May 26, 2020

Cris Matthews, Site Manager
Washington Department of Ecology
Bellingham Field Office
913 Squalicum Way, Unit 101
Bellingham, WA 98225

Re: Final Remedial Investigation/Feasibility Study: Former Anacortes Water Treatment Plant Site
Agreed Order No. DE 16576
City of Anacortes, Washington

Dear Cris,

In compliance with the Agreed Order (AO) entered into by the City of Anacortes (City) and the Washington Department of Ecology (Ecology) on August 28, 2019 (No. DE 16576), the City is submitting the enclosed Final Remedial Investigation (RI) and Feasibility Study (FS) reports for the Former Water Treatment Plant Site located at 14489 River Bend Road in Mt. Vernon, Washington (Site).

As you are aware, the public notice period completed in April 2020 yielded a single public comment on the RI. Ecology was able to address this comment in the May 2020 Response to Comments Summary and no revisions to the RI report were required. As such, the documents listed as follows serve as final documentation for the Site.

- April 2019 Public Review Draft RI Report (Stantec 2019; Attachment A)
- May 2020 Final Feasibility Study (Anchor QEA 2020; Attachment B)

The City will continue to work with Ecology in 2020 to fulfill the remaining obligations required by the AO, including development of a Preliminary Draft Cleanup Action Plan for the Site.

If you have any questions, please contact me at (360) 293-1919 or fredb@cityofanacortes.org.

Sincerely,

Fred Buckenmeyer, Site Coordinator

City of Anacortes

cc: Darcy Swetnam, City of Anacortes
Jacqueline Quarré, Foster Garvey, PC
Ken Lederman, Foster Garvey, PC
Julia Fitts, L.G., Anchor QEA, LLC
Rebecca Gardner, P.E., Anchor QEA LLC

Attachments

Attachment A   Public Review Draft Remedial Investigation (Final RI Report)

Attachment B   Final Feasibility Study

Attachment A
Public Review Draft Remedial Investigation
(Final Remedial Investigation Report)

Remedial Investigation Report

Report Version: Public Review Draft

Site Name:	Anacortes Water Treatment Plant
Site Address:	14549 River Bend Road Mount Vernon, Skagit County, Washington 98273
Alternate Location Info:	Skagit County Parcel # 21669 Latitude: 48.43770 Longitude: -122.37045

Quad Name	USGS Quad	DNR Map
MOUNT VERNON	48122D3	522
PORT TOWNSEND	F48122A1	203

Ecology Facility Site ID No.: (Anacortes WTP)	Storm Water - 3730; Tier II - 79423677; Haz Waste - CRK000000400

Prepared By:

Gregory S. Harris, PE
Principal Engineer
Stantec Consulting Services, Inc.
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Suite 200
Bellevue, WA 98005

Prepared For:

The City of Anacortes
14549 River Bend Road
Mount Vernon, Washington 98273

Signature:

Date: 3/11/19

This report was prepared by the staff of MWH Americas, Inc. under the supervision of the Engineer whose seal and signature appears hereon, as required by Chapters 18.43 and 18.220, Revised Code of Washington (RCW).

The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.

Note, in May 2016, MWH Global Inc., and its subsidiaries were acquired by Stantec Inc. Effective January 1, 2017, MWH Americas, Inc. ("MWH") merged into its affiliated corporation Stantec Consulting Services Inc. ("Stantec"). All references to MWH Global, MWH Americas Inc., and/or

MWH throughout this document and supporting attachments shall be inferred to now be Stantec Consulting Services Inc. (Stantec).

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
CLP	USEPA Contract Laboratory Program
COC	Contaminant/Chemical of Concern
CSID	Cleanup Site Identification number
CSM	Conceptual Site Model
CUL	clean-up levels
Ecology	Washington State Department of Ecology
FOC	Fraction of Organic Carbon
FSID	Facility Site identification number
HASP	Health and Safety Plan
MGD	Million Gallons per Day
MTCA	Model Toxics Control Act
PCB	Polychlorinated Biphenyl
PID	Photoionization detector
PSD	particle size distribution
QAPP	Quality Assurance Project Plan
RCW	Revised Code of Washington
SAP	Sampling and Analysis Plan
TEE	Terrestrial Ecological Evaluation
TPH	total petroleum hydrocarbon
VCP	Voluntary Cleanup Program
TSCA	Toxic Substance Control Act
WAC	Washington State Administrative Code
WDOE	Washington Department of Ecology
WTP	Water Treatment Plant

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EXECUTIVE SUMMARY

A decommissioned Water Treatment Plant (Site) situated adjacent to a new, operating water treatment plant (WTP) that is owned and operated by the City of Anacortes, is the focus of this work. The Site is located in Mount Vernon, Skagit County, Washington. The Site is no longer in active use and is being considered for deconstruction.

The Site and current WTP are located on Skagit County Parcel #21669 at 14549 River Bend Road in Mt. Vernon, Washington (Property). The Property is included in the Agricultural-Natural Resource Lands (Ag-NRL) zoning district. A Special Use Permit for Major Utility Development (PL10-0048) was issued November 9, 2010 for the construction of the new WTP.

The Site was constructed between 1969 and 1970 and used for treatment of water from the Skagit River prior to transfer to the City of Anacortes municipal water storage and distribution network. The average production capacity was 21 million gallons per day (MGD). The City of Anacortes conducted regular sampling of drinking water produced from the former WTP between 1976 and 2009. No samples of drinking water tested for PCBs ever contained detectable concentrations of PCBs. . The Site was taken out of service in 2013, when a new WTP was completed in a directly adjacent location on the Property. The Administration Building, Sedimentation Basin, Filtration Basin, and Clearwell associated with the Site are not in active use and no production water flows or accumulates in the structures. Site workers and visitors no longer access the Site.

In the course of evaluating deconstruction of the Site, a Hazardous Materials Assessment conducted by DLH Environmental Consulting in 2015 identified PCBs at concentrations exceeding Model Toxics Control Act (MTCA) Method A cleanup levels in a single shallow soil sample taken at the base of the Sedimentation Basin exterior wall.

Based upon the initial hazardous materials assessment, the Site underwent environmental characterization in two phases. The first phase focused on building construction materials to define the potential source of PCBs and identified the nature of the contamination as PCBs in coatings used on the structures.

A second phase of investigation was completed in order to fill data gaps for media potentially impacted by weathered coatings. The second phase incorporated shallow soil boring activities and composite sample collection, along with installation of temporary groundwater monitoring wells and collection of groundwater samples using low flow sampling methodology. Select asbestos and PCB samples were collected from subsurface mastic used on the buried portions of structures which were not otherwise painted or coated. PCB wipe samples were collected from equipment inside the Administration Building.

Testing shows that the only PCB impacts are to shallow soils adjacent to the base of the Sedimentation Basin and Filtration Basin walls. The impacts are likely the result of the weathering of industrial PCB-containing coatings. No groundwater impacts have been identified. Soil sampling has identified specific Areas of Concern that include only shallow soils (0 inches to 12 inches below ground surface) in defined areas adjacent to the Sedimentation Basin and Filtration Basin. Since there are no known impacts beyond the boundary of the Property, the “Site” for purposes of MTCA and the Property are identical.

Current and future exposures from the Site are to workers and contractors, as well as trespassers. The relevant exposure pathway is for soil and related dust to become airborne (most likely under dry conditions), incidental ingestion, and dermal contact during activities at the Site such as excavation, grading, or other soil disturbance.

A Simplified Terrestrial Ecologic Evaluation was conducted for the Site. The evaluation indicates that that there is limited potential for exposure of wildlife to low levels of PCBs in soil when all open space areas within 500 feet of the Site are considered. Ruderal wildlife species that are adapted to disturbance may utilize this non-native habitat that is highly fragmented by treatment plant infrastructure and pavement. However, the largest contiguous portion of undeveloped land at the Site is comprised of approximately 1.6 acres. Based on Step 2 of the Simplified TEE, Exposure Analysis condition 2, no further ecological evaluation is warranted.

The continued weathering of coating materials on the exterior walls of the Sedimentation Basin and Filtration Basin remain a source for potential additional soil impacts due to PCB containing materials.

1. INTRODUCTION

The purpose of this Remedial Investigation (RI) is to characterize the nature and extent of contamination at the Site.

1.1. GENERAL SITE INFORMATION

Site Name:	Former Anacortes Water Treatment Plant
Site Address:	14549 River Bend Road Mount Vernon, Washington 98273
Property Owner:	City of Anacortes 14549 River Bend Road Mount Vernon, Washington 98273
Facility Operator:	City of Anacortes – Department of Public Works 14549 River Bend Road Mount Vernon, Washington 98273
Project Consultant:	MWH Americas, Inc. Gregory S. Harris, PE Principal Engineer 2353 130th Avenue N.E. Suite 200 Bellevue, WA 98005 Phone: 425.896.6924 Email: gregory.s.harris@mwhglobal.com

1.2. LOCATION INFORMATION

The Site (Figure 1) is located in Mount Vernon, Skagit County, Washington and consists of that portion of the Property containing decommissioned structures associated with the former Water Treatment Plant (WTP). The Property is located on Skagit County Parcel #21669, and is owned and operated by the City of Anacortes. The former WTP, including a former Administration Building, Filtration Basin, and Sedimentation Basin, was replaced with a new WTP in 2013. All of these facilities, including the former facilities that are inactive as well as the new replacement WTP facilities are shown on the Site Plan in Figure 2.

The former WTP structures that underwent building characterization sampling during the first phase of investigation are highlighted on Figure 2A and are further described as follows:

- Sedimentation Basin – Approximately 240’ x 82’ concrete basin with 2 identical 8-bay sections that featured gravity flow through the system to clean water overflow troughs/weirs with sediment collection apparatus. The Sedimentation Basin is partially buried on all four sides and is approximately 17’ deep.
- Filtration Basin – Approximately 102’ x 78’ concrete basin with 2 identical 3-bay sections. Each filter section contained filter media in three layers consisting of anthracite, sand, and a gravel bed. The filter bays are approximately 15’ deep, and the filter media depth was

specified to be 3.5' deep.

- Clearwell – Approximately 12,000 square foot (sf), multi-chambered concrete storage chamber below grade beneath the Administration Building, Filtration Basin, and pump room. Due to confined space entry limitations, only 5,000 sf of space in the north portion of the Clearwell was accessed for sampling. Adjacent to the Clearwell is the concrete Wastewell structure where sediment was collected periodically prior to pumping to the settling lagoons. The Wastewell was entered and sampled during Clearwell sampling activities.
- Administration Building – Two story, above grade building that housed a control room, laboratory, and chemical additive mixing operations.

1.3. SITE HISTORY

The Administration Building, the Filtration Basin, and the Sedimentation Basin were constructed between 1969 and 1970. The Site was used for treatment of water from the Skagit River prior to transfer to the City of Anacortes municipal water storage and distribution network. The current WTP was completed in an adjacent location on the Property in 2013.

A 2015 Hazardous Materials Assessment conducted by DLH Environmental Consulting identified PCBs at concentrations exceeding MTCA Method A cleanup levels in a single shallow soil sample taken at the base of the Sedimentation Basin exterior wall.

There were no prior or known spills, leaks, or discharges of materials that would have contributed to the localized soil impacts observed at the Site.

1.4. SITE USE

The Site includes a decommissioned WTP that had an average daily production capacity of 21 MGD of water. The former Administration Building, Sedimentation Basin, Filtration Basin, and Clearwell are no longer in active use, and no production water flows or is accumulated in these structures. Construction of a new replacement WTP was completed in 2013.

The raw water treated in the former WTP came from the Skagit River. Water first flowed into the Sedimentation Basin where large particles were allowed to collect at the bottom of the unit. From there, water flowed to the Filtration Basin where finer particles were filtered out of the water. Finally, filtered water flowed to the Clearwell and then into the potable water distribution system. The Administration Building housed the Clearwell, Wastewell, control center, and water quality lab. The Wastewell served as the chamber where waste water generated during the filter backwash operations was discharged to the settling lagoons.

Sediment removed from the water during the treatment process in the former WTP was collected into three settling lagoons for drying. The settling lagoons were rotated for filling, drying, and removal of sediment.

The City of Anacortes is evaluating potential further activities relative to the former WTP. The evaluation included an initial assessment of potential regulated materials in and around the structures, which is discussed in Section 2.1.

The Anacortes WTP currently operates under the following water treatment plant general permit.

> Permit number: WAG643002 - Washington State Department of Ecology Water Treatment Plant General Permit
>
> Facility Name: Anacortes WTP
>
> Dates of Coverage: September 1, 2014 – August 31, 2019
>
> The following condition description was included in the July 16, 2014 permit coverage authorization letter from the Washington State Department of Ecology (Ecology), *"the Anacortes water treatment plant discharges to the Skagit River, which is listed as a water body impaired for pH. Therefore, as long as the treated filter backwash wastewater discharge has*

> *pH values ranging only within the limits of 6.0 to 9.0 standard units, permit Special Condition S-2.3, bullet 2 will not come into play. However, if the pH of the Anacortes water treatment plant discharge is either less than 6.0 or greater than 9.0 standard units, you must then demonstrate that the discharge will cause no further degradation of the pH of the Skagit River, identify steps that you can take to reduce the discharge of that out-of-range wastewater, and incrementally implement those steps."*

The City of Anacortes conducted regular sampling of drinking water produced from the former WTP between 1976 and 2009. No samples of drinking water tested for PCBs ever contained detectable concentrations of PCBs.

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2. FIELD INVESTIGATIONS

2.1. PREVIOUS ENVIRONMENTAL INVESTIGATIONS

2.1.1. JANUARY 2015 DLH HAZARDOUS MATERIALS ASSESSMENT

The first environmental assessment of the decommissioned WTP was the City of Anacortes Water Treatment Plant Hazardous Materials Assessment, January 28, 2015, conducted by DLH Environmental Consulting (Appendix B). The Hazardous Materials Assessment included collection of four concrete wall samples from the Sedimentation Basin interior, Filtration Basin interior and exterior, and the Clearwell interior; two composite soil samples (only one sample was analyzed); nine paint samples for lead; and 15 building material samples for asbestos analysis. The Hazardous Materials Assessment was a preliminary screening assessment. Sampling and analysis activities conducted for the Hazardous Materials Assessment were not in accordance with a formalized Sampling Plan or Quality Assurance Project Plan (QAPP). Concrete sample collection was not conducted in accordance with Draft Standard Operating Procedure for Sampling Concrete in the Field; USEPA Region 1; December 1, 1997. The data from only one soil sample is not considered representative of Site conditions.

The following is a general summary of the conclusions drawn in the Hazardous Materials Assessment:

- PCB levels in the concrete samples collected and analyzed were above the applicable federal TSCA regulations for characterization as a PCB waste. The PCBs were likely the result of weathered coatings on the interior and exterior walls of the Sedimentation Basin and Filtration Basin.
- PCB and PAH levels in a single soil sample collected and analyzed were above the allowable cleanup limits for MTCA Method A cleanup levels.
- Due to the presence of lead paint on piping and other equipment, a Lead Paint Exposure Assessment under Labor and Industries regulations for the worker protection in the State of Washington will have to be conducted prior to any demolition of equipment.
- Asbestos-containing material in the form of tile floor mastic will require permitted abatement prior to Administration Building demolition.

2.1.2. 2010 SHANNON & WILSON, INC. GEOTECHNICAL DATA REPORT

The design phase of the new WTP included preparation of a Geotechnical Data Report, Anacortes Water Treatment Plant, Mount Vernon, Washington, September 24, 2010, Shannon & Wilson, Inc. (Appendix B). The geotechnical investigation included drilling and sampling eight new soil borings and reviewing seven previous soil borings detailed in a 1965 geotechnical investigation report. The 1965 geotechnical report was completed in preparation for the original construction of the WTP. The borings installed and evaluated for the Geotechnical Data Report were all within the Property boundaries and no more than 1,000 feet from the Site. The following geotechnical analyses were conducted on select samples from the eight borings installed in 2010: visual classification, natural water content, grain size analyses, resistivity tests, and Atterberg limit.

Following is a summary of subsurface conditions from the 2010 Geotechnical Data Report:

> "Based on the soils encountered in the subsurface explorations, the site is primarily underlain by loose to dense alluvial sand, silt, and gravel. The borings encountered the following generalized subsurface conditions, which are illustrated in Figures 3 and 4, Generalized Subsurface Profiles A-A' and B-B':
>
> - Ground surface (Elevation 29 to 35 feet) to elevation 10 to -6 feet; very loose to loose, slightly silty to silty, fine sand; thickness ranges from 22 to 38 feet.
> - Elevation 10 to -6 feet to Elevation -18 to -36; medium dense to dense, trace to slightly silty sand; thickness ranges from 23 to 40 feet.

- Elevation -18 to -36 to Elevation -61 to -68 feet; medium dense to dense, slightly silty to silty sand; thickness ranges from 30 to 50 feet.
- Elevation -61 to -68 feet to bottom of borings; dense to very dense, sandy gravel.

Borings RB-5, RB-6, and RB-7 encountered 4 to 12 feet of medium stiff to very stiff silt above the dense sandy gravel. Boring RB-6 also encountered a very soft silt pocket between Elevation -27 and -33 feet mean sea level. We note that the subsurface conditions are relatively consistent between borings; therefore, borings RB-1, RB-6, and RB-7 are generally representative of the subsurface conditions beneath the Pretreatment/Filtration Facility and the Chemical Facility.

The explorations encountered groundwater between Elevation 12 and 15 feet (depths of 17 to 20 feet) in February 2009 and April 1965, as shown in Subsurface Profiles A-A' and B-B'. The groundwater elevation likely fluctuates seasonally and is expected to be coincident with the water level in the Skagit River adjacent to the project site."

The groundwater elevations encountered during the investigations in 1965 and 2009 are consistent with elevations recorded during the 2016 groundwater monitoring activities and within expected seasonal variation. In addition, the 2016 soil sampling activities indicated that PCBs were only detected in some of the 0-1 ft depth intervals and not detected in all the 1 to 3 ft intervals. This indicates that there is a significant distance between detected PCBs and the water table.

2.2. SITE CHARACTERIZATION

Based upon the Hazardous Materials Assessment, site characterization was undertaken in two phases. The first phase, known as the **Initial Investigation**, focused on building construction materials in order to define the source and distribution of PCBs identified in the Hazardous Materials Assessment. It defined the nature of the contamination as PCBs in coatings and provided data for use in determining appropriate means and methods for decontamination, deconstruction and subsequent disposal. A second phase, known as the **Data Gap Investigation**, was completed in order to fill data gaps for media that were not addressed in the first phase or instances where additional sample data would provide insight into material characterization.

The Sampling Plan (SP v1.10, April 2016) describes the quantity and location for sample collection in order to ensure representativeness and comparability quality objectives were met. Representativeness and comparability are defined in the project-specific Quality Assurance Project Plan (QAPP v1.6, March 2015). The SP and QAPP are included in Appendix A.

Criteria used to design the sampling program are detailed in Tables 1 and 2. The tables divide the Site into Sub-Areas intended to group sample collection activities geographically. Each Sub-Area contains various media intended for sample collection based upon review of construction drawings, site photographs, and prior investigation activities.

Specific conditions or dimensions are listed for the media, and the criteria used to calculate the proposed number of samples is documented. Criteria included a number of samples per bay/chamber or other location; number of horizontal surface or vertical surface samples; number of soil borings with associated monitoring wells along perimeter sides; or other distribution factors intended to ensure representativeness.

2.2.1. HEALTH AND SAFETY PRECAUTIONS

This project was conducted in accordance with Hazardous Waste Operations requirements under 29 CFR 1926.65 and WAC 296-843. A site-specific Health and Safety Plan (HASP) was developed and implemented to minimize exposure to hazardous materials and risk of injury or illness due to field sampling activities. The HASP incorporated elements of a written emergency plan as required in WAC 296-155-17309.

Air monitoring for particulate was required during concrete drilling and sand/residue collection based upon visual dust observations. A threshold for work stoppage and dust mitigation was established if airborne particulate exceeded 2.5 mg/m^3 on a time weighted average basis. This is half of the OSHA PEL of 5 mg/m^3 for the respirable fraction of silicon dust. No work stoppage or additional dust mitigation efforts were required.

Confined space entry was required for sample collection in the Sedimentation Basin, Filtration Basin, and Clearwell. Field sample collection personnel were certified in confined space entry and followed all procedures in the MWH HASP and City of Anacortes POL 28.23.11a Confined Space Entry.

2.2.2. INITIAL INVESTIGATION SAMPLE DESIGN

Sampling activities for the Initial Investigation included interior basin sediments and loose filtration media collection from inside the structures; scraping and collecting loose paint and protective coatings from both inside and outside the structures; collecting concrete cores inside the structures; collecting expansion joint materials from inside the Sedimentation Basin; collecting caulking and glazing materials from inside the Administration Building; and collecting wipe samples from inside the structures and the Administration Building. Work for the Initial Investigation was conducted according to the Field Sampling Plan and the Quality Assurance Project Plan (QAPP) contained in Appendix A.

2.2.2.1. CONCRETE COATINGS

Twenty coating samples and six QC samples were collected from concrete structures of the Sedimentation Basin and Filtration Basin. All coating samples were analyzed for PCBs with some samples analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals.

Coating samples were collected by scraping coated concrete surfaces to separate coating materials from the concrete substrate and collecting the coating chips or flakes in metal trays.

Samples were collected by hand and placed into sealed sample jars for transport to the laboratory. No preservatives were applied to bulk samples.

2.2.2.2. CONCRETE AND REDWOOD SAMPLE COLLECTION

A total of sixty-four concrete samples and fifteen QC samples were collected from the Sedimentation Basin, Filtration Basin, the Filtration Basin pipe gallery, Clearwell, and Wastewell for analyses of PCBs. Some samples were analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals. An additional three samples and three associated QC samples were collected from redwood baffles located in the Clearwell.

A hammer drill with a 1-inch diameter carbide-tipped bit was used to drill into concrete floors and walls at specified locations.

Drilling was conducted in accordance with Draft Standard Operating Procedure for Sampling Concrete in the Field; USEPA Region 1; December 1, 1997. Sample holes were generally less than 3 inches in depth. Multiple holes were required in a single location to collect sufficient sample mass. A new hammer drill bit was used for each discreet sampling location. Used hammer drill bits were not decontaminated for reuse.

The wood samples were collected by drilling into the wood surface using one-inch wood bits and collecting the wood shavings and dust. A new drill bit was used for each sample location.

Horizontal surfaces to be drilled were first covered with foil to prevent dust/materials generated during drilling from contacting sediments or coating. Dust from vertical drilling activities was collected in metal trays positioned to capture loose material prior to it falling to the floor. A new metal tray was used for each sample location.

Dust generated during drilling was collected by hand using disposable spoons and placed into sealed sample jars for transport to the laboratory. No preservative was applied to bulk samples.

2.2.2.3. SEALANT, CORK, AND CAULK/GLAZING SAMPLE COLLECTION

A total of twenty-seven sealant, cork, or window caulk/glazing bulk samples and twelve QC samples were collected from the Sedimentation Basin expansion joint and Administration Building window caulk/glazing for analysis of PCBs, and some samples were analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals.

Samples were collected by cutting or scraping sealants and cork into sample jars. Sample personnel used paint scrapers and/or razor blades to extract the sealant and cork from the expansion joint or separate window caulk/glazing from the sill and frame. New scrapers and blades were used for each sample. Samples were collected by hand and placed into sealed sample jars for transport to the laboratory. No preservative was applied to bulk samples.

2.2.2.4. SEDIMENT AND FILTER MEDIA SAMPLE COLLECTION

Thirty-six bulk interior basin sediment/anthracite/sand/filter bed samples and sixteen QC samples were collected from the Sedimentation Basin, Filtration Basin, Clearwell, and Wastewell. All samples were analyzed for PCBs, and some samples were analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals.

Samples were collected by hand or using disposable spoons in locations where sediments were less than six inches in depth to underlying substrate. In locations with over six inches of accumulated sediment, a hand auger was used to access the full depth and facilitate collection of discreet grab samples at separate strata or pre-designated depths. Samples were placed into sealed sample jars for transport to the laboratory. No preservative was applied to bulk samples.

The hand auger was decontaminated between sample locations by washing in potable water amended with Alconox and rinsing in deionized water. Decontamination wash and rinse water was kept in separate, sealable 5-gallon buckets. Three rinsate QC samples were collected during auger decontamination efforts.

2.2.2.5. SURFACE WIPE SAMPLE COLLECTION

Thirteen wipe samples were collected from the fiberglass troughs in the Filtration Basin, fiberglass collector boards in the Sedimentation Basin, steel agitator blades in the Sedimentation Basin, and window sills in the Administration Building. Wipe samples were collected in accordance with the definition of Standard Wipe Test outlined in 40 CFR 761.123 and analyzed for PCBs. Individual disposable templates measuring 10 cm X 10 cm were used to isolate sample areas. A new, clean template was used for each separate wipe sampling location, and hexane was employed as the solvent for PCB wipe samples.

2.2.2.6. WASTE CHARACTERIZATION SAMPLING

A representative number of samples collected during the Initial Investigation were analyzed for additional waste characterization parameters in addition to PCBs. Concrete, coatings, filter media, sediments, and building joints/caulking materials were analyzed for metals, volatile organic constituents (VOCs), and semi-volatile organic constituents (SVOCs). Some samples were prepared by toxic characteristic leaching protocol (TCLP) extraction methods prior to analysis.

2.2.3. DATA GAP INVESTIGATION SAMPLE DESIGN

A second phase was completed in order to fill data gaps for media that were not addressed in the first phase or instances where additional sample data would provide insight into material characterization. Sampling included media that were not addressed in the first phase and follow-up investigation where additional sample data would provide insight into material characterization. The second phase, known as the Data Gap Investigation, incorporated shallow soil boring activities and composite sample collection, along with installation of temporary groundwater monitoring wells and collection of groundwater samples using low flow sampling methodology.

Samples were also collected from two Settling Lagoons in the sand strata beneath the dried sediment layer. Additional samples were collected from the Clearwell, and additional wipe sampling was performed inside the Administration Building. Select asbestos samples were collected from subsurface mastic that had not been over-painted or over-coated by other coatings and was used on the below grade portions of the Sedimentation Basin, and Filtration Basin.

2.2.3.1. SOIL SAMPLING

Soils at sixteen locations were sampled for PCBs, ten from the vicinity of the Sedimentation Basin and six from the vicinity of the Filtration Basin. Soil samples were collected using a shallow hand auger[1]. Two rinsate QC samples were collected during auger decontamination efforts. Soil boring locations are shown on Figure 5.

Prior to initiating soil boring activity, soil boring locations were marked out and a third-party utility locator scanned the areas to be excavated for buried utilities and other underground hazards. The utility locator cleared all boring locations. Each location was bored to 5 feet using a hand auger, and a composite soil sample was collected from the 0 inches to 12 inches interval and from the 12 inches to 36 inches interval of each location for a total of thirty two discrete samples. Excess soil was collected and stored in drums for proper disposal following laboratory waste characterization analysis.

Sample locations at the Sedimentation Basin were selected in pairs along the north, east and south sides of the basin. One location from each pair was set as close to the basin's wall as practicable for a Geoprobe to be used to install a monitoring well. The second location was several feet in a direct perpendicular line further away from the basin's wall. The option of a paired, further distanced location was not practical for borings along the west side of the Sedimentation Basin due to the slope of the ground surface and close proximity of the WTP access road. Soil borings and groundwater wells were not installed on the north and west sides of the Filtration Basin because the structure is abutted on those sides by the Administration Building to the west and the concrete top of the Clearwell to the north.

2.2.3.2. GROUNDWATER SAMPLING

Sixteen groundwater wells were planned at soil sample locations (see Figure 5) and one additional monitoring well was planned to be located down gradient west of the Sedimentation Basin. Three of the proposed wells were not installed at soil boring locations. At two locations, FB-SOIL-05 and SB-SOIL-05, the hand auger met refusal several times before advancing to five feet below ground surface. At FB-SOIL-03, the proposed well location would have been within two feet of PZ-FILT-04 after relocation due to the presence of an underground water pipe.

The down gradient well was planned to be installed south of the Sedimentation Basin, midway between PZ-SED-07 and PZ-SED-08. However, the well was relocated to a point several feet northwest of the northeast corner of the new filtration facility. This location west of the Sedimentation Basin was chosen to provide greater distance from the other wells in order to evaluate groundwater elevations further down gradient. Monitoring well locations are shown on Figure 5.

Fourteen groundwater samples were collected from monitoring wells installed at locations cleared by soil boring. Monitoring wells were developed the week prior to sampling by pumping a minimum of three well volumes of groundwater from each well. Purge water was collected and stored in drums for proper disposal following laboratory waste characterization analysis. Groundwater samples were collected with a peristaltic pump using low-flow purging methods in which well drawdown is monitored by occasional depth to water measurements, and water quality parameters including pH, dissolved oxygen and turbidity are measured at regular time intervals. After stabilization was achieved, determined by three consecutive water quality readings within a certain range, samples were collected. Purging until water quality parameters have stabilized ensures that groundwater sampled is representative of aquifer groundwater. Sampling purge water was collected and stored in drums for proper disposal following laboratory waste characterization analysis.

[1] Although the original sampling plan indicated that geoprobes would be used to obtain soil samples and collect groundwater samples, we realized it was necessary to hand auger the boring holes for the first 3 ft (i.e. below the actual sample depth) in order to clear for potential buried utilities, so the sample collection method was changed to the hand augers, since that is the method used to obtain the soil samples before pushing further with the geoprobes for the groundwater samples.

2.2.3.3. SEDIMENT SAMPLE COLLECTION

Six samples of interior basin sediment were collected from the floor of the Clearwell during the Data Gap Investigation. Four samples were collected from accumulated dry sediment locations and two were collected from the pump well, which contained standing water. The two aqueous samples were collected by vigorous agitation of standing water within the pump well and collecting the sample in 2-L water containers. The four dry samples were collected using disposable spoons and placed into sealed sample jars for transport to the laboratory. No preservative was applied to bulk samples.

2.2.3.4. SETTLING LAGOON SAMPLING

Two samples were collected from each of two accessible settling lagoons (Lagoon 1 and Lagoon 2) located east of the Site for a total of four samples. An existing layer of settled sediment was removed by hand and a hand auger was advanced to collect a sample of sandy soils from the 0 inches to 12 inches interval below the surface. Samples were collected using disposable scoops and placed into sealed sample jars for transport to the laboratory.

2.2.3.5. SUBGRADE COATINGS

Four exterior subsurface mastic samples were collected from below ground surface on exterior walls of the Sedimentation Basin, Filtration Basin, and Clearwell (where the mastic was not over-painted or over-coated by other coatings) and analyzed for PCBs and asbestos fibers. Samples were collected by a Washington State licensed asbestos inspector. The below grade mastic was exposed by excavating surface soils, to approximately two to three feet deep and then the mastic was chipped from the concrete substrate.

2.2.3.6. SURFACE WIPE SAMPLE COLLECTION

Twelve surface wipe samples were collected from equipment located inside the Administration Building and pump room. Wipe samples were collected in accordance with the definition of Standard Wipe Test outlined in 40 CFR 761.123 and analyzed for PCBs. Individual disposable templates measuring 10 cm x 10 cm were used to isolate sample areas. A new, clean template was used for each separate wipe sampling location, and hexane was employed as the solvent for PCB wipe samples. Templates were not used on window sill locations due to the configuration of the surfaces. 100 cm^2 areas were measured and marked, with wipe samples collected within the identified areas.

2.2.4. QUALITY CONTROL SAMPLES

The overall quality assurance (QA) objective for this project was to develop and implement procedures for field sampling, laboratory analysis, chain-of-custody, and reporting that will meet all applicable industry standards. The QAPP outlines specific requirements to meet this objective, including collection of field quality control (QC) samples. Field QC sample distribution is calculated and exhibited in Tables 1 and 2 based upon the level of quality control effort described in the QAPP:

- Duplicate samples are analyzed to check for sampling and analytical reproducibility. One duplicate sample for every 10 investigative samples collected (or fewer investigative samples) of a given matrix.
- MS/MSDs provide information about the effect of the sample matrix on the digestion and measurement method. MS/MSD samples are designated for organic analyses only. One MS/MSD should be collected for every 20 (or fewer) investigative samples of a given matrix.

2.2.5. SAMPLE MANAGEMENT AND CUSTODY

Proper management of samples and associated data is crucial for subsequent utilization in reporting internally and to regulatory agencies. Sufficient data regarding sample conditions, locations, and geographic distributions serves to facilitate decision making with respect to building materials disposition.

2.2.5.1. FIELD CUSTODY PROCEDURES

Custody procedures help ensure relevance, accuracy and authenticity of collected samples. Field custody procedures are described in the project QAPP.

2.2.6. FIELD CORRECTIVE ACTIONS

The number and identification of samples by Sub-Area or media was subject to change based upon field conditions, and were documented accordingly as required in the QAPP Field Corrective Action section. The MWH Project Technical Lead (PTL) or his designee was responsible for all site activities. In this role, the MWH PTL, at times, was required to adjust the site programs to accommodate site specific needs. When it became necessary to modify a sampling portion of the program, the responsible person notified the MWH PTL of the anticipated change and implemented the necessary changes after obtaining the approval of the MWH PTL. The MWH PTL was responsible for the controlling, tracking, and implementation of the identified changes. Reports on all changes were distributed to affected parties and are included in Appendices C1 and C2.

2.3. SITE GEOLOGY

Soil from borings completed during the Data Gap Investigation in May 2016 consisted mainly of silty fine-grained sand to around 25 feet below ground surface (bgs), with trace to small amounts of silt, medium to coarse sands and fine to coarse gravels; then fine sand with some medium sand thereafter. Upper strata of silty sand appeared to be fill brought onto the site during construction of the Filtration Basin and Sedimentation Basin. The soil borings collected on the south side of the Filtration Basin, FB-01, FB-02, and FB-06, indicated a depth of imported fill of approximately 13.25 feet bgs; FB-04 on the east side indicated a fill depth of approximately 11.25 feet bgs. Depths of apparent imported fill at soil borings located around the Sedimentation Basin ranged from 8.5 feet on the north side of the building at SB-06, 10 to 11.5 feet on the west side at SB-07 and SB-08, 11.5 to 12.5 on the east side at SB-01, SB-02, SB-09 and SB-10, and 17.5 feet bgs on the south side at SB-03 and SB-04. Fill depth at DG-GW located north of the new Filtration Facility extended to approximately 16.5 feet bgs. Soil below these depths appeared to be native soil, in some cases apparently re-worked during construction. Soil borings for all locations were extended to 30 feet bgs except SB-08 (34 feet) and DG-GW (25 feet). Figure 3 presents cross sections depicting the soil stratigraphy in the north to south and east to west directions through the Sedimentation Basin and Filtration Basin area soils.

The 2010 Geotechnical Data Report (Appendix B) observed that: "Based on the soils encountered in the subsurface explorations, the site is primarily underlain by loose to dense alluvial sand, silt, and gravel." The soil encountered during the 2016 Data Gap Investigation was consistent with this historical description of Site geology.

