0.04 (c)	7.9	7.9	7.9	0.04
Tributyltin	56-35-9				0.0074	0.0074	0.0074
Trichloroethylene	79-01-6	81 (c)	7.0 (c)				7.0
Vinyl Chloride	75-01-4	525 (c)	1.6 (c)				1.6

A blank cell means no value has been promulgated or published under the authority cited.

NTR = National Toxics Rule (40 CFR 131.36), last updated in 1992. When based on protection of human health, uses a fish consumption rate (FCR) = 6.5 g/day and fish diet fraction (FDF) = 1.

NRWQC = National Recommended Water Quality Criteria developed under Section 304 of the Federal Clean Water Act, last updated in June, 2015. When based on protection of human health, uses a FCR of either 17.5 or 22 g/day and a FDF = 1 for most substances. One noted exception is arsenic, which uses a FCR = 6.5 g/day.

"Aquatic life" means the standard is based on aquatic toxicity. This is also considered protective of marine mammals and wildlife.

(c) = based on a carcinogenic risk of 1×10^{-6}; all other human health based NTR and WQC values are based on noncancer risk.

* The 2.4 µg/L value in the NTR requires a site-specific "water effects ratio" (WER). EPA has not established a method for determining a WER for marine waters, and has since replaced this approach with 3.1 µg/L for marine waters in the NRWQC. This later value (3.1 µg/L) is used by Ecology's Water Quality Program for marine waters, and thus has been incorporated here.

** A range of values is provided for benzene under the NRWQC, reflecting the cancer slope factor recommended range of 0.015 to 0.055. EPA recommends the upper end of the recommended range be used (58 µg/L).

*** Under WAC 173-201A total PCBs equals the sum of Aroclor 1242, 1254, 1221, 1232, 1248, 1260, and 1016. Under the NTR and NRWQC, total PCBs equals the sum of all congener or all isomer or homolog or Aroclor analyses.

Table 5: Toxic substance concentrations based on protection of aquatic life for groundwater discharging to marine surface water and recommended value

Substance	CAS Number	Aquatic-Based Water Quality Standards (µg/L)			Concentrations Protective of Aquatic Life from Literature Sources (µg/L)					Most Stringent Concentration µg/L
		NTR 40 CFR	WAC 173-201A	NRWQC	ORNL	SQuiRT	Verbruggen et al.	De Rooij, et al.	EcoTox	
Arsenic, inorganic	7440-38-2	36	36	36						36
Barium	7440-39-3					200			500	200
Cadmium	7440-43-9	9.3	9.3	8.8						8.8
Chromium (III)	16065-83-1				56	27.4				27.4
Chromium (VI)	18540-29-9	50	50	50						50
Copper	7440-50-8	2.4*	3.1	3.1						3.1
Lead	7439-92-1	8.1	8.1	8.1						8.1
Mercury	7439-97-6	0.025	0.025	0.94						0.025
Silver	7440-22-4			1.9 (acute)						1.9 (acute)
Zinc	7440-66-6	81	81	81						81
Benzene	71-43-2				109	110	80			80
Bis(2-ethylhexyl)phthalate	117-81-7					360				360
Butyl benzyl phthalate	85-68-7				29.4	3.4				3.4
Total cPAHs										
Benzo(a)anthracene	56-55-3					300	0.012			0.012
Benzo(a)pyrene	50-32-8					300	0.022			0.022
Benzo(b)fluoranthene	205-99-2					300	0.017			0.017
Benzo(k)fluoranthene	207-08-9					300	0.017		300	0.017
Chrysene	218-01-9					300	0.07			0.07
Dibenzo(a,h)anthrecene	53-70-3					300	0.0014			0.0014
Indeno(1,2,3-cd)pyrene	193-39-5					300	0.0027			0.0027
Dioxin/Furans	1746-01-6				1.20E-05					1.20E-05
Napthalene	91-20-3				1.4	1.4	2.0			1.4
PCBs **	1336-36-3		0.03	0.03						0.03
Aroclor 1016	12674-11-2	0.03								0.03
Aroclor 1254	11097-69-1	0.03								0.03
Aroclor 1260	11096-82-5	0.03								0.03
Pentachlorophenol	87-86-5	7.9	7.9	7.9						7.9
Tributyltin	56-35-9		0.0074							0.0074
Trichloroethylene	79-01-6				194	200				194
Vinyl Chloride	75-01-4							210		210

A blank cell means no value has been promulgated or published under the reference cited.

NTR 40CFR = National Toxics Rule, USEPA 40 CFR 131.36

WAC 173-201 = WAC 173-201A-240. Toxic Substances.

NRWQC = National Recommended Water Quality Criteria published by EPA under Section 304 of the Federal Clean Water Act. Aquatic Life Criteria Table

ORNL = Oak Ridge National Laboratory - The Risk Information System. University of Tennessee. Chemical/Marine or Salt Water Screening Benchmarks

SQuiRT = NOAA Screening Quick Reference Tables

EcoTox = USEPA's EcoTox Database. No observed effects concentration (NOEC) and No observable effects level (NOEL) for marine/salt water

While the term "aquatic life" is used here, these values are also considered protective of marine mammals and wildlife.

* The 2.4 µg/L value in the NTR requires a site-specific "water effects ratio" (WER). EPA has not established a method for determining a WER for marine waters, and has since replaced this approach with 3.1 µg/L for marine waters in the NRWQC. This later value (3.1 µg/L) is used by Ecology's Water Quality Program for marine waters, and thus has been incorporated here.
** Under 201A total PCBs is the sum of Aroclor 1242, 1254, 1221, 1232, 1248, 1260, and 1016. Under the NRWQC it is the sum of all congener or all isomer or homolog or Aroclor analyses.