2.4. SITE HYDROGEOLOGY

Groundwater was encountered in the presumed native soil layers in the initial soil borings at all locations, in dark or very dark grayish brown or olive brown fine grained sand with silt. A synoptic water level round was conducted on June 1, 2016, after monitoring wells were installed. Groundwater at the Site was observed to flow in a northwesterly direction towards the Skagit River (Figure 4a). Depths to water ranged from 18.0 feet at PZ-SED-04 (located at SB-04 south of the Sedimentation Basin) to 17.2 feet at DG-GW (north of the new Filtration Facility) and 17.2 feet at PZ-FILT-06 (located at FB-06 on the south side of the Filtration Basin).

A synoptic water level round conducted on November 6, 2016, showed groundwater at the Site was flowing in a northeasterly direction, also towards the Skagit River. The site is located on the curve of an oxbow in the Skagit River (Figure 4b). Depths to water ranged from 21.9 feet at PZ-SED-04 (south of the Sedimentation Basin) to 20.8 feet at PZ-FILT-04 (located at FB-04 on the northeast corner of the Filtration Basin).

The observed fluctuations in groundwater levels and direction of flow may be related in part to seasonal variations and to influences from tidal fluctuations from the Skagit River, which empties into Skagit Bay a short distance south of the City of Mount Vernon.

The 2010 Geotechnical Data Report (Appendix B) observed that: "The explorations encountered groundwater between Elevation 12 and 15 feet (depths of 17 to 20 feet) in February 2009 and the previous geotechnical investigation in April 1965 (assumed to be completed for initial Site construction), as shown in Subsurface Profiles A-A' and B-B'. The groundwater elevation likely fluctuates seasonally and is expected to be coincident with the water level in the Skagit River adjacent to the project site."

The groundwater elevations encountered during the investigations in 1965 and 2009 are consistent with elevations recorded during 2016 groundwater monitoring activities and within expected seasonal variation.

2.5. BUILDING MATERIALS

The TSCA federal regulations under Title 40, Chapter 761 of the Code of Federal Regulations (CFR) prescribe management and waste disposal methodology for bulk materials containing concentrations over 50 parts per million or mg/kg. These requirements are mandated for materials with wipe sample results over 10 µg/100cm2. Depending upon the material with PCB contamination and the method or configuration of installation, materials may be managed as either PCB Bulk Product Waste or PCB Remediation Waste with differing regulatory standards for each type of PCB waste material. Tables 1 and 2 each contain a column identifying the differing materials that were sampled as either potential PCB Bulk Product Waste or potential PCB Remediation Waste.

The State of Washington regulates dangerous wastes in Washington Administrative Code (WAC) 303-173-100. PCBs are considered halogenated organic compounds and waste materials are assigned dangerous waste codes based upon their concentration as follows:

- If the sum of individual PCB Aroclor concentrations equals or exceeds .01% (100 mg/kg) and is less than 1.0% (10,000 mg/kg), then building materials, debris, and process residuals would be designated as dangerous waste and assigned State of Washington waste code "WP02" per WAC 173-303-100.
- If the sum of individual PCB Aroclor concentrations equals or exceeds 1.0% (10,000) mg/kg, then building materials, debris, and process residuals would be designated as extremely hazardous waste and assigned State of Washington waste code "WP01" per WAC 173-303-100.

Analytical results for building material samples discussed below include indication of whether the respective materials would be characterized as dangerous waste or extremely hazardous waste.

2.6. OTHER SITE INFORMATION

The current and former Anacortes WTPs are located on Skagit County Parcel #21669, which is included in the Agricultural-Natural Resource Lands (Ag-NRL) zoning district. A Special Use Permit for Major Utility Development (PL10-0048) was issued on November 9, 2010 for the new WTP. The permit decision document is included in Appendix E.

A search of the National Wetlands Inventory (NWI) on-line wetlands mapper identified one mapped wetland on the Property. Prints of the NWI map of the site and surrounding areas are included in Appendix E and F. It was classified as PEM1Cx. Per the NWI, this code indicates the wetland is described as follows:

- P - System PALUSTRINE: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft.) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

- EM - Class EMERGENT: Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
- 1 - Subclass Persistent: Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems.
- C - Water Regime Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Other Modifier(s):

- x - SPECIAL MODIFIER Excavated: This Modifier is used to identify wetland basins or channels that were excavated by humans.

In summary, the NWI on-line wetlands mapper identified one mapped PEM1Cx wetland on the Property. The NWI map and a description of the PEM1Cx classification. However, it should be noted that the "x" indicates that the wetland channel was excavated by humans. Additionally, the seasonally wet depression mapped in the NWI is not consistent with current conditions on the Property. No complete migration or exposure pathways have been identified between the contamination at the Site and the wetland.

A Flood Hazard Area Title Notification for Parcel #21669 dated September 9, 2002 states: "This parcel is located in a Special Flood Hazard Area as identified on the Flood Insurance Rate Map (FIRM) and as adopted by Skagit County." The notification indicates Flood Hazard Zone A21 with a Base Flood Elevation of 30 M.S.L or Depth. The Title notification is included in Appendix E. The Site itself has not flooded since being constructed. Even if flooding were to occur in the future, the area of PCB soil impacts is at a high point of the entire Property.

No sites on the National Register of Historic places were identified on or near the Property. The Washington Information System for Architecture & Archeological Data (WISAARD) identified no registered entities on or near the Property.

2.7. ANALYTICAL RESULTS

The samples were analyzed as indicated in Tables 1 and 2. All analyses were performed in accordance with respective USEPA methods. The following laboratory methods were specified for analyzing samples:

- PCBs by USEPA Method SW-846 8082. Analytical results for bulk solid samples will be reported in mg/kg with a detection limit of 1.0 mg/kg (ppm). Analytical results for PCB wipes samples will be reported in µg/100cm2 with a goal for detection limits of 0.5 µg/100 cm2 but at least equal to or below 1.0 µg/100 cm2.
- TCLP RCRA regulated metals prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Methods SW-846 6010/7470 and 7471 for mercury.
- TCLP RCRA regulated VOCs prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Method SW-846 8260C.
- TCLP RCRA regulated SVOCs prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Method SW-846 8270C.
- Percent asbestos by polarized light microscopy.

Sample analysis was completed by Friedman & Bruya, Inc. Environmental Chemists. Analytical results were reported electronically and are summarized below. Analytical results for PCBs were reported in accordance with USEPA Contract Laboratory Program (CLP) Tier IV data protocols. Appendices D1 and D2 contain the laboratory analytical data in pdf format.

2.7.1. QUALITY ANALYSES

All data was qualified as useable during the Quality Analysis.

In accordance with Section 3.8.2 of the QAPP, a 100-percent review of the data, which allowed for complete independent data review without reconstruction of analytical data, was conducted by a third party data validation contractor prior to use as final data in investigation reports. The validation included a review of sample collection and holding times, and the QC measurement data associated with each sample set. The reviews were performed by Laboratory Data Consultants, Inc. (LDC) using professional judgment and the following documents, as applicable to each method:

- Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington, June 2015;
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014;
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update liB, January 1995; update Ill, December 1996; update IliA, April 1998; IIIB, November 2004; Update IV, February 2007.

In general, the data were found to be usable as qualified. However, data qualifiers were applied to results that did not meet project goals and in accordance with the QAPP. For several sample results, a "J" qualifier was added to indicate that the result should be considered estimated due to laboratory precision or accuracy. Further discussions of the data validation and qualifiers applied for the Initial Investigation and Data Gap Investigation are provided in Appendices D1 and D2, respectively.

Appendices D2 and D4 contain a detailed discussion of the data validation results and the laboratory data packages are included in Appendices D1 and D3.

2.7.2. SOIL RESULTS

Results of soil PCB analysis are depicted on Figure 5 and provided in Tables 7 and 8. All detected concentrations of PCBs in soil were below the TSCA 50 mg/kg threshold. Thirteen of 32 soil samples contained detectable levels of total PCBs (>0.2 mg/kg total Aroclors). Of the thirteen detected total PCB concentrations from the 0 inches to 12 inches interval, seven were above 1.0 mg/kg, the proposed Method A Soil Cleanup Level for unrestricted land use listed in WAC Chapter 173-340 Table 740-1 for PCB Mixtures. None of the total PCB samples from the 12 inches to 36 inch interval exceed the 1.0 mg/kg at any sample location.

Two shallow soil samples taken from near the Sedimentation Basin contained total PCBs above 1.0 mg/kg in the 0 inches to 12 inches interval. Three additional samples from near the Sedimentation Basin contained total PCBs less than 1.0 mg/kg in the 0 inches to 12 inches interval. The remaining five samples from the 0 inches to 12 inches interval near the Sedimentation Basin did not contain detectable concentrations of PCBs. The corresponding deeper samples (12 inches to 36 inches interval) near the Sedimentation Basin contained two total PCB samples less than the 1.0 mg/kg and eight total PCB results that were not detectable

Five shallow soil samples taken from near the Filtration Basin contained total PCBs above 1.0 mg/kg in the 0 inches to 12 inches interval. The remaining sample from the 0 inches to 12 inches interval near the Filtration Basin did not contain detectable concentrations of total PCBs. The corresponding deeper samples (12 inches to 36 inches interval) near the Filtration Basin contained two total PCB samples less than the 1.0 mg/kg and four total PCB results that were not detectable.

As field conditions allowed, sample locations were paired with one location being closer to the investigated structure and the second being further from the structure. These included FB-03 and FB-04 (15.6 mg/kg total PCBs closer and 3.1 mg/kg total PCBs further), FB-05 (1.1 mg/kg total PCBs with no further out corresponding pair), and FB-06 (1.32 mg/kg total PCBs with no further out corresponding pair). At the remaining sample locations, closer samples were either less than 1.0 mg/kg total PCBs or were bounded by a further boring either less than 1.0 mg/kg total PCBs or with no detectable total PCB concentrations.

2.7.3. GROUNDWATER RESULTS

Results of groundwater PCB analysis are provided in Table 11. All groundwater sample results for PCBs were below the laboratory reporting limit of 0.01 µg/l.

2.7.4. INTERIOR BASIN SEDIMENT RESULTS

Results of interior basin sediment PCB analysis from the initial investigation are provided in Table 5. Sediments in both the Clearwell and Wastewell contained low levels of PCBs; however, none of the samples exceeded levels for consideration as TSCA PCB waste or dangerous waste in the State of Washington. All six interior basin sediment samples collected from the Clearwell during the Data Gap Investigation contained low levels of PCBs, but all were well below the TSCA 50 mg/kg threshold (Table 9). The low level PCB sediment results are more of a function of the system operating correctly as shown by the non-detectable PCB results in drinking water samples.

Six interior basin sediment samples from the Sedimentation Basin had detected concentrations of PCBs. Only two samples, taken from the overflow troughs, exceeded TSCA and State of Washington dangerous waste levels. These specific exceedances were detected in the overflow troughs located above the water level in the basins that were used to carry collected sediment out of the basin and were not used to transport water to the Filtration Basin. Results of the Sedimentation Basin interior basin sediment samples are included in Table 3.

None of the anthracite, sand, or filter bed media collected from the Filtration Basin contained PCBs, with the exception of one low level concentration in FB-BED-01. None of these materials would be considered TSCA PCB wastes or State dangerous wastes. Results of the Filtration Basin filter media samples are included in Table 4.

2.7.5. SETTLING LAGOON RESULTS

PCB analysis of soils collected from the soil/sand strata beneath sediment layers in two Settling Lagoons are provided in Table 10. No lagoon soil/sand samples contained detectable concentrations of PCBs.

2.7.6. COATING SAMPLE RESULTS

Eight exterior coating samples and two interior coating samples collected from the Sedimentation Basin contained PCBs in excess of the TSCA 50 mg/kg threshold when disposing of the material. Nine of the ten samples exceeded 10,000 mg/kg total when summing all detected Aroclors, and would be identified as extremely hazardous waste in the State of Washington when disposing of the material. Results of the Sedimentation Basin coating samples are included in Table 3.

Four exterior coating samples and five of six interior coating samples collected from the Filtration Basin contained PCBs in excess of the TSCA 50 mg/kg threshold when disposing of the material. The exterior coating samples exceeded 10,000 mg/kg total when summing all detected Aroclors and would be identified as extremely hazardous waste in the State of Washington when disposing of the material. Interior coatings would be considered dangerous waste in the State of Washington. Results of the Filtration Basin coating samples are included in Table 4.

Results of below grade mastic coating PCB and asbestos analysis are provided in Table 13. No mastic samples contained asbestos. Two mastic samples contained PCBs but all were below the TSCA 50 mg/kg threshold. Below grade mastic was collected from the Sedimentation Basin and Clearwell.

Five of the ten glaze or caulk samples collected from windows and doors in the Administration Building contained PCBs in excess of the 50 mg/kg level, such that the caulk and glaze would be considered TSCA PCB bulk product waste when disposing of the material. Four of those samples would be considered dangerous waste in the State of Washington. Results of the Administration Building glaze and caulk samples are included in Table 6.

2.7.7. CONCRETE SAMPLE RESULTS

PCBs were identified in only eight of the 40 concrete samples collected from the Sedimentation Basin. All eight samples with PCB exceedances were collected from the overflow troughs in the top portions of the Sedimentation Basin clarifier bays. Six of those eight specific samples exceeded 50 mg/kg, which requires management of the demolition debris as PCB remediation waste when disposing of the material. Only two samples exceeded 100 mg/kg for designation as dangerous waste in accordance with State of Washington requirements. All concrete samples collected in the bottom elevations of the Sedimentation Basin bays and mixer bays were below the 50 mg/kg TSCA threshold. Results of the Sedimentation Basin concrete samples are included in Table 3.

All six concrete samples collected from the Filtration Basin bays and one concrete sample collected from the pipe gallery exceeded 50 mg/kg, which requires management of the demolition debris as PCB remediation waste when disposing of the material. Four of the six samples from the bays and the pipe gallery concrete sample had concentrations that would be considered dangerous waste in the State of Washington when disposing of the material. Results of the Filtration Basin concrete samples are included in Table 4.

No concrete samples from the Clearwell contained detected levels of PCBs (Table 5).

2.7.8. OTHER BUILDING MATERIALS

Four samples from the Sedimentation Basin expansion joint, one cork sample and nine of the ten sealant samples contained PCBs that exceeded regulatory thresholds. Due to the configuration of the various layers of sealant and cork in the expansion joints, all materials removed from the joints would be considered PCB bulk product waste and managed in accordance with TSCA regulations. Two of the three caulk samples contained PCBs above TSCA and dangerous waste levels. Like the expansion joints, all caulk material would be classified as PCB bulk product waste. Results of the Sedimentation Basin expansion joint samples are included in Table 3.

No redwood baffle samples collected from the Clearwell contained detected levels of PCBs (Table 5).

2.7.9. SURFACE WIPE SAMPLE RESULTS

One window sill wipe sample, AB-WINDOW WIPE-02, had detected PCBs. The result of 13 ug/100cm^2 exceeds the TSCA level of 10 ug/100cm^2 to be considered TSCA PCB waste. Three surface wipe samples of equipment in the Administration Building and Pump Room contained PCBs at or over the 10 ug/100cm^2 threshold. Results of the Administration Building wipe samples are included in Tables 6 and 12.

None of the wipe samples collected from fiberglass collector boards or steel agitator blades in the Sedimentation Basin contained PCBs.

None of the wipe samples collected from fiberglass troughs in the Filtration Basin contained PCBs.

2.7.10. WASTE CHARACTERIZATION SAMPLE RESULTS

With the exception of paint chip sample PC-01, none of the Sedimentation Basin samples that were analyzed for TCLP waste toxicity characteristics exceeded the limits to be considered federal hazardous waste or State of Washington dangerous waste. The paint associated with PC-01, taken from blue paint on guardrails, would be considered lead-based paint. If removed from the railing and disposed as a separate waste stream from the scrap steel railings, the paint would also be considered a hazardous waste/dangerous waste when disposing of the material due to levels of barium and chromium in addition to the lead content.

With the exception of paint chip sample PC-03, none of the Filtration Basin samples that were analyzed for TCLP waste toxicity characteristics exceeded the limits to be considered federal hazardous waste or State of Washington dangerous waste. The paint associated with PC-03, taken from blue paint on guardrails is considered lead-based paint. If removed from the railing and disposed as a separate waste stream from the scrap steel railings, the paint would be considered a hazardous waste/dangerous waste due to levels of chromium in addition to the lead content.

None of the Clearwell or Wastewell samples that were analyzed for TCLP waste toxicity characteristics exceeded the limits to be considered federal hazardous waste or State of Washington dangerous waste.

None of the paint chip samples collected in the Administration Building are considered lead-based paint. Several samples, however, could be considered hazardous/dangerous waste based upon lead levels, and PC-06 could be considered hazardous/dangerous waste based upon the barium concentration. If these paints were to be removed from substrates and collected for separate disposal, analysis by TCLP would be required to confirm whether they meet toxicity levels for characterization as hazardous of dangerous wastes.

2.7.11. RESULTS SUMMARY

The following three tables summarize the PCB sample results from the Initial Investigation and Data Gap Investigation relative to the criteria discussed above. As shown in this table the primary media in which PCBs were detected above criteria include:

- Sedimentation Basin - Exterior Coating, Interior Coating, Concrete, Cork, Caulk, and Sealant
- Filtration Basin - Exterior Coating, Interior Coating, and Concrete
- Administration Building (Admin Bldg). – Glaze and Caulk

Table A – Summary of Soil & Groundwater Results

Media	Investigation Phase	Number of Samples	Number of Detections	Number of Detections above Method A Cleanup Level		
Soil	Data Gap	32	13	7		
Groundwater	Data Gap	16	None	None		

Table B – Summary of Interior Basin Sediment Results

Media	Investigation Phase	Number of Samples	Number of Detections	Number of Detections above 50 mg/kg (TSCA)	Number of Detections between 100 and 10,000 mg/kg (Dangerous Waste)	Number of Detections above 10,000 mg/kg (Extremely Hazardous Waste)
Clearwell and Wastewell - Interior Basin Sediment	Initial	10	9	None	None	None
Clearwell Interior Basin - Sediment & Water	Data Gap	6	6	None	None	None

Sedimentation Basin - Interior Sediment	Initial	10	6	**2**	**2**	None
Filtration Basin Media	Initial	18	1	None	None	None
Media	**Investigation Phase**	**Number of Samples**	**Number of Detections**	**Number of Detections above 50 mg/kg (TSCA)**	**Number of Detections between 100 and 10,000 mg/kg (Dangerous Waste)**	**Number of Detections above 10,000 mg/kg (Extremely Hazardous Waste)**
Settling Lagoon Soil	Data Gap	4	None	None	None	None
Sedimentation Basin - Exterior Coating	Initial	8	8	**8**	**8**	**8**

Table C – Summary of Building Material Results

Media	Investigation Phase	Number of Samples	Number of Detections	Number of Detections above 50 mg/kg (TSCA)	Number of Detections between 100 and 10,000 mg/kg (Dangerous Waste)	Number of Detections above 10,000 mg/kg (Extremely Hazardous Waste)
Sedimentation Basin - Interior Coating	Initial	2	2	**2**	**2**	**1**
Filtration Basin - Exterior Coating	Initial	4	4	**4**	**4**	**4**
Filtration Basin - Interior Coating	Initial	6	6	**4**	**4**	None
Below Grade Mastic Coating	Data Gap	4	2	None	None	None
Admin Bldg. – Glaze & Caulk	Initial	10	10	**6**	**4**	None
Sedimentation Basin - Concrete	Initial	40	8	**6**	**2**	None
Filtration Basin - Concrete	Initial	6	6	**6**	**4**	None
Clearwell - Concrete	Initial	10	None	None	None	None
Sedimentation Basin – Cork, Caulk, Sealant	Initial	17	14	**12**	**12**	**2**
Clearwell – Baffles	Initial	3	None	None	None	None

Table D – Summary of Surface Wipe Results

Media	Investigation Phase	Number of Samples	Number of Detections	Number of Detections >10 ug/100cm2 (TSCA)		
Admin Bldg. - Surface Wipe	Initial/Data Gap	15	4	**4**		

Sedimentation Basin – Surface Wipe	Initial	4	None	None		
Filtration Basin – Surface Wipe	Initial	6	None	None		

3. CONCEPTUAL SITE MODEL

3.1. SOURCES OF CONTAMINATION

The Site has undergone two phases of investigation in support of potential deconstruction of the former WTP structures. The initial investigation defined the nature of contamination as industrial coatings on the exterior of the Sedimentation Basin and Filtration Basin containing PCBs in concentrations ranging from 10,000 mg/kg to 20,000 mg/kg. PCBs have been determined to be the chemical of potential concern (COPC) at the Site. The exterior coatings of both the Sedimentation Basin and the Filtration Basin are the source of PCBs in external structures and shallow soils at the Site. PCBs were also detected in samples from inside of the Administration Building. Because the building is intact, these PCB results were not considered to represent a source of soil and/or groundwater impact.

Coatings containing PCBs on the exterior of the Sedimentation Basin and Filtration Basin have weathered along the base of the exterior walls. Due to the direct soil impact from weathered coatings, soil along the exterior of the Sedimentation Basin and Filtration Basin is a secondary source of PCBs at the Site.

3.2. IMPACTED MEDIA

Soil and groundwater testing near the Sedimentation Basin and the Filtration Basin was conducted in the second phase, Data Gap investigation. The results of the sampling are discussed below.

3.2.1. SOIL

Soil sampling and analysis indicated PCBs in shallow soils ranging from non-detectable concentrations to 15.6 mg/kg. No soils were identified with PCBs to be considered federal TSCA regulated waste or State of Washington dangerous waste.

Seven shallow soil borings contained PCBs over 1.0 mg/kg, the Method A Soil Cleanup Level for unrestricted land use listed in WAC Chapter 173-340 Table 740-1 for PCB Mixtures. The detections primarily came from the boring closest to the outer basin wall while the paired further boring did not contain detectable PCBs. At two locations, there was no paired further boring due to access issues. The results at these 2 locations were 1.1 and 1.32 mg/kg, very close to the 1.0 mg/km Cleanup Level. At one paired location, PCB concentrations decreased from 15.6 mg/kb to 3.1 mg/kg over a short distance.

In addition, only the shallowest soil sample (0-1 ft deep) contained detectable concentrations of PCBs above 1.0 mg/kg while 1-3 ft. deep samples did not contain detectable PCBs above 1.0 mg/kg. Figure 6 depicts these soil boring locations and results containing PCBs over 1.0 mg/kg, and two defined Areas of Concern (AOC): (1) soils along the south and east sides of the Filtration Basin; and (2) soils along the northern side and the north half of the eastern side of the Sedimentation Basin.

3.2.2. GROUNDWATER

Groundwater sampling and analysis from fourteen monitoring wells indicated no detectable concentrations of PCBs. Thus, groundwater is not considered to be impacted media.

3.3. PRELIMINARY CONCEPTUAL SITE MODEL

A preliminary conceptual site model (CSM) has been developed for the Site. The CSM describes the sources and media impacted at the Site, the potential transport pathways, the potential exposure media, and the potential receptors. A preliminary CSM diagram is shown in Figure 7. The sources and media impacted at the Site have been described in the previous sections.

3.3.1. POTENTIAL TRANSPORT PATHWAYS AND EXPOSURE MEDIA

Surface soil at the Site has been impacted by PCBs and is the primary exposure media. Soil at the Site is stabilized by vegetation; therefore, erosion and sediment transport is not considered likely to be a transport mechanism. The proximity of impacted soils to concrete structures mitigates the potential for wind dispersion to be a transport pathway for PCBs adhered to particulates. Since PCBs have low vapor pressure, volatilization is not considered a pathway for transport or exposure at the Site.

The location of impacted soils is relatively well contained topographically, and the dikes/berms surrounding the Site preclude runoff as a transport mechanism to surface water bodies in the vicinity of the Site. In addition, there is no evidence that storm drains at the Site have been exposed to surface water runoff that has been potentially impacted by PCB contaminated soil. Thus, no feasible pathway to the river has been identified. The locations of the AOCs and the topography of the Site have limited overland transport as evidenced by the almost complete lack of detectable PCBs above 1.0 mg/kg in the furthest sample location of the matched pairs.

PCBs adhere to organic matter in the soil and are primarily found in the top 12 inches of soil at the Site. Transport to groundwater via leaching, infiltration, or percolation was not indicated based on groundwater testing that was performed, which showed no detectable concentrations of PCBs in groundwater.

3.3.2. POTENTIAL RECEPTORS

The current land use for the Site is considered Major Utility Development (PL10-0048) under a Special Use Permit issued November 9, 2010 for the new WTP. There are no plans for the Site use to change in the future; however, the Administration Building, Sedimentation Basin, Filtration Basin, and Clearwell are being considered for deconstruction. Access to the Site is restricted to employees and approved visitors by a locked fence with access controlled vehicle gates.

The current and future receptors with potential for exposure consist of workers at the Site, including WTP employees and contractors, as well as potential site visitors or trespassers. Potential exposure routes for site workers to soil consist of incidental ingestion, dermal contact, and inhalation of particulate matter. However, exposure to employees and contractors is unlikely as no routine activities at the Site include excavation, grading, or other soil disturbance. To the extent that non-routine activities could expose employees and workers to PCBs, appropriate precautions would need to be taken to protect their health and safety. Exposure routes for site visitors or trespassers at the Site also consist of incidental ingestion, dermal contact, and inhalation of particulate matter, but exposure to these individuals is even less likely given the secured nature of the Site.

The preliminary CSM developed for the Site is based on the current characterization of the primary and secondary sources of PCB contamination at the Site, the impacted media as determined by the sampling that has been conducted at the Site, and the transport mechanisms and exposure media for potential current and future receptors at the Site. The preliminary CSM will be modified or updated, as necessary, as new information becomes available regarding additional characterization or sampling at the Site.

4. PROPOSED CLEANUP STANDARDS

4.1. PROPOSED MTCA CLEANUP LEVELS FOR SOIL AND GROUNDWATER

The cleanup of contaminated sites in Washington is guided by the MTCA Cleanup Regulation (WAC Chapter 173-340) implemented by Ecology, under which various methods for determining cleanup standards and cleanup actions are described. Cleanup standards consist of a cleanup level and a point of compliance. A cleanup level under MTCA is the concentration of a hazardous substance in specific media that is protective of human health and the environment. MTCA uses a risk-based approach to setting cleanup levels, as well as background concentrations, detection limits, and applicable or relevant and appropriate requirements (ARARs).

To identify cleanup levels, MTCA uses three methods referred to as Method A, Method B, and Method C.

Method A is for very simple and straight-forward cleanups. MTCA specifies that Method A can be used to establish cleanup levels for sites that have few hazardous substances in which the site will undergo a routine cleanup action or where numerical cleanup standards are available for all indicator hazardous substances in each media.

A routine cleanup action is a remedial action meeting all of the following criteria:

- Cleanup standards for each hazardous substance addressed by the cleanup are obvious and undisputed, and allow for an adequate margin of safety for protection of human health and the environment;
- It involves an obvious and limited choice among cleanup action alternatives and uses an alternative that is reliable, has proven capable of accomplishing cleanup standards, and with which the department has experience;
- The cleanup action does not require preparation of an environmental impact statement; and
- The site qualifies under WAC 173-340-7491 or an exclusion from conducting a simplified or site-specific terrestrial eco-logical evaluation, or if the site qualifies for a simplified ecological evaluation, the evaluation is ended under WAC 173-340-7492(2), or the values in Table 749-2 are used.

Routine cleanup actions consist of, or are comparable to, one or more of the following remedial actions:

- Cleanup of above-ground structures;
- Cleanup of below-ground structures;
- Cleanup of contaminated soils where the action would restore the site to cleanup levels; or
- Cleanup of solid wastes, including containers.

Method B can be used for any site. Method B cleanup levels are risk-based and use a reasonable maximum exposure (RME) scenario based on current and future use of the site/media. The RME scenario for establishing a cleanup level is based on residential or industrial use of the site, but an alternative RME scenario can be considered when assessing the remedy for the site.

Method C is for industrial properties and has several additional caveats if it is to be used. Once it has been determined which method is appropriate to use for establishing cleanup levels, they can either be looked up in tables if using Method A, or calculated based on standard or modified approaches using Methods B or C.

Selecting the cleanup method under MTCA is based on the current and future land use of the site, the number of hazardous substances in potentially contaminated media and the availability of acceptable and undisputed cleanup levels for those substances, and the complexity of the cleanup action. For sites with few hazardous substances that have well-established cleanup levels and that will undergo straightforward cleanup action that has been proven to meet cleanup standards, a Method A approach may be used.

Based on the current and future land use of the Site and the potential receptors, the proposed MTCA Method A cleanup levels for unrestricted land use are appropriate. Groundwater has not been impacted by the limited PCB concentrations in shallow soil, as no groundwater samples detected PCBs at concentrations exceeding the MTCA Method A cleanup level for groundwater of 0.1 micrograms per liter (ug/L). The only media with detected concentrations of PCBs on the Site was shallow soil directly adjacent to the Sedimentation Basin and Filtration Basin. Thus, the MTCA Method A cleanup level for PCBs in soils is proposed for the Site. The proposed Method A Soil Cleanup Level for unrestricted land use listed in Table 740-1 for PCB Mixtures is 1.0 milligrams per kilogram (mg/kg). This cleanup level is based on the federal Toxic Substances Control Act under 40 CFR 761.61. The proposed cleanup level for soil at the Site is based on comparison to Total PCB concentrations.

4.2. WASTE DISPOSITION STANDARDS FOR BUILDING DECONSTRUCTION MATERIALS

The TSCA federal regulations under 40 Code of Federal Regulations (CFR) 761 prescribe management and waste disposal methodology for bulk materials containing concentrations over 50 parts per million or mg/kg. These requirements are also mandated for materials with wipe sample results over 10 $\mu g/100cm^2$. Depending upon the material with PCB contamination and the method or configuration of installation, materials may be managed as either PCB Bulk Product Waste or PCB Remediation Waste with differing regulatory standards for each type of PCB waste material. Tables 1 and 2 each contain a column identifying the differing materials that were sampled as either potential PCB Bulk Product Waste or potential PCB Remediation Waste.

The State of Washington regulates dangerous wastes in WAC 173-303-100. PCBs are considered halogenated organic compounds and waste materials are assigned dangerous waste codes based upon their concentration as follows:

- If the sum of individual PCB Aroclor concentrations equals or exceeds .01% (100 mg/kg) and is less than 1.0% (10,000 mg/kg), then building materials, debris, and process residuals would be designated as dangerous waste and assigned State of Washington waste code “WP02” per WAC 173-303-100.
- If the sum of individual PCB Aroclor concentrations equals or exceeds 1.0% (10,000) mg/kg, then building materials, debris, and process residuals would be designated as extremely hazardous waste and assigned State of Washington waste code “WP01” per WAC 173-303-100.

Analytical results for building material samples discussed in Section 2.7 include indication of whether the respective materials would be characterized as dangerous waste or extremely hazardous waste.

4.3. TERRESTRIAL ECOLOGICAL EVALUATION

In accordance with WAC 173-340-7492, a Simplified Terrestrial Ecologic Evaluation was conducted for the Site (Appendix E). The evaluation indicates that that there is limited potential for exposure of wildlife to low levels of PCBs in soil when all open space areas within 500 feet of the Site are considered. Ruderal wildlife species that are adapted to disturbance may utilize this non-native habitat that is highly fragmented by treatment plant infrastructure and pavement. However, the largest contiguous portion of undeveloped land at the Site is comprised of approximately 1.6 acres. Based on Step 2 of the Simplified TEE, Exposure Analysis condition 2, no further ecological evaluation is warranted.

5. SUMMARY AND CONCLUSIONS

No PCBs were detected in groundwater at the Site. Shallow soil samples from two defined Areas of Concern contained PCBs exceeding the MTCA Method A Soil Cleanup Level of 1.0 mg/kg: (1) soils along the south and east sides of the Filtration Basin; and (2) soils along the northern side and the north half of the eastern side of the Sedimentation Basin. The Areas of Concern include only shallow soils (0 inches to 12 inches below ground surface). PCB impacts to shallow soils at the base of the Sedimentation Basin and Filtration Basin walls is believed to be the result of aboveground weathered PCB-containing coatings along the exterior walls of the basins.

The current and future receptors with potential for exposure consist of workers at the Site, as well as contractors, visitors and trespassers. Possible exposure pathways for soil consist of inhalation of soil or dust particles, incidental ingestion and dermal contact through non-routine activities such as excavation, grading, or other soil disturbance. No workers, contractors or visitors currently access the now decommissioned elements of the Site and, given the secured nature of the Property, it is unlikely for trespassers to access the Site. No transport or migration pathways were identified.

The continuing weathering and resulting degradation of coating materials on the exterior walls of the Sedimentation Basin and Filtration Basin remains a source for potential additional shallow soil impacts.

No PCBs have been detected in drinking water generated from the former WTP or the current WTP.

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6. REFERENCES

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- Geotechnical Data Report, Anacortes Water Treatment Plant, Mount Vernon, Washington, September 24, 2010, Shannon & Wilson, Inc.
- Details for Parcel #21699, November 1, 2016, http://www.skagitcounty.net/Search/Property
- Anacortes WTP Wetland PEM1Cx, September 16, 2016, U.S. Fish and Wildlife Service National Wetlands Inventory
- Coverage Under the Water Treatment Plant General Permit, Permit Number: WAG643002, Facility Name: Anacortes WTP, July 6, 2014, State of Washington Department of Ecology
- Order on Special Use Permit PL10-0048, November 19, 2010, Skagit County Hearing Examiner
- Title Notification – Special Flood Hazard Area, September 9, 2002, Skagit County
- Draft Standard Operating Procedure for Sampling Concrete in the Field; USEPA Region 1; December 1, 1997
- City of Anacortes POL 28.23.11a Confined Space Entry
- USEPA Contract Laboratory Program (CLP) Tier IV data protocols
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014;
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update liB, January 1995; update Ill, December 1996; update IliA, April 1998; IIIB, November 2004; Update IV, February 2007.

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FIGURES

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SOURCE:
U.S.G.S. 7.5 minute quadrangles of Mt Vernon and La Conner, Washington—dated 2011.

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SITE LOCATION

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FIGURE 1

S:\STAFF Share\Rich Malcolm\Anacortes WTP\Figures\ANAC-WTP_SITE LOC.dwg

ANACORTES WTP
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MT. VERNON, WASHINGTON

SITE PLAN

MWH®

FIGURE 2

\\Ussea5s01\BU20152\Projects\City of Anacortes\Confidential – WTP Haz Assessment\5.0_REPORTS\RI Report Figures\Update 060618\ANAC-WTP_SITE FIGURES\ANAC-WTP_SITE PLAN.dwg

LEGEND

SITE

0 12.5 25 50
SCALE: FEET
1"=50'

ANACORTES WTP
DRAFT REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SITE LAYOUT

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FIGURE 2A

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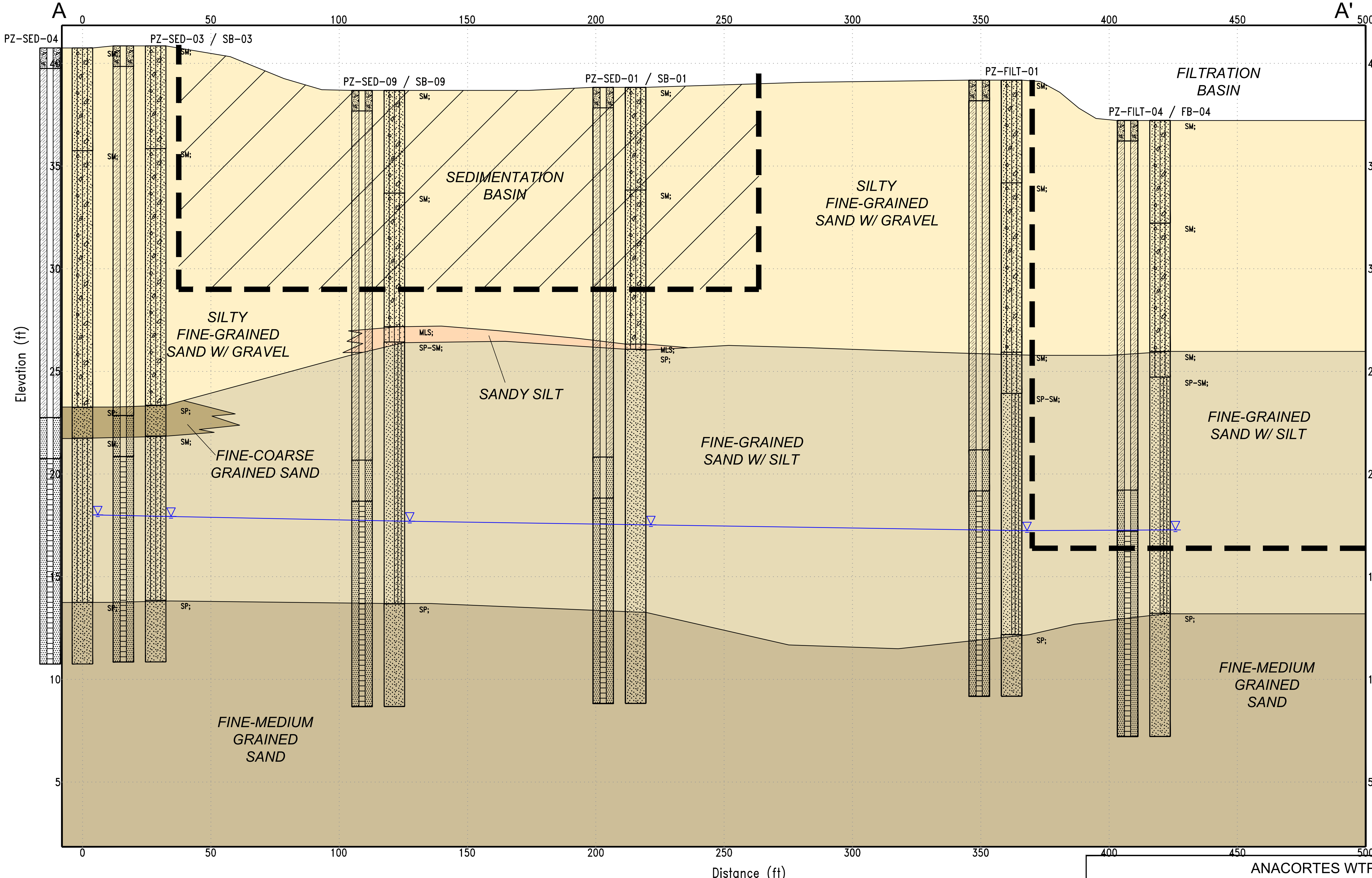
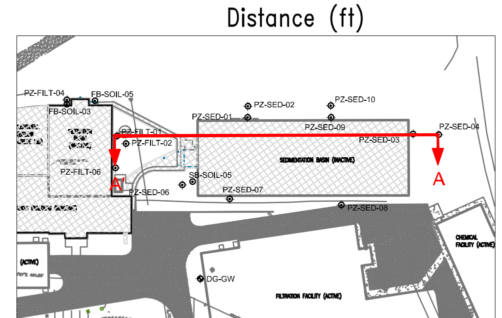


LEGEND

Sandy Silt (ML)
Sand with Silt (SP–SM)
Silty Sand (SM)
Sand (SP)
Silty Sand with Gravel (SM)
Groundwater Level



0 1.25 2.5 5
VERT SCALE: FEET
1"=5'

0 12.5 25 50
HOR SCALE: FEET
1"=50'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

CROSS-SECTION A-A'

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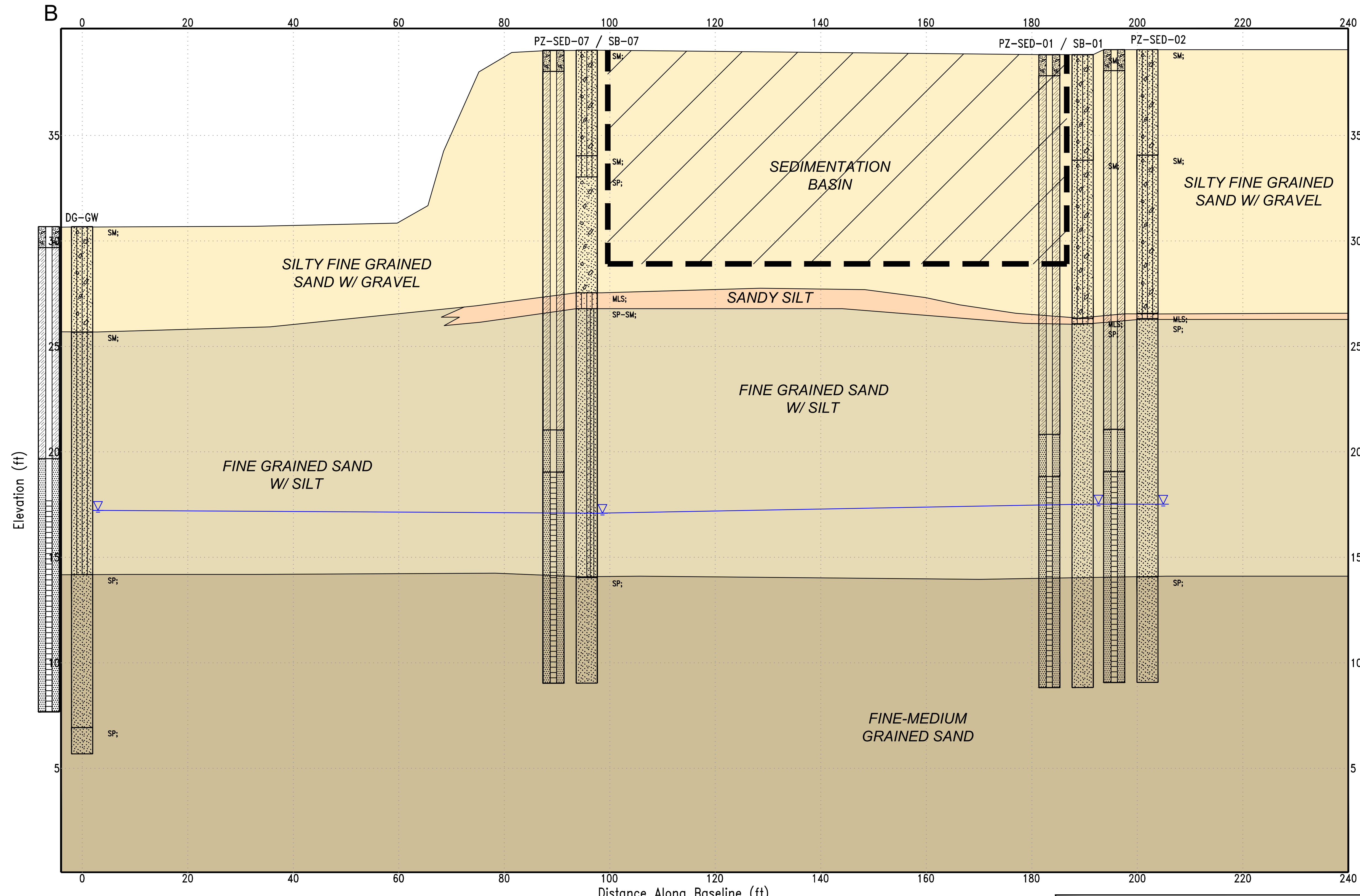
FIGURE 3-AA



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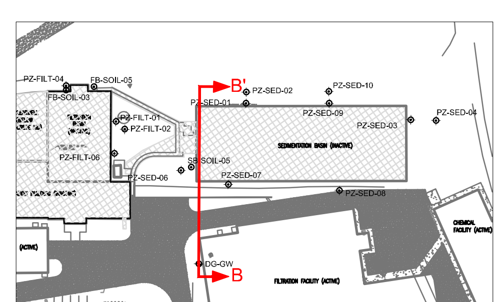
LEGEND

- Sandy Silt (ML)
- Sand with Silt (SP-SM)
- Silty Sand (SM)
- Sand (SP)
- Silty Sand with Gravel (SM)
- Sand with Gravel (SP)
- Groundwater Level



0 1.25 2.5 5
VERT SCALE: FEET
1"=5'

0 5 10 20
HOR SCALE: FEET
1"=20'

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REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

CROSS-SECTION B-B'

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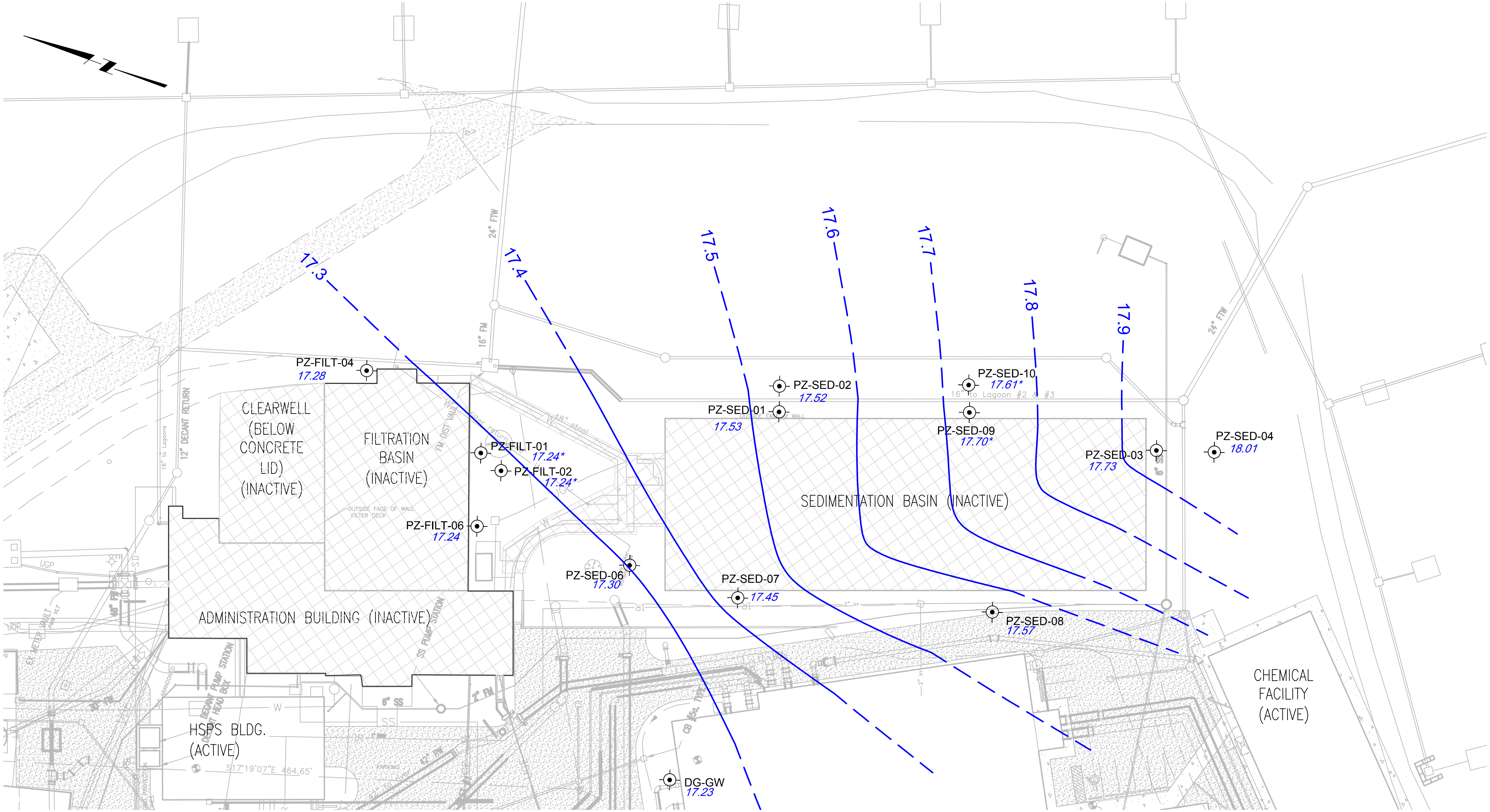
FIGURE 3-BB



LEGEND

- SOIL BORING / MONITORING WELL
- WATER TABLE SURFACE CONTOUR
- *17.45* GROUNDWATER ELEVATION (FT, MSL)

NOTES:

1. * - GAUGED ON 5/31/16, THEREFORE NOT USED IN CREATING CONTOURS.
2. GROUNDWATER ELEVATIONS MEASURED ON MAY 31, 2016 AND JUNE 1, 2016.

0 12.5 25 50
SCALE: FEET
1"=50'

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MT. VERNON, WASHINGTON

SITE MAP-GROUNDWATER CONTOURS AND ELEVATIONS

MWH

FIGURE 4a

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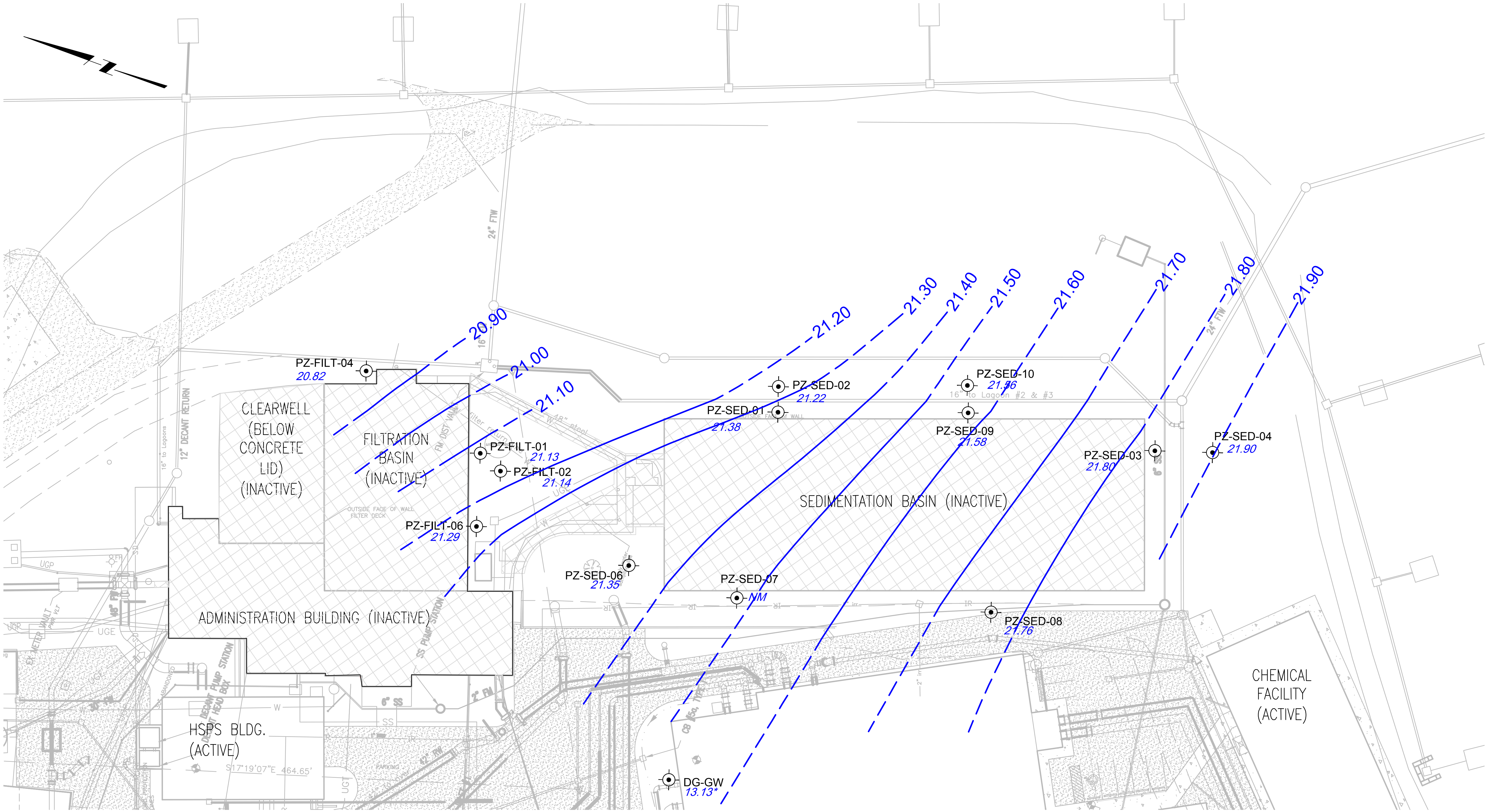

LEGEND

- SOIL BORING / MONITORING WELL
- WATER TABLE SURFACE CONTOUR
- 17.45 GROUNDWATER ELEVATION (FT, MSL)

NOTES:

1. * - MEASUREMENT LIKELY ERRONEOUS, THEREFORE NOT USED IN CREATING CONTOURS.
2. GROUNDWATER ELEVATIONS MEASURED ON NOVEMBER 6, 2016.

0 12.5 25 50
SCALE: FEET
1"=50'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SITE MAP-GROUNDWATER CONTOURS AND ELEVATIONS

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FIGURE 4b

S:\STAFF Share\Rich Malcolm\Anacortes WTP\Figures\ANAC-WTP_NOV_GWPOT.dwg

FB-SOIL-05 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.57**
Aroclor 1260	**0.53**
Total Aroclors	**1.1**
PCBs (0-1 FT)(DUP)	
Aroclor 1254	**0.36**
Aroclor 1260	**0.35**
Total Aroclors	**0.71**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

SB-SOIL-01 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**3.3**
Aroclor 1260	**3.5**
Total Aroclors	**6.8**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-01 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

SB-SOIL-02 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.33**
Aroclor 1260	**0.29**
Total Aroclors	**0.62**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-02 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-04 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**1.9**
Aroclor 1260	**1.2**
Total Aroclors	**3.1**
PCBs (1-3 FT)	
Aroclor 1254	**0.24**
Aroclor 1260	<0.2 U
Total Aroclors	**0.24**

SB-SOIL-10 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-10 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-03 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**6.9**
Aroclor 1260	**8.7**
Total Aroclors	**15.6**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

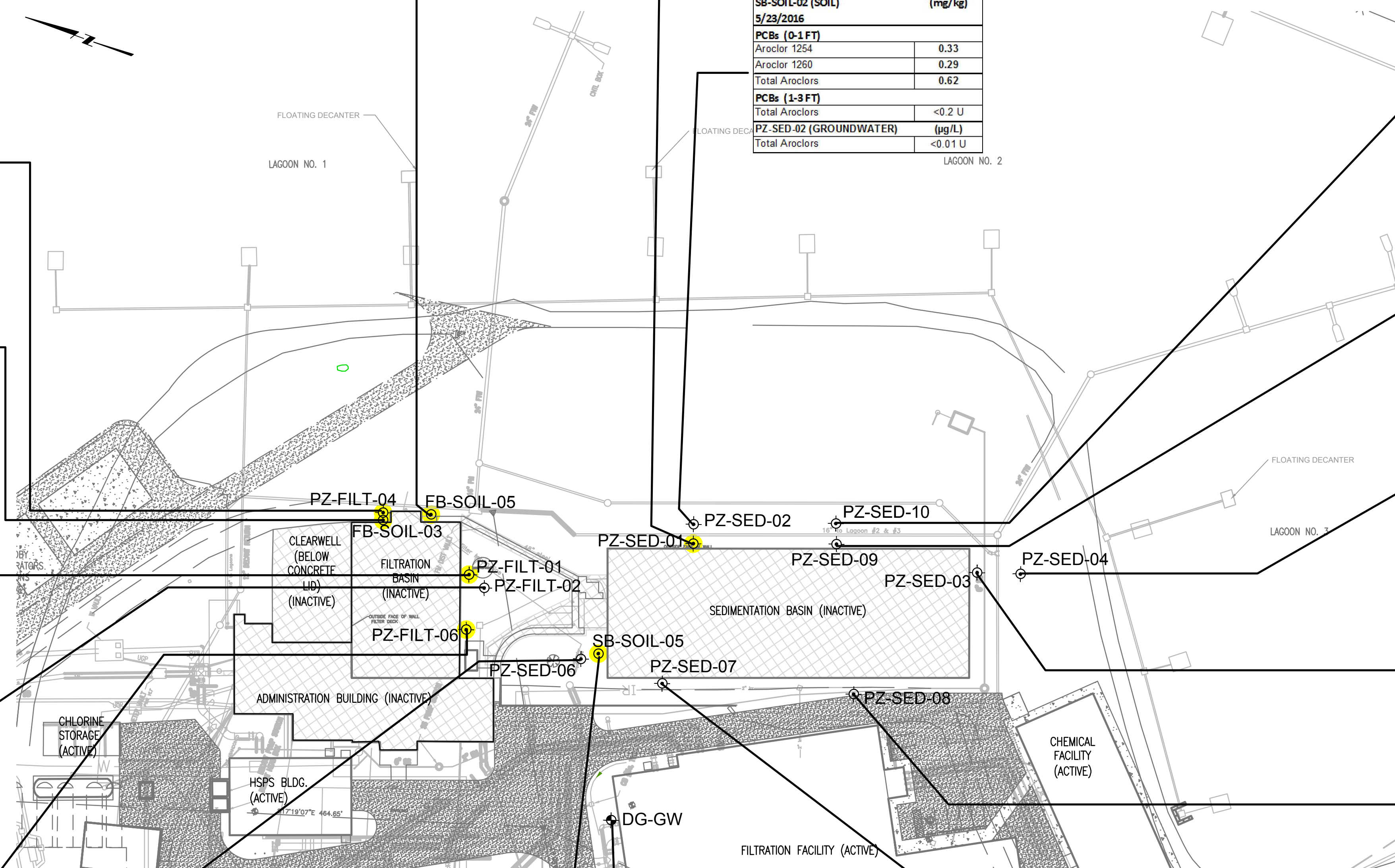
SB-SOIL-09 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.33**
Aroclor 1260	**0.57**
Total Aroclors	**0.9**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-09 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

SB-SOIL-04 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-04 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-01	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.52**
Aroclor 1260	**0.54**
Total Aroclors	**1.06**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

SB-SOIL-03 (SOIL)	(mg/kg)
5/24/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.34**
Aroclor 1260	**0.20**
Total Aroclors	**0.54**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-03 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-02 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Total Aroclors	<0.2 U



SB-SOIL-08 (SOIL)	(mg/kg)
5/24/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (0-1 FT)(DUP)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Aroclor 1254	**0.21**
Total Aroclors	**0.21**
PZ-SED-08 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-06 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Aroclor 1254	**0.60**
Aroclor 1260	**0.72**
Total Aroclors	**1.32**
PCBs (1-3 FT)	
Aroclor 1254	**0.33**
Aroclor 1260	**0.24**
Total Aroclors	**0.57**

SB-SOIL-06 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-06 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

SB-SOIL-05 (SOIL)	(mg/kg)
5/24/2016	
PCBs (0-1 FT)	
Aroclor 1254	**1.2**
Aroclor 1260	**1.5**
Total Aroclors	**2.7**
PCBs (1-3 FT)	
Aroclor 1254	**0.28**
Aroclor 1260	**0.29**
Total Aroclors	**0.57**

DG-GW (GROUNDWATER)	(µg/L)
5/23/2016	
Total Aroclors	<0.01 U

SB-SOIL-07 (SOIL)	(mg/kg)
5/23/2016	
PCBs (0-1 FT)	
Total Aroclors	<0.2 U
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-07 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

LEGEND

- MONITORING WELL
- SOIL BORING / MONITORING WELL
- SOIL BORING

NOTES:
Bold indicates the analyte was detected above the MDL.
U - The analyte was analyzed for but was not detected above the MDL.
UJ - The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
DUP - Duplicate sample for QC purposes
MDL - Method Detection Limit
Soil results reported in mg/kg (miligrams per kilogram)
No PCBs were detected in Groundwater samples

0 25 50 100
SCALE: FEET
1"=100'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SITE MAP-SOIL AND GROUNDWATER ANALYTICAL RESULTS

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FIGURE 5

S:\STAFF Share\Rich Malcolm\Anacortes WTP\Figures\ANAC-WTP_GW Results.dwg

FB-SOIL-05 (SOIL) 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**0.57**
Aroclor 1260	**0.53**
Total Aroclors	**1.1**
PCBs (0-1 FT)(DUP)	
Aroclor 1254	**0.36**
Aroclor 1260	**0.35**
Total Aroclors	**0.71**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

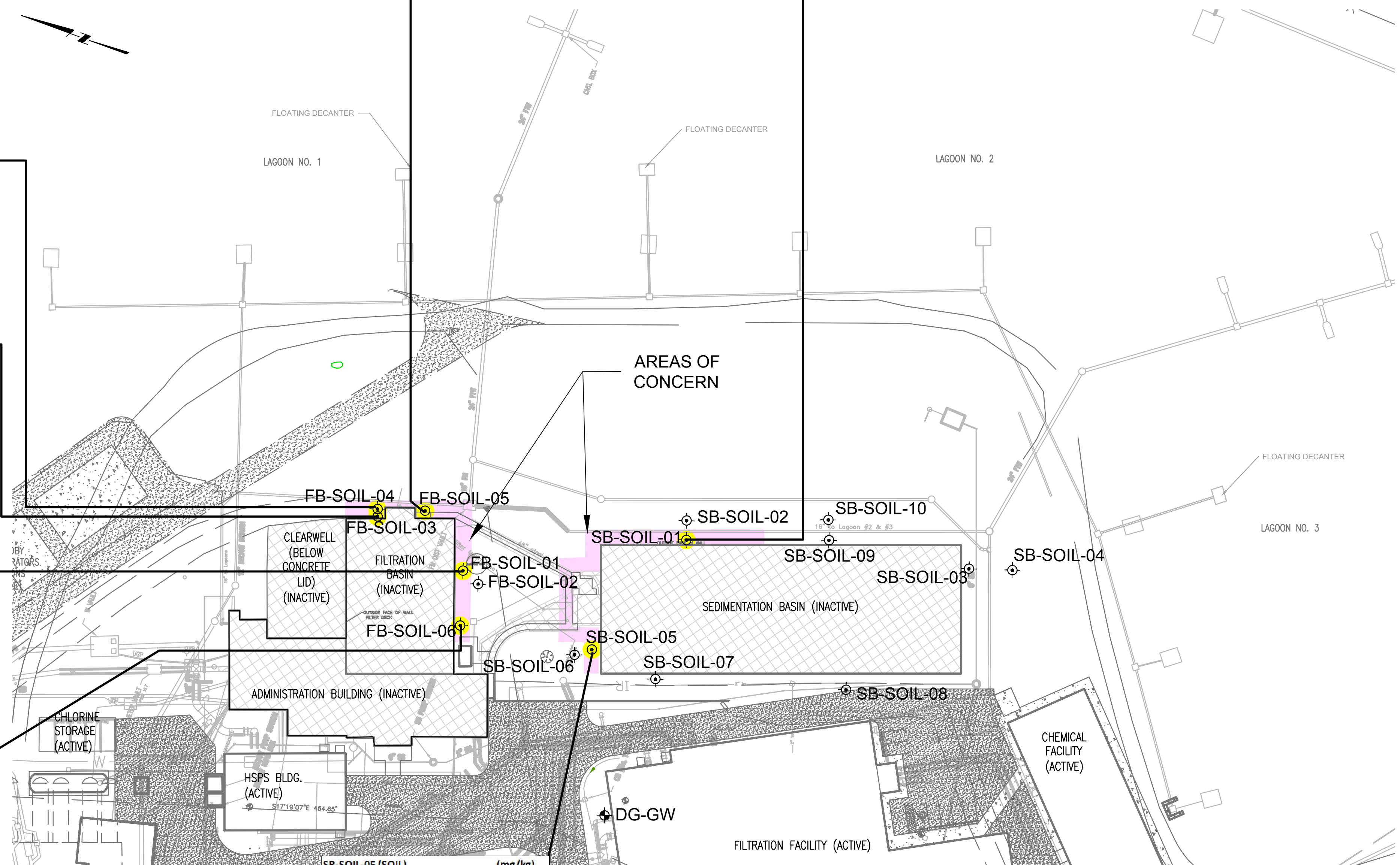
SB-SOIL-01 (SOIL) 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**3.3**
Aroclor 1260	**3.5**
Total Aroclors	**6.8**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U
PZ-SED-01 (GROUNDWATER)	**(µg/L)**
Total Aroclors	<0.01 U

FB-SOIL-04 (SOIL) 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**1.9**
Aroclor 1260	**1.2**
Total Aroclors	**3.1**
PCBs (1-3 FT)	
Aroclor 1254	**0.24**
Aroclor 1260	<0.2 U
Total Aroclors	**0.24**

FB-SOIL-03 (SOIL) 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**6.9**
Aroclor 1260	**8.7**
Total Aroclors	**15.6**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

FB-SOIL-01 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**0.52**
Aroclor 1260	**0.54**
Total Aroclors	**1.06**
PCBs (1-3 FT)	
Total Aroclors	<0.2 U

FB-SOIL-06 (SOIL) 5/23/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**0.60**
Aroclor 1260	**0.72**
Total Aroclors	**1.32**
PCBs (1-3 FT)	
Aroclor 1254	**0.33**
Aroclor 1260	**0.24**
Total Aroclors	**0.57**



SB-SOIL-05 (SOIL) 5/24/2016	(mg/kg)
PCBs (0-1 FT)	
Aroclor 1254	**1.2**
Aroclor 1260	**1.5**
Total Aroclors	**2.7**
PCBs (1-3 FT)	
Aroclor 1254	**0.28**
Aroclor 1260	**0.29**
Total Aroclors	**0.57**

LEGEND
- MONITORING WELL
- SOIL BORING / MONITORING WELL
- SOIL BORING

NOTES:
Bold indicates the analyte was detected above the MDL.
U - The analyte was analyzed for but was not detected above the MDL.
UJ - The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
DUP - Duplicate sample for QC purposes
MDL - Method Detection Limit
Soil results reported in mg/kg (miligrams per kilogram)
No PCBs were detected in Groundwater samples

0 25 50 100
SCALE: FEET
1"=100'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SOIL AREAS OF CONCERN

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FIGURE 6

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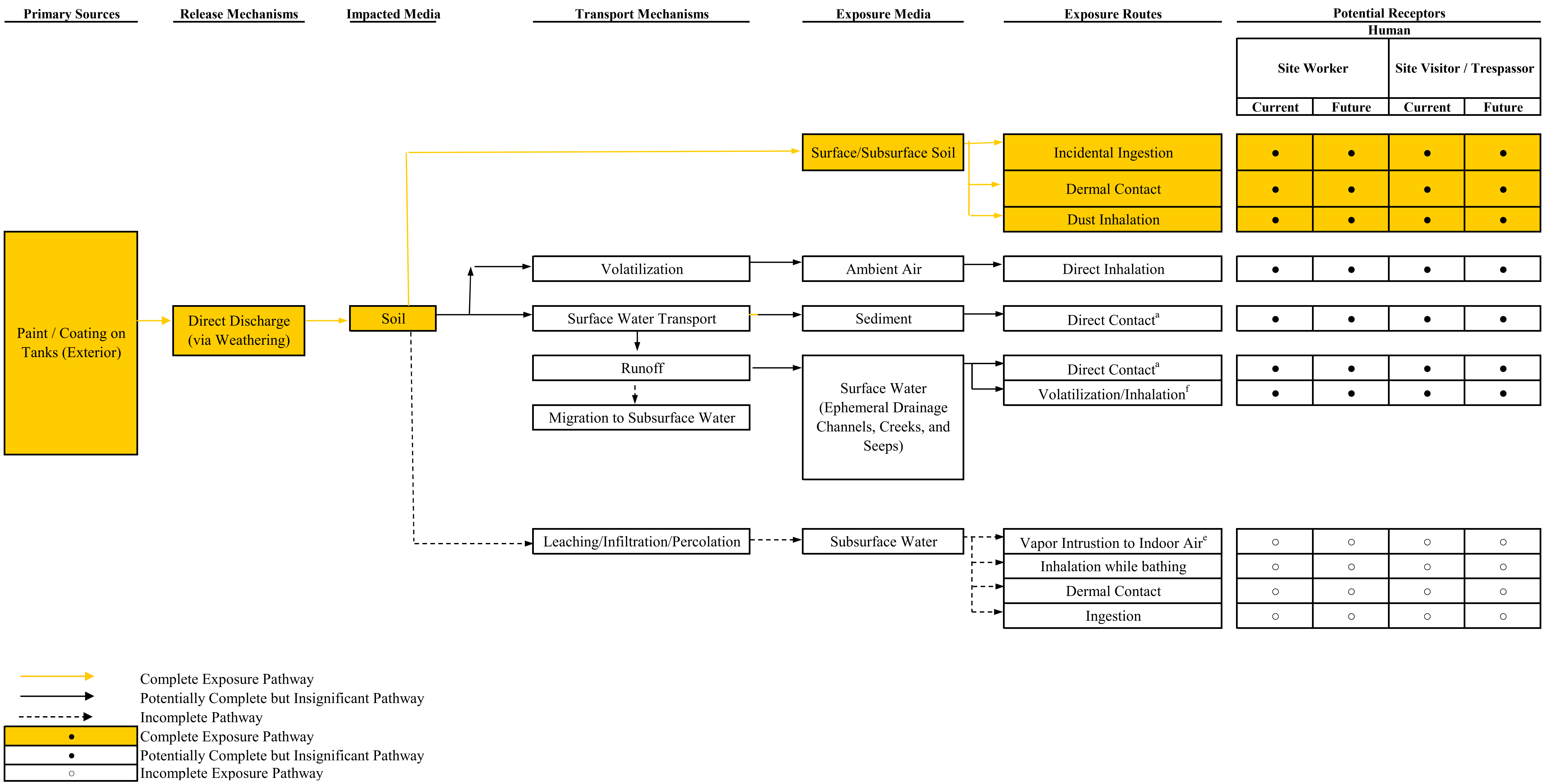
Figure 7. Preliminary Conceptual Site Model



Notes:

[a] Direct Contact means exposure through both incidental ingestion of sludge, sediment, or surface water and through dermal abosrption of the contaminant from sludge, sediment, or surface water.