Table 6: Toxic substance groundwater concentrations anticipated to be protective of sediment cleanup levels in ROD

Substance	CAS Number	Sediment Cleanup Level Human Health (mg/Kg) (1)	Sediment Cleanup Level Benthic (mg/Kg) (2)	Sediment Cleanup Level Benthic (mg/Kg OC) (3)	Converted Sediment Cleanup Level Benthic (mg/Kg) (4)	Most Stringent Sediment Cleanup Level (mg/Kg)
Arsenic, inorganic	7440-38-2	7				7
Arsenic, inorganic	7440-38-2		57			57
Cadmium	7440-43-9		5.1			5.1
Chromium (III)	16065-83-1		260			260
Copper	7440-50-8		390			390
Lead	7439-92-1		450			450
Mercury	7439-97-6		0.41			0.41
Silver	7440-22-4		6.1			6.1
Zinc	7440-66-6		410			410
Bis(2-ethylhexyl)phthalate	117-81-7			47	0.89	0.89
Butyl benzyl phthalate	85-68-7			4.9	0.093	0.093
Total cPAHs (5)		0.09				0.09
Benzo(a)anthracene	56-55-3		110		2.09	2.09
Benzo(a)pyrene	50-32-8		99		1.88	1.88
Chrysene	218-01-9			110	2.09	2.09
Dibenzo(a,h)anthracene	53-70-3			12	0.23	0.23
Indeno(1,2,3-cd)pyrene	193-39-5			34	0.65	0.65
Total Dioxins/Furans (6)		2.0E-6				2.0E-6
Napthalene	91-20-3			99	1.88	1.88
PCBs (fish consumption)	1336-36-3	0.002				0.002
PCBs (benthic toxicity)	1336-36-3			12	0.23	0.23
Pentachlorophenol	87-86-5		0.36			0.36

A blank means no values was established in EPA's Record of Decision for Lower Duwamish Waterway, 2014 (ROD).

(1) To protect for seafood consumption and direct human contact, from Table 19 in EPA's ROD. The arsenic, dioxin and PCB values are based on sediment background. The cPAH value is the most stringent of the human direct contact values (90 µg/kg for selected beaches; 150 µg/kg for clamming; 380 µg/kg for all other locations)

(2) To protect benthic invertebrates, from Table 20 in EPA's ROD. The valence state of chromium was not identified in the ROD but the value in WAC 173-204-562 which this is based on is for total chromium. Since chromium typically is in the form of chromium III in the environment, this valence state was assumed for this calculation.

(3) To protect benthic invertebrates, organic carbon normalized values from Table 20 in EPA's ROD.

(4) mg/Kg OC X 0.019 = mg/kg dry weight (assuming 1.9% foc); Metals and some organics did not need to be converted.

(5) Based on benzo(a)pyrene.

(6) Based on 2,3,7,8 TCDD.

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Appendix A

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The following procedure was used to determine surface water concentrations protective of human health.

- ***Check to see if a chemical has one or more ARARs:*** Select the lowest of these values. In some cases the lowest ARAR is based on protection of aquatic life (not human health).
- ***Calculate Method B values using Standard Method B equations (54 g/day and FDF =0.5)***
  - **For non-carcinogens:**
    - **Table A-1:** Standard Method B values calculated with Equation 730-1 using updated toxicity information.
  - **For carcinogens:**
    - **Table A-2:** Standard Method B values calculated with Equation 730-2 using updated toxicity information.
- ***Evaluate the lowest ARAR for each chemical for protectiveness using Standard Method B:*** **(Table A-3)**
  - **For non-carcinogen health effects**, the ARAR is divided by the most stringent Standard Method B value from Table A-1 to calculate a hazard quotient. If the hazard quotient is 1 or less, then the ARAR is considered protective for non-cancer health effects. Only Aroclors 1016 and 1254 exceeded this threshold.[17]
  - **For carcinogenic health effects**, the ARAR is divided by the most stringent Standard Method B value from Tables A-2 to determine the level of cancer risk. If the resulting value is 10 or less (equivalent to 1×10^{-5}), the ARAR is considered protective for cancer health effects. Only Aroclors 1016 and 1254, exceeded this threshold.
  - ***If necessary, adjust the ARAR downward to the MTCA risk thresholds:*** If the level of risk for an ARAR exceeded a hazard quotient of one (1), or an excess cancer risk of one in one hundred thousand (1×10^{-5}), the ARAR is adjusted downward so these risk thresholds are not exceeded. This adjustment only needed to be made for Aroclors 1016 and 1254.[18]
- ***If a chemical does not have an ARAR:*** Use the lowest value calculated with Standard Method B using Equations 730-1 and 730-2 as the cleanup level. This was needed for only two chemicals—chromium III and naphthalene.
- ***Evaluate the lowest ARAR for each chemical for protectiveness using Modified Method B:*** **(Tables A-4 to A-6)** Repeat the evaluation for protectiveness using Modified Method B and the fish consumption rate in EPA's Record of Decision (97.5 g/day and fish diet fraction of 1.0).
- ***If a chemical does not have an ARAR:*** Use the lowest value calculated with Modified Method B using Equations 730-1 and 730-2 as the cleanup level. This was needed for only two chemicals—chromium III and naphthalene.

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[17] The three Aroclors included in this evaluation (1016, 1254 & 1260) were specifically identified by the Lower Duwamish Waterway Team at Ecology's Northwest Regional Office as contaminants of concern at upland sites along the waterway.

[18] While this adjustment is shown for completeness, the total PCB standard is considerably more stringent than the standards for individual PCB Aroclors. As a result, this adjustment under MTCA has no practical effect on the outcome of the analysis that the total PCB ARAR meets the MTCA risk thresholds.