TABLES

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Table 1. RI - Initial Investigation Sampling Information and Laboratory Methods
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sub-Area	Location and Media	Sample Identification	Potential PCB Waste Type	Notes	Sample Criteria	Bulk Samples
SB	Sedimentation Basin Coating - Exterior	SB-EXPC-XX	PCB Bulk Product Waste	240' X 82' X; 2 layers coating	3 vert/wall; 1 vert/end	8
	Sedimentation Basin Coating - Interior	SB-INPC-XX	PCB Bulk Product Waste	Coating only on troughs; thin coat	1 per SB side	2
	Sedimentation Basin Concrete	SB-CONC-XX	PCB Bulk Product Waste	20 bays	1 horiz; 1 vert	40
	Sedimentation Basin Sediment	SB-SED-XX	PCB Remediation Waste	20 bays	10 total; 1 per mixer	10
	Sedimentation Basin Fiberglass Collector Boards	SB-FIBWIPE-XX	PCB Remediation Waste	Non-porous; wipe samples	2 samples	2
	Sedimentation Basin Steel Agitator Blades	SB-STEELWIPE-XX	PCB Remediation Waste	Non-porous; wipe samples	2 samples	2
	Sedimentation Basin Expansion Joint Sealant	SB-SEAL-XX	PCB Bulk Product Waste	1 joint full width	Multi layered	10
	Sedimentation Basin Expansion Joint Cork	SB-CORK-XX	PCB Bulk Product Waste	1 joint full width	Upper and Lower	4
	Sedimentation Basin Caulk	SB-CAULK-XX	PCB Bulk Product Waste	Caulk applied at joints	2 horiz; 2 vert	3
FB	Filter Basin Coating - Exterior	FB-EXPC-XX	PCB Bulk Product Waste	100' X 92'; 2 layers coating	1/wall	4
	Filter Basin Coating - Interior	FB-INPC-XX	PCB Bulk Product Waste	6 bays; no access to bottom of bay	1/bay	6
	Filter Basin Concrete	FB-CONC-XX	PCB Bulk Product Waste	6 bays	1/bay	6
	Filter Basin Fiberglass Troughs	FB-FIBWIPE-XX	PCB Remediation Waste	Non-porous; wipe samples	1/bay	6
	Filter Basin Anthracite Media	FB-ANTH-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Filter Media	FB-SAND-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Gravel (or brick/block) Bed	FB-BED-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Pipe Gallery Coating	FB-PGPC-XX	PCB Bulk Product Waste	No coating present		0
	Filter Basin Pipe Gallery Concrete	FB-PGCONC-XX	PCB Bulk Product Waste	100' long; 20' wide	1 horiz; 1 vert	2
CW	Clear Well Concrete	CW-CONC-XX	PCB Bulk Product Waste	~5 chambers	1 horiz+1 vert/chamb	10
	Clear Well Sediment	CW-SED-XX	PCB Remediation Waste	~5 chambers	1/chamber	6
	Clear Well Redwood Baffles	CW-BAF-XX	PCB Remediation Waste	6 baffles	1/2 baffles	3
	Waste Well Concrete	CW-WFCONC-XX	PCB Bulk Product Waste	100' long; 20' wide	1 horiz; 5 vert	6
	Waste Well Sediment	CW-WFSED-XX	PCB Remediation Waste	100' long; 20' wide	2 Total; half length	2
AB	Admin Bldg Window Caulk/Glaze	AB-SEAL-XX	PCB Bulk Product Waste	27 windows per schedule	7 glaze; 3 caulk	10
	Admin Bldg Window Wipes	AB-WINDOWWIPE-XX	PCB Remediation Waste	Added per request of Intertox	3 samples	3
	Admin Bldg Roof T-Beam Joint Material	AB-JOINT-XX	PCB Bulk Product Waste	No joint material		0
					TOTAL # SAMPLES	**163**

PCBs by USEPA Method SW-846 8082

XX = Sequential sample number

Table 2. RI - Data Gap Investigation Sampling Information and Laboratory Methods
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sub-Area	Location and Media	Sample Identification	Potential PCB Waste Type	Notes	Sample Criteria	Bulk Samples
SB	Sedimentation Basin Below Grade Mastic Coating	SB-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	2
	Soil 0-12"	SB-SOIL-12-XX	PCB Remediation Waste	Geoprobe	Offset SBs; all 4 sides	10
	Soil 12"-36"	SB-SOIL-36-XX	PCB Remediation Waste	Geoprobe	Offset SBs; all 4 sides	10
	Groundwater	SB-GW-XX		Geoprobe	Low Flow	9
	Downgradient Well	DG-GW-XX		Geoprobe	Toward River	1
FB	Soil 0-12"	FB-SOIL-12-XX	PCB Remediation Waste	Geoprobe	Offset SBs; 2 sides not CW	6
	Soil 12"-36"	FB-SOIL-36-XX	PCB Remediation Waste	Geoprobe	Offset SBs; 2 sides not CW	6
	Groundwater	FB-GW-XX		Geoprobe	Low Flow	4
	Filtration Basin Below Grade Mastic Coating	FB-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	1
CW	Clearwell Sediment	CW-SED-XX	PCB Remediation Waste	Wet from pump well	High TSS Water	2
	Clearwell Sediment	CW-SED-XX	PCB Remediation Waste	Dry - uninvestigated areas	Above water; semi-solid	4
	Clearwell below Grade Mastic Coating	CW-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	1
AB	Wipe Samples	AB-WIPE-XX	PCB Bulk Product Waste	Walls/Floor & Pump Room	Equipment	12
SL	Settling Lagoon Sediments	SL-SED-XX	PCB Bulk Product Waste	Grab Sample	Inactive Lagoons (2 per)	4
					TOTAL # SAMPLES	**72**

PCBs by USEPA Method SW-846 8082

XX = Sequential sample number

Table 3. RI - Initial Investigation Site Data – Sedimentation Basin
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Exterior Coating (mg/kg)							
SB-EXPC-01	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	**11000 J**	**10000 J**
SB-EXPC-02	100 U	100 U	100 U	100 U	100 U	**14000 J**	**13000 J**
SB-EXPC-03	500 UJ	500 UJ	500 UJ	500 U	500 U	**18000 J**	**16000 J**
SB-EXPC-04	100 UJ	100 UJ	100 UJ	100 U	100 U	**6000 J**	**4400 J**
SB-EXPC-05	100 U	100 U	100 U	100 U	100 U	**12000 J**	**9300 J**
SB-EXPC-06	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	**6400 J**	**4700 J**
SB-EXPC-07	100 U	100 U	100 U	100 U	100 U	**16000 J**	**12000 J**
SB-EXPC-08	100 UJ	100 UJ	100 UJ	100 U	100 U	**6900 J**	**4600 J**
Interior Coating (mg/kg)							
SB-INTPC-01	10 U	10 U	10 U	10 UJ	10 UJ	**1600 J**	10 UJ
SB-INTPC-02	200 U	200 U	200 U	200 U	200 U	**20000**	200 U
Concrete (mg/kg)							
SB-CONC-01	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-03	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-04	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-05	0.2 U	0.2 U	0.2	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-06	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-07	0.2 U	0.2 U	0.2	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-08	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-09	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-10	0.2 U	0.2 U	0.2	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-11	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-12	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-13	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-14	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-15	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-16	0.4 U	0.4 U	0.4 U	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ
SB-CONC-17	0.2 UJ	0.2 UJ	0.2 UJ	0.2	0.2 U	0.2 U	0.2 U
SB-CONC-18	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-19 (trough)	1 UJ	1 UJ	1 UJ	1 U	1 U	**83 J**	1 U
SB-CONC-20 (trough)	1 UJ	1 UJ	1 UJ	1 U	1 U	**71 J**	1 U
SB-CONC-21 (trough)	10 U	10 U	10 U	10 UJ	10 UJ	**260 J**	10 UJ
SB-CONC-22 (trough)	2 U	2 U	2 U	2 UJ	2 UJ	**61 J**	2 UJ
SB-CONC-23	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-25	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U

Table 3. RI - Initial Investigation Site Data – Sedimentation Basin
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
SB-CONC-26	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-27	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-28	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-29	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-CONC-30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-31	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-32	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-33	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-34	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-35	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-36	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-CONC-37 (trough)	20 U	20 U	20 U	20 U	20 U	**260 J**	20 U
SB-CONC-38 (trough)	0.2 UJ	0.2 UJ	0.2 UJ	0.2	0.2	**22 J**	0.2
SB-CONC-39 (trough)	1 UJ	1 UJ	1 UJ	1 U	1 U	**48 J**	1 U
SB-CONC-40 (trough)	1 U	1 U	1 U	1 U	1 U	**65 J**	1 U
Sediment (mg/kg)							
SB-SED-01	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-SED-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-SED-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.25 J**	0.2 U
SB-SED-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SED-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**5.5**	0.2 U
SB-SED-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**6.1 J**	0.2 U
SB-SED-07	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
SB-SED-08	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.31 J**	0.2 U
SB-SED-09 (trough)	200 U	200 U	200 U	200 U	200 U	**1900 J**	200 U
SB-SED-10 (trough)	10 U	10 U	10 U	10 U	10 U	**1800 J**	10 U
Expansion Joint Cork (mg/kg)							
SB-CORK-01	500 UJ	500 UJ	500 UJ	500 U	**1100 J**	500 U	500 U
SB-CORK-02	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SB-CORK-03	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SB-CORK-04	1 UJ	1 UJ	1 UJ	**1 J**	1 U	1 U	1 U
Expansion Joint Caulk (mg/kg)							
SB-CAULK-01 (trough)	100 U	100 U	**430 J**	100 U	100 U	**3000 J**	**1800 J**
SB-CAULK-02	1 U	1 U	**3.6 J**	1 U	1 U	1 U	1 U
SB-CAULK-03	10 U	10 U	10 U	10 U	10 U	**480 J**	10 U

Table 3. RI - Initial Investigation Site Data – Sedimentation Basin
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Expansion Joint Sealant (mg/kg)							
SB-SEAL-01	100 UJ	100 UJ	**9700 J**	100 U	**13000 J**	100 U	100 U
SB-SEALA-01	20 UJ	20 UJ	20 UJ	20 U	**470 J**	20 U	20 U
SB-SEALB-01	10 UJ	10 UJ	10 UJ	10 U	**1100 J**	10 U	10 U
SB-SEALC-01	10 UJ	10 UJ	10 UJ	10 U	**1500 J**	10 U	10 U
SB-SEAL-02 (resin)	20 U	20 U	20 U	20 U	20 U	**850 J**	20 U
SB-SEALC-02	100 U	**2700 J**	100 U	**1400 J**	**1500 J**	100 UJ	100 UJ
SB-SEALA-03	1 U	1 U	1 U	1 U	**120 J**	1 U	1 U
SB-SEALB-03	1000 U	1000 U	1000 U	**38000 J**	1000 U	1000 U	1000 U
SB-SEALC-03	100 U	100 U	100 U	**1700 J**	100 U	100 U	100 U
SB-SEAL-04	1 UJ	1 UJ	1 UJ	**8.7 J**	1 U	1 U	1 U
Wipe (ug/100cm2)							
SB-FIBWIPE-01	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SB-FIBWIPE-02	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SB-STEELWIPE-01	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
SB-STEELWIPE-02	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Data Qualifiers

J = Estimated Value (The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.)

UJ = Non-detected estimated (The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.)

U = Not detected

Bold = Detected Concentration

Bold = Detected Concentration

Boxed = Exceeds TSCA 50 ppm threshold

Shaded = 100 - 10,000 mg/kg (Dangerous Waste)

Underlined = Exceeds 10,000 mg/kg (Extremely Hazardous Waste)

BLUE = Non-detected results whose detection limit exceeds TSCA 50 ppm threshold due to dilution of sample

mg/kg - milligrams per kilogram

ug/100cm2 - micrograms per 100 square centimeters

< - The analyte was not detected above the indicated reporting limit.

Table 4. RI - Initial Investigation Site Data – Filtration Basin
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Exterior Coating (mg/kg)							
FB-EXPC-01	100 U	100 U	100 U	100 U	100 U	**14000 J**	**11000 J**
FB-EXPC-02	1,000 UJ	1,000 UJ	1,000 UJ	1,000	1,000	**20000 J**	**15000 J**
FB-EXPC-03	100 U	100 U	100 U	100 U	100 U	**14000 J**	**11000 J**
FB-EXPC-04	100 UJ	100 UJ	100 UJ	100 U	100 U	**15000 J**	**11000 J**
Interior Coating (mg/kg)							
FB-INPC-01	100 U	100 U	**200 J**	100 U	100 U	**870 J**	100 U
FB-INPC-02	1 U	1 U	**2.1 J**	1 U	1 U	**6.3 J**	1 U
FB-INPC-03	100 UJ	100 UJ	100 UJ	100 U	100 U	**330 J**	100 U
FB-INPC-04	100 U	100 U	**770**	100 U	100 U	**3300 J**	100 U
FB-INPC-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.26 J**	0.2 U
FB-INPC-06	20 U	20 U	**130 J**	20 U	20 U	**680 J**	20 U
Concrete (mg/kg)							
FB-CONC-01	20 U	20 U	**43 J**	20 U	20 U	**190 J**	20 U
FB-CONC-02	20 UJ	20 UJ	20 UJ	20 U	20 U	**160 J**	20 U
FB-CONC-03	20 UJ	20 UJ	20 UJ	20 U	20 U	**180 J**	20 U
FB-CONC-04	4 U	4 U	**25**	4 U	4 U	**110 J**	4 U
FB-CONC-05	4 U	4 U	**11**	4 U	4 U	**59 J**	4 U
FB-CONC-06	4 U	4 U	**10**	4 U	4 U	**54 J**	4 U
Pipe Gallery Concrete (mg/kg)							
FB-PGCONC-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.52 J**	0.2 U
FB-PGCONC-02	2 U	2 U	2 U	2 U	2 U	**180 J**	2 U
Filer Media Anthracite (mg/kg)							
FB-ANTH-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U
FB-ANTH-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
FB-ANTH-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-ANTH-04	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
FB-ANTH-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-ANTH-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Filter Media Sand (mg/kg)							
FB-SAND-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SAND-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
FB-SAND-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SAND-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SAND-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SAND-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 4. RI - Initial Investigation Site Data – Filtration Basin
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Filter Media Gravel Bed (mg/kg)							
FB-BED-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.22 J**	0.2 U
FB-BED-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
FB-BED-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-BED-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-BED-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-BED-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Fiberglass Trough Wipe (ug/100cm2)							
FB-FIBWIPE-01	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FB-FIBWIPE-02	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FB-FIBWIPE-03	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FB-FIBWIPE-04	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FB-FIBWIPE-05	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FB-FIBWIPE-06	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Data Qualifiers
J = Estimated Value (The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.)
UJ = Non-detected estimated (The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.)
U = Not detected
Bold = Detected Concentration

Bold = Detected Concentration
Boxed = Exceeds TSCA 50 ppm threshold
Shaded = 100 - 10,000 mg/kg (Dangerous Waste)
Underlined = Exceeds 10,000 mg/kg (Extremely Hazardous Waste)
BLUE = Non-detected results whose detection limit exceeds TSCA 50 ppm threshold due to dilution of sample
mg/kg - milligrams per kilogram
ug/100cm2 - micrograms per 100 square centimeters
< - The analyte was not detected above the indicated reporting limit.

Table 5. RI - Initial Investigation Site Data – Clearwell
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Clear Well - Redwood Baffle (mg/kg)							
CW-BAF-01	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CW-BAF-02	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CW-BAF-03	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Clear Well - Concrete (mg/kg)							
CW-CONC-01	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-03	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-04	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-05	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-06	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-07	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-08	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-09	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
CW-CONC-10	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
Clear Well - Sediment (mg/kg)							
CW-SED-01	0.2 UJ	0.2 UJ	**2.3 J**	0.2 UJ	0.2 UJ	**4.1 J**	0.2 UJ
CW-SED-02	0.2 U	0.2 U	**2 J**	0.2 U	0.2 U	**5.6 J**	0.2 UJ
CW-SED-03	0.2 UJ	0.2 UJ	**7.3 J**	0.2 UJ	0.2 UJ	**3.7 J**	0.2 UJ
CW-SED-04	0.2 UJ	0.2 UJ	**1.1 J**	0.2 UJ	0.2 UJ	**4 J**	0.2 UJ
CW-SED-05	0.2 UJ	0.2 UJ	**1.2 J**	0.2 UJ	0.2 UJ	**5 J**	0.2 UJ
CW-SED-06	0.2 UJ	0.2 UJ	**0.38 J**	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ

Table 5. RI - Initial Investigation Site Data – Clearwell
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Wastewell - Concrete (mg/kg)							
WF-CONC-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WF-CONC-02	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WF-CONC-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WF-CONC-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WF-CONC-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WF-CONC-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Wastewell - Sediment (mg/kg)							
WF-SED-01	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	**0.26 J**	0.2 U
WF-SED-02	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
WF-SED-03	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	**3.4 J**	0.2 U
WF-SED-04	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	**0.49 J**	0.2 U

Data Qualifiers
J = Estimated Value (The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.)
UJ = Non-detected estimated (The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.)

Bold = Detected Concentration
mg/kg = milligrams per kilogram
< = The analyte was not detected above the indicated reporting limit.

Table 6. RI - Initial Investigation Site Data – Administration Building
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Caulk/Glaze (mg/kg)							
AB-SEAL-01	20 U	20 U	20	20	20	**500 J**	20 U
AB-SEAL-02	1 UJ	1 UJ	1 UJ	1 U	1 U	**47 J**	1 U
AB-SEAL-03	1 U	1 U	1 U	1 U	1 U	**91 J**	1 U
AB-SEAL-04	1 UJ	1 UJ	1 UJ	1 U	1 U	**6.6 J**	1 U
AB-SEAL-05	10 U	10 U	10 U	10 U	10 U	**160 J**	**250 J**
AB-SEAL-06	20 U	20 U	20 U	20 U	20 U	**420 J**	**220 J**
AB-SEAL-07	5 U	5 U	5 U	5 U	5 U	**260 J**	5 U
AB-SEAL-08	2 UJ	2 UJ	**2.8 J**	2 U	2 U	**15 J**	2 U
AB-SEAL-09	5 U	5 U	5 U	5 U	5 U	**53 J**	5 U
AB-SEAL-10	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	**9.6 J**
Paint Chip (mg/kg)							
AB-WINDOW WIPE-01	1 U	1 U	1 U	1 U	1 U	**1.7**	1 U
Window Sill Wipe (*u* g/100cm^2)							
AB-WINDOW WIPE-01	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-WINDOW WIPE-02	10 U	10 U	10 U	10 U	10 U	**13 J**	10 U
AB-WINDOW WIPE-03	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Data Qualifiers

J = Estimated Value (The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.)

UJ = Non-detected estimated (The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.)

Bold = Detected Concentration

Boxed = Exceeds TSCA 50 ppm threshold

Boxed = Exceeds TSCA 10 *u* g/100cm^2 threshold

Shaded = 100 - 10,000 mg/kg (Dangerous Waste)

U = Not detected

- The analyte was not detected above the indicated reporting limit.

mg/kg - milligrams per kilogram

ug/100cm^2 - micrograms per 100 square centimeters

Table 7. RI- Data Gap Investigation – Sedimentation Basin Soil
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 605479										
SB-SOIL-12-01	5/23/2016	605479-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**3.3**	**3.5**	**6.8**
SB-SOIL-36-01	5/23/2016	605479-02	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-02	5/23/2016	605479-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.33**	**0.29**	**0.62**
SB-SOIL-36-02	5/23/2016	605479-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-03	5/24/2016	605479-31	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.34**	**0.2**	**0.54**
SB-SOIL-36-03	5/24/2016	605479-32	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-04	5/23/2016	605479-09	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-36-04	5/23/2016	605479-10	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-05	5/24/2016	605479-29	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**1.2**	**1.5**	**2.7**
SB-SOIL-36-05	5/24/2016	605479-30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.28**	**0.29**	**0.57**
SB-SOIL-12-06	5/23/2016	605479-11	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-36-06	5/23/2016	605479-12	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-07	5/24/2016	605479-27	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-36-07	5/24/2016	605479-28	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-08	5/24/2016	605479-33	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-DUP	5/24/2016	605479-35	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-36-08	5/24/2016	605479-34	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.21**	0.2 U	**0.21**
SB-SOIL-12-09	5/23/2016	605479-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.33**	**0.57**	**0.9**
SB-SOIL-36-09	5/23/2016	605479-06	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-12-10	5/23/2016	605479-07	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SB-SOIL-36-10	5/23/2016	605479-08	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RINSATE-02	5/24/2016	605479-43	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
Bold indicates the analyte was detected above the MDL.
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

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Table 8. RI- Data Gap Investigation – Filtration Basin Soil
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 605479										
FB-SOIL-12-01	5/23/2016	605479-15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.52**	**0.54**	**1.06**
FB-SOIL-36-01	5/23/2016	605479-16	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SOIL-12-02	5/23/2016	605479-13	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SOIL-36-02	5/23/2016	605479-14	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SOIL-12-03	5/23/2016	605479-24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**6.9**	**8.7**	**15.6**
FB-SOIL-36-03	5/23/2016	605479-25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RINSATE-01	5/23/2016	605479-26	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
FB-SOIL-12-04	5/23/2016	605479-22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**1.9**	**1.2**	**3.1**
FB-SOIL-36-04	5/23/2016	605479-23	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.24**	0.2 U	**0.24**
FB-SOIL-12-05	5/23/2016	605479-19	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.57**	**0.53**	**1.1**
FB-SOIL-12-DUP	5/23/2016	605479-21	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.36**	**0.35**	**0.71**
FB-SOIL-36-05	5/23/2016	605479-20	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
FB-SOIL-12-06	5/23/2016	605479-17	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.6**	**0.72**	**1.32**
FB-SOIL-36-06	5/23/2016	605479-18	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.33**	**0.24**	**0.57**

Notes:
Bold indicates the analyte was detected above the MDL.
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

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Table 9. RI - Data Gap Investigation – Clearwell Sediment
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 605479										
CW-SED-01	5/24/2016	605479-36	0.00001 U	0.00001 U	0.00001 U	0.00001 U	**0.00085**	**0.00068**	0.00001 U	**0.00153**
CW-SED-02	5/24/2016	605479-37	0.00001 U	0.00001 U	0.00001 U	0.00001 U	**0.00071**	**0.00032**	0.00001 U	**0.00103**
CW-SED-DUP	5/24/2016	605479-38	0.00001 U	0.00001 U	0.00001 U	0.00001 U	**0.00058**	**0.00025**	0.00001 U	**0.00083**
CW-SED-03	5/24/2016	605479-39	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**0.67**	0.4 U	**0.67**
CW-SED-04	5/24/2016	605479-40	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**2.8**	0.4 U	**2.8**
CW-SED-05	5/24/2016	605479-41	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**1.9**	0.4 U	**1.9**
CW-SED-06	5/24/2016	605479-42	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**2.5**	0.4 U	**2.5**

Notes:
Bold indicates the analyte was detected above the MDL.
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

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Table 10. RI - Data Gap Investigation – Settling Lagoon Soil
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 606032										
SL-SOIL-01	5/25/2016	606032-01	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SL-SOIL-02	5/25/2016	606032-02	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SL-SOIL-03	5/25/2016	606032-03	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SL-SOIL-04	5/25/2016	606032-04	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SL-SOIL-DUP	5/25/2016	606032-05	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Notes:
Bold indicates the analyte was detected above the MDL.
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

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Table 11. RI - Data Gap Investigation – Groundwater
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 606032										
PZ-FILT-01	6/1/2016	606032-08	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-FILT-02	6/1/2016	606032-09	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-FILT-04	6/1/2016	606032-06	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-FILT-06	6/1/2016	606032-21	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DUP-2	6/1/2016	606032-20	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-01	5/31/2016	606032-18	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-02	5/31/2016	606032-24	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-03	6/1/2016	606032-07	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-04	6/1/2016	606032-10	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-04 MS	6/1/2016	606032-11	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-04 MSD	6/1/2016	606032-12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-06	6/1/2016	606032-13	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-07	6/1/2016	606032-17	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-08	6/1/2016	606032-22	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-09	5/31/2016	606032-25	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DUP-1	5/31/2016	606032-19	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
PZ-SED-10	5/31/2016	606032-26	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DG-GW	6/1/2016	606032-23	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

Notes:
Bold indicates the analyte was detected above the MDL.
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

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Table 12. RI - Data Gap Investigation – PCB Wipe Samples
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 605479										
AB-Wipe-01	5/25/2016	605479-49	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-02	5/25/2016	605479-50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-03	5/25/2016	605479-51	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-04	5/25/2016	605479-52	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-05	5/25/2016	605479-53	10 U	10 U	10 U	10 U	10 U	**10**	10 U	**10**
AB-Wipe-06	5/25/2016	605479-54	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-07	5/25/2016	605479-55	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-08	5/25/2016	605479-56	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-09	5/25/2016	605479-57	10 U	10 U	10 U	10 U	10 U	**17**	10 U	**17**
AB-Wipe-10	5/25/2016	605479-58	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-11	5/25/2016	605479-59	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
AB-Wipe-12	5/25/2016	605479-60	10 U	10 U	10 U	10 U	10 U	**43**	10 U	**43**

Notes:
Bold indicates the analyte was detected above the MDL.
Boxed = Exceeds TSCA 10 *u* g/100cm^2 threshold
U: The analyte was analyzed for but was not detected above the MDL.
UJ: The analyte was not detected above the reported analyte MDL, however the detection limit is estimated.
SDG: Sample Delivery Group
MDL: Method Detection Limit

Results reported in mg/kg (ppm)
mg/kg miligrams per kilogram
ppm: parts per million
DUP: Duplicate sample for QC purposes

Method SW-846 8082

Table 13. RI - Data Gap Investigation – Mastic Coating
Remedial Investigation - Anacortes Water Treatment Plant
Mount Vernon, Washington

Sample ID	Sample Date	Laboratory ID	Aroclor 1221	Aroclor 1232	Aroclor 1016	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total Aroclors
SDG: 1610630/605479			**TCLP Polychlorinated Biphenyls (PCBs) µg/L (ppb)**							
SB-MASTIC-01	5/20/2016	16220849	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**3.2**	**1.7**	**4.9**
SB-MASTIC-02	5/20/2016	16220850	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**3.1**	**1.6**	**4.7**
DUP-MASTIC-01	5/20/2016	16220851	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
FB-MASTIC-01	5/20/2016	16220852	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
CW-MASTIC-01	5/20/2016	16220853	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

Sample ID	Sample Date	Laboratory ID	Layer 1 of 3	Layer 2 of 3	Layer 3 of 3
SDG: 1610630/605479			**Asbestos (%)**		
SB-MASTIC-01	5/20/2016	16220849	1% U	1% U	1% U
SB-MASTIC-02	5/20/2016	16220850	1% U	1% U	1% U
DUP-MASTIC-01	5/20/2016	16220851	1% U	1% U	1% U
FB-MASTIC-01	5/20/2016	16220852	1% U	1% U	1% U
CW-MASTIC-01	5/20/2016	16220853	1% U	1% U	1% U

Notes:
Bold indicates the analyte was detected above the MDL.
Total Aroclors = sum of individual Aroclors
U: The analyte was analyzed for but was not detected above the MDL.
SDG: Sample Delivery Group
SB: Sedimentation Basin
FB: Filtration Basin
CW: Clear Well

DUP: Duplicate sample for QC purposes
TCLP = Toxicity Characteristic Leaching Procedure

Methods:
TCLP PCBs: SW-846 8082
Asbestos: EPA/600/R-93/116 & EPA/600/M4-82-020

APPENDICES

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Appendix A. SP and QAPP

1 - FINAL Anacortes WTP SP v1.10 (04-14-16)

2 - FINAL Anacortes WTP QAPP v1.7 (06-4-15)

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SAMPLING PLAN

Anacortes Water Treatment Plant
Mount Vernon, Washington

Prepared For:
City of Anacortes, c/o Foster Pepper PLLC

Prepared By:
MWH Americas, Inc.

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1. INTRODUCTION

This ***Sampling Plan*** has been prepared by MWH Americas, Inc. (MWH) on behalf of the City of Anacortes, at the request of Foster Pepper PLLC (legal counsel for the City). The purpose of the plan is to support future sampling activities associated with the demolition of unused facilities located at the Anacortes Water Treatment Plant (WTP) in Mount Vernon, Washington.

This Sampling Plan describes the following representative sample methods utilized for the characterization of the following types of materials prior to demolition of unused features on site:

(1) Concrete structures – collection of dust from hammer drill penetration
(2) Material used to coat concrete structures and other metal structures – collection of paint chips and below grade mastic
(3) Sediment within settling basins – grab sample collection
(4) Redwood baffles – collection of dust from drill penetration
(5) Expansion joint sealant – grab sample collection
(6) Expansion joint cork - grab sample collection
(7) Filter basin filter media - grab sample collection
(8) Filter basin gravel bed - grab sample collection
(9) Window caulk/glazing - grab sample collection
(10) Soil – composite sample collection from varying depth of geoprobe/hand auger boring
(11) Groundwater – low flow grab sample collection

Samples will be analyzed for polychlorinated biphenyl (PCB) Aroclors. The results for each Aroclor will be summed and then compared with the Toxic Substances Control Act (TSCA) limit of 50 milligrams per kilogram (mg/kg) to determine if the material will be managed as TSCA or non-TSCA material. In addition, select samples will be analyzed for Resource, Conservation, and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals to determine whether hazardous waste limits have been exceeded. Select samples will be analyzed for total lead for health and safety purposes, utilizing SW-846 requirements and industry standards.

Lead-based paint screening will be conducted using a handheld X-Ray Fluorescence (XRF) analyzer. A full asbestos survey will be conducted by a certified asbestos inspector under separate contract, and is not part of this ***Sampling Plan***.

1.1. BACKGROUND

The site is located in Mount Vernon, Washington and consists of a WTP. The WTP is owned and operated by the City of Anacortes. Several on-site features are scheduled for demolition and disposal (e.g., admin building, filter basins, and sedimentation basins.)

The plan has been to remove/salvage mechanical equipment and then break up the concrete and brick, push the rubble into the existing basins, and place a soil cap on top. Building materials were recently characterized prior to demolition and found to contain elevated levels of lead, arsenic, aromatic hydrocarbons, and PCBs. Based on preliminary characterization information, the detected PCBs may come from coatings and sealants used in construction and applied to interior and exterior surfaces of concrete basins and structures, and potentially to window treatment compounds.

2. SAMPLE PROGRAM DESIGN

This section addresses sample program design, including identification of the quantity, and location for sample collection in order to ensure representativeness and comparability quality objectives are met. Representativeness and comparability are defined in the project-specific ***Quality Assurance Project Plan*** (QAPP, March 2015).

2.1. SAMPLE CRITERIA

Criteria used to design the sampling program are detailed in ***Tables 1 and 1A.*** The tables divide the site into Sub-Areas intended to group sample collection activities geographically. Each Sub-Area contains various media intended for sample collection based upon review of construction drawings, site photographs, and prior screening-level investigation activities (***Hazardous Materials Investigation, City of Anacortes Water Treatment Plant; DLH Environmental Consulting; January 28, 2015***).

Specific conditions or dimensions are listed for the media, and criteria used to calculate the proposed number of samples is documented. Criteria included a number of samples per bay/chamber or other location; number of horizontal surface or vertical surface samples; or other distribution factors intended to ensure representativeness.

2.2. QUALITY CONTROL SAMPLES

The overall quality assurance (QA) objective for this project is to develop and implement procedures for field sampling, laboratory analysis, chain-of-custody, and reporting that will meet all applicable industry standards. The QAPP outlines specific requirements to meet this objective, including collection of field quality control (QC) samples. Field QC sample distribution is calculated and exhibited in ***Tables 1 and 1A*** based upon the level of quality control effort described in the QAPP:

- Duplicate samples are analyzed to check for sampling and analytical reproducibility. **One duplicate sample for every 10 investigative samples collected (or fewer investigative samples) of a given matrix**

- MS/MSDs provide information about the effect of the sample matrix on the digestion and measurement method. MS/MSD samples are designated for organic analyses only. **One MS/MSD should be collected for every 20 (or fewer) investigative samples of a given matrix.**

2.3. SAMPLE MATRICES

Based upon the number of samples calculated for each Sub-Area and the type of media in ***Table 1***, specific sample identification nomenclature has been established to facilitate tracking and assessment of analytical results. A sample matrix for each Sub-Area is included in ***Table 2*** that lists all preliminary sample identifier assignments by media along with associated analytical requirements.

The number and identification of samples by Sub-Area or media is subject to change based upon field conditions, and will be documented accordingly as required in the QAPP Field Corrective Action section. The MWH Project Technical Lead (PTL) or his designee is responsible for all site activities. In this role, the MWH PTL, at times is, required to adjust the site programs to accommodate site specific needs. When it becomes necessary to modify a sampling portion of the program, the responsible person notifies the MWH PTL of the anticipated change and implements the necessary changes after obtaining the approval of the MWH PTL. The MWH PTL must approve the change in writing or verbally prior to field implementation, if feasible. If unacceptable, the action taken during the period of deviation will be evaluated in order to determine the significance of any departure from established program practices and action taken. The MWH PTL is responsible for the controlling, tracking, and implementation of the identified changes. Reports on all changes will be distributed to affected parties.

3. SAMPLING PROCEDURES

This section addresses field sample collection methods by describing tools, equipment, personal protective equipment (PPE), decontamination, and waste management.

3.1. COATING SAMPLE COLLECTION

3.1.1 Concrete Coatings

Thirty-six coating samples and eight QC samples will be collected from concrete structures of the sediment basin, filter basin, and pipe gallery. The coating materials will be analyzed for PCBs; some samples will be analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals as indicated in ***Table 2***.

Four samples of below grade, exterior mastic samples will be collected from the sedimentation basin, filter basin, and pipe gallery as indicated in ***Table 1A***. Mastic material will be analyzed for PCBs and asbestos fibers. The below grade mastic material will be collected by a Washington State licensed asbestos inspector.

- Coating samples will be collected by scraping coated concrete surfaces to separate coating materials from the concrete substrate and collecting the coating chips or flakes.
- Sampling personnel will use paint scrapers, chisels, hammers, and/or razor blades to separate coating materials from concrete.
- To prevent volatilization of PCBs or metals from sample materials, mechanical grinders and thermal paint removal tools will not be used.
- Sample collection personnel will wear appropriate eye protection and inner nitrile gloves and outer leather gloves. Samplers will wear dust masks.
- Samples will be collected by hand and placed into sealed sample jars for transport to the laboratory.
- No preservative will be applied to bulk samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

3.1.2 Lead-Based Paint Screening

Representative quantities and locations of painted surfaces will be analyzed for the presence of lead in accordance with ASTM Standard E 1908-97 - Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for TCLP Testing for Leachable Lead. The quantities and locations for analysis will be determined in the field by the sampling team. Prior to collecting a sample, the concentration of total lead in painted surfaces will be field-screened using an Olympus DELTA DS2000 XRF handheld metals analyzer or equivalent. The screening will be performed in accordance with the manufacturer's instructions and as described in the ***Sample and Waste Characterization Plan Number Four - Screen and***

Calculate Lead Concentration, located on the State of Washington Department of Ecology website at http://www.ecy.wa.gov/programs/hwtr/dangermat/samplePlans.html.

A concentration of 100 milligrams per kilogram represents the lowest possible mass analysis concentration which could leach out greater than 5.0 milligrams per liter in a TCLP test. This is due to the 20:1 dilution ratio of the TCLP test protocol, and also assumes that 100% of the lead in the sample will leach out. Although in reality 100% of the lead would rarely leach out this assumption must be made in the place of actual TCLP results. This "worst-case" assumption adds a "safety factor" to compensate for potential errors in the data or in calculating the mass of the structure.

For locations where the concentration of lead is greater than 100 mg/kg, a bulk sample of paint will be collected as described above and analyzed for total and TCLP lead in order to determine if lead abatement precautions are required, or if the paint and/or painted substrate should be considered dangerous waste in accordance with WAC 173-303-090. For locations where the concentration of lead is less than 100 mg/kg, a limited number of samples (one per paint color) will be collected for laboratory analysis to confirm the initial XRF readings.

3.2. CONCRETE AND REDWOOD SAMPLE COLLECTION

A total of sixty-six concrete samples and fifteen QC samples will be collected from the sedimentation basin, filter basin, and clear-well for analyses of PCBs, and some samples analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals. An additional three samples and three associated QC samples will be collected from redwood baffles located in the clear-well. See the Sample Matrices (***Table 2)*** for analysis specified at each location. Samples will be collected from locations without surface coating materials.

- A hammer drill with 1” carbide-tipped bit will be used to drill into concrete floors and walls at specified locations.
- Drilling will be conducted in accordance with ***Draft Standard Operating Procedure for Sampling Concrete in the Field; USEPA Region 1; December 1,*** 1997 **(Appendix A*)***. Sample holes will be less than 3” in depth. Multiple holes may be required in a single location to collect sufficient sample mass, or if obstructions are encountered from aggregate and rebar in the concrete. Multiple holes are to be located adjoining or overlapping to ensure sample homogeneity to the extent possible.
- A new hammer drill bit will be used for each discreet sampling location. Used hammer drill bits will not be decontaminated for reuse. Used bits will be wrapped in plastic or sealed in individual bags, labeled with the sample location, and stored in a sealed container pending sample analytical results. If analytical results indicate concrete media is below TSCA regulatory thresholds, the drill bits will be recycled as scrap steel. Otherwise, the drill bits will be disposed with other PCB regulated wastes.
- The wood samples will be collected by drilling into the wood surface using wood-specified bits and collecting the wood shavings and dust. A new drill bit will be used for each sample location.
- Used drill bits will not be decontaminated for reuse. Used bits will be wrapped in plastic or sealed in individual bags, labeled with the sample location, and stored in a sealed container pending sample analytical results. If analytical results indicate wood media is

below regulatory thresholds, the drill bits will be recycled as scrap steel. Otherwise, the drill bits will be disposed with other PCB regulated wastes.

- Drilling and sampling personnel will wear appropriate eye and hearing protection. Disposable Tyvek suits and leather gloves will be worn by drill operators. Respiratory protection in the form of half-face respirators with particulate cartridges will be required. Sample collection personnel will wear nitrile gloves.
- Surfaces to be drilled will be covered with foil to prevent dust/materials generated during drilling from contacting sediments or coating. Dust from vertical drilling activities will be collected in bags or trays positioned to capture loose material prior to it falling to the floor.
- Dust generated during drilling will be collected by hand using disposable spoons or scoops and placed into sealed sample jars for transport to the laboratory. The spoons or scoops will not be reused and will be included with the associated sample drill bit and ultimately disposed in the same manner. No preservative will be applied to bulk samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

3.3. SEALANT, CORK, AND CAULK/GLAZING SAMPLE COLLECTION

A total of twenty-three sealant, cork, or window caulk/glazing bulk samples and ten QC samples will be collected from the sedimentation basin expansion joint, Administration Building roof beam joints, and Administration Building window caulk/glazing for analysis of PCBs, and some samples analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals.

- Samples will be collected by cutting or scraping sealants and cork into sample jars.
- Sample personnel will use paint scrapers, chisels, hammers, and/or razor blades to extract the sealant and cork from the expansion joint or separate window caulk/glazing from the sill and frame.
- To prevent volatilization of PCBs, SVOCs, or metals from sample materials, mechanical grinders and thermal removal tools will not be used.
- Sample collection personnel will wear appropriate eye protection and inner nitrile gloves and outer leather gloves. Respiratory protection in the form of half-face respirators with particulate cartridges will be required for asbestos sampling.
- Samples will be collected by hand and placed into sealed sample jars for transport to the laboratory.
- No preservative will be applied to bulk samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

3.4. SEDIMENT AND FILTER MEDIA SAMPLE COLLECTION

Thirty-five bulk sediment/anthracite/sand/filter bed samples and sixteen QC samples will be collected from the sedimentation basin, filter basin, and clear-well. Sample locations and identifications are shown on ***Table 2.*** All samples will be analyzed for PCBs, and some samples will be analyzed for total lead, TCLP VOCs, TCLP SVOCs, and TCLP metals.

Four additional dry sediment samples will be collected from previously uninvestigated portions of the clear well. Two wet sediment samples will be collected from the pump well. Three QC samples will also be collected. Samples are indicated in ***Table 1A***

- Samples will be collected using disposable spoons or trowels in locations where sediments are less than six inches in depth to underlying substrate.
- Samples collected from within standing water will be collected as sediment laden water to be settled, decanted, and analyzed as solid. Each wet sample will be at least two liters in volume.
- In locations with over six inches of accumulated sediment, hand augers or cores will be used to access the full depth and facilitate collection of discreet grab samples at separate strata or pre-designated depths.
- Hand augers or cores will be decontaminated between sample locations by washing in potable water amended with Alconox and rinsing in deionized water. Decontamination wash and rinse water will be kept in separate, sealable 5-gallon buckets, which will be emptied into a waste disposal drum at the end of each day.
- One rinsate QC sample will be collected per 10 discreet sediment characterization samples.
- Sample collection personnel will wear disposable Tyvek suits, appropriate eye protection inner nitrile gloves and outer leather gloves.
- Samples will be collected by hand and placed into sealed sample jars for transport to the laboratory.
- No preservative will be applied to bulk samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

3.5. SURFACE WIPE SAMPLE COLLECTION

Six wipe samples will be collected from the fiberglass troughs in the filter basin, and two wipe samples will be collected from fiberglass collector boards in the sedimentation basin. Wipe samples will be collected in accordance with the definition of Standard Wipe Test outlined in 40 CFR 761.123 and analyzed for PCBs.

Twelve wipe samples will be collected from walls, floors, and equipment surfaces in the Administration Building and Pump Room as indicated in ***Table 1A***.

- Individual disposable templates measuring 10 cm X 10 cm will be used to isolate sample areas. A new, clean template will be used for each separate wipe sampling location, and hexane will be employed as the solvent for PCB wipe samples.
- Sample collection wipes shall be delivered from the laboratory pre-wetted with hexane.
- Wipe sample collection personnel will wear appropriate eye protection and nitrile gloves.

3.6. SOIL SAMPLE COLLECTION

MWH will subcontract a WA licensed drilling firm to advance a total of 17 geoprobe soil borings with temporary piezometers installed to collect groundwater. Ten geoprobe soil borings will be advanced in the vicinity of the Sedimentation Basin, and six geoprobe soil borings will be advanced in the vicinity of the Filtration Basin and Clearwell.

- Soil samples from drilling will be continuously logged by a qualified geologist/engineer for lithologic description.
- One composite soil sample will be collected from the 0”-12” interval of each of 16 geoprobes for a total of 16 samples as indicated in ***Table 1A*** and analyzed for PCBs. No soil samples will be collected from the single downgradient groundwater sampling geoprobe.
- One composite soil sample will be collected from the 12”-36” interval of each of 16 geoprobes for a total of 16 samples as indicated in ***Table 1A*** and analyzed for PCBs. No soil samples will be collected from the single downgradient groundwate sampling geoprobe.
- Six QC samples will also be collected.
- Sample collection personnel will wear disposable Tyvek suits, appropriate eye protection and nitrile gloves.
- Soil for testing will be extracted from the sample tooling and placed directly into laboratory-supplied sample containers using decontaminated or single-use disposable tools as necessary jars for transport to the laboratory.
- No preservative will be applied to bulk samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

Two hand auger soil borings will be advanced in one of the sediment settling lagoons. Location will be determined by assessing which lagoon is dry and affords geoprobe equipment access.

- Soil samples will be collected from the “native” soil stratum beneath the sediment layer in the lagoon.
- One soil sample will be collected from the 0”-12” interval of native soils in each of 2 hand auger borings for a total of 2 samples as indicated in ***Table 1A*** and analyzed for PCBs.
- One QC sample will also be collected.

3.7. GROUNDWATER SAMPLE COLLECTION

MWH will subcontract a WA licensed drilling firm to advance a total of 17 geoprobe soil borings with 1.5" diameter polyvinylchloride temporary piezometers installed to collect groundwater. Ten geoprobe soil borings will be advanced in the vicinity of the Sedimentation Basin, and six geoprobe soil borings will be advanced in the vicinity of the Filtration Basin and Clearwell. Upon completion, the piezometers will be developed by surging, bailing, and/or pumping to reduce turbidity of the extracted groundwater. An attempt will be made to evacuate ten well volumes of water from each monitoring well during development activities. Monitoring wells will be developed for a maximum period of two hours. Geochemical data – conductivity, pH, temperature, oxidation-reduction potential, dissolved oxygen, and turbidity – will be collected before and after development.

- Groundwater samples will be collected at least 24 hours following well development. Prior to collecting groundwater samples, the depth to groundwater will be measured in each of the wells relative to a fixed reference point at the top of the well casing created during an elevation survey. Groundwater will be purged following low-flow sampling procedures and then sampled once geochemical data (same as above) have stabilized per USEPA guidelines. Groundwater purging and sampling will be limited to a maximum period of 1.5 hours per well that is sampled.
- Each groundwater sample will be two liters in volume.
- One groundwater sample will be collected from the temporary piezometer installed in each of 16 soil borings for a total of 16 groundwater samples as indicated in ***Table 1A*** and analyzed for PCBs.
- One groundwater sample will be collected from a temporary piezometer installed in the assumed down gradient location from the sedimentation basin as indicated in ***Table 1A***. The groundwater sample will be analyzed for PCBs.
- Four QC samples will also be collected.
- Sample collection personnel will wear disposable Tyvek suits, appropriate eye protection and nitrile gloves.
- Groundwater samples will be transferred directly into laboratory-supplied containers for transport to the laboratory.
- No preservative will be applied to aqueous groundwater samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.
- Temporary piezometers will be abandoned according to state of Washington requirements upon receipt of laboratory results. Piezometers may be sampled a second time based on the results of the initial data.

3.8. INVESTIGATION DERIVED WASTE (IDW)

Separate composite samples from liquid and solid Investigate Derived Wastes (IDW) will be collected and analyzed for common waste characterization parameters.

- Samples will be analyzed for TCLP VOCs, TCLP SVOCs, and TCLP metals.

- Sample collection personnel will wear disposable Tyvek suits, appropriate eye protection and nitrile gloves.
- Soil Samples will be collected by hand and placed into sealed sample jars for transport to the laboratory.
- Groundwater samples will be transferred directly into laboratory-supplied containers for transport to the laboratory.
- No preservative will be applied to IDW soil samples.
- Any unused samples will be retained for one year by the laboratory, in accordance with USEPA hold time requirements. After one year, the laboratory will dispose of all unused samples according to their disposal protocol.

3.9. ANALYSES

The samples are to be analyzed as indicated in ***Tables 1, 1A and 2***. All analyses are to be performed in accordance with respective USEPA methods. The following laboratory methods are specified for analyzing samples:

- PCBs by USEPA Method SW-846 8082. Analytical results for bulk solid samples will be reported in mg/kg with a detection limit of 1.0 mg/kg (ppm). Analytical results for PCB wipes samples will be reported in μg/100cm^2 with a goal for detection limits of 0.5 μg/100 cm^2 but at least equal to or below 1.0 μg/100 cm^2.

- TCLP RCRA regulated metals prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Methods SW-846 6010/7470 and 7471 for mercury.

- TCLP RCRA regulated VOCs prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Method SW-846 8260C.

- TCLP RCRA regulated SVOCs prepared by USEPA Method SW-846 1311 and then analyzed by USEPA Method SW-846 8270C.

- Total lead by USEPA Method SW-846 6010/7470**.**

- Percent asbestos by polarized light microscopy.

3.10. SAMPLE MANAGEMENT AND CUSTODY

Proper management of samples and associated data is crucial for subsequent utilization in reporting internally and to regulatory agencies. Sufficient data regarding sample conditions, locations, and geographic distributions serves to facilitate decision making with respect to building materials disposition.

3.10.1. Sample Data

An example sampling checklist is included in ***Appendix B***. The following information must be recorded for each sample:

(1) Sample Identification
(2) Analytical requirements
(3) Notes regarding sample site location and condition
(4) Sample Location – GPS coordinates, triangulated measurements, or survey data
(5) Photographs of before, during, and after sample extraction and collection conditions. Cross reference photograph IDs with sample locations and identification.
(6) Monitoring data collected during sampling if applicable.
(7) Associated QC sample identification.
(8) Laboratory chain-of-custody and shipment identification.

3.10.2. Field Custody Procedures

Custody is one of several factors which are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity.

A sample or evidence file is under custody if:

- The item is in actual possession of a person.
- The item is in the view of the person after being in actual possession of the person.
- The item was in actual physical possession but is locked up to prevent tampering.
- The item is in a designated and identified secure area.

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain-of-custody intact. An example chain-of-custody form is included in ***Appendix B***.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. Field procedures have been designed such that as few people as possible will handle the samples. Sample tags will be used for all samples for which chain-of-custody is to be maintained.

- All bottles will be identified by the use of sample tags with sample numbers, sampling locations, date/time of collection, and type of analysis.

- Sample tags will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample tag because the ballpoint pen would not function in freezing weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage area.

- Samples will be properly packaged on ice at 4ºC for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be locked and secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by the field team leader. The cooler will be strapped shut with strapping tape in at least two locations.

- Shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and the pink and yellow copies will be retained by the sampler for returning to the sampling office.

- If the samples are sent by common carrier, a bill of lading will be used. Receipts of bills of lading will be retained as part of the permanent documentation. If sent by mail, the package will be registered with return receipt requested. Commercial carriers are not required to sign off on the custody form since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples will be transported to the laboratory the same day that the samples are collected (or as soon as possible) by overnight carrier.

3.11. MANAGEMENT OF PPE, SUPPLIES, AND CONSUMABLES

Equipment, containers, sampling devices, and supplies will be obtained prior to the beginning of the field activity. Disposable supplies (e.g., gloves, filters, Ziploc bags) will be purchased and stored in containers designated for this project.

Disposable Tyvek suits and nitrile gloves will not be transferred between sub-areas. Upon exiting one sub-area, field sampling personnel will doff disposable PPE and place into plastic bags for disposal. Field sampling personnel will don new disposable PPE upon entering any sub-area.

3.12. HEALTH AND SAFETY PRECAUTIONS

This project shall be conducted in accordance with Hazardous Waste Operations requirements under 29 CFR 1926.65 and WAC 296-843. A site-specific Health and Safety Plan (HASP) will be developed and implemented to minimize exposure to hazardous materials and risk of injury or illness due to field sampling activities. The HASP will incorporate elements of a written emergency plan as required in WAC 296-155-17309.

Preliminary sampling activities identified lead in coatings and/or concrete at concentrations below 50 ppm. Due to the low concentrations, exposure to lead is not expected to exceed the Occupational Safety and Health Administration (OSHA) PEL on an 8-hour time weighted average basis. An exposure assessment will be conducted in accordance with 29 CFR 1926.62 and WAC 296-155-176 during sampling activities via collection of personal air monitoring data. The results of personal air monitoring will be compared to the OSHA action level for airborne lead of 30 ***u***g/m^3. Personal air monitoring will also be conducted for comparison with OSHA Permissible Exposure Limits (PELs) for PCBs set at 0.5 mg/m^3 (54% chlorine) and 1.0 mg/m^3 (42% chlorine). In order to preclude potential volatilization of lead and PCBs, mechanical grinding and thermal removal are not authorized for sample extraction.

Air monitoring for particulate may be required during concrete drilling and sand/residue collection based upon visual dust observations. Work will be stopped and dust mitigation will be initiated as necessary, should ambient levels of airborne particulate exceed 2.5 mg/m^3 on a time weighted average basis. This is half of the OSHA PEL of **5 mg/m^3** for the respirable fraction of silicon dust.

Confined space entry will be required for sample collection in the sedimentation basin, filter basin, and clear-well. Field sample collection personnel will be certified in confined space entry and follow all procedures in the MWH HASP and City of Anacortes POL 28.23.11a Confined Space Entry. Confined spaces will have ambient air monitoring, means of communication, and at least one attendant at all times during active entries. Under no circumstances will the confined space attendant enter the confined space.

Some sample locations will require use of a ladder or scaffold for access. Under no circumstances should a sampler step off of a ladder or scaffold onto an elevated structure or lean more than ½ their body over the side of a ladder. Care should be taken when moving the ladder or scaffold to avoid pinches, or strains. Sample collection personnel will adhere to MWH HASP and City of Anacortes fall protection standards at all times. No samples will be collected from sedimentation basin troughs in locations where adequate fall protection is not available. Sample locations will be offset as needed to provide for the safety of the samplers.

Use of hammer drills, chisels, utility knives, and other mechanical equipment must be in accordance with manufacturer's recommendations, as well as the HASP and QAPP. Appropriate eye, hearing, and hand protection must be worn while operating equipment. Care should be taken during lifting and moving equipment to avoid pinches or strains. Appropriate harnesses, straps, stands, or other stabilization equipment provided by the manufacturer should be utilized to prevent injury. Any electric cords must be equipped with a GFI. The project HASP should be reviewed before starting work for detailed discussion on appropriate safety measures.

3.12.1. Training Requirements

Training requirements for this project are specified in 29 CFR 1910.120. Training shall be provided to all project personnel to ensure compliance with the health and safety plan and technical competence in performing the work effort. Documentation of this training shall be maintained in the records of the contracted organizations.

The following current training is required of field personnel:

- 40-hour HAZWOPER
- Ladder Safety
- Fall Protection PPE Usage
- Working with Lead Exposure in Construction Environments (1 hour)
- Asbestos Awareness (0.75 hour)
- Health and Safety Plan Review and Acknowledgement

3.12.2. Inspection Requirements

Routine documented inspections will be required to ensure safety.

The following daily inspections will be required:

- Ladders and scaffold
- Fall Protection PPE
- Electric Tools
- Electric Cords

3.13. WASTE DISPOSAL

All used nitrile gloves, Tyvek, hearing protection, respiratory protection (cartridges or masks), and empty discarded sample jars will be collected in a trash bag, and placed into on-site non-hazardous waste containers.

Decontamination wash and rinse water will be placed into drums with proper label indicating “waste pending profile,” sampled for waste analysis determination, and closed for storage. Waste materials will be transported for disposal within 90 days of filling the drum.

Used drill bits will be wrapped in plastic or sealed in individual bags, labeled with the sample location, and stored in a sealed container pending sample analytical results. If analytical results indicate concrete media is below TSCA regulatory thresholds, the drill bits will be recycled as scrap steel. Otherwise, the drill bits will be disposed with other PCB regulated wastes.

3.14. DATA MANAGEMENT

3.14.1. Data Reduction

Raw data from field measurements and sample collection activities will be appropriately recorded in the field notebook. If the data are to be used in the project reports, they will be reduced to a format appropriate for presentation (e.g., spreadsheet). Each document will undergo a quality control check wherein the raw data are compared with the data presented in the document.

3.14.2. Documents and Records

The final evidence file will be the repository for all documents which constitute evidence relevant to sampling activities as described in this Sampling Plan. MWH, on behalf of Foster Pepper, is the custodian of the evidence file and maintains the contents of evidence files for the investigations, including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews in a secured, limited access area. This area will be located:

MWH Office
2353 130th Avenue NE, Suite 200
Bellevue, Washington 98005

2353 130th Avenue NE, Suite 200
Bellevue, Washington 98005

If not otherwise directed by the City or counsel for the City, documents will be retained for up to three years following sample collection and will be the responsibility of the MWH Project Manager. Documents will not be discarded or deleted without advance notice to the City.

The final evidence file will include:

- Field logbooks
- Field data and data deliverables
- Photographs – Digital photograph will not be taken using cellular telephones
- Drawings
- Soil boring logs
- Laboratory data deliverables
- Data validation reports
- Data assessment reports
- Progress reports, QA reports, interim project reports, etc.
- All custody documentation (tags, forms, air bills, etc.)

4. REFERENCES

Hazardous Materials Investigation, City of Anacortes Water Treatment Plant; DLH Environmental Consulting; January 28, 2015.

Sample and Waste Characterization Plan Number Four - Screen and Calculate Lead Concentration, (http://www.ecy.wa.gov/programs/hwtr/dangermat/samplePlans.html).

WAC 173-303-090 Dangerous Waste Characteristics.

Draft Standard Operating Procedure for Sampling Concrete in the Field; USEPA Region 1; December 1, 1997.

City of Anacortes POL 28.23.11a Confined Space Entry.

USEPA, 40 CFR 761.123

OSHA , 29 CFR 1926.62 - Lead

OSHA, 29 CFR 1926.65 – Hazardous Waste Operations

WAC 296-155-176 – Lead

WAC 296-843 – Hazardous Waste Operations

WAC 296-155-17309 – Emergency Situations

Tables

Table 1 - Sample Program Criteria

Sub-Area	Location and Media	Sample Identification	Potential PCB Waste Type	Notes	Sample Criteria	Bulk Samples
SB	Sedimentation Basin Coating - Exterior	SB-EXPC-XX	PCB Bulk Product Waste	240' X 82' X; 2 layers coating	3 vert/wall; 1 vert/end	8
	Sedimentation Basin Coating - Interior	SB-INPC-XX	PCB Bulk Product Waste	Coating only on troughs; 8 sections	1 horiz; 1 vert	16
	Sedimentation Basin Concrete	SB-CONC-XX	PCB Bulk Product Waste	20 bays	1 horiz; 1 vert	40
	Sedimentation Basin Sediment	SB-SED-XX	PCB Remediation Waste	20 bays	10 total; 1 per mixer	10
	Sedimentation Basin Fiberglass Collector Boards	SB-FIBWIPE-XX	PCB Remediation Waste	Non-porous; wipe samples	2 samples	2
	Sedimentation Basin Expansion Joint Sealant	SB-SEAL-XX	PCB Bulk Product Waste	1 joint full width	2 horiz; 2 vert	4
	Sedimentation Basin Expansion Joint Cork	SB-CORK-XX	PCB Bulk Product Waste	1 joint full width	2 horiz; 2 vert	4
FB	Filter Basin Coating - Exterior	FB-EXPC-XX	PCB Bulk Product Waste	100' X 92'; 2 layers coating	1/wall	4
	Filter Basin Coating - Interior	FB-INPC-XX	PCB Bulk Product Waste	6 bays; no access to bottom of bays	1/bay	6
	Filter Basin Concrete	FB-CONC-XX	PCB Bulk Product Waste	6 bays	1/bay	6
	Filter Basin Fiberglass Troughs	FB-FIBWIPE-XX	PCB Remediation Waste	Non-porous; wipe samples	1/bay	6
	Filter Basin Anthracite Media	FB-ANTH-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Filter Media	FB-SAND-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Gravel (or brick/block) Bed	FB-BED-XX	PCB Remediation Waste	6 bays	1/bay	6
	Filter Basin Pipe Gallery Coating	FB-PGPC-XX	PCB Bulk Product Waste	100' long; 20' wide; Beige paint	1 horiz; 1 vert	2
	Filter Basin Pipe Gallery Concrete	FB-PGCONC-XX	PCB Bulk Product Waste	100' long; 20' wide	1 horiz; 1 vert	2
CW	Clear Well Concrete	CW-CONC-XX	PCB Bulk Product Waste	~5 chambers	1 horiz+1 vert/chamb	10
	Clear Well Sediment	CW-SED-XX	PCB Remediation Waste	~5 chambers	1/chamber	5
	Clear Well Redwood Baffles	CW-BAF-XX	PCB Remediation Waste	6 baffles	1/2 baffles	3
	Clear Well Wastewater Flume Concrete	CW-WFCONC-XX	PCB Bulk Product Waste	100' long; 20' wide	4 horiz; 4 vert	8
	Clear Well Wastewater Flume Sediment	CW-WFSED-XX	PCB Remediation Waste	100' long; 20' wide	2 Total; half length	2
AB	Admin Bldg Window Caulk	AB-SEAL-XX	PCB Bulk Product Waste	27 windows per schedule	6/floor	12
AB	Admin Bldg Roof T-Beam Joint Material	AB-JOINT-XX	PCB Bulk Product Waste	Typical material throughout	3 samples	3
	XX = Sequential sample number				**TOTAL # SAMPLES**	**171**

	Media	Sample Identification	Total Samples	Field Duplicate	MS/MSD	Total QC Samples
QC	Coating	PC-DUP; PC-MS	36	4	4	8
	Concrete	CONC-DUP; CONC-MS	66	7	8	15
	Sediment	SED-DUP- SED-MS	17	3	4	7
	Sealant	SEAL-DUP; SEAL-MS	19	3	4	7
	Cork	CORK-DUP; CORK-MS	4	1	2	3
	Wipe	WIPE-DUP	8	0	0	0
	Filter Anthracite Media	ANTH-DUP; ANTH-MS	6	1	2	3
	Filter Media	SAND-DUP; SAND-MS	6	1	2	3
	Filter Bed	BED-DUP; BED-MS	6	1	2	3
	Wood	BAF-DUP; BAF-MS	3	1	2	3
	Auger Rinsate	RINS-XX	3			3
	Paint Chips to Calibrate XRF	PC-XX	6			6
						61

Table 1A - Data Gap Investigation Sample Criteria

Sub-Area	Location and Media	Sample Identification	Potential PCB Waste Type	Notes	Sample Criteria	Bulk Samples
SB	Sedimentation Basin Below Grade Mastic Coating	SB-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	2
	Soil 0-12"	SB-SOIL-12-XX	PCB Remediation Waste	Geoprobe	Offset SBs; all 4 sides	10
	Soil 12"-36"	SB-SOIL-36-XX	PCB Remediation Waste	Geoprobe	Offset SBs; all 4 sides	10
	Groundwater	SB-GW-XX		Geoprobe	Low Flow	10
	Downgradient Well	DG-GW-XX		Geoprobe	Toward River	1
FB	Soil 0-12"	SB-SOIL-12-XX	PCB Remediation Waste	Geoprobe	Offset SBs; 2 sides not CW	6
	Soil 12"-36"	SB-SOIL-36-XX	PCB Remediation Waste	Geoprobe	Offset SBs; 2 sides not CW	6
	Groundwater	SB-GW-XX		Geoprobe	Low Flow	6
	Filtration Basin Below Grade Mastic Coating	FB-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	1
CW	Clearwell Sediment	CW-SED-XX	PCB Remediation Waste	Wet from pump well	High TSS Water	2
	Clearwell Sediment	CW-SED-XX	PCB Remediation Waste	Dry - uninvestigated areas	Above water; semi-solid	4
	Clearwell below Grade Mastic Coating	CW-MASTIC-XX	PCB Bulk Product Waste	Grab Sample - Below Grade	Screening	1
AB	Wipe Samples	AB-WIPE-XX	PCB Bulk Product Waste	Walls/Floor & Pump Room	Equipment	12
LAG	Lagoon Sediment	SL-SOIL-XX	PCB Remediation Waste	Hand Auger Grab Sample	Inactive Lagoons (2 per)	4
IDW	IDW Liquids	IDW-Liquid-XX	Waste Characterization	Composite sample		1
	IDW Solids	IDW-Solid-XX	Waste Characterization	Composite sample		1
	XX = Sequential sample number				**TOTAL # SAMPLES**	**77**

	Media	Sample Identification	Total Samples	Field Duplicate	MS/MSD	Total QC Samples
QC	Mastic Coating		4	1	2	3
	Sediment		6	1	2	3
	Wipe		0	0	0	0
	Soil		36	3	5	8
	Groundwater		17	2	2	4
	Waste Characterization		2	0	0	0
						18

Table 2 - Sample Matrix by Sub-Area [Sedimentation Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
SB-EXPC-01	Sed Basin Exterior	Coating	Grab/Chip	1	1	1	1	1
SB-EXPC-02	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-03	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-04	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-05	Sed Basin Exterior	Coating	Grab/Chip	1	1	1	1	1
SB-EXPC-06	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-07	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-08	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-DUP	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-MS	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-EXPC-MSD	Sed Basin Exterior	Coating	Grab/Chip	1				
SB-INPC-01	Sed Basin Interior	Coating	Grab/Chip	1	1	1	1	1
SB-INPC-02	Sed Basin Interior	Coating	Grab/Chip	1				
SB-INPC-03	Sed Basin Interior	Coating	Grab/Chip	1				
SB-INPC-04	Sed Basin Interior	Coating	Grab/Chip	1				
SB-INPC-05	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-06	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-07	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-08	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-09	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-10	Sed Basin Interior	Coating	Grab-Chip	1	1	1	1	1
SB-INPC-11	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-12	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-13	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-14	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-15	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-16	Sed Basin Interior	Coating	Grab-Chip	1				
SB-INPC-DUP	Sed Basin Interior	Coating	Grab/Chip	1				
SB-CONC-01	Sed Basin Interior	Concrete	Grab-Dust	1	1	1	1	1
SB-CONC-02	Sed Basin Interior	Concrete	Grab-Dust	1				

Table 2 - Sample Matrix by Sub-Area [Sedimentation Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
SB-CONC-03	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-04	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-05	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-06	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-07	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-08	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-09	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-10	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-11	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-12	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-13	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-14	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-15	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-16	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-17	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-18	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-19	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-20	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-21	Sed Basin Interior	Concrete	Grab-Dust	1	1	1	1	1
SB-CONC-22	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-23	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-24	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-25	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-26	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-27	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-28	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-29	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-30	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-31	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-32	Sed Basin Interior	Concrete	Grab-Dust	1				

Table 2 - Sample Matrix by Sub-Area [Sedimentation Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
SB-CONC-33	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-34	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-35	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-36	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-37	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-38	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-39	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-40	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-DUP1	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-MS1	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-MSD1	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-DUP2	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-MS2	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-MSD2	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-CONC-DUP3	Sed Basin Interior	Concrete	Grab-Dust	1				
SB-SED-01	Sed Basin Interior	Sediment	Grab	1	1	1	1	1
SB-SED-02	Sed Basin Interior	Sediment	Grab	1				
SB-SED-03	Sed Basin Interior	Sediment	Grab	1				
SB-SED-04	Sed Basin Interior	Sediment	Grab	1				
SB-SED-05	Sed Basin Interior	Sediment	Grab	1				
SB-SED-06	Sed Basin Interior	Sediment	Grab	1				
SB-SED-07	Sed Basin Interior	Sediment	Grab	1				
SB-SED-08	Sed Basin Interior	Sediment	Grab	1				
SB-SED-09	Sed Basin Interior	Sediment	Grab	1				
SB-SED-10	Sed Basin Interior	Sediment	Grab	1	1	1	1	1
SB-SED-DUP	Sed Basin Interior	Sediment	Grab	1				
SB-SED-MS	Sed Basin Interior	Sediment	Grab	1				
SB-SED-MSD	Sed Basin Interior	Sediment	Grab	1				
SB-SEAL-01	Sed Basin Interior	Sealant	Grab	1	1	1	1	1
SB-CORK-01	Sed Basin Interior	Cork	Grab	1	1	1	1	1

Table 2 - Sample Matrix by Sub-Area [Sedimentation Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
SB-SEAL-02	Sed Basin Interior	Sealant	Grab	**1**				
SB-CORK-02	Sed Basin Interior	Cork	Grab	**1**				
SB-SEAL-03	Sed Basin Interior	Sealant	Grab	**1**				
SB-CORK-03	Sed Basin Interior	Cork	Grab	**1**				
SB-SEAL-04	Sed Basin Interior	Sealant	Grab	**1**				
SB-CORK-04	Sed Basin Interior	Cork	Grab	**1**				
SB-SEAL-DUP	Sed Basin Interior	Sealant	Grab	**1**				
SB-SEAL-MS	Sed Basin Interior	Sealant	Grab	**1**				
SB-SEAL-MSD	Sed Basin Interior	Sealant	Grab	**1**				
SB-CORK-DUP	Sed Basin Interior	Cork	Grab	**1**				
SB-CORK-MS	Sed Basin Interior	Cork	Grab	**1**				
SB-CORK-MSD	Sed Basin Interior	Cork	Grab	**1**				
SB-FIBWIPE-01	Filter Basin Interior	Fiberglass	Wipe	**1**				
SB-FIBWIPE-02	Filter Basin Interior	Fiberglass	Wipe	**1**				
PC-01	Blue Railing Paint	Paint	Grab		**1**			**1**
			TOTAL	104	11	10	10	11
			# Samples	**PCB**	**Total Lead**	**TCLP RCRA VOC**	**TCLP RCRA SVOC**	**TCLP RCRA Metals**

Table 2 - Sample Matrix by Sub-Area [Filtration Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
FB-EXPC-01	Filter Basin Exterior	Coating	Grab/Chip	1	1	1	1	1
FB-EXPC-02	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-EXPC-03	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-EXPC-04	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-EXPC-DUP	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-EXPC-MS	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-EXPC-MSD	Filter Basin Exterior	Coating	Grab/Chip	1				
FB-INPC-01	Filter Basin Interior	Coating	Grab/Chip	1	1	1	1	1
FB-INPC-02	Filter Basin Interior	Coating	Grab/Chip	1				
FB-INPC-03	Filter Basin Interior	Coating	Grab/Chip	1				
FB-INPC-04	Filter Basin Interior	Coating	Grab/Chip	1				
FB-INPC-05	Filter Basin Interior	Coating	Grab-Chip	1				
FB-INPC-06	Filter Basin Interior	Coating	Grab-Chip	1				
FB-CONC-01	Filter Basin Interior	Concrete	Grab-Dust	1	1	1	1	1
FB-CONC-02	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-03	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-04	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-05	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-06	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-DUP	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-MS	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-CONC-MSD	Filter Basin Interior	Concrete	Grab-Dust	1				
FB-FIBWIPE-01	Filter Basin Interior	Fiberglass	Wipe	1				
FB-FIBWIPE-02	Filter Basin Interior	Fiberglass	Wipe	1				