Table A-1: Standard Method B surface water calculations for noncarcinogens using Equation 730-1

Substance	CAS #	Rfd (mg/kg-day)	ABW (kg)	UCF1 (µg/mg)	UCF2 (g/L)	HQ (unitless)	AT (years)	BCF (L/kg)	FCR (g/day)	FDF (unitless)	ED (years)	Result (µg/L)
Arsenic, inorganic	7440-38-2	0.0003	70	1,000	1,000	1.0	30	44	54	0.5	30	18
Barium	7440-39-3	0.02	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Cadmium	7440-43-9	0.001	70	1,000	1,000	1.0	30	64	54	0.5	30	40
Chromium (III)	16065-83-1	1.5	70	1,000	1,000	1.0	30	16	54	0.5	30	243,056
Chromium (VI)	18540-29-9	0.003	70	1,000	1,000	1.0	30	16	54	0.5	30	486
Copper	7440-50-8	0.04	70	1,000	1,000	1.0	30	36	54	0.5	30	2,881
Lead	7439-92-1	NV	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Mercury	7439-97-6	NV	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Silver	7440-22-4	0.005	70	1,000	1,000	1.0	30	0.5	54	0.5	30	25,926
Zinc	7440-66-6	0.3	70	1,000	1,000	1.0	30	47	54	0.5	30	16,548
Benzene	71-43-2	0.004	70	1,000	1,000	1.0	30	5.2	54	0.5	30	1,994
Bis(2-ethylhexyl)phthalate	117-81-7	0.02	70	1,000	1,000	1.0	30	130	54	0.5	30	399
Butyl benzyl phthalate	85-68-7	0.2	70	1,000	1,000	1.0	30	414	54	0.5	30	1,252
Total cPAHs												
Benzo(a)anthracene	56-55-3	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Benzo(a)pyrene	50-32-8	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Benzo(b)fluoranthene	205-99-2	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Benzo(k)fluoranthene	207-08-9	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Chrysene	218-01-9	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Dibenzo(a,h)anthracene	53-70-3	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
Indeno(1,2,3-cd)pyrene	193-39-5	NV	70	1,000	1,000	1.0	30	30	54	0.5	30	
2,3,7,8 TCDD	1746-01-6	7E-10	70	1,000	1,000	1.0	30	5,000	54	0.5	30	3.63E-07
Napthalene	91-20-3	0.02	70	1,000	1,000	1.0	30	10.5	54	0.5	30	4,938
PCBs	1336-36-3	NV	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Aroclor 1016	12674-11-2	0.00007	70	1,000	1,000	1.0	30	31,200	54	0.5	30	0.0058
Aroclor 1254	11097-69-1	0.00002	70	1,000	1,000	1.0	30	31,200	54	0.5	30	0.00166
Aroclor 1260	11096-82-5	NV	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Pentachlorophenol	87-86-5	0.005	70	1,000	1,000	1.0	30	11	54	0.5	30	1,178
Tributyltin	56-35-9	0.0003	70	1,000	1,000	1.0	30	NV	54	0.5	30	
Trichloroethylene	79-01-6	0.0005	70	1,000	1,000	1.0	30	10.6	54	0.5	30	122
Vinyl Chloride	75-01-4	0.003	70	1,000	1,000	1.0	30	1.17	54	0.5	30	6,648

Equation 730-1

$$\text{SWCUL } (\mu g/L) = \frac{\text{Rfd x ABW x UCF1 x UCF2 x HQ x AT}}{\text{BCF x FCR x FDF x ED}}$$

NV = No value available; Rfd = reference dose; ABW = average body weight; UCF1 and UCF2 are unit conversion factors; HQ = hazard quotient; AT = averaging time;

BCF = bioconcentration factor; FCR = fish consumption rate; FDF = fish diet fraction; ED = exposure duration

Equation values for the Rfd are from June 2015 CLARC tables; values for the BCF are from CLARC (i.e. NTR values).

Table A-2: Standard Method B surface water calculations for carcinogens using Equation 730-2

Substance	CAS #	Risk (unitless)	AWB (kg)	AT (years)	UCF1 (µg/mg)	UCF2 (g/L)	CPF (kg-day/mg)	BCF (L/kg)	FCR (g/day)	FDF (unitless)	ED (years)	Result (µg/L)
Arsenic, inorganic	7440-38-2	0.000001	70	75	1,000	1,000	1.5	44	54	0.5	30	0.098
Barium	7440-39-3	0.000001	70	75	1,000	1,000	NV	NV	54	0.5	30	
Cadmium	7440-43-9	0.000001	70	75	1,000	1,000	NV	64	54	0.5	30	
Chromium (III)	16065-83-1	0.000001	70	75	1,000	1,000	NV	16	54	0.5	30	
Chromium (VI)	18540-29-9	0.000001	70	75	1,000	1,000	NV	16	54	0.5	30	
Copper	7440-50-8	0.000001	70	75	1,000	1,000	NV	36	54	0.5	30	
Lead	7439-92-1	0.000001	70	75	1,000	1,000	NV	NV	54	0.5	30	
Mercury	7439-97-6	0.000001	70	75	1,000	1,000	NV	NV	54	0.5	30	
Silver	7440-22-4	0.000001	70	75	1,000	1,000	NV	0.5	54	0.5	30	
Zinc	7440-66-6	0.000001	70	75	1,000	1,000	NV	47	54	0.5	30	
Benzene	71-43-2	0.000001	70	75	1,000	1,000	0.055	5.2	54	0.5	30	22.7
Bis(2-ethylhexyl)phthalate	117-81-7	0.000001	70	75	1,000	1,000	0.014	130	54	0.5	30	3.56
Butyl benzyl phthalate	85-68-7	0.000001	70	75	1,000	1,000	0.0019	414	54	0.5	30	8.24
Total cPAHs												
Benzo(a)anthracene	56-55-3	0.000001	70	75	1,000	1,000	0.73	30	54	0.5	30	0.296
Benzo(a)pyrene	50-32-8	0.000001	70	75	1,000	1,000	7.3	30	54	0.5	30	0.0296
Benzo(b)fluoranthene	205-99-2	0.000001	70	75	1,000	1,000	0.73	30	54	0.5	30	0.296
Benzo(k)fluoranthene	207-08-9	0.000001	70	75	1,000	1,000	0.073	30	54	0.5	30	2.96
Chrysene	218-01-9	0.000001	70	75	1,000	1,000	0.0073	30	54	0.5	30	29.6
Dibenzo(a,h)anthracene	53-70-3	0.000001	70	75	1,000	1,000	7.3	30	54	0.5	30	0.0296
Indeno(1,2,3-cd)pyrene	193-39-5	0.000001	70	75	1,000	1,000	0.73	30	54	0.5	30	0.296
2,3,7,8 TCDD	1746-01-6	0.000001	70	75	1,000	1,000	130,000	5,000	54	0.5	30	9.97E-09
Napthalene	91-20-3	0.000001	70	75	1,000	1,000	NV	10.5	54	0.5	30	
PCBs	1336-36-3	0.000001	70	75	1,000	1,000	2	31,200	54	0.5	30	0.000104
Aroclor 1016	12674-11-2	0.000001	70	75	1,000	1,000	0.07	31,200	54	0.5	30	0.00297
Aroclor 1254	11097-69-1	0.000001	70	75	1,000	1,000	2	31,200	54	0.5	30	0.000104
Aroclor 1260	11096-82-5	0.000001	70	75	1,000	1,000	2	NV	54	0.5	30	
Pentachlorophenol	87-86-5	0.000001	70	75	1,000	1,000	0.4	11	54	0.5	30	1.47
Tributyltin	56-35-9	0.000001	70	75	1,000	1,000	NV	NV	54	0.5	30	
Trichloroethylene	79-01-6	0.000001	70	75	1,000	1,000	0.0464	10.6	54	0.5	30	13.2
Vinyl Chloride	75-01-4	0.000001	70	75	1,000	1,000	1.5	1.17	54	0.5	30	3.69