Table 2 - Sample Matrix by Sub-Area [Filtration Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
FB-FIBWIPE-03	Filter Basin Interior	Fiberglass	Wipe	1				
FB-FIBWIPE-04	Filter Basin Interior	Fiberglass	Wipe	1				
FB-FIBWIPE-05	Filter Basin Interior	Fiberglass	Wipe	1				
FB-FIBWIPE-06	Filter Basin Interior	Fiberglass	Wipe	1				
FB-ANTH-01	Filter Basin Interior	Filter Media	Grab	1	1	1	1	1
FB-SAND-01	Filter Basin Interior	Filter Media	Grab	1	1	1	1	1
FB-BED-01	Filter Basin Interior	Filter Bed	Grab	1	1	1	1	1
FB-ANTH-02	Filter Basin Interior	Filter Media	Grab	1				
FB-SAND-02	Filter Basin Interior	Filter Media	Grab	1				
FB-BED-02	Filter Basin Interior	Filter Bed	Grab	1				
FB-ANTH-03	Filter Basin Interior	Filter Media	Grab	1				
FB-SAND-03	Filter Basin Interior	Filter Media	Grab	1				
FB-BED-03	Filter Basin Interior	Filter Bed	Grab	1				
FB-ANTH-04	Filter Basin Interior	Filter Media	Grab	1				
FB-SAND-04	Filter Basin Interior	Filter Media	Grab	1				
FB-BED-04	Filter Basin Interior	Filter Bed	Grab	1				
FB-ANTH-05	Filter Basin Interior	Filter Media	Grab	1				
FB-SAND-05	Filter Basin Interior	Filter Media	Grab	1				
FB-BED-05	Filter Basin Interior	Filter Bed	Grab	1				
FB-ANTH-06	Filter Basin Interior	Filter Media	Grab	1				
FB-SAND-06	Filter Basin Interior	Filter Media	Grab	1				
FB-BED-06	Filter Basin Interior	Filter Bed	Grab	1				
RINS-01	Filter Basin Interior	Water	Grab	1				
RINS-02	Filter Basin Interior	Water	Grab	1				

Table 2 - Sample Matrix by Sub-Area [Filtration Basin]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
RINS-03	Filter Basin Interior	Water	Grab	**1**				
FB-ANTH-DUP	Filter Basin Interior	Filter Media	Grab	**1**				
FB-ANTH-MS	Filter Basin Interior	Filter Media	Grab	**1**				
FB-ANTH-MSD	Filter Basin Interior	Filter Media	Grab	**1**				
FB-SAND-DUP	Filter Basin Interior	Filter Media	Grab	**1**				
FB-SAND-MS	Filter Basin Interior	Filter Media	Grab	**1**				
FB-SAND-MSD	Filter Basin Interior	Filter Media	Grab	**1**				
FB-BED-DUP	Filter Basin Interior	Filter Bed	Grab	**1**				
FB-BED-MS	Filter Basin Interior	Filter Bed	Grab	**1**				
FB-BED-MSD	Filter Basin Interior	Filter Bed	Grab	**1**				
FB-PGPC-01	Pipe Gallery	Coating	Grab-Chip	**1**	**1**	**1**	**1**	**1**
FB-PGPC-02	Pipe Gallery	Coating	Grab-Chip	**1**				
FB-PGPC-DUP	Pipe Gallery	Coating	Grab-Chip	**1**				
FB-PGCONC-01	Pipe Gallery	Concrete	Grab-Dust	**1**	**1**	**1**	**1**	**1**
FB-PGCONC-02	Pipe Gallery	Concrete	Grab-Dust	**1**				
FB-PGCONC-DUP	Pipe Gallery	Concrete	Grab-Dust	**1**				
PC-02	Pipe Coating	Paint	Grab		**1**			**1**
PC-03	Paint TBD	Paint	Grab		**1**			**1**
			TOTAL	64	10	8	8	10
			# Samples	**PCB**	**Total Lead**	**TCLP RCRA VOC**	**TCLP RCRA SVOC**	**TCLP RCRA Metals**

Table 2 - Sample Matrix by Sub-Area [Clear Well and Administration Building]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
CW-CONC-01	Clear Well	Concrete	Grab-Dust	1	1	1	1	1
CW-CONC-02	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-03	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-04	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-05	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-06	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-07	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-08	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-09	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-10	Clear Well	Concrete	Grab-Dust	1				
CW-CONC-DUP	Clear Well	Concrete	Grab-Dust	1				
CW-WFCONC-01	Wastewater Flume	Concrete	Grab-Dust	1	1	1	1	1
CW-WFCONC-02	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-03	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-04	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-05	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-06	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-07	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-08	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-DUP	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-MS	Wastewater Flume	Concrete	Grab-Dust	1				
CW-WFCONC-MSD	Wastewater Flume	Concrete	Grab-Dust	1				
CW-BAF-01	Clear Well	Wood	Grab-Dust	1	1	1	1	1
CW-BAF-02	Clear Well	Wood	Grab-Dust	1				

Table 2 - Sample Matrix by Sub-Area [Clear Well and Administration Building]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
CW-BAF-03	Clear Well	Wood	Grab-Dust	1				
CW-BAF-DUP	Clear Well	Wood	Grab-Dust	1				
CW-BAF-MS	Clear Well	Wood	Grab-Dust	1				
CW-BAF-MSD	Clear Well	Wood	Grab-Dust	1				
AB-SEAL-01	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-02	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-03	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-04	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-05	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-06	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-07	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-08	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-09	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-10	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-11	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-12	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-DUP	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-MS	Admin Building	Caulk/Glaze	Grab	1				
AB-SEAL-MSD	Admin Building	Caulk/Glaze	Grab	1				
AB-JOINT-1	Admin Building	Roof Joint	Grab	1				
AB-JOINT-2	Admin Building	Roof Joint	Grab	1				
AB-JOINT-3	Admin Building	Roof Joint	Grab	1				
AB-JOINT-DUP	Admin Building	Caulk/Glaze	Grab	1				
CW-SED-01	Clear Well	Sediment	Grab	1	1	1	1	1

Table 2 - Sample Matrix by Sub-Area [Clear Well and Administration Building]

Sample Identifier	Location	Material	Sample Type	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals
CW-SED-02	Clear Well	Sediment	Grab	1				
CW-SED-03	Clear Well	Sediment	Grab	1				
CW-SED-04	Clear Well	Sediment	Grab	1				
CW-SED-05	Clear Well	Sediment	Grab	1				
CW-WFSED-01	Wastewater Flume	Sediment	Grab	1	1	1	1	1
CW-WFSED-02	Wastewater Flume	Sediment	Grab	1				
CW-WFSED-DUP	Clear Well	Sediment	Grab	1				
CW-SED-DUP	Clear Well	Sediment	Grab	1				
CW-SED-MS	Clear Well	Sediment	Grab	1				
CW-SED-MSD	Clear Well	Sediment	Grab	1				
PC-04	White wall paint	Paint	Grab		1			1
PC-05	Yellow paint	Paint	Grab		1			1
PC-06	Paint TBD	Paint	Grab		1			1
			TOTAL	58	8	5	5	8
			# Samples	PCB	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals

Sample Identifier	Location	Material	Sample Type	PCB	% ACM	Date Sampled	Notes	Coordinates	Photo ID	Photo ID	Photo ID	Chain of Custody
SB-MASTIC-01	Sed Basin Exterior	Coating	Grab/Chip	1	1	5/20/2016	West side of SB					
SB-MASTIC-02	Sed Basin Exterior	Coating	Grab/Chip	1	1	5/20/2016	East side of SB					
Asbestos Duplicate	Sed Basin Exterior	Coating	Grab/Chip		1	5/20/2016	Duplicate of SB-MASTIC-02					
SB-SOIL-12-01	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
SB-SOIL-36-01	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
PZ-SED-01	Sed Basin Exterior	Groundwater	Grab	1		5/31/2016	East side of SB					
SB-SOIL-12-02	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
SB-SOIL-36-02	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
PZ-SED-02	Sed Basin Exterior	Groundwater	Grab	1		5/31/2016	East side of SB					
SB-SOIL-12-03	Sed Basin Exterior	Soil	Composite	1		5/24/2016	South end of SB					
SB-SOIL-36-03	Sed Basin Exterior	Soil	Composite	1		5/24/2016	South end of SB					
PZ-SED-03	Sed Basin Exterior	Groundwater	Grab	1		6/1/2016	South end of SB					
SB-SOIL-12-04	Sed Basin Exterior	Soil	Composite	1		5/23/2016	South end of SB					
SB-SOIL-36-04	Sed Basin Exterior	Soil	Composite	1		5/23/2016	South end of SB					
PZ-SED-04	Sed Basin Exterior	Groundwater	Grab	1		6/1/2016	South end of SB					
SB-SOIL-12-05	Sed Basin Exterior	Soil	Composite	1		5/24/2016	North end of SB					
SB-SOIL-36-05	Sed Basin Exterior	Soil	Composite	1		5/24/2016	North end of SB					
~~SB-GW-05~~	~~Sed Basin Exterior~~	~~Groundwater~~	~~Grab~~	~~0~~			No Well Installed					
SB-SOIL-12-06	Sed Basin Exterior	Soil	Composite	1		5/23/2016	North end of SB					
SB-SOIL-36-06	Sed Basin Exterior	Soil	Composite	1		5/23/2016	North end of SB					
PZ-SED-06	Sed Basin Exterior	Groundwater	Grab	1		6/1/2016	North end of SB					
SB-SOIL-12-07	Sed Basin Exterior	Soil	Composite	1		5/24/2016	West side of SB					
SB-SOIL-36-07	Sed Basin Exterior	Soil	Composite	1		5/24/2016	West side of SB					
PZ-SED-07	Sed Basin Exterior	Groundwater	Grab	1		6/1/2016	West side of SB					
SB-SOIL-12-08	Sed Basin Exterior	Soil	Composite	1		5/24/2016	West side of SB					
SB-SOIL-36-08	Sed Basin Exterior	Soil	Composite	1		5/24/2016	West side of SB					
PZ-SED-08	Sed Basin Exterior	Groundwater	Grab	1		6/1/2016	West side of SB					
SB-SOIL-12-DUP	Sed Basin Exterior	Soil	Composite	1		5/24/2016	Duplicate of SB-SOIL-12-08					
SB-SOIL-12-09	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
SB-SOIL-36-09	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
PZ-SED-09	Sed Basin Exterior	Groundwater	Grab	1		5/31/2016	East side of SB					
DUP-1	Sed Basin Exterior	Groundwater	Grab	1		5/31/2016	Duplicate of PZ-SED-09					
SB-SOIL-12-10	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
SB-SOIL-36-10	Sed Basin Exterior	Soil	Composite	1		5/23/2016	East side of SB					
SB-GW-10	Sed Basin Exterior	Groundwater	Grab	1		5/31/2016	East side of SB					

Sample Identifier	Location	Material	Sample Type	PCB	% ACM	Date Sampled	Notes	Coordinates	Photo ID	Photo ID	Photo ID	Chain of Custody
FB-MASTIC-01	Filtration Basin Exterior	Coating	Grab/Chip	1		5/20/2016	South side of FB					
FB-SOIL-12-01	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
FB-SOIL-36-01	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
PZ-FILT-01	Filtration Basin Exterior	Groundwater	Grab	1		6/1/2016	South side of FB					
FB-SOIL-12-02	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
FB-SOIL-36-02	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
PZ-FILT-02	Filtration Basin Exterior	Groundwater	Grab	1		6/1/2016	South side of FB					
FB-SOIL-12-03	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
FB-SOIL-36-03	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
~~FB-GW-03~~	~~Filtration Basin Exterior~~	~~Groundwater~~	~~Grab~~	~~0~~			No Well Installed					
FB-SOIL-12-04	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
FB-SOIL-36-04	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
PZ-FILT-04	Filtration Basin Exterior	Groundwater	Grab	1		6/1/2016	East side of FB					
FB-SOIL-12-05	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
FB-SOIL-36-05	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	East side of FB					
~~FB-GW-05~~	~~Filtration Basin Exterior~~	~~Groundwater~~	~~Grab~~	~~0~~			No Well Installed					
FB-SOIL-12-DUP	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	Duplicate of FB-SOIL-12-05					
FB-SOIL-12-06	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
FB-SOIL-36-06	Filtration Basin Exterior	Soil	Composite	1		5/23/2016	South side of FB					
PZ-FILT-06	Filtration Basin Exterior	Groundwater	Grab	1		6/1/2016	South side of FB					
Dup-2	Filtration Basin Exterior	Groundwater	Grab	1		6/1/2016	Duplicate of PZ-FILT-06					
DG-GW-01	Down Gradient Well	Groundwater	Grab	1		6/1/2016	North of new building					
CW-MASTIC-01	Clearwell Exterior	Coating	Grab/Chip	1	1	5/20/2016	West side of Clearwell					
PCB duplicate	Clearwell Exterior	Coating	Grab/Chip	1		5/20/2016	Duplicate of CW-MASTIC-01					
CW-SEDIMENT-01	Clearwell Interior	Sediment	Grab	1		5/24/2016	Aqueous sample from pump well					
CW-SEDIMENT-02	Clearwell Interior	Sediment	Grab	1		5/24/2016	Aqueous sample from pump well					
CW-SEDIMENT-03	Clearwell Interior	Sediment	Grab	1		5/24/2016	Watery silt		DSCF0033			
CW-SEDIMENT-04	Clearwell Interior	Sediment	Grab	1		5/24/2016	Slightly watery		DSCF0034			
CW-SEDIMENT-05	Clearwell Interior	Sediment	Grab	1		5/24/2016	Dense packed		DSCF0035			
CW-SEDIMENT-06	Clearwell Interior	Sediment	Grab	1		5/24/2016	Flat chunks; solidified		DSCF0042			
CW-SEDIMENT-DUP	Clearwell Interior	Sediment	Grab	1		5/24/2016	QC Duplicate of CW-SEDIMENT-02					
CW-SEDIMENT-MS	Clearwell Interior	Sediment	Grab	1		5/24/2016	QC MS; CW-SEDIMENT-03					
CW-SEDIMENT-MSD	Clearwell Interior	Sediment	Grab	1		5/24/2016	QC MSD; CW-SEDIMENT-03					
AB-WIPE-01	Administration Building	Wipe	Wipe	1		5/25/2016	Alum Room Hopper #1					
AB-WIPE-02	Administration Building	Wipe	Wipe	1		5/25/2016	Alum Room Polymer Feed Control					

Sample Identifier	Location	Material	Sample Type	PCB	% ACM	Date Sampled	Notes	Coordinates	Photo ID	Photo ID	Photo ID	Chain of Custody
AB-WIPE-03	Administration Building	Wipe	Wipe	1		5/25/2016	2nd Floor Control Console					
AB-WIPE-04	Administration Building	Wipe	Wipe	1		5/25/2016	1st Floor Alum Feed Control Cabinet					
AB-WIPE-05	Administration Building	Wipe	Wipe	1		5/25/2016	Lime Dust Collector - Torit					
AB-WIPE-06	Administration Building	Wipe	Wipe	1		5/25/2016	Dry Transformer					
AB-WIPE-07	Administration Building	Wipe	Wipe	1		5/25/2016	Generator transfer switch					
AB-WIPE-08	Administration Building	Wipe	Wipe	1		5/25/2016	Pump #9 Electrical Connection Box					
AB-WIPE-09	Administration Building	Wipe	Wipe	1		5/25/2016	Pump #1 Housing Internal					
AB-WIPE-10	Administration Building	Wipe	Wipe	1		5/25/2016	Pump #7 Electrical Connection Box					
AB-WIPE-11	Administration Building	Wipe	Wipe	1		5/25/2016	Pump #1 MCC					
AB-WIPE-12	Administration Building	Wipe	Wipe	1		5/25/2016	PLC Rack #4					
SL-SOIL-01	Settling Lagoon	Soil	Grab	1		5/25/2016	West Side of Lagoon #2					
SL-SOIL-02	Settling Lagoon	Soil	Grab	1		5/25/2016	East Side of Lagoon #2					
SL-SOIL-03	Settling Lagoon	Soil	Grab	1		5/25/2016	West Side of Lagoon #1					
SL-SOIL-04	Settling Lagoon	Soil	Grab	1		5/25/2016	East Side of Lagoon #1					
SL-SOIL-DUP	Settling Lagoon	Soil	Grab	1		5/25/2016	Duplicate of SL-SOIL-02					
			TOTAL	81	4							

Appendix A – Draft Standard Operating Procedure for Sampling Concrete in the Field

REGION I, EPA-NEW ENGLAND

DRAFT
STANDARD OPERATING PROCEDURE
FOR SAMPLING CONCRETE IN THE FIELD

U.S. EPA-NEW ENGLAND
Region I
Quality Assurance Unit Staff
Office of Environmental Measurement and Evaluation

Prepared by:	**Alan W Peterson** **Quality Assurance Chemist**	**Date:**	12/30/97
Reviewed by:	**Andrew Beliveau** **Senior Technical Specialist**	**Date:**	12/30/97
Approved by:	**Nancy Barmakian** **Branch Chief**	**Date:**	12/30/97

Region I, EPA New England

Standard Operating Procedure for Sampling Concrete in the Field

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Region I, EPA New England

Standard Operating Procedure for Sampling Concrete in the Field

1.0 Scope and Application

The following Standard Operating Procedure (SOP) describes a concrete sampling technique which uses an impact hammer drill to generate a uniform, finely ground, powder which is easily homogenized, extracted and analyzed. This procedure is primarily geared at providing enough sample for one or two different analyses at a time. That is, the time required to generate sufficient sample for a full suite of analyses may be impractical. The concrete powder is suitable for all types of environmental analyses, with the exception of volatile compounds, and may be analyzed in the field or at a fixed laboratory. This procedure is applicable for the collection of samples from concrete floors, walls, and ceilings.

The impact hammer drill is far less labor intensive than previous techniques using coring devices, or hammers and chisels. It allows for easy selection of sample location and sample depth. Not only can the project planner control the depth to sample into the concrete, from surface samples (0 - ½ inch) down to a core of the entire slab, but the technique can also be modified to collect samples at discrete depths within the concrete slab.

Another issue with concrete sampling is the fact that the amount of time spent drilling translates into the weight of sample produced. Thus, to maximize sampling time, it is important to know the minimum amount of sample required for each analysis. To do this, the project planner should take the following steps: 1) Use the Data Quality Objective (DQO) process and familiarity with the site to develop the objectives of the sampling project and the depth(s) of sample to be collected. 2) Review the site history and any previous data collected to determined possible contaminants of concern. 3) Establish the action levels for those possible contaminants and determine the appropriate analytical methods (both field and/or fixed laboratory) to meet the DQOs of the project. 4) Based on the detection limits of these methods, determine the amount of sample required for each analysis and the total sample weight require for each sample location (including quality control samples).

As with any environmental data collection project, all aspects of a concrete sampling episode should be well thought out, prior to going out in the field, and thoroughly described in a Quality Assurance Project Plan (QAPP). The QAPP should clearly state the DQOs of the project and document a complete Quality Assurance/Quality Control program to reconcile the data generated with the established DQOs. For more information on these subjects, refer to EPA documents QA/R-5, <u>EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations</u>, and QA/G-4, <u>Guidance for the Data Quality Objective Process</u>.

2.0 Method Summary

A one-inch diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine concrete powder suitable for analysis. The powder is placed in a sample container and homogenized for field or fixed laboratory analysis. The procedure can be used to sample a single depth into the concrete, or may be modified to sample the concrete at distinctly different depth zones. The modified depth sampling procedure is designed to minimize any cross contamination between the sampling zones. If different sampling depths are required, two different diameter drill bits and a vacuum sampling apparatus are employed.

3.0 Health and Safety

Eye and hearing protection are required at all times during sample drilling. A small amount of dust is generated during the drilling process. Proper respiratory protection and/or a dust control system must be in place at all times during sampling.

4.0 Interferences and Potential Problems

Since this sampling technique produces a finely ground uniform powder, physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition) are minimized. Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

As stated in Section 1.0 above, this sampling procedure is not recommended for volatile organic compound (VOC) analysis. The combination of heat generated during drilling and the exposure of a large amount of surface area will greatly reduce VOC recovery. If low boiling point semi-volatile compounds (i.e., naphthalene) are being analyzed, then the drill speed should be reduced to minimize heat build-up.

5.0 Equipment and Supplies

5.1 Single Depth Concrete Sampling

5.1.1 Rotary impact hammer drill
5.1.2 1-inch diameter carbide drill bits
5.1.3 Stainless steel scoopulas
5.1.4 Stainless steel spoonulas (for collecting sample in deeper holes, >2-inches)
5.1.5 Rectangular aluminum pans (to catch concrete during wall and ceiling sampling)
5.1.6 Gasoline powered generator (if alternative power source is required)

5.2 Multiple Depth Sampling (in addition to all the above)

5.2.1 ½ inch diameter carbide drill bits
5.2.2 Vacuum/sample trap assembly (see Section 7.2 and Figure 1)

5.2.2.1 Vacuum pump
5.2.2.2 2-hole rubber stopper
5.2.2.3 Glass tubing (to fit stopper)
5.2.2.4 Large glass test tubes, or Erlenmeyer flasks, for sample trap (several are suggested)
5.2.2.5 Polyethylene tubing for trap inlet (Tygon tubing may be used for the trap outlet)
5.2.2.6 Pasture pipets
5.2.2.7 Pipe cleaners
5.2.2.8 In-line dust filter (glass fiber filter, or equivalent)

6.0 Sample Containers, Preservation, and Storage

Concrete samples must be collected in glass containers for organic analyses, and may be collected in either glass or plastic containers for inorganic analyses. In general, a 2-ounce sample container with Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient volume for most analyses. A 2-

ounce jar can hold roughly 90 grams sample. Note, samples which require duplicate and/or matrix spike/matrix spike duplicate analyses may require a larger sample container, or additional 2-ounce sample containers.

Organic samples are to be shipped on ice and maintained at 4°C (± 2°C) until the time of extraction and analysis. Inorganic samples may be shipped and stored at room temperature. Refer to 40 CFR Part 136 for guidelines on analysis holding times.

To maintain sample integrity, chain-of-custody procedures must be implemented at the time of sampling to 1) document all sample locations and associated field sample identification numbers, 2) document all quality control samples taken, including field duplicates, split samples for confirmatory analyses, and PE samples, and 3) document the transfer of field samples from field sampler to field chemist or fixed laboratory.

7.0 Procedure

7.1 Single Depth Concrete Sampling

Lock a 1-inch diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. (A gasoline generator will be needed if electricity is not available.) For easy identification, sample locations may be pre-marked using a crayon or a non-contaminating spray paint. (Note, the actual drilling point must not be marked.) Depending on the appearance of the sample location, or the objectives of the sampling project, it may be desired to wipe the concrete surface with a clean dry cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground concrete powder that can be easily collected, homogenized and analyzed. Having several decontaminated impact drill bits on hand will help expedite sampling when numerous sample locations are to be drilled.

<u>Sample Collection</u>

A ½-inch deep hole (using a 1-inch diameter drill bit) generates about 10 grams of concrete powder. Based on this and the action levels for the project, determine the sampling depth, and/or the number of sample holes to be composited, to generate sufficient sample volume for all of the required analyses. (Note, with the absorbency of concrete, a ½-inch deep hole can be considered a surface sample.)

A decontaminated stainless steel scoopula can be used to collect the sample. The powder can either be collected directly from the surface of the concrete and/or the concrete powder can be scraped back into the hole and the less rounded back edge of the scoopula can be used to collect the sample. For holes greater than 2-inches in depth, a stainless steel spoonula will make it easier to collect the sample from the bottom of the hole.

To ensure collection of a representative sample when multiple analyses are required, a concrete sample should always be collected and homogenized in a single container and then divided up into the individual containers for the various analyses or split samples. This is particularly important when sample holes are deep, or when several holes are drilled adjacent to each other to form a sample composite.

Wall and Ceiling Sampling

A team of two samplers will be required for wall and ceiling sampling. The second person will be needed to hold a clean catch surface (i.e., an aluminum pan) below the drill to collect the falling powder. For wall samples, a scoopula, or spoonula, can be used to collect remaining concrete powder from within the hole. For ceiling holes, it may be necessary to drill the hole at an angle so the concrete powder can fall freely in the collection plan (and avoid falling on the drill). Another alternative might be to use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. Thus, the driller can be drilling straight up while the assistant steadies the pan to catch the falling dust. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the mechanical vents. (Note, the plastic should deflect dust from the drill, but be loose enough underneath to allow for proper ventilation.)

7.2 Multiple Depth Concrete Sampling

The above method for concrete sampling can also be used to collect samples from different depths within the concrete. To do this, two different sized drill bits (i.e., ½ inch and 1 inch) and a simple vacuum pump with a vacuum trap assembly is required (see Figure 1). First, the 1 inch drill bit is used to drill to the first level and the concrete sample is collected as described in Section 7.1. The vacuum pump is then turned on and the hole is cleaned out using the vacuum trap assembly. The drill bit is then changed to the ½ inch bit and the next depth is drilled out (the ½ inch bit is used to avoid contact with the sides of the first hole). A clean tube or flask is placed on the vacuum trap, and the sample from the second drilling is collected. To go further, the 1 inch drill is used to open up the hole to the second level, the hole is cleared, and then the ½ inch drill is used again to go to a third level, etc. Note, the holes and concrete surface should be vacuumed thoroughly to minimize any cross-contamination between sample depths.

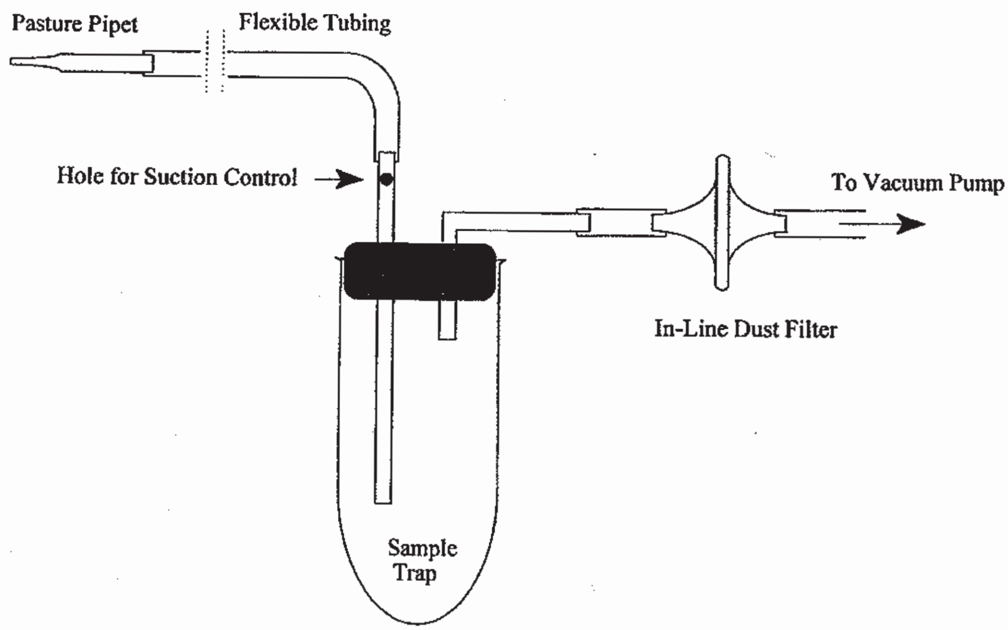
Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) The pasture pipet and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

7.3 Decontamination Procedure

Necessary supplies for decontamination include: two small buckets, a scrub brush, potable water, deionized water, a squirt bottle for the deionized water, and paper towels. The first bucket contains a soap and potable water solution, and the second bucket contains just potable water. Place all used drill bits and

Figure 1



utensils in the soap and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the concrete powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece in the potable water bucket, and follow with a deionized water rinse from the squirt bottle. Place the deionized water rinsed pieces on clean paper towels and individually dry and inspect each piece. Note, all pieces should be dry prior to reuse.

8.0 Field Documentation

All Site related documentation and reports generated from concrete sampling should be maintained in the central Site file. If personal logbooks are used, legible copies of all pertinent pages must be placed in the Site file.

8.1 Field Logbooks

All field documentation should be maintained in bound logbooks with numbered pages. If loose-leaf logsheets are used to document site activities, extra care should be taken in keep track of all logsheets. The original copy of all logsheets should be maintained in the central Site file. Note, all sample locations must be documented by tying in their location to a detailed site map, or by using two or more permanent landmarks. The following information should be documented in the field logbooks:

- Site name and location,
- EPA Site Manager,
- Name and affiliation of field samplers (EPA, Contractor company name, etc.),
- Sampling date,
- Sample locations and IDs,
- Sampling times and depths, and
- Other pertinent information or comments

8.2 Sample Labeling and Chain-of-Custody

8.2.1 Sample Labels

Sample labels will be affixed to all sample containers. Labels must contain the following information:

- Project name,
- Sample number, and/or location
- Date and time of sampling,
- Analysis,
- Preservation, and
- Sampler's name.

8.2.2 Chain-of-Custody

All samples must be traced from collection, to shipment, to laboratory receipt and laboratory custody. The Chain-of-Custody (COC) Record is a multi-part form that is initiated as samples are acquired and accompanies a sample (or group of samples) as they are transferred from person to person. The COC form is signed by all individuals responsible for sampling, sample transport, and laboratory receipt. (Note, overnight deliver services, often used with sample transport, are exempt from having to sign the COC form. However, copies of all shipping invoices must be kept with the COC documentation.) One copy of the COC is retained by the field sampling crew, while the original (top, signed copy) and remaining carbonless copies are placed in a zip-lock bag and taped to the inside lid of the shipping cooler. If multiple coolers are required for a sample shipment to a single laboratory, the COC need only be sent with one of the coolers. The COC should state how many coolers are included with the shipment. All sample shipments to different laboratories require individual COC forms. The original COC form accompanies the samples until the project is complete, and is then kept in the permanent project file. A copy of the COC is also kept with the project manager, the laboratory manager, and attached to the data package.

8.2.3 Custody Seal

The Custody seal is an adhesive-backed label which is also part of the chain-of-custody process. The custody seal is used to prevent tampering with the samples after they have been collected in the field and sealed in coolers for transit to the laboratory. The Custody seals are signed and dated by a sampler and affixed across the opening edges of each cooler containing samples. Clear packing tape should be wrapped around the cooler, and over the Custody seal, to secure the cooler and avoid accidental tampering with the Custody seal.

9.0 Quality Assurance and Quality Control (QA/QC)

A solid QA/QC program is essential to establishing the quality of the data generated so that proper project decisions can be made. The following are key quality control elements which should be incorporated into a concrete sampling and analytical program.

9.1 Equipment Blanks

An equipment blank should be performed on decontaminated drill bits and collection utensils at a frequency of 1 per 20 samples or 1 per day, whichever is greater. To prepare the equipment blank, place the decontaminated drill bit and utensils in a large clean stainless steel bowl. Pour sufficient deionized water into the bowl to fill all of the required sample containers. Next, stir the drill bit and utensils in the bowl with a clean utensil to thoroughly mix the blank. Finally, decant off the equipment blank into the sample containers. Note, a clean funnel may help to pour off the equipment blank into the containers.

9.2 Field Duplicates

Field duplicates are samples collected adjacent to each other (collocated) at the same sample location (not two aliquots of the same sample). Field duplicates not only help provide an indicator of overall precision, but measure the cumulative effects of both the field and analytical precision, and also measure the representativeness of the sample. Field duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater. An example of a non-related concrete matrix might be the investigation of two different types of chemical spills.

Calculate the Relative Percent Difference (RPD) between the sample and its duplicate using Equation 1.

Equation 1

$$RPD = \frac{|S - D|}{\frac{(S + D)}{2}} x\ 100$$

Where:

S = Original sample result
D = Duplicate sample result

The following general guidelines have been established for field duplicate criteria:

- If both the original and field duplicate values are ≥ practical quantitation limit (PQL), then the control limit for RPD is ≤50%,
- If one or both values are < PQL, then do not assess the RPD.

If more rigorous field duplicate criteria are needed to achieve project DQOs, then that criteria should be documented in the project QAPP.

If the field duplicate criteria specified above are not met, then flag that target element with an "*" on the final report for both the original and field duplicate samples. Report both the original and field duplicate analyses; do not report the average. Field duplicate samples should be indicated on the sample ID. For example, the sample ID can contain the suffix "FD."

9.3 Laboratory Duplicates

Laboratory duplicates are two aliquots of the same sample that are prepared, homogenized and analyzed in the same manner. (Note, proper sample homogenization is critical in producing meaningful results.) The precision of the sample preparation and analytical methods is determined by performing a laboratory duplicate analysis. Laboratory duplicates can be prepared in the field and submitted as blind samples, or the laboratory can be requested to perform the laboratory duplicate analysis. In the case of laboratory prepared duplicates, the field sampling team must be sure to provide sufficient sample volume. Laboratory duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the RPD between the sample and its duplicate using Equation 1. The following general guidelines have been established for laboratory duplicate criteria:

- If both the original and laboratory duplicate values are ≥ PQL, then the control limit for RPD is ≤25%,
- If one or both values are < PQL, then do not assess the RPD.

If duplicate criteria are not met, then flag that target element with an "*" on the final report for both the original and duplicate samples. Report both the original and duplicate analyses; do not report the average.

9.4 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate samples (MS/MSDs) are two additional aliquots of a sample which are spiked with the appropriate compound(s) or analyte(s) of concern and then prepared and analyzed along with the original sample. (Note, proper sample homogenization, prior to spiking, is critical in producing meaningful results.) MS/MSDs help evaluate the effects of sample matrix on the analytical methods being used. The field sampling team must provide sufficient sample volume such that the field or fixed laboratory can prepare and analyze MS/MSDs at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the recovery of each matrix spike compound or analyte using Equation 2.

Equation 2

$$MSR = \frac{SSR - SR}{SA} \times 100$$

Where,

MSR	=	Matrix Spike Recovery,	SA	=	Spike Added
SSR	=	Spiked Sample Result,	SR	=	Sample Result

Calculate the relative percent difference (RPD) between the recoveries of each compound or analyte in the matrix spike and matrix spike duplicate using Equation 3.

Equation 3

$$RPD = \frac{|MSR - MSRD|}{\frac{(MSR + MSRD)}{2}} \times 100$$

Where,

MSR = Matrix Spike Recovery
MSRD = Matrix Spike Duplicate Recovery

9.5 Performance Evaluation Samples

In accordance with the EPA Region I Performance Evaluation Program Guidance, performance evaluation (PE) samples should be submitted for each type of analysis to be performed in the field or by the fixed laboratory performing full protocol EPA methods. PE samples provide information on the quality of the individual data packages. PE samples are certified standard reference materials (SRMs) from a source other than that used to calibrate the instrument. If both field and fixed laboratories are being used to analyze samples, at least one solid PE sample should undergo both field analysis and confirmatory full protocol EPA method analysis to facilitate data comparability. A copy of the certified values for the SRM must be submitted with the final data packages to facilitate data evaluation.

9.6 Data Verification and Validation

All field data and supporting information (including chain-of-custody) that is collected during a concrete sampling episode should be verified daily, by a person other than that performing the work, to check for possible errors.

During the project planning process, a plan for data validation should be established for all data, both for field and fixed laboratories. All data must be validated to assure that it is of a quality suitable to make project decisions. For help in developing a data validation program refer to Region I, EPA New England, Data Validation Functional Guidelines for Evaluating Environmental Analyses.

9.7 Audits

9.7.1 Internal Audits

As part of the Quality Assurance/Quality Control Program for any sampling project, a series of internal audit checks should be instituted to monitor and maintain the integrity of the sample collection process. Timely internal reviews will insure that proper sampling, decontamination, chain-of-custody and quality control procedures are being followed. Also, the internal audit review is there to monitor any corrective actions taken, and/or institute corrective actions that should have been taken and were not. All corrective actions taken must be documented in an appropriate logbook, and if any corrective actions impact the final data reported, then they must also be documented in the final report narrative. The results of all internal audits must be documented in a report, and copies of the report issued to the Project Manager and the Quality Assurance Manager. The original copy of any audit report must remain with the main project file and be available for review.

9.7.2 External Audits

The Agency reserves the right to perform periodic field audits to ensure compliance with this SOP.

10.0 References

1) Guidance for the Data Quality Objective Process, QA/G-4, EPA/600/R-96/055, September 1994.

2) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Interim Final, October 1997.

3) Guidance for the Preparation of Standard Operating Procedures for Quality-related Operations, QA/G-6, EPA/600/R-96/027, November 1995.

4) Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, July 1996.

5) EPA Region I Performance Evaluation Program Guidance, July 1996.

6) U.S. EPA Code of Federal Regulations, 40 CFR, Part 136, Appendix B, Revised as of July 1995.

Appendix B – Example Forms

Friedman and Bruya
3012 16th Avenue West
Seattle WA 98119
phone 206-815-8282 fax 206-283-5044

Chain of Custody Record

Privileged and Confidential

Client Contact	Project Manager: Greg Harris	Site Contact:	Date:	COC No:
MWH Americas, Inc.	Tel/Fax:	Lab Contact:	Carrier:	_______ of ______ COCs
2353 130th Avenue NE, Suite 200-520 Corporate Center	**Analysis Turnaround Time**			Job No.
Bellevue, WA	Calendar (C) or Work Days (W) __________			
425-896-6900 Phone	TAT if different from Below _________			
425-602-4020 FAX	☐ 2 weeks			SDG No.
Project Name: Anacortes WTP	☐ 1 week			
Site: Anacortes WTP, Mount Vernon, WA	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	PCB - 8082	Total Lead - 200.8	TCLP RCRA Metals - 6010	TCLP Hg - 7471	TCLP SVOC - 8270													Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____________

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ ***Return To Client*** ☐ ***Disposal By Lab*** ☐ ***Archive For __________ Months***

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

QUALITY ASSURANCE PROJECT PLAN

Anacortes Water Treatment Plant
Mount Vernon, Washington

Prepared For:
City of Anacortes, c/o Foster Pepper PLLC

Prepared By:
MWH Americas, Inc.

Gregory S Warner 5/27/2016

Project Manager Date
MWH Americas, Inc.

Bradley R Toth 5/27/2016

Quality Assurance Manager Date
MWH Americas, Inc.

Norman M. Cira 5/27/2016

Project Technical Lead Date
MWH Americas, Inc.

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1. INTRODUCTION

This Quality Assurance and Project Plan (QAPP) has been prepared by MWH Americas, Inc. (MWH), on behalf of the City of Anacortes c/o Foster Pepper PLLC (legal counsel for the City). The purpose of the QAPP is to support future sampling activities associated with the demolition of unused facilities located at the Anacortes Water Treatment Plant (WTP) in Mount Vernon, Washington.

This QAPP applies to the characterization of the following types of materials prior to demolition of unused features on site. Other materials may be included if discovered during the project.

(1) Concrete structures
(2) Material used to coat concrete and metal structures
(3) Sediment within settling basins
(4) Redwood baffles
(5) Expansion joint sealant
(6) Expansion joint cork
(7) Filter basin filter media
(8) Filter basin gravel bed
(9) Window caulk/glazing

2. PROJECT MANAGEMENT

This section addresses project management, including project history, current objectives, and specific roles and responsibilities of the participants.

2.1. DISTRIBUTION LIST

The following individuals and their organization shall be included in the distribution of this QAPP and subsequent revisions.

Ken Lederman
Foster Pepper
1111 3rd Avenue, #3400
Seattle, Washington
98101-3299
LedeK@foster.com

Gregory Harris
MWH Americas, Inc.
2353 130th Avenue NE
Suite 200
Bellevue, WA 98005
Gregory.S.Harris@mwhglobal.com

Mike Cira
MWH Americas, Inc.
5021 Pine Road
Cedarburg, WI 53012
Norman.M.Cira@mwhglobal.com

2.2. PROJECT/TASK ORGANIZATION

This section summarizes the responsibilities of the key parties involved with this project.

Foster Pepper – Ken Lederman

Foster Pepper Legal Counsel is responsible for providing legal representation to the City of Anacortes. Legal counsel will have additional responsibilities related to technical, financial, and scheduling as delegated by the City of Anacortes. Foster Pepper Legal Counsel will communicate directly with outside entities (as necessary) and will provide the major point of contact and control for matters concerning the project.

City of Anacortes

The City of Anacortes Project Manager is responsible for overseeing the operational aspects of the project, and with the Foster Pepper Legal Counsel, has the authority to commit the resources necessary to meet project objectives and requirements. The City of Anacortes Project Manager has overall responsibility to ensure that technical, financial, and scheduling objectives are achieved successfully. The City of Anacortes Project Manager will communicate through Foster Pepper.

MWH Project Manager – Gregory Harris

The MWH Project Manager has responsibility for ensuring that the project meets the client's objectives and MWH quality standards. The MWH project manager will provide assistance to the Foster Pepper Legal Counsel in terms of distributing the project documents (e.g. reports, QAPP) to all those parties connected with the project. The MWH Project Manager will report directly to the Foster Pepper Legal Counsel on matters related to scope, schedule, and budget. The MWH Project Manager, under the direction of the City and Foster Pepper Legal Counsel, will:

- Define project objectives and develop a detailed work plan schedule
- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness
- Review and analyze overall task performance with respect to planned requirements and authorizations
- Final approve all reports (deliverables) before their submission to the City and Foster Pepper Legal Counsel
- Ultimately be responsible for the preparation and quality of interim and final reports
- Ensure that the project team is adequately represented at meetings and public hearings

MWH Project Technical Lead – Mike Cira

The MWH project technical lead (PTL) has responsibility for the technical quality of the project to ensuring that the project meets the client's objectives and MWH quality standards. The MWH PTL will report directly to the Foster Pepper Legal Counsel on matters of technical quality control (QC) and project oversight. The MWH PTL, under the direction of the MWH Project Manager and the City and Foster Pepper Legal Counsel, will:

- Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule constraints
- Orient all field leaders and support staff concerning the project's special considerations;
- Monitor and direct the field leaders
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product
- Assist the MWH Project Manager with review of the work performed on each task to ensure its quality, responsiveness, and timeliness
- Assist the MWH Project Manager, to approve all reports (deliverables) before their submission to the City and Foster Pepper Legal Counsel

MWH Quality Assurance Manager – Bradly Toth

The MWH Quality Assurance (QA) manager reports directly to the MWH project manager and will be responsible for ensuring that all MWH procedures for this project are being followed. In addition, the MWH QA manager will be responsible for coordinating and reviewing the data validation of all sample results from the analytical laboratory. Data validation will be performed by a third-party data validation company.

MWH Field Team Leader – Rich Malcolm
The MWH project manager will be supported by the MWH field team leader. He is responsible for leading and coordinating the day-to-day activities of the various resource specialists under his/her supervision. The MWH field team leader is an experienced environmental professional and will report directly to the MWH PTL. Specific field team leader responsibilities include:

- Provision of day-to-day coordination with the MWH PTL on technical issues in specific areas of expertise
- Developing and implementing of field-related work plans, assurance of schedule compliance, and adherence to management-developed study requirements
- Coordinating and managing field staff including sampling and drilling, and supervising field laboratory staff
- Implementing QC for technical data provided by the field staff including field measurement data
- Adhering to work schedules provided by the project manager
- Authoring, writing, and approving of text and graphics required for field team efforts
- Coordinating and overseeing technical efforts of subcontractors assisting the field team;
- Identifying problems at the field team level, resolving difficulties in consultation with the MWH project manager, implementing and documenting corrective action procedures, and provision of communication between team and upper management
- Participating in preparation of the final report

Laboratory Project Manager – Eric Young, Friedman & Bruya, Inc.
Analyses will be performed by Friedman & Bruya, Inc. of Seattle Washington under contract to the City c/o Foster Pepper. The laboratory project manager will coordinate directly with the MWH PTL and will be responsible for the following:

- Ensuring all resources of the laboratory are available on an as-required basis
- Overseeing production and final review of analytical reports
- Coordinating laboratory analyses
- Supervising in-house chain-of-custody
- Scheduling sample analyses
- Overseeing data review
- Overseeing preparation of analytical reports
- Approving final analytical reports prior to submission to MWH
- Coordinate third party validation

Third Party Data Validation – Laboratory Data Consultants (LDC)
The third party data validation company (LDC of Carlsbad, California) will report directly to the MWH QA manager and will be responsible for the following: reviewing and validating all laboratory data in accordance with this QAPP.

2.3. BACKGROUND

The site is located in Mount Vernon, Washington and consists of a WTP. The WTP is owned and operated by the City of Anacortes. Several on-site features are scheduled for demolition and disposal (e.g., admin building, filter basin, and sedimentation basin.)

The plan has been to remove/salvage mechanical equipment and then break up the concrete and brick, push the rubble into the existing basins, and place a soil cap on top. Building materials were recently characterized in a preliminary manner (prior to demolition) and found to contain elevated levels of lead, arsenic, aromatic hydrocarbons, and polychlorinated biphenyls (PCBs).

Based on very preliminary information, the detected PCBs may come from coatings and sealants used in construction and applied to interior and exterior surfaces of the concrete basins and structures.

2.4. PROJECT DESCRIPTION

To further characterize PCBs in the materials that will be generated during demolition, samples will be collected from facilities located at the Anacortes WTP in Mount Vernon, Washington. The materials that will be included (but not limited to) are:

(1) Concrete structures
(2) Material used to coat concrete and metal structures
(3) Sediment within settling basins
(4) Redwood baffles
(5) Expansion joint sealant
(6) Expansion joint cork
(7) Filter basin filter media
(8) Filter basin gravel bed
(9) Window caulk/glazing

Sampling procedures are outlined in the ***Sampling Plan***. Samples will be analyzed for PCB Aroclors. The results for each Aroclor will be summed and then compared with the Toxic Substances Control Act (TSCA) limit of 50 milligrams per kilogram (mg/kg) to determine if the material will be managed as TSCA or non-TSCA material. In addition, select samples will be analyzed for Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure volatile and semivolatile organic compounds to determine whether hazardous waste limits have been exceeded, and select samples will be analyzed for asbestos or total lead for health and safety purposes.Painted surfaces throughout the facility will be analyzed for the presence of lead in paint using an Olympus DELTA DS2000 X-Ray Fluorescence (XRF) Handheld Metals Analyzer or equivalent. Bulk samples of paint from various substrates will be collected and analyzed for total lead in order to calibrate results acquired using the XRF. The additional, not TSCA-related, analyses are not intended to be covered by this QAPP, and will follow SW-846 requirements and industry standards.

2.5. QUALITY OBJECTIVES AND CRITERIA

The overall QA objective for this project is to develop and implement procedures for field sampling, laboratory analysis, chain-of-custody, and reporting that will provide results which meet all relevant and applicable technical standards within the industry. This section will provide, in greater detail, specific project objectives and intended data usages. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal QC, audits, preventive maintenance of field equipment, and corrective action are described in other sections of this QAPP. Data quality and quantity are measured by comparison of resulting data with established acceptable limits for precision, accuracy, representativeness, comparability and completeness (PARCC). Data outside PARCC QA objectives will be evaluated, according to the criteria contained in the specified analytical method, to determine what, if any, aspects of the data can be defensibly used to meet the project objectives.

2.5.1. Precision

Definition – Precision is a measure of the degree to which two or more measurements are in agreement.

Field Precision Objectives – Field precision is assessed through the collection and measurement of field duplicates at a rate of 1 duplicate per 10 analytical samples.

Laboratory Precision Objectives - Precision in the laboratory is assessed through the calculation of relative percent differences (RPD) and relative standard deviations (RSD) for three or more replicate samples. The equations to be used for precision in this project are presented below.

For organic analyses, laboratory precision shall be assessed through the analysis of matrix spike/matrix spike duplicate (MS/MSD) and field duplicate samples.

$$\text{Relative Standard Deviation (RSD)} = (S/\overline{X}) \times 100$$

$$\text{Relative Percent Difference (RPD)} = \left(\frac{(X_1 - X_2)}{(X_1 + X_2)/2}\right) \times 100$$

2.5.2. Accuracy

Definition – Accuracy is the degree of agreement between an observed value and an accepted reference or true value. Sources of error that may contribute to poor accuracy are:

- Laboratory error
- Sampling inconsistency
- Field and/or laboratory contamination
- Handling
- Matrix interference
- Preservation

Field Accuracy Objectives – Accuracy in the field is assessed through the use of field blanks and through the adherence to sample handling, preservation and holding times.

Laboratory Accuracy Objectives – Laboratory accuracy is assessed through the analysis of MS/MSD, standard reference materials (SRM), laboratory control samples (LCS) and surrogate compounds, and the determination of percent recoveries. The equations to be used for accuracy in this project are presented below.

Percent Difference (%D) =	$\frac{x_1 - x_2}{x_1}$ x 100	Measure of the difference of 2 observations
Percent Recovery (%R) =	$\left(\frac{X_{meas}}{X_{true}}\right)$ x 100	Recovery of spiked compound in pure matrix

2.5.3. Representativeness

Definition – Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary.

Measures to Ensure Representativeness of Field Data - Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that work plans are followed and that proper sampling techniques are used. In designing the sampling program, media of concern have been specified.

Measures to Ensure Representativeness of Laboratory Data – Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, meeting sample holding times and analyzing and assessing field duplicate samples. The sampling network was designed to provide data representative of facility conditions. During development of this network, consideration was given to past waste disposal practices, existing analytical data, physical setting and processes, and for samples for hazardous characterization and disposal, constraints inherent to the RCRA program.

2.5.4. Comparability

Definition – Comparability is an expression of the confidence with which one data set can be compared to another.

Measures to Ensure Comparability of Field Data – Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that sampling plans are followed and that proper sampling techniques are used.

Measures to Ensure Comparability of Laboratory Data – Planned analytical data will be comparable when similar sampling and analytical methods are used and documented in the QAPP. Comparability is also dependent on similar QA objectives.

2.5.5. Completeness

Definition - Completeness is a measure of the amount of data that is judged to be valid to achieve the objectives of the project compared to the total amount of data collected.

Field Completeness Objectives – Field completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The equation for completeness is presented below. The field completeness objective for this project will be greater than 90 percent.

Laboratory Completeness Objectives – Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The equation for completeness is presented in below. The laboratory completeness objective for this project, with respect to critical measurement parameters will be greater than 90 percent for soils and 95 percent waters.

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

2.6. Data Quality Objectives (DQOs)

Data quality objectives (DQOs) are qualitative and quantitative statements derived from outputs of each step of the DQO Process, that:

- Clarify the study objective
- Define the most appropriate type of data to collect
- Determine the most appropriate conditions from which to collect the data

The DQOs are then used to develop a scientific and resource-effective sampling design.

The DQO Process allows decision makers to define their data requirements and acceptable levels of decision during planning before any data are collected. DQOs are based on the seven-step process described in EPA's February 2006 "Guidance on Systematic Planning Using the Data Quality Objectives Process" (QA/G-4). The DQOs are presented in ***Appendix A*** and the decision rule and error limits are summarized below.

Decision Rule

- If the sum of individual PCB Aroclor concentrations detect is less than the TSCA level (50 mg/kg), then the building materials can be handled as non-TSCA waste.

- If the sum of individual PCB Aroclor concentrations detected exceeds the TSCA level (50 mg/kg), then building materials, debris, and process residuals would require special demolition, handling, and disposal in accordance with 40 CFR 761.

- If the sum of individual PCB Aroclor concentrations exceeds 98 mg/kg (or equal to) and is less than 9,800 mg/kg, then building materials, debris, and process residuals would require additional designation at “WP02” per WAC 173-303-100.

- If the sum of individual PCB Aroclor concentrations exceeds 9,800 mg/kg (or equal to), then building materials, debris, and process residuals would require additional designation at "WP01" per WAC 173-303-100.

Error Limit

- The error limit for this project is 2 percent. Therefore, the following criteria will be used for determining material management.

- If the sum of individual PCB Aroclor concentrations detected is **less than 49 mg/kg**, then the materials can be handled as non-TSCA waste.

- If the sum of individual PCB Aroclor concentrations **exceeds 49 mg/kg** (or equal to), then building materials, debris, and process residuals would require special demolition, handling, and disposal in accordance with 40 CFR 761.

- If the sum of individual PCB Aroclor concentrations **exceeds 98 mg/kg** (or equal to) and is **less than 9,800 mg/kg**, then building materials, debris, and process residuals would require additional designation as "WP02" per WAC 173-303-100.

- If the sum of individual PCB Aroclor concentrations **exceeds 9,800 mg/kg** (or equal to), then building materials, debris, and process residuals would require additional designation as "WP01" per WAC 173-303-100.

2.7. Level of Quality Control Effort

Field blank, method blank, field duplicate, laboratory duplicate, laboratory control, and matrix spike/matrix spike duplicate (MS/MSD) samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. The type and frequency of QC samples that will be collected are summarized below.

- Equipment blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field sampling program. Equipment blank samples are analyzed to check for procedural contamination at the facility which may cause sample contamination.
  One equipment blank per day (collected from sampling equipment that is re-used)

- Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures.
  One method blank per laboratory analytical batch

- Duplicate samples are analyzed to check for sampling and analytical reproducibility.
  One duplicate sample for every 10 investigative samples collected (or fewer investigative samples) of a given matrix

- Laboratory control samples (LCS) are used to measure the accuracy of the investigative sample results.
  One LCS per laboratory analytical batch

- MS/MSDs provide information about the effect of the sample matrix on the digestion and measurement methodology. MS/MSD samples are designated/collected for organic analyses only.
  One MS/MSD should be collected for every 20 (or fewer) investigative samples of a given matrix.

2.8. TRAINING REQUIREMENTS

Training requirements for this project are specified in 29 CFR 1910.120. Training shall be provided to all project personnel to ensure compliance with the health and safety plan and technical competence in performing the work effort. Documentation of this training shall be maintained in the records of the contracted organizations. No specialized training is required for the actual sampling; however, training may be required for confined space entry, fall protection, and lead awareness.

2.9. DOCUMENTS AND RECORDS

The final evidence file will be the repository for all documents which constitute evidence relevant to sampling and analysis activities as described in this QAPP. MWH, on behalf of Foster Pepper, is the custodian of the evidence file and maintains the contents of evidence files for the investigations, including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports, and data reviews in a secured, limited access area. This area will be located:

MWH Office
2353 130th Avenue NE, Suite 200
Bellevue, Washington 98005

Unless otherwise directed by the City or Foster Pepper, documents will be retained for up to three years following sample collection, and will be the responsibility of the MWH Project Manager. Destruction or discarding of the documents will not occur without advance written notice to the City.

The final evidence file will include:

- Field logbooks
- Field data and data deliverables
- Photographs
- Drawings
- Soil boring logs
- Laboratory data deliverables
- Data validation reports
- Data assessment reports
- Progress reports, QA reports, interim project reports, etc.
- All custody documentation (tags, forms, air bills, etc.)

- Progress reports, QA reports, interim project reports, etc.
- All custody documentation (tags, forms, air bills, etc.)

3. DATA GENERATION AND ACQUISITION ELEMENTS

This section addresses aspects of data generation and acquisition to ensure that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and QC activities are employed and documented.

3.1. SAMPLING PROCESS DESIGN

The sampling program and methods are defined in the ***Sampling Plan***.

3.2. SAMPLE HANDLING AND CUSTODY

Custody procedures help to satisfy requirements for relevance and authenticity.

A sample or evidence file is under custody if:

- The item is in actual possession of a person.
- The item is in the view of the person after being in actual possession of the person.
- The item was in actual physical possession but is locked up to prevent tampering.
- The item is in a designated and identified secure area.

3.2.1. Field Custody Procedures

Dedicated field logbooks will provide the means of recording data collecting activities performed during the investigation. As such, entries will be described in as much detail as possible so that persons going to the facility could reconstruct a particular situation without reliance on memory.

Field log books will be bound field survey books or notebooks. Logbooks will be assigned to field personnel, but will be stored in the document control center when not in use. Each logbook will be identified by the project-specific document number.

The title page of each logbook will contain the following:

- Person to whom the logbook is assigned
- Logbook number
- Project name
- Project start date
- End date

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection equipment being used, and the signature of the person making the entry will be entered.

The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made in permanent ink, signed, and dated and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark which is signed and dated by the sampler.

Whenever a sample is collected, or a measurement is made, a detailed description of the location of the station, which includes compass and distance measurements, or, latitude and longitude information (e.g., obtained by using a global positioning system) shall be recorded. The number of the photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, along with the date of calibration.

Samples will be collected following the sampling procedures documented in this QAPP and the ***Sampling Plan***. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers.

Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. Field procedures have been designed such that as few people as possible will handle the samples. Sample tags will be used for all samples for which chain-of-custody is to be maintained.

- All bottles will be identified by the use of sample tags with sample numbers, sampling locations, date/time of collection, and type of analysis.

- Sample tags will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample tag because the ballpoint pen would not function in freezing weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage area.

- Samples will be properly packaged on ice (to ensure receipt at the laboratory at 4 degrees Celsius (^{o}C) ± 2 ^{o}C), for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by the field team leader. The cooler will be strapped shut with strapping tape in at least two locations.

- Shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and the pink and yellow copies will be retained by the sampler for returning to the sampling office.

- If the samples are sent by common carrier, a bill of lading will be used. Receipts of bills of lading will be retained as part of the permanent documentation. If sent by mail, the package will be registered with return receipt requested. Commercial carriers are not required to sign off on the custody form since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples will be transported to the laboratory the same day that the samples are collected (or as soon as possible) by overnight carrier.

3.2.2. Example Forms

Example forms that will be used during this project (e.g., custody forms, field auditing) are provided in ***Appendix B***.

3.2.3 Internal Laboratory Chain of Custody Procedures

The analyzing laboratory will follow their written internal chain of custody procedures. Internal chains of custody will be maintained and provided. When requested, as with this project, the laboratory enacts additional sample security measure. The analyzing laboratory's written standard operating procedure for internal chain of custody is included as ***Appendix C***.

3.3. ANALYTICAL METHODS AND QUALITY CONTROL

QA documents and standard operating procedures for laboratory analyses are available upon request from the laboratory.

A summary of the methods anticipated for this project are provided in the following section.

3.3.1. SW-846 Method 8082A

The method of PCB analysis that will be used for the sampling described in this QAPP is SW-846 8082A. The complete method is provided in ***Appendix D***. A summary is provided below.

Summary: This method is used to determine the concentrations of PCBs as Aroclors in extracts from solid and aqueous matrices, using open-tubular, capillary columns with electron capture detectors (ECD) or electrolytic conductivity detectors (ELCD). The Aroclors listed below will be quantified using this method to the concentrations show in the following table:

Table 1. Project-Required Reporting Limits for Method SW-846 8082A

PCB Aroclor	CAS Number	Reporting Limit (RL)
Aroclor 1016	12674-11-2	1.0 mg/kg
Aroclor 1221	11104-28-2	1.0 mg/kg
Aroclor 1232	11141-16-5	1.0 mg/kg
Aroclor 1242	53469-21-9	1.0 mg/kg
Aroclor 1248	12672-29-6	1.0 mg/kg
Aroclor 1254	11097-69-1	1.0 mg/kg
Aroclor 1260	11096-82-5	1.0 mg/kg

Table 2. Summary of Calibration and QC Procedures for Method SW-846 8082A

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria
Initial Calibration (ICAL) for all analytes (including surrogates)	At instrument set-up and after ICV or CCV failure, prior to sample analysis.	**ICAL must meet one of the three options below:** Option 1: linear - mean RSD for each analyte ≤ 20%; Option 2: non-linear least squares regression for each analyte: r2 ≥ 0.99; Option 3: least squares regression for each analyte: r2 ≥ 0.99.	Correct problem then repeat initial calibration	Flagging is not appropriate. All samples should be reanalyzed. If samples are not reanalyzed, apply R to all results for all samples associated with the calibration.
Initial Calibration Verification (ICV)	Once after each ICAL, analysis of a second source standard prior to sample analysis.	All reported analytes within established RT windows. All reported analytes within ± 20% of true value	Correct problem, rerun ICV. If that fails, repeat ICAL.	Flagging is not appropriate. All samples should be reanalyzed. If samples are not reanalyzed, apply R to all results for all samples associated with the calibration.
Retention time window position establishment	Once per ICAL and at the beginning of the analytical sequence.	Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed. On days when ICAL is not performed, the initial CCV is used.	NA.	NA.
Retention Time (RT) window width	At method set-up and after major maintenance (e.g., column change).	**RT width is ± 3 times standard deviation for each analyte RT from the 72-hour study.**	NA	NA

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria
Continuing Calibration Verification (CCV)	Before sample analysis, after every 10 field samples, and at the end of the analysis sequence.	**All reported analytes and surrogates within established RT windows.** **All reported analytes and surrogates within ± 20% of true value.**	Recalibrate, and reanalyze all affected samples since the last acceptable CCV; or Immediately analyze two additional consecutive CCVs. If both pass, samples may be reported without reanalysis. If either fails, take corrective action(s) and re-calibrate; then reanalyze all affected samples since the last acceptable CCV.	If reanalysis cannot be performed, data must be qualified and explained in the case narrative. Apply R-flag to all results for the specific analyte(s) in all samples since the last acceptable calibration verification.
Method blank	One per preparatory batch.	No analytes detected > 1/2 LOQ or > 1/10 the amount measured in any sample or 1/10 the regulatory limit, whichever is greater.	Correct problem. If required, reprep and reanalyze MB and all samples processed with the contaminated blank	If reanalysis cannot be performed, data must be qualified and explained in the case narrative. Apply B-flag to all results for the specific analyte(s) in all samples in the associated preparatory batch.
LCS for all analytes	One per preparatory batch.	% Recovery: 50-150 for Aroclor 1016 and 1260.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available .	For specific analyte(s) in all samples in the associated analytical batch; if the LCS %R > UCL, apply J to all positive results; if the LCS %R < LCL, apply J to all positive results, apply R to all non-detects.
MS/MSD	One per preparatory batch.	Aroclor 1016: % R 29-135 RPD 0-15. Aroclor 1260: %R 29-135 RPD 0-20.	none	For the specific analyte(s) in all samples collected from the same site matrix as the parent: %R < 20, apply J to all positive results, apply R to all non-detects; 20% ≤ %R < LCL; apply J for detects and UJ for non-detects; %R or RPD > UCL; J for detects.
Confirmation of positive results (second column)	All positive results must be confirmed	Calibration and QC criteria for second column are the same as for initial or primary column analysis. Results between primary and secondary column RPD ≤ 40%.	NA	Apply J-flag if RPD > 40%. Discuss in the case narrative.

QC Check	Minimum Frequency	Acceptance Criteria	Corrective Action	Flagging Criteria
Surrogate spike	All field and QC samples.	30-150%	Correct problem, then reprep and reanalyze all failed samples for all surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary.	For the samples; if the %R > 150% for a surrogate, apply J to all positive results; if the %R < 10% apply J to all positive results; apply R to all non-detect results; 10% ≤ %R < 30% apply J for detects and UJ for non-detects; if any surrogate recovery is <10%, apply R to all results.
Results reported between MDL and RL	none	none	none	Apply J to all results between MDL and RL.

3.3.2. Reserved

This section is reserved for possible other analyses that may be required.

3.4. INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

3.4.1. Field Instrument

Specific preventative maintenance procedures to be followed for field equipment are based on those recommended by the manufacturer. Field instruments will be checked and calibrated daily before use. Calibration checks will be documented on the Field Calibration log sheets. The maintenance schedule and trouble-shooting procedures for field instruments are available in their respective operating manuals.

3.4.2. Laboratory Instrument

Designated laboratory employees regularly perform routine scheduled maintenance and repair of all instruments. All maintenance that is performed is documented in the laboratory's operating record. All laboratory instruments are maintained in accordance with manufacturer's specifications.

3.5. INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

3.5.1. Laboratory Instrument Calibration

Calibration procedures for a specific laboratory instrument will consist of initial calibration, initial calibration verification and continuing calibration verification. For a description of the calibration procedures for a specific laboratory instrument, refer to the laboratory SOPs (not included herein, but available upon request). For each analysis performed in a laboratory, the laboratory SOP describes the calibration procedures, their frequency, acceptance criteria and the conditions that will require recalibration. In all cases, the initial calibration will be verified using an independently prepared calibration verification solution.

The laboratory maintains a sample logbook for each instrument which will contain the following information: instrument identification, serial number, date of calibration, analyst, calibration solutions run and the samples associated with these calibrations.

Calibration of laboratory equipment will be based on approved written procedures. Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing QC activities. These records will be filed at the location where the work is performed and will be subject to a QA audit.

The records of calibration will be kept as follows:

- If possible, each instrument will have record of calibration permanently affixed with an assigned record number.
- A label will be affixed to each instrument showing description, manufacturer, model numbers, date of last calibration, by whom calibrated (signature), and due date of next calibration reports and compensation or correction figures will be maintained with instrument.
- A written stepwise calibration procedure will be available for each piece of test and measurement equipment.
- Any instrument that is not calibrated to within the manufacturer's original specification will display a warning tag to alert that analyst that the device carries only a "Limited Calibration."

3.5.2. Field Instrument Calibration

Calibration of field instruments will consist of initial and continuing calibration (as appropriate per instrument). Continuing calibration will be performed after every ten samples analyzed or every 4 hours, whichever comes first.

Calibration information for each field instrument will be kept in the sampler’s field notebook. This information will include: instrument identification number, date and times of calibration, analyst, and calibration solutions.

Calibration will be based on instrument specific procedures based on manufacturer instructions.

3.6. INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Equipment, containers, sampling devices, and supplies will be obtained prior to the beginning of the field activity. Disposable supplies (e.g., gloves, filters, Ziploc bags) will be purchased and stored in containers designated for this project.

The laboratory shall inspect supplies and consumables prior to their use in analysis. The materials description in the methods of analysis shall be used as a guideline for establishing the acceptance criteria for these materials. Purity of reagents shall be monitored by analysis of LCSs. An inventory and storage system for these materials shall assure use before manufacturers' expiration dates and storage under safe and chemically compatible conditions.

3.7. NON-DIRECT MEASUREMENTS

Non-direct measurements are not anticipated for this project.

3.8. DATA MANAGEMENT

This section of the QAPP presents the procedures for data reduction, validation, and reporting.

3.8.1. Data Reduction

Field Screening and Sample Collection – Raw data from field measurements and sample collection activities will be appropriately recorded in the field notebook. If the data are to be used in the project reports, they will be reduced to a format appropriate for presentation (e.g., spreadsheet). Each document will undergo a QC check wherein the raw data are compared with the data presented in the document.

Laboratory Analytical Review – The laboratory will perform in-house analytical data reduction under the direction of the Laboratory Project Manager. The laboratory is responsible for assessing data quality and advising of any data which were rated "preliminary", "unacceptable", "estimated", or other notations which would caution the data user of possible unreliability.

3.8.2. Data Validation

The laboratory will review the data and confirm compliance with laboratory QC criteria as specified by this QAPP. The data review will identify any data points outside control limits and data omissions and interact with the laboratory to correct data deficiencies. Decisions to repeat sample collection and analyses may be made by the MWH project manager based on the extent of the deficiencies and their importance in the overall context of the project. Non-compliant data will be qualified and a case narrative prepared to describe the corrective actions taken and the implications as the validity of the data.

A 100-percent review of the data, which allows for complete independent data review without reconstruction of analytical data, will be conducted by a third party data validation contractor prior to use as final data in investigation reports. The validation will include a review of sample collection and holding times, and the QC measurement data associated with each sample set. Data validation actions will be based on USEPA guidance documents (USEPA Contract

Laboratory Program National Functional Guidelines for Organic Data Review, most recent version), the analytical method, and the professional judgment of the QA manager. Data qualifiers will be applied to results that do not meet project goals and in accordance with this QAPP (see ***Table 2***).

3.8.3. Data Reporting

Laboratory results will be provided in both electronic and paper formats. Data package requirements are specified in Section 5.2.1.

4. ASSESSMENT AND OVERSIGHT

This section addresses the activities for assessing the effectiveness of project implementation and associated QA and QC activities.

4.1. ASSESSMENT AND RESPONSE ACTIONS

4.1.1. Performance and System Audits

Performance and system audits of both field and laboratory activities may be conducted to verify that sampling and analysis are performed in accordance with the procedures established in the work plan and QAPP. The audits of field and laboratory activities include two independent parts: internal and external audits. Internal audits are defined as those completed by MWH. External audits are defined as those completed by the City or Foster Pepper Legal Counsel or designated entity. Audits may or may not be announced/performed, and the frequency is at the sole discretion of the aforementioned auditing entities. Copies of any audits performed will be distributed to the City, Foster Pepper Legal Counsel, and MWH. The MWH QA manager (or designee) may perform a field audit at the beginning of the sampling program. Additional field audits may be performed if significant quality issues are identified. An example field audit form is presented in ***Appendix B***. If significant laboratory issues should arise during the course of this project, the City and Foster Pepper Legal Counsel will either perform a laboratory audit or select a new laboratory. The new laboratory will be one that has been previously approved by the City and Foster Pepper Legal Counsel. An example laboratory audit form is presented in ***Appendix B***.

A Performance Audit is an independent check by a person or an audit team designated by management (i.e., the QA manager) to evaluate the data produced by a laboratory's analytical system. It is sometimes categorized as a quantitative appraisal of quality. Performance audits will include data reviews and may consist of the following:

a) Analysis worksheet reviews;
b) On-site analyst work review/observation;
c) Inter-laboratory check sample or "blind" sample analysis and review;
d) Inter-laboratory check sample or "round robin" samples' analysis and review; and,
e) Analyst proficiency test sample analysis review.

A System Audit is an on-site inspection and review of a laboratory's or field operation's QC system and procedures. It is sometimes categorized as a qualitative appraisal of quality. It will cover the operational elements of the QA program.

1. Critical items for a field system audit include:
    a. Appropriate sampling plans (QAPP, SP, etc.);
    b. Calibration procedures and documentation for field equipment;
    c. Documentation in field logbooks and sampling data sheets;
    d. Organization and minimization of potential contamination sources while in the field;
    e. Proper sample collection, storage, and transportation procedures; and,

   f. Compliance with established chain-of-custody and transfer procedures.