Equation 730-2

$$\text{SWCUL } (\mu g/L) = \frac{\text{Risk x ABW x AT x UCF1 x UCF2}}{\text{CPF x BCF x FCR x FDF x ED}}$$

NV = No value available; Risk = cancer risk; ABW = average body weight; AT = averaging time; UCF1 and UCF2 are unit conversion factors; CPF = cancer potency factor;

BCF = bioconcentration factor; FCR = fish consumption rate; FDF = fish diet fraction; ED = exposure duration

Equation values for the CPFs are from June 2015 CLARC tables; values for the BCFs are from CLARC (i.e. NTR values).

Table A-3: Analysis of human health protectiveness of ARARs using the Standard Method B values from Tables A-1 and A-2 for comparison and the resulting recommended groundwater concentrations for protection of human health

Substance	CAS Number	Most Stringent ARAR (1) (µg/L)	Non Cancer Toxicity Calc (3)			Cancer Toxicity Calc (4)			Ground Water Conc (µg/L)	Basis for Value
			Std Method B Noncancer (2) (µg/L)	ARAR HH Toxicity HQ	Adjusted ARAR (HQ=1)	Std Method B Cancer (2) (µg/L)	ARAR HH Toxicity 10^{-6} Risk	Adjusted ARAR (10^{-5} Risk)		
Arsenic, inorganic	7440-38-2	0.14	17.7	0.0079		0.098	1.4256		0.14	ARAR
Barium	7440-39-3									
Cadmium	7440-43-9	8.8	40.5	0.2172					8.8	ARAR
Chromium (III)	16065-83-1		243,056						243,056	Method B
Chromium (VI)	18540-29-9	50	486	0.1029					50	ARAR
Copper	7440-50-8	3.1	2,881	0.0011					3.1	ARAR
Lead	7439-92-1	8.1							8.1	ARAR
Mercury	7439-97-6	0.025							0.025	ARAR
Silver	7440-22-4	1.9	25,926	0.0001					1.9	ARAR
Zinc	7440-66-6	81	16,548	0.0049					81	ARAR
Benzene	71-43-2	58	1,994	0.0291		22.7	2.5551		58	ARAR
Bis(2-ethylhexyl)phthalate	117-81-7	0.37	399	0.0009		3.56	0.1039		0.37	ARAR
Butyl benzyl phthalate	85-68-7	0.10	1,252	0.0001		8.24	0.0121		0.1	ARAR
Total cPAHs										
Benzo(a)anthracene	56-55-3	0.0013				0.296	0.0044		0.0013	ARAR
Benzo(a)pyrene	50-32-8	0.00013				0.0296	0.0044		0.00013	ARAR
Benzo(b)fluoranthene	205-99-2	0.0013				0.296	0.0044		0.0013	ARAR
Benzo(k)fluoranthene	207-08-9	0.013				2.96	0.0044		0.013	ARAR
Chrysene	218-01-9	0.031				29.6	0.0010		0.031	ARAR
Dibenzo(a,h)anthracene	53-70-3	0.00013				0.00296	0.0044		0.00013	ARAR
Indeno(1,2,3-cd)pyrene	193-39-5	0.0013				0.296	0.0044		0.0013	ARAR
2,3,7,8 TCDD	1746-01-6	5.10E-09	3.63E-07	0.0141		9.97E-09	0.5115		5.10E-09	ARAR
Napthalene	91-20-3		4,938						4,938	Method B
PCBs (total)	1336-36-3	0.000064				0.000104	0.6162		0.000064	ARAR
Aroclor 1016	12674-11-2	0.03	0.00582	5.1576	0.0058	0.00297	10.1088	0.0297	0.000064	total PCB ARAR
Aroclor 1254	11097-69-1	0.03	0.00166	18.0514	0.0017	0.000104	288.8229	0.00104	0.000064	total PCB ARAR
Aroclor 1260	11096-82-5	0.03							0.000064	total PCB ARAR
Pentachlorophenol	87-86-5	0.04	1,178	0.000003		1.47	0.0272		0.04	ARAR
Tributyltin	56-35-9	0.0074							0.0074	ARAR
Trichloroethylene	79-01-6	7.0	122	0.0574		13.2	0.5303		7.0	ARAR
Vinyl Chloride	75-01-4	1.6	6,648	0.0002		3.69	0.4336		1.6	ARAR

(1) From Table 4. Total PCBs equals the sum of all congener or all isomer or homolog or Aroclor analyses.

(2) Standard Method B uses a fish consumption rate of 54 g/day and fish diet fraction of 0.5.

(3) The non-cancer toxicity calculation = ARAR/Modified Method B calculated value. If resulting HQ > 1, then ARAR may not meet MTCA acceptable non cancer risk threshold of HQ = 1. These values are highlighted in red, with the ARAR adjusted to HQ = 1. Only Aroclors 1016 & 1254 exceeded this threshold, however the ARAR for total PCBs is more stringent and overrides these adjusted values.

(4) The cancer toxicity calculation = ARAR/Modified Method B calculated value. If resulting cancer risk >10×10^{-6}, then ARAR may not meet MTCA acceptable cancer risk threshold of 1×10^{-5}. These values are highlighted, with the ARAR adjusted to 1×10^{-5}. Only Aroclors 1016 & 1254 exceeded this threshold, however the ARAR for total PCBs is more stringent and overrides this adjustment.

Table A-4: Modified Method B surface water calculations for noncarcinogens using Equation 730-1, modified using FCR = 97.5 g/day and FDF = 1

Substance	CAS #	Rfd (mg/kg-day)	ABW (kg)	UCF1 (µg/mg)	UCF2 (g/L)	HQ (unitless)	AT (years)	BCF (L/kg)	FCR (g/day)	FDF (unitless)	ED (years)	Result (µg/L)
Arsenic, inorganic	7440-38-2	0.0003	70	1,000	1,000	1.0	30	44	97.5	1	30	4.9
Barium	7440-39-3	0.02	70	1,000	1,000	1.0	30	NV	97.5	1	30	
Cadmium	7440-43-9	0.001	70	1,000	1,000	1.0	30	64	97.5	1	30	11
Chromium (III)	16065-83-1	1.5	70	1,000	1,000	1.0	30	16	97.5	1	30	67,308
Chromium (VI)	18540-29-9	0.003	70	1,000	1,000	1.0	30	16	97.5	1	30	135
Copper	7440-50-8	0.04	70	1,000	1,000	1.0	30	36	97.5	1	30	798
Lead	7439-92-1	NV	70	1,000	1,000	1.0	30	NV	97.5	1	30	
Mercury	7439-97-6	NV	70	1,000	1,000	1.0	30	NV	97.5	1	30	
Silver	7440-22-4	0.005	70	1,000	1,000	1.0	30	0.5	97.5	1	30	7,179
Zinc	7440-66-6	0.3	70	1,000	1,000	1.0	30	47	97.5	1	30	4,583
Benzene	71-43-2	0.004	70	1,000	1,000	1.0	30	5.2	97.5	1	30	552
Bis(2-ethylhexyl)phthalate	117-81-7	0.02	70	1,000	1,000	1.0	30	130	97.5	1	30	110
Butyl benzyl phthalate	85-68-7	0.2	70	1,000	1,000	1.0	30	414	97.5	1	30	347
Total cPAHs												
Benzo(a)anthracene	56-55-3	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Benzo(a)pyrene	50-32-8	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Benzo(b)fluoranthene	205-99-2	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Benzo(k)fluoranthene	207-08-9	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Chrysene	218-01-9	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Dibenzo(a,h)anthracene	53-70-3	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
Indeno(1,2,3-cd)pyrene	193-39-5	NV	70	1,000	1,000	1.0	30	30	97.5	1	30	
2,3,7,8 TCDD	1746-01-6	7E-10	70	1,000	1,000	1.0	30	5,000	97.5	1	30	0.00000010
Napthalene	91-20-3	0.02	70	1,000	1,000	1.0	30	10.5	97.5	1	30	1,368
PCBs	1336-36-3	NV	70	1,000	1,000	1.0	30	31,200	97.5	1	30	
Aroclor 1016	12674-11-2	0.00007	70	1,000	1,000	1.0	30	31,200	97.5	1	30	0.0016
Aroclor 1254	11097-69-1	0.00002	70	1,000	1,000	1.0	30	31,200	97.5	1	30	0.00046
Aroclor 1260	11096-82-5	NV	70	1,000	1,000	1.0	30	NV	97.5	1	30	
Pentachlorophenol	87-86-5	0.005	70	1,000	1,000	1.0	30	11	97.5	1	30	326
Tributyltin	56-35-9	0.0003	70	1,000	1,000	1.0	30	NV	97.5	1	30	
Trichloroethylene	79-01-6	0.0005	70	1,000	1,000	1.0	30	10.6	97.5	1	30	34
Vinyl Chloride	75-01-4	0.003	70	1,000	1,000	1.0	30	1.17	97.5	1	30	1,841

Equation 730-1 SWCUL (µg/L) = $\frac{\text{Rfd x ABW x UCF1 x UCF2 x HQ x AT}}{\text{BCF x FCR x FDF x ED}}$

NV = No value available; Rfd = reference dose; ABW = average body weight; UCF1 and UCF2 are unit conversion factors; HQ = hazard quotient; AT = averaging time;

BCF = bioconcentration factor; FCR = fish consumption rate; FDF = fish diet fraction; ED = exposure duration

Equation values for the Rfd are from June 2015 CLARC tables; values for the BCF are from CLARC (i.e. NTR values).

Table A-5: Modified Method B surface water calculations for carcinogens using Equation 730-2, modified using FCR = 97.5 g/day and FDF = 1

Substance	CAS #	Risk (unitless)	AWB (kg)	AT (years)	UCF1 (µg/mg)	UCF2 (g/L)	CPF (kg-day/mg)	BCF (L/kg)	FCR (g/day)	FDF (unitless)	ED (years)	Result (µg/L)
Arsenic, inorganic	7440-38-2	0.000001	70	75	1,000	1,000	1.5	44	97.5	1	30	0.027
Barium	7440-39-3	0.000001	70	75	1,000	1,000	NV	NV	97.5	1	30	
Cadmium	7440-43-9	0.000001	70	75	1,000	1,000	NV	64	97.5	1	30	
Chromium (III)	16065-83-1	0.000001	70	75	1,000	1,000	NV	16	97.5	1	30	
Chromium (VI)	18540-29-9	0.000001	70	75	1,000	1,000	NV	16	97.5	1	30	
Copper	7440-50-8	0.000001	70	75	1,000	1,000	NV	36	97.5	1	30	
Lead	7439-92-1	0.000001	70	75	1,000	1,000	NV	NV	97.5	1	30	
Mercury	7439-97-6	0.000001	70	75	1,000	1,000	NV	NV	97.5	1	30	
Silver	7440-22-4	0.000001	70	75	1,000	1,000	NV	0.5	97.5	1	30	
Zinc	7440-66-6	0.000001	70	75	1,000	1,000	NV	47	97.5	1	30	
Benzene	71-43-2	0.000001	70	75	1,000	1,000	0.055	5.2	97.5	1	30	6.3
Bis(2-ethylhexyl)phthalate	117-81-7	0.000001	70	75	1,000	1,000	0.014	130	97.5	1	30	0.99
Butyl benzyl phthalate	85-68-7	0.000001	70	75	1,000	1,000	0.0019	414	97.5	1	30	2.28
Total cPAHs												
Benzo(a)anthracene	56-55-3	0.000001	70	75	1,000	1,000	0.73	30	97.5	1	30	0.082
Benzo(a)pyrene	50-32-8	0.000001	70	75	1,000	1,000	7.3	30	97.5	1	30	0.0082
Benzo(b)fluoranthene	205-99-2	0.000001	70	75	1,000	1,000	0.73	30	97.5	1	30	0.082
Benzo(k)fluoranthene	207-08-9	0.000001	70	75	1,000	1,000	0.073	30	97.5	1	30	0.82
Chrysene	218-01-9	0.000001	70	75	1,000	1,000	0.0073	30	97.5	1	30	8.2
Dibenzo(a,h)anthracene	53-70-3	0.000001	70	75	1,000	1,000	7.3	30	97.5	1	30	0.0082
Indeno(1,2,3-cd)pyrene	193-39-5	0.000001	70	75	1,000	1,000	0.73	30	97.5	1	30	0.082
2,3,7,8 TCDD	1746-01-6	0.000001	70	75	1,000	1,000	130,000	5,000	97.5	1	30	2.46E-09
Napthalene	91-20-3	0.000001	70	75	1,000	1,000	NV	10.5	97.5	1	30	
PCBs	1336-36-3	0.000001	70	75	1,000	1,000	2	31,200	97.5	1	30	0.000029
Aroclor 1016	12674-11-2	0.000001	70	75	1,000	1,000	0.07	31,200	97.5	1	30	0.00082
Aroclor 1254	11097-69-1	0.000001	70	75	1,000	1,000	2	31,200	97.5	1	30	0.000029
Aroclor 1260	11096-82-5	0.000001	70	75	1,000	1,000	2	NV	97.5	1	30	
Pentachlorophenol	87-86-5	0.000001	70	75	1,000	1,000	0.4	11	97.5	1	30	0.41
Tributyltin	56-35-9	0.000001	70	75	1,000	1,000	NV	NV	97.5	1	30	
Trichloroethylene	79-01-6	0.000001	70	75	1,000	1,000	0.0464	10.6	97.5	1	30	3.65
Vinyl Chloride	75-01-4	0.000001	70	75	1,000	1,000	1.5	1.17	97.5	1	30	1.02

Equation 730-2

$$\text{SWCUL } (\mu g/L) = \frac{\text{Risk} \times \text{ABW} \times \text{AT} \times \text{UCF1} \times \text{UCF2}}{\text{CPF} \times \text{BCF} \times \text{FCR} \times \text{FDF} \times \text{ED}}$$

NV = No value available; Risk = cancer risk; ABW = average body weight; AT = averaging time; UCF1 and UCF2 are unit conversion factors; CPF = cancer potency factor;

BCF = bioconcentration factor; FCR = fish consumption rate; FDF = fish diet fraction; ED = exposure duration

Equation values for the CPFs are from June 2015 CLARC tables; values for the BCFs are from CLARC (i.e. NTR values).

Table A-6: Analysis of human health protectiveness of ARARs using the Modified Method B values from Tables A-4 and A-5 for comparison and the resulting recommended groundwater concentrations for protection of human health

Substance	CAS Number	Most Stringent ARAR (1) (µg/L)	Non Cancer Toxicity Calc (3)			Cancer Toxicity Calc (4)			Ground Water Conc (µg/L)	Basis for Value
			Modified B Noncancer (µg/L) FCR = 97.5 (2)	ARAR HH Toxicity HQ	Adjusted ARAR (HQ=1)	Modified B Cancer (µg/L) FCR = 97.5 (2)	ARAR HH Toxicity 10^{-6} Risk	Adjusted ARAR (1×10^{-5} Risk)		
Arsenic, inorganic	7440-38-2	0.14	4.9	0.0286		0.0272	5.1480		0.14	ARAR
Barium	7440-39-3									
Cadmium	7440-43-9	8.8	11.2	0.7845					8.8	ARAR
Chromium (III)	16065-83-1		67,308						67,308	Mod. Method B
Chromium (VI)	18540-29-9	50	135	0.3714					50	ARAR
Copper	7440-50-8	3.1	798	0.0030					3.1	ARAR
Lead	7439-92-1	8.1							8.1	ARAR
Mercury	7439-97-6	0.025							0.025	ARAR
Silver	7440-22-4	1.9	7,179	0.0003					1.9	ARAR
Zinc	7440-66-6	81	4,583	0.0177					81	ARAR
Benzene	71-43-2	58	552	0.1051		6.3	9.2063		58	ARAR
Bis(2-ethylhexyl)phthalate	117-81-7	0.37	110	0.0034		0.99	0.3737		0.37	ARAR
Butyl benzyl phthalate	85-68-7	0.10	347	0.0003		2.28	0.0439		0.1	ARAR
Total cPAHs										
Benzo(a)anthracene	56-55-3	0.0013				0.082	0.0159		0.0013	ARAR
Benzo(a)pyrene	50-32-8	0.00013				0.0082	0.0159		0.00013	ARAR
Benzo(b)fluoranthene	205-99-2	0.0013				0.0082	0.0159		0.0013	ARAR
Benzo(k)fluoranthene	207-08-9	0.013				0.082	0.0159		0.013	ARAR
Chrysene	218-01-9	0.031				8.2	0.0038		0.031	ARAR
Dibenzo(a,h)anthracene	53-70-3	0.00013				0.0082	0.0159		0.00013	ARAR
Indeno(1,2,3-cd)pyrene	193-39-5	0.0013				0.082	0.0159		0.0013	ARAR
2,3,7,8 TCDD	1746-01-6	5.10E-09	1.01E-07	0.0507		2.76E-09	1.8469		5.10E-09	ARAR
Napthalene	91-20-3		1,368						1,368	Mod. Method B
PCBs (total)	1336-36-3	0.000064				0.000029	2.2250		0.000064	ARAR
Aroclor 1016	12674-11-2	0.03	0.0016	18.6245	0.0016	0.00082	36.5040	0.0082	0.000064	total PCB ARAR
Aroclor 1254	11097-69-1	0.03	0.00046	65.1857	0.00046	0.000029	1042.9714	0.00029	0.000064	total PCB ARAR
Aroclor 1260	11096-82-5	0.03							0.000064	total PCB ARAR
Pentachlorophenol	87-86-5	0.04	326	0.0001		0.41	0.0976		0.04	ARAR
Tributyltin	56-35-9	0.0074							0.0074	ARAR
Trichloroethylene	79-01-6	7.0	34	0.2059		365	1.9178		7.0	ARAR
Vinyl Chloride	75-01-4	1.6	1,841	0.0009		1.02	1.5686		1.6	ARAR

(1) From Table 4. Total PCBs equals the sum of all congener or all isomer or homolog or Aroclor analyses.

(2) Modified Method B includes modification of the fish consumption rate to 97.5 g/day and fish diet fraction of 1.

(3) The non-cancer toxicity calculation = ARAR/Modified Method B calculated value. If resulting HQ > 1, then ARAR may not meet MTCA acceptable non cancer risk threshold of HQ = 1. These values are highlighted in red, with the ARAR adjusted to HQ = 1. Only Aroclors 1016 & 1254 exceeded this threshold, however the ARAR for total PCBs is more stringent and overrides these values.

(4) The cancer toxicity calculation = ARAR/Modified Method B calculated value. If resulting cancer risk > 10×10^{-6}, then ARAR may not meet MTCA acceptable cancer risk threshold of 1×10^{-5}. These values are highlighted, with the ARAR adjusted to 1×10^{-5}. Only Aroclors 1016 & 1254 exceeded this threshold, however the ARAR for total PCBs is more stringent and overrides these values.

Table A-7: Lower Duwamish Waterway pH measurements at the East Marginal Way Bridge

Field Collection Date (1)	pH Value	Field Collection Date (2)	pH Value	
1/14/2004	7.5	9/13/2006	7.2	
2/11/2004	7.4	10/11/2006	7.3	
3/10/2004	7.2	11/15/2006	7.3	
4/14/2004	7.5	12/13/2006	7.7	
5/12/2004	7.6	1/10/2007	7.3	
6/16/2004	7.4	2/7/2007	7.3	
7/14/2004	7.5	3/7/2007	7.3	
8/11/2004	7.2	4/4/2007	7.2	
10/12/2004	7.7	5/9/2007	7.5	
11/10/2004	7.4	6/6/2007	7.06	
12/7/2004	7.5	7/5/2007	7.88	
1/11/2005	7.3	8/8/2007	7.82	
2/16/2005	7.9	9/5/2007	7.12	
3/16/2005	7.4	10/10/2007	7.41	
4/13/2005	7.8	11/7/2007	7.11	
5/11/2005	7.4	12/12/2007	7.91	
6/15/2005	7.5	1/9/2008	7.17	
7/13/2005	7.5	2/6/2008	7.11	
8/10/2005	7.3	3/5/2008	7.35	
9/14/2005	7.4	4/9/2008	7.43	
10/12/2005	7.2	5/7/2008	7.01	
11/16/2005	7.1	6/12/2008	7.45	
12/14/2005	7.6	7/9/2008	7.15	
2/15/2006	7.5	8/6/2008	7.15	
3/15/2006	7.9	9/4/2008	7.13	
4/12/2006	7.0	10/8/2008	7.09	
5/10/2006	7.6	11/5/2008	7.18	
6/14/2006	8.0 (high)	12/3/2008	7.15	
7/12/2006	7.0 (low)	9/13/2006		
8/16/2006	7.5			
			Overall Average	**7.4**
			Overall Median	**7.4**

(1) Hydrolab Surveyor Multi-Parameter Probe

(2) Measurement with Multi-Parameter Water Quality Field Meter/Probe
Source: EIM download by Richard Thomas, NWRO

Table A-8: Calculation of groundwater concentrations anticipated to be protective of sediment

Substance	CAS No.	Sediment Cleanup Level (Cs) (mg/Kg) (1)	Units Conversion Factor (mg/kg)	Soil Water (0w) (cc/cc) (2)	Bulk Density (Pb) (g/cc) (3)	(Koc) (ml/g) (4)	Fraction Organic (foc) (%) (5)	Distribution Coefficient (Kd) (cc/g) (6)	Dilution Factor (DF) (unitless)	Groundwater Concentration (Cw) (µg/L) (6)
Arsenic, inorganic	7440-38-2	7.0	0.001	0.615	1.02			29 / 31	1	236 / 222
Arsenic, inorganic	7440-38-2	57	0.001	0.615	1.02			29 / 31	1	1,925 / 1,804
Cadmium	7440-43-9	5.1	0.001	0.615	1.02			6.7 / 4,300	1	698 / 1.2
Chromium (III)	16065-83-1	260	0.001	0.615	1.02			1,000 / 4,300,000	1	260 / 0.1
Copper	7440-50-8	390	0.001	0.615	1.02			22 / 28,500	1	17,254 / 14
Lead	7439-92-1	450	0.001	0.615	1.02			10,000 / 23,270	1	45 / 19
Mercury	7439-97-6	0.41	0.001	0.615	1.02			52 / 200	1	7.8 / 2.0
Silver	7440-22-4	6.1	0.001	0.615	1.02			8.3 / 110	1	685 / 55
Zinc	7440-66-6	410	0.001	0.615	1.02			62 / 530	1	6,549 / 773
Bis(2-ethylhexyl)phthalate	117-81-7	0.89	0.001	0.615	1.02	111,123	1.9%	2,222	1	0.42
Butyl benzyl phthalate	85-68-7	0.093	0.001	0.615	1.02	13,746	1.9%	275	1	0.36
Total cPAHs		0.09	0.001	0.615	1.02	968,774	1.9%	19,375	1	0.0049
Benzo(a)anthracene	56-55-3	2.09	0.001	0.615	1.02	357,537	1.9%	7,151	1	0.3076
Benzo(a)pyrene	50-32-8	1.88	0.001	0.615	1.02	968,774	1.9%	19,375	1	0.1021
Chrysene	218-01-9	2.09	0.001	0.615	1.02	398,000	1.9%	7,960	1	0.28
Dibenzo(a,h)anthracene	53-70-3	0.23	0.001	0.615	1.02	1,789,101	1.9%	35,782	1	0.0068
Indeno(1,2,3-cd)pyrene	193-39-5	0.65	0.001	0.615	1.02	3,470,000	1.9%	69,400	1	0.0099
Total dioxins		0.000002	0.001	0.615	1.02	249,100	1.9%	4,982	1	4.23E-07
Napthalene	91-20-3	1.88	0.001	0.615	1.02	1,191	1.9%	23.82	1	81
PCBs (total-fish consumption)	1336-36-3	0.002	0.001	0.615	1.02	309,000	1.9%	5,871	1	0.00034
PCBs (total-benthic toxicity)	1336-36-3	0.23	0.001	0.615	1.02	309,000	1.9%	5,871	1	0.039
Aroclor 1016 (fish consumption)	12674-11-2	0.002	0.001	0.615	1.02	107,285	1.9%	2,038	1	0.00098
Aroclor 1254 (fish consumption)	11097-69-1	0.002	0.001	0.615	1.02	130,500	1.9%	2,480	1	0.00081
Aroclor 1260 (fish consumption)	11096-82-5	0.002	0.001	0.615	1.02	822,422	1.9%	15,626	1	0.00013
Aroclor 1016 (benthic toxicity)	12674-11-2	0.23	0.001	0.615	1.02	107,285	1.9%	2,038	1	0.11
Aroclor 1254 (benthic toxicity)	11097-69-1	0.23	0.001	0.615	1.02	130,500	1.9%	2,480	1	0.093
Aroclor 1260 (benthic toxicity)	11096-82-5	0.23	0.001	0.615	1.02	822,422	1.9%	15,626	1	0.015
Pentachlorophenol	87-86-5	0.36	0.001	0.615	1.02	592 / 410	1.9%	11.2 / 7.8	1	30 / 43

(1) From Lower Duwamish Waterway ROD, EPA November 2014; OC normalized concentrations converted by multiplying by 0.019 (1.9%) TOC. (see Table 6 in the body of this memo)

(2) Midpoint value from Lower Duwamish Waterway Remedial Investigation.

(3) Calculated value using 61.5% porosity and 2.65 g/cc particle density from Lower Duwamish Waterway Remedial Investigation. ((1-0.615) × 2.65 g/cc = 1.02 g/cc)

(4) From Table 747-1 in WAC 173-340-900; chrysene & indeno (1,2,3-cd) pyrene from June, 2015 CLARC tables; used Koc for 2,3,7,8 TCDD from October 2015 EPA PRG's for total dioxin calculation; pentachlorophenol Koc from Table 747-2 (first value for pH of 6.8, second value for pH of 8).

(5) Average value from Lower Duwamish Waterway Remedial Investigation.

(6) Organic Kd = Koc * foc (Equation 747-2 in WAC 173-340-747); 1st metals Kd for pH of 6.8; 2nd Kd for pH of 8.0 (i.e. [based on pH 6.8]/[based on pH8.0]). Sources of pH 6.8 Kds from Table 747-3 except silver from EPA May 1996 Soil Screening Guidance. Sources of pH 8.0 from EPA May 1996 Soil Screening Guidance, except lead from "Understanding Variation in Partition Coefficient (Kd) Values, EPA 402-R-99-004B, August 1999", copper from "Review of Copper Partitioning Coefficients in the Aquatic Environment and Processes Causing the Observed Variation, EU 2005"

(7) Default dilution factor for saturated soil (WAC 173-340-747)

(8) Three phase model equation modified to solve for water concentration; assumes zero air porosity (equation 747-1 in WAC 173-340-747)

Cw = Cs/((UCF×DF)×(Kd+(0w/Pb))) See next page for derivation.

Derivation of formula for calculating a groundwater concentration that is anticipated to meet the sediment cleanup standards established in EPA's Record of Decision (ROD)

Start with Equation 747-1:

$$C_s = C_w (UCF) DF \left[K_d + \frac{(\theta_w + \theta_a H_{cc})}{\rho_b} \right] \text{ (Equation 747-1)}$$

Since sediment should be saturated, with all the soil pores filled with water, that portion of the formula calculating the mass in the vapor phase ($\theta_a H_{cc}$) can be eliminated since θ_a = zero.

$$C_s = C_w (UCF) DF \left[K_d + \frac{\theta_w}{\rho_b} \right]$$

Rearranging to solve for a water concentration, results in the following formula:

$$C_w = \frac{C_s}{UCFxDF \left[K_d + \frac{\theta_w}{\rho_b} \right]}$$

Where:

C_s = Sediment concentration (mg/kg)

C_w = Sediment pore water concentration (i.e. groundwater concentration) (µg/L)

UCF = Unit conversion factor (1 mg/1,000 µg)

DF = Dilution factor (dimensionless); used a value of 1 for saturated sediment per WAC 173-340-747(4)(e).

K_d = Distribution coefficient (L/kg)

= K_{oc} x f_{oc} (for hydrophobic organics per equation 747-2 in WAC 173-340-747(4))

Where:

K_{oc} = Soil organic carbon-water partitioning coefficient (ml/g)

f_{oc} = Fraction of organic carbon in sediment (g/g);

Used a value of 1.9% or 0.019 g/g for sediment, based on data in the Lower Duwamish Waterway Remedial Investigation.

θ_w = Water-filled porosity (ml water/ml soil); used a value of 0.615, based on data in the Lower Duwamish Waterway Remedial Investigation.

θ_a = Air-filled soil porosity (ml air/ml soil); used a value of 0 for saturated sediment per WAC 173-340-747(4)(e).

H_{cc} = Henry's law constant (dimensionless)

ρ_b = Dry soil bulk density (kg/L); calculated value using a particle density of 2.65 g/cc and assuming that part of the sediment volume not occupied by water filled porosity is solid sediment particles.

ρ_b = (1-0.615) × 2.65 g/cc = 1.02 kg/L