2. Critical items for a laboratory system audit include:
   a. Sample custody procedures;
   b. Calibration procedures and documentation;
   c. Completeness of data forms, notebooks, and other reporting requirements;
   d. Data review and validation procedures;
   e. Data storage, filing, and record keeping procedures;
   f. QC procedures, tolerances, and documentation;
   g. Operating conditions of facilities and equipment;
   h. Documentation of training and maintenance activities;
   i. Systems and operations overview; and,
   j. Security of laboratory automated systems.

4.1.2. Corrective Action

Corrective action is the process of identifying, recommending, approving and implementing measures to counter unacceptable procedures or out of QC performance which can affect data quality. Corrective action can occur during field activities, laboratory analyses, data review, and data assessment. Corrective actions proposed and implemented will be documented in the QA reports to management as necessary. Corrective action should only be implemented after approval by the project manager. A Corrective Action Request form is presented in ***Appendix B***. If immediate corrective action is required, approvals secured by telephone from the project/site manager should be documented in an additional memorandum.

For noncompliance problems, a formal corrective action program will be determined and implemented at the time the problem is identified. The person who identifies the problem will be responsible for notifying the MWH PTL (within one day of identifying the problem), who in turn will notify Foster Pepper Legal Counsel. Implementation of corrective action will be confirmed in writing through the same channels.

Any non-conformance with the established QC procedures in the QAPP or work plan will be identified and corrected in accordance with the QAPP. The MWH PTL, or designee, will issue a non-conformance report for each non-conformance condition.

Corrective actions will be implemented and documented in the field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped by stop-work order by the MWH Project Manager or PTL.

Copies of any corrective action reports prepared will be distributed to the City and to Foster Pepper Legal Counsel and MWH (within five days of identifying the problem).

4.1.3. Field Corrective Action

Corrective action in the field can be needed when the sample network is changed (i.e. more/less samples, sampling locations other than those specified in the QAPP, etc.), sampling procedures and/or field analytical procedures require modification, etc. due to unexpected conditions. Technical staff and project personnel will be responsible for reporting all suspected technical or

QA non-conformances or suspected deficiencies of any activity or issued document by reporting the situation to the MWH PTL or designee. This manager will be responsible for assessing the suspected problems in consultation with the MWH QA manager on making a decision based on the potential for the situation to impact the quality of the data. If it is determined that the situation warrants a reportable non-conformance requiring corrective action, then a non-conformance report will be initiated by the MWH QA manager.

The MWH QA manager will be responsible for ensuring that corrective actions for non-conformances are initiated by:

- Evaluating all reported non-conformances;
- Controlling additional work on nonconforming items;
- Determining disposition or action to be taken;
- Maintaining a log of non-conformances;
- Reviewing non-conformance reports and corrective actions taken; and
- Ensuring non-conformance reports are included in the final site documentation in project files.

If appropriate, the MWH QA manager will ensure that no additional work that is dependent on the nonconforming activity is performed until the corrective actions are completed. Corrective actions for field measurements may include:

- Repeat the measurement to check the error
- Check for all proper adjustments for ambient conditions such as temperature
- Check the batteries
- Re-Calibration
- Check the calibration
- Replace the instrument or measurement devices
- Stop work (if necessary)

The MWH PTL or his designee is responsible for all site activities. In this role, the MWH PTL at times is required to adjust the site programs to accommodate site specific needs. When it becomes necessary to modify a program, the responsible person notifies the MWH QA manager of the anticipated change and implements the necessary changes after obtaining the approval of the MWH QA manager. The MWH PTL and Project Manager must approve the change in writing or verbally prior to field implementation, if feasible. If unacceptable, the action taken during the period of deviation will be evaluated in order to determine the significance of any departure from established program practices and action taken.

The MWH QA manager is responsible for the controlling, tracking, and implementation of the identified changes. Reports on all changes will be distributed to affected parties.

Corrective action resulting from internal field audits will be implemented immediately if data may be adversely affected due to unapproved or improper use of approved methods. The QA officer will identify deficiencies and recommended corrective action to the project manager. Implementation of corrective actions will be performed by the field team. Corrective action will be documented in QA reports to the MWH PTL.

Corrective actions will be implemented and documented in the field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped.

4.1.4. Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during and after initial analyses. A number of conditions such as broken sample containers, multiple phases, low/high pH readings, potentially high concentration samples may be identified during sample log-in or just prior to analysis. Following consultation with lab analysts and section leaders, it may be necessary for the Laboratory Project Manager to approve the implementation of corrective action. These conditions may include dilution of samples and automatic re injection/reanalysis when certain QC criteria are not met, etc.

Corrective actions are required whenever an out-of-control event or potential out-of-control event is noted. The investigative action taken is somewhat dependent on the analysis and the event.

Laboratory personnel are alerted that corrective actions may be necessary if:

- QC data are outside the warning or acceptable windows for precision and accuracy;
- Blanks contain target analytes above acceptable levels;
- Undesirable trends are detected in spike recoveries or RPD between duplicates;
- There are unusual changes in detection limits;
- Deficiencies are detected by the QA Department during internal or external audits or from the results of performance evaluation samples; or
- Inquiries concerning data quality are received.

Corrective action procedures are often handled at the bench level by the analyst, who reviews the preparation or extraction procedure for possible errors, checks the instrument calibration, spike and calibration mixes, instrument sensitivity, and so on. If the problem persists or cannot be identified, the matter is referred to the Laboratory Project Manager for further investigation. Once the issue is resolved, full documentation of the corrective action will be documented.

These corrective actions are performed prior to release of the data from the laboratory. The corrective actions will be documented in both the laboratory's corrective action log (signed by analyst and Laboratory Project Manager), and the narrative data report sent from the laboratory to the MWH QA manager.

4.1.5. Corrective Action during Data Review and Data Assessment

The facility may identify the need for corrective action during either the data review or data assessment. Potential types of corrective action may include re-sampling by the field team or re-injection/reanalysis of samples by the laboratory.

These actions are dependent upon the ability to mobilize the field team, and whether re-sampling or reanalysis are necessary to meet the required QA and DQOs. When the MWH data assessor identifies a corrective action situation, it is the MWH PTL who will be responsible for approving the implementation of corrective action, including re-sampling, during data assessment. All corrective actions of this type will be documented by the MWH QA manager.

4.2. REPORTS TO MANAGEMENT

The need for corrective action will be identified as a result of the audits previously described or problems reported by personnel. If problems become apparent that are identified as originating in the field or laboratory, immediate corrective action will take place. If immediate corrective action does not resolve the problem, appropriate personnel will be assigned to investigate and evaluate the cause of the problem. When a corrective action is implemented, the effectiveness of the action will be verified such that the end result is elimination of the problem. Non-conformances and subsequent corrective action will be noted and reported to the MWH PTL. A report for each significant non-conformance will be prepared and submitted to the City and to Foster Pepper Legal Counsel.

5. DATA VALIDATION AND USABILITY

This section addresses the QA activities that occur after the data collection phase of the project is complete.

5.1. DATA REVIEW, VERIFICATION, AND VALIDATION

Scientifically sound data of known and documented quality which meet project DQOs are essential for use in the decision-making process. Data review is the process whereby data are examined and evaluated to varying levels of detail and specificity by a variety of personnel who have different responsibilities within the data management process. It includes verification, validation, and usability assessment. There must be persuasive records which document data review activities to afford effective assessment of the data for its quality and usability. The data can then move forward with associated qualifiers indicating the overall usability of the data.

Data verification is the first step in data review. As used here, data verification is confirmation that the specified requirements have been performed, i.e., it is a completeness check.

Data validation extends this and is confirmation that the requirements for a specific intended use are fulfilled. Data validation is the systematic process of evaluating the compliance of the data with the pre-defined requirements of the project, including method, procedural, or contractual requirements and the comparison of the data with criteria based on the quality objectives documented in the project QAPP. The purpose of data validation is to assess the performance associated with the analysis in order to determine the quality of the data. Data validation includes a determination, to the extent possible, of the reasons for any failure to meet performance requirements, and an evaluation of the impact of such failures on the usability of the data.

The data usability assessment is an evaluation based on the results of data validation and verification in the context of the overall project decisions or objectives. The assessment determines whether the project execution and resulting data meet project quality objectives. Both the sampling and analytical activities must be considered, with the ultimate goal of assessing whether the final, qualified results support the decisions to be made with the data.

5.2. VERIFICATION AND VALIDATION METHODS

5.2.1. Laboratory Requirements

The analytical data package must contain adequate information and be presented in a clear and concise manner. In general, a Level IV data package must be provided. Minimum requirements include:

1. Title page
2. Sample reference list
3. Analysis request form, field chain of custody
4. Sample administration receipt and documentation log
5. Internal chains of custody (if necessary)

6. Method summary/references
7. Analysis reports/laboratory chronicles
8. Case narrative and conformance/non-conformance summary
9. QC summary
    a. duplicate, matrix spike, matrix spike duplicate, blank, LCS, and surrogate recovery summary forms
    b. summaries for calibration and standardization
10. Sample data
    a. all raw sample data including instrument printouts (including calibration raw data)
    b. MDL summary form
11. Raw QC data
    a. blank raw data
    b. preparation logs

Based on the information in the data package, a reviewer should be able to determine the sensitivity, precision, accuracy, representativeness, comparability, and completeness of the data. Additional information may be required, depending on the detail of data review performed. Data packages will be delivered to the Project Manager within 21 calendar days of submitting the samples to the laboratory.

Laboratory Data Reporting Requirements

An important part of the laboratory documentation is the case narrative. The case narrative contains essential information which affords an informed evaluation of data usability. The case narrative shall include, but not be limited to:

- Table summarizing samples received, correlating field sample numbers, laboratory sample numbers, and laboratory tests completed;
- Discussion of sample appearance and integrity issues which may affect data usability (e.g., temperature, preservation, pH, sample containers, air bubbles, etc.);
- Samples received but not analyzed and why;
- Discussion of holding time exceedances for sample preparation and analyses;
- Analysis of all out-of-control or discrepancies of calibrations, continuing calibrations or QC sample results (surrogates, LCS, MS/MSD, etc.), raw data/chromatograms and corrective actions taken;
- Identification of samples and analytes for which manual integration was necessary;
- Discussion of all qualified data and definition of qualifying flags; and,
- Discussion and recommendations of potential data usability of qualified data.
- Reporting details:
- MDLs and sample results should be reported to one decimal place more than the corresponding RL, unless the appropriate number of significant figures for the measurement otherwise dictates;
- Soil samples shall have results reported on a dry weight basis. A wet weight aliquot of sample equivalent to the method specified dry weight aliquot of sample should be taken for analysis. Alternatively, the lab may choose to use a consistent wet weight aliquot that is expected to be large enough to compensate for the moisture in the sample (e.g., 50% more) and use this as a consistent weight;
- If possible, samples should be analyzed undiluted and non-detects reported to standard laboratory reporting limits (RLs). RLs for minority constituents in highly contaminated samples may have to be adjusted for dilutions.

Manual Integrations

Manual integrations are an integral part of the chromatographic analysis process. Manual integrations should be used judiciously to correct any incorrect integration by the automated instrumentation and not as a routine procedure for the purpose of meeting calibration or method QC acceptance criteria. Improper use of manual integrations (e.g., peak shaving or peak enhancement) are considered improper, unethical, or illegal actions if performed solely to meet QC requirements. Manual integrations shall be done solely as corrective action measures. When manual integrations are used, the following procedures are to be implemented for documenting the event and for consistency in performing the manual integration:

- There should be a laboratory SOP for manual integrations. This SOP shall specify when automated integrations by the instrument are likely to be unreliable, what constitutes an unacceptable automated integration, and how the problems should be resolved by the analyst. This includes procedures for the analyst to follow in documenting any required manual integrations;
- When manual integrations are performed, raw data records shall include a complete audit trail for those manipulations. The raw data records shall include the results of both the automated and manual integrations (i.e., “before” and “after” chromatograms of manually integrated peaks), notation of the cause and justification for performing the manual integrations, date, and signature/initials of the person performing the manual operations;
- All manual integrations must be reviewed and approved by the Section supervisor and/or the QA officer; and
- All manual integrations must be identified in the case narrative.

Laboratory Data Review Requirements

All analytical data generated by the laboratory shall be verified prior to submittal to MWH. This internal data review process, which is multi-tiered, shall include all aspects of data generation, reduction, and QC assessment. In each laboratory analytical section, the analyst performing the tests shall review 100 percent of the definitive data. After the analyst’s review has been completed, 100 percent of the data shall be reviewed independently by a senior analyst or by the supervisor of the respective analytical section using the same criteria.

The following elements for review/verification at each level must include, but not be restricted to:

- Sample receipt procedures and conditions;
- Sample preparation;
- Appropriate SOPs and analytical methodologies;
- Accuracy and completeness of analytical results;
- Correct interpretation of all raw data, including all manual integrations;
- Appropriate application of QC samples and compliance with established control limits;
- Verification of data transfers;
- Documentation completeness; and,
- Accuracy and completeness of data deliverables (hard copy and electronic).

Laboratory Data Evaluation

The calibration, QC, corrective actions, and flagging requirements for definitive data are shown in the ***Table 3*** and ***Table 4***. Data qualifiers shall be applied by the laboratory according to the requirements in the ***Table 3***. The allowable data qualifiers for definitive data are R, J, B, U, and

UJ. The definitions of the data qualifiers are provided in Table 3. Flagging criteria apply when acceptance criteria are not met and corrective actions were not successful or not performed. The data qualifiers are reviewed by the supervisor of the respective analytical sections after the first and second level reviews of the laboratory data have been performed.

The laboratory QA section shall perform a 100 percent review of 10 percent of the completed data packages, and the laboratory project representative shall complete a final review on all the completed data packages.

The third-party validator subsequently evaluates the flags applied by the laboratory as part of their data validation and usability assessment activities. The flags may be accepted, modified, or rejected. For all data qualifiers which are changed, the third-party validator must provide clear justification for those modifications based on project-specific quality objectives.

5.2.2. Prime Contractor Requirements

The ultimate goal of data review is to ensure that the decisions which are made as a result of the environmental data collection effort are supported by data of the type and quality suitable for their intended use. The prime contractor, MWH, has overall responsibility for data quality and may be assisted in its review by external organizations. MWH will use a third-party contractor to perform an unbiased validation of project data.

Responsibilities and Qualifications

The data validation/usability assessment processes involve the exercise of professional judgment. Regardless of who performs these, the individual should possess the disciplinary expertise, experience, and theoretical knowledge to perform the task. It is also imperative that these individuals possess a complete understanding of the intended use of the data and the relationship of the QC results to the usability of the data. For this reason, it is essential that they be involved during project planning in the systematic planning process, choice of preparation and analytical methods, and decisions made regarding data verification and data validation. When this is not feasible, such as when a third-party is contracted for data validation, all project planning documents and procedures, as well as sample collection information must be made available to the individuals assigned to the task.

Data Verification Guidelines

The data verification performed by the laboratory should be reviewed for completeness and accuracy. Data verification may be done electronically or manually, or by a combination of both. This may include, but is not limited to:

- Sampling documentation (COC Form, etc.);
- Preservation summary and technical holding times;
- Presence of all analyses and analytes requested;
- Use of the required sample preparation and analysis procedures;
- The method detection and reporting limits will be evaluated against the project requirements;
- The correctness of the concentrations units; and,
- Case narrative.

Data Validation Guidelines

The data validation process builds on data verification. The laboratory case narrative and data validation results should be reviewed and data qualifiers removed or added in light of project knowledge. It can involve an in-depth review of the raw data to verify accuracy followed by analysis and interpretation of the data in the context of the project objectives and end-use as part of the usability assessment.

The raw data review should include, but is not limited to:

- Instrument calibration and QC parameters. These shall be reviewed for compliance with the criteria specified in the applicable Summary of Calibration and QC procedures tables, and flagged as necessary;
- Review of raw data and inspections of chromatograms;
- Review of System Performance;
- Review for proper integration;
- Review of spectral matches, and/or retention times to verify analyte identification;
- Check for interference problems or system performance problems, such as chromatographic baseline anomalies and drifts, evidence of column degradation, etc.;
- Estimated results; and,
- Resolution by the laboratory of any identified problems, as necessary.
- Data analysis and interpretation relies heavily on the validator's professional judgment. It should include, but is not limited to:
- Evaluation of all B-flagged data and final determination of its usability;
- Evaluation of duplicate, replicate, and split sample analyses. Indications of poor precision should be investigated for cause and the impact on the overall usability of the data must be discussed;
- Evaluation of the impact of multiple data issues on the final analytical results;
- Evaluation of the deficiencies identified during data verification and assessment of their impact on the sample results;
- Incorporation of site-specific factors and assessment of their impact on the data;
- Assessment of data usability and assignment of final data qualifiers, as necessary; and,
- Discussion of completeness, representativeness, and comparability.

A data validation report will be prepared summarizing the findings and discussing their impact on the overall data usability.

Blank Evaluation Guidelines

MWH is expected to evaluate laboratory B-qualified data such as method blanks, as well as other blanks (equipment blanks, etc.) based on the concentration of the analyte in the samples in relation to the concentration in the blank, during the data validation process. The B-flag may be removed and not utilized if the analyte concentrations in the samples are much higher (≥5X) than in the blank (≥10X in the case of common laboratory contaminants). Any blank contamination which may impact the data usability must be discussed by MWH in conjunction with project-specific goals.

Duplicate/Replicate Evaluation Guidelines

QC measures for precision include field duplicates, laboratory duplicates, matrix spike duplicates, analytical replicates, and surrogates. These measures are evaluated by the laboratory and qualified according to the guidelines below, with the exception of field duplicates.

Specifically, field duplicates or split samples should be sent to the laboratory as blind samples and should be given unique sample identification numbers. These sample results can then be associated by MWH and can be used to assess field sampling precision, laboratory precision, and the representativeness of the matrix sampled. MWH must use experience and site-specific knowledge to assess the value of the field duplicate samples as a measure of precision or representativeness. Flagging of results associated with field duplicates should be assigned such that the level of uncertainty required, as provided by the project-specific objectives, is taken into account. Poor overall precision may be the result of one or more of the following: field instrument variation, analytical measurement variation, poor sampling technique, sample transport problems, or spatial variation (heterogeneous sample matrices). To identify the cause of imprecision, the field sampling design rationale and sampling techniques should be evaluated by MWH, and both field and analytical duplicate sample results should be reviewed. If poor precision is indicated in both the field and analytical duplicates, then the laboratory may be the source of the error. If poor precision is limited to the field duplicate results, then the sampling technique, field instrument variation, sample transport, and/or spatial variability may be the source of the error. If data validation reports indicated that analytical imprecision exists for a particular data set or sample delivery group, then the impact of that imprecision on usability must be discussed in the report.

Matrix Interference Evaluation Guidance

In the case of matrix interference, the laboratory will follow the guidelines specified in the tables below. However, MWH must apply flags to additional samples from the same site and same matrix, as appropriate.

Flagging Conventions

The allowable final data qualifiers for definitive data, and the hierarchy of data qualifiers, listed in order of the most severe through the least severe, are R, J, B, U, and UJ.

Table 3. Data Qualifiers

Qualifier	Description
R	The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.
J	The analyte was positively identified, the quantitation is an estimation.
B	The analyte was found in an associated blank, as well as in the sample.
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific QC criteria.

Table 4. Data Validation Qualifying Conventions

QC Requirement	Criteria	Data Qualifier Flag	Flag Applied To
Holding Time	Time exceeded for extraction or analysis.	J or R	All analytes in the sample (based on reviewer judgment).
LCS	See Table 2 above		
Method Blank	See Table 2 above		
Equipment Blank	See Table 2 above		
Field duplicates	Field duplicates > RLs AND RPD outside CL.	J for the positive results; R for the non-detects.	The specific analyte(s) in all samples collected on the same sampling date.
MS/MSD	See Table 2 above		
Sample Preservation/ Collection	Preservation/collection requirements not met.	R for all results	All analytes in the sample.
Sample Storage	< 2°C or > 6°C	J for the positive results; R for the non-detects.	All analytes in the sample.

5.3. RECONCILIATION WITH USER REQUIREMENTS

Field and laboratory data will be compared with DQOs. The QA manager and MWH PTL will evaluate whether these data are suitable for decision-making. Data that do not meet the DQOs or are not suitable for decision-making will be identified and flagged to alert users of any potential concerns or limitations with using the data.

The QA manager will review the data anomalies or data gaps to evaluate whether identified issues are due to sample collection or analyses. If the identified issues are attributable to laboratory analyses, the QA manager will contact the laboratory regarding the situation and to solicit recommendations to correct the problem.

6. REFERENCES

Third Edition of SW-846, USEPA
http://www.epa.gov/osw/hazard/testmethods/sw846/online/index.htm

National Functional Guidelines for Superfund Organic Methods Data Review, USEPA
http://www.epa.gov/superfund/programs/clp/download/som/som22nfg.pdf

Appendix A – Data Quality Objectives (DQOs)

DQOs are qualitative and quantitative statements derived from outputs of each step of the DQO Process, that:

- Clarify the study objective;
- Define the most appropriate type of data to collect; and,
- Determine the most appropriate conditions from which to collect the data.

The DQOs are then used to develop a scientific and resource-effective sampling design.

The following process allows decision makers to define their data requirements and acceptable levels of decision during planning before any data are collected. DQOs are based on the seven step process described EPA's February 2006 "Guidance on Systematic Planning Using the Data Quality Objectives Process" (QA/G-4). These steps are summarized below.

Step 1 - Problem Statement
Purpose: Summarize the problem that will require new environmental data, and identify the resources available to resolve the problem.

Output: There is a need to collect adequate data to evaluate the potential that structures at the Water Plant (sedimentation basin, filter basin, clear well, sludge settling basin, and interconnections) have been impacted by PCBs or whether coatings and/or concrete associated with the structures was manufactured with PCBs.

Step 2 - Decision Statement
Purpose: To identify the decision that requires new environmental data to address the problem.

Output: The data are being collected as part of pre-demolition decision making in order to establish procedures for demolishing the former water treatment system including sedimentation basin, filter basin, clear well, sludge settling basin, and interconnections.

Step 3 - Inputs
Purpose: To identify the information that will be required to support the decision and specify which inputs require new environmental measurements.

Output: The previous material assessment will be used to support data collection and sampling. The results from the new data collection and sampling will be used to support the decision rule below.

Step 4 - Boundaries
Purpose: To define the spatial and temporal boundaries that the data must represent to support the decision.

Output: The media that will be sampled include:

(1) concrete structures
(2) material used to coat concrete and metal structures
(3) sediment within settling basins
(4) redwood baffles
(5) expansion joint sealant
(6) expansion joint cork
(7) filter basin filter media
(8) filter basin gravel bed
(9) window caulk/glazing

Because PCBs are relatively stable and the media of interest will remain undisturbed during characterization, the temporal boundaries of this study are defined as the pre-demolition time period.

Step 5 - Decision Rule
Purpose: To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing among alternative actions; and develop an "if . . . then . . ." decision rule that defines the conditions that would cause the decision maker to choose among alternative actions.

- Output: If the sum of individual PCB Aroclor concentration exceeds TSCA level (50 mg/kg), then building materials, debris and process residuals would require special demolition, handling, and disposal.

- If sum of individual PCB Aroclor concentrations is detected less than the TSCA level (50 mg/kg), then the materials can be handled as non-TSCA waste.

Step 6 - Decision Error Limits
Purpose: To specify the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data.

Output: For Water Plant structures, the TSCA regulatory limit is 50 mg/kg. The error limit for this project is 1 mg/kg.

Step 7 – Optimization
Purpose: To identify a resource-effective sampling and analysis design for generating data that are expected to satisfy the DQOs.

Output: The ***Sampling Plan*** has been developed to meet the DQOs.

Appendix B – Example Forms

Friedman and Bruya
3012 16th Avenue West

Seattle WA 98119
phone 206-815-8282 fax 206-283-5044

Chain of Custody Record

Privileged and Confidential

Client Contact	Project Manager: Greg Harris	Site Contact:	Date:	COC No:
MWH Americas, Inc.	Tel/Fax:	Lab Contact:	Carrier:	_______ of ______ COCs
2353 130th Avenue NE, Suite 200-520 Corporate Center	**Analysis Turnaround Time**			Job No.
Bellevue, WA	Calendar (C) or Work Days (W) __________			
425-896-6900 Phone	TAT if different from Below _________			SDG No.
425-602-4020 FAX	☐ 2 weeks			
Project Name: Anacortes WTP	☐ 1 week			
Site: Anacortes WTP, Mount Vernon, WA	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	PCB - 8082	Total Lead - 200.8	TCLP RCRA Metals - 6010	TCLP Hg - 7471	TCLP SVOC - 8270													Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____________

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ ***Return To Client*** ☐ ***Disposal By Lab*** ☐ ***Archive For __________ Months***

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Corrective Action Request Form

Project:____ Date:______________

Project Number:______________ MWH Project Manager____________________________

Description of Problem:____

Requested By:____ Date:____________

Submit this form to QA Manager Promptly

Significant Condition Adverse to Quality? Yes / No

Responsible for action__________________________________ Response due:__________

Submit completed response to:____

To be completed by the responsible person. Include evidence that corrective action has been implemented.

Describe the problem: ____

Corrective Action to be taken to correct problem and prevent recurrence:_________________

Signature:____ Date:____________

Corrective Action Plan Accepted:___________________________ Date:____________

CA Verified By:____ Date:____________

Corrective Action Accepted:________________________________ Date:____________

LABORATORY AUDIT OVERVIEW AND CHECKLIST

This document is intended for use by MWH staff trained to perform analytical laboratory audits. It should be used in conjunction with project and program specific requirements. The auditor should be familiar with commercial client requirements.

OVERALL OPERATIONS

The auditor will review all aspects of the laboratory as deemed necessary. Generally, it is advised that the auditor follow the trail of a laboratory sample from sample control, preparation area, analysis and data reporting. Listed below is a summary of overall operations information used to evaluate the laboratory compliance with standard project requirements.

Statistical Calculations

Statistic	**Symbol**	**Formula**	**Definition**	**Uses**
Mean	$\bar{X}$	$\dfrac{\left(\sum_{i=1}^{n} x_i\right)}{n}$	Measure of central tendency	Used to determine average value of measurements
Standard Deviation	S	$\left(\dfrac{\Sigma(x_i-\bar{X})^2}{(n-1)}\right)^{½}$	Measure of relative scatter of the data	Used in calculating variation of measurements
Relative Standard Deviation	RSD	$(S/\bar{X})$ x 100	Relative standard deviation, adjusts for magnitude of observations	Used to assess precision for replicate results
Percent Difference	%D	$\dfrac{x_1 - x_2}{x_1}$ x 100	Measure of the difference of 2 observations	Used to assess accuracy
Relative Percent Difference	RPD	$\left(\dfrac{(X_1 - X_2)}{(X_1 + X_2)/2}\right)$ x 100	Measure of variability that adjusts for the magnitude of observations	Used to assess total and analytical precision of duplicate measurements
Percent Recovery	%R		Recovery of spiked compound in pure matrix	Used to assess accuracy
Percent Recovery	%R	$\dfrac{\left(\text{value of spiked sample} - \text{value of unspiked sample}\right)}{\text{Value of added spike}}$ x	Recovery of spiked compound in sample matrix	Used to assess matrix effects and total precision

Correlation Coefficient	r	see SW8000B section 7.5.3		Evaluation of "goodness of fit" of a regression line
Coefficient of Determination	COD	see SW8000B section 7.5.3		Evaluation of "goodness of fit" of a polynomial equation

x = Observation (concentration)
n = Number of observations

GENERAL METHOD COMPLIANCE ISSUES
Method Detection Limits
The method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The laboratory shall establish MDLs for each method, matrix, and analyte for each instrument the laboratory plans to use for the project. The laboratory shall revalidate these MDLs at least once per twelve month period.

Laboratories participating in this work effort shall demonstrate the MDLs for each instrument, including confirmatory columns, method of analysis, analyte, and matrix (i.e., water and soil) using the following instructions:

(1) Estimate the MDL using one of the following:
a) the concentration value that corresponds to an instrument signal/noise ratio in the range of 2.5 to 5, or
b) the concentration equivalent of 3 times the standard deviation of replicate measurement of the analyte in reagent water, or
c) the region of the standard curve where there is a significant change in sensitivity (i.e., a break in the slope of the standard curve).

(2) Prepare (i.e., extract, digest, etc.) and analyze seven samples of a matrix spike (ASTM Type II water for aqueous methods, Ottawa sand for soil methods, glass beads of 1 mm diameter or smaller for metals) containing the analyte of interest at a concentration three to five times the estimated MDL.

(3) Determine the variance (S^2) for each analyte as follows:

$$S^2 = \frac{1}{n-1}\left[\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2\right]$$

where x_i = the ith measurement of the variable x and $\bar{x}$ = the average value of x

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

(4) Determine the standard deviation (s) for each analyte as follows:

$$s = (S^2)^{1/2}$$

(5) Determine the MDL for each analyte as follows:

$$MDL = 3.14(s)$$

(note: 3.14 is the one-sided t-statistic at the 99 percent confidence level appropriate for determining the MDL using 7 samples)

(6) If the spike level used in step 2 is more than 5 times the calculated MDL, repeat the process using a smaller spiking level.

Where multiple instruments are used, the MDL used for reporting purposes shall represent the least sensitive instrument.

Reporting Limits

The laboratories shall compare the results of the MDL demonstrations to the reporting limits (RLs) for each method required. The MDL may not be more than one-half the corresponding RL. The laboratories shall also verify RLs by including a standard at or below the RL as the lowest point on the calibration curve.

All results shall be reported at or above the MDL values, however, for those results falling between the MDL and the RL, an data quality flag shall be applied to the results indicating the variability associated with the result. No results shall be reported below the MDL.

Instrument Calibration

Analytical instruments shall be calibrated in accordance with the analytical methods. All analytes reported shall be present in the initial and continuing calibrations, and these calibrations shall meet the acceptance criteria specified in the required method. All results reported shall be within the calibration range. Records of standard preparation and instrument calibration shall be maintained. Records shall unambiguously trace the preparation of standards and their use in calibration and quantitation of sample results. Calibration standards shall be traceable to standard materials.

All calibration criteria shall satisfy SW-846 requirements at a minimum. The initial calibration shall be checked at the frequency specified in the method using materials prepared independently of the calibration standards. Multipoint calibrations shall contain the minimum number of calibration points specified in the method with all points used for the calibration being contiguous. If more than the minimum number of standards is analyzed for the initial calibration, all of the standards analyzed shall be included in the initial calibration. The only exception to this rule is a standard that has been statistically determined as being an outlier can be dropped from the calibration, providing the requirement for the minimum number of standards is met. Analyte concentrations are determined with either calibration curves or response factors (RFs). For gas chromatography (GC) and gas chromatography/mass spectroscopy (GC/MS) methods, when using RFs to determine analyte concentrations, the average RF from the initial five point calibration shall be used. The continuing calibration shall not be used to update the RFs from the initial five point calibration. The continuing calibration verification cannot be used as the laboratory control sample (LCS).

ELEMENTS OF QUALITY CONTROL

This section presents QC requirements relevant to analysis of environmental samples that shall be followed during all analytical activities for fixed-base, mobile, and field laboratories producing definitive data. The purpose of this QC program is to produce data of known quality that satisfy the project objectives and that meet or exceed the requirements of the standard methods of analysis. This program provides a mechanism for ongoing control and evaluation of data quality measurements through the use of QC materials.

Laboratory QC samples (e.g., blanks and laboratory control samples) shall be included in the preparation batch with the field samples. Any analytical laboratory processes are batch processes, where a batch of samples is used as the frequency of the quality control elements. Two types of batches are used in the laboratory: the preparation and instrument batch. A preparation batch (herein referred to as "batch") is defined as a group of 20 or less environmental samples of the same matrix that are prepared (e.g., extracted or digested) within the same time period (concurrently) or in limited continuous sequential time periods. Keeping batches "open" for more than 2 hours will not be permissible; samples and their associated QC samples must be prepared in continuous process. The batch must be analyzed sequentially on a single instrument.

The instrument batch is a group of 20 or less environmental samples that are analyzed together within the same analytical run sequence or in continuous sequential time periods. In general, if an instrument is not used for periods of time or shut down (e.g., overnight) then a new instrumental batch must be started. Samples in each batch are of similar matrix (e.g., soil, sludge, liquid waste, water), are treated in a similar manner, and use the same reagents.

For volatile organics analyses by GC or GC/MS, the preparation and instrument batch definitions become less distinct since the sample preparation (purge and trap) is performed as part of the instrumental analysis, and sample preparation is more of a sequential rather than batch process. For the purpose of QC frequency, GC and GC/MS batches for VOCs are defined as 20 or less environmental samples analyzed within a calibration (and for GC/MS, tune) time period, or within sequential continuous calibration time periods.

In general, preparation batches should be analyzed together, as a unit, within the same instrument batch. If samples from the same preparation batch are not analyzed within the same instrument batch because of dilution requirements or matrix interference, the following is required:

- All samples from the preparation batch must be clearly associated with their corresponding preparation batch QC samples, and appropriate corrective actions must be performed on all samples of the preparation batch, based on the results of the associated preparation batch QC.

- All instrument QC for each instrument batch (initial and continuing calibrations, instrument blank analyses, and tuning) must meet the established criteria for the method.

- Instrument cleanliness must be proven through the analysis of an instrument blank, the preparation batch blank, or a preparation blank from another batch.

(The preparation batch LCS and MS/MSD need not be analyzed on additional instruments.)

When preparation batches must be split among instruments to meet expedited turnaround times, each instrument batch needs to contain quality control elements equivalent to the quality control elements available in single instrument batch analyses.

An analytical batch is defined as a number of samples (not to exceed 20 environmental samples plus the associated laboratory QC samples) that are similar in composition (matrix) and that are extracted or digested at the same time and with the same lot of reagents. Matrix spikes and matrix spike duplicates count as environmental samples. The term analytical batch also extends to cover samples that do not need separate extraction or digestion (e.g., volatile analyses by purge and trap). This analytical batch is a number of samples (not to exceed 20 environmental samples plus the associated laboratory QC samples) that are similar in composition (matrix) and analyzed sequentially. The identity of each analytical batch shall be unambiguously reported with the analyses so that a reviewer can identify the QC samples and the associated environmental samples.

The type of QC samples and the frequency of use of these samples are discussed below.

Confirmation
Quantitative confirmation of results at or above the RL for samples analyzed by GC or HPLC shall be required, unless otherwise specified for the method, and shall be completed within the method-required holding times. For GC methods, a second column is used for confirmation. For HPLC methods, a second column or a different detector is used. The result of the first column/detector shall be the result reported.

Standard Materials
Standard materials, including second source materials, used in calibration and to prepare samples shall be traceable to National Institute Standards and Technology (NIST), EPA, American Association of Laboratory Accreditation (A2LA) or other equivalent approved source, if available. If an NIST, EPA or A2LA standard material is not available, the standard material proposed for use shall be included in an addendum to the SAP and approved before use. The standard materials shall be current, and the following expiration policy shall be followed: The expiration dates for ampulated solutions shall not exceed the manufacturer's expiration date or one year from the date of receipt, whichever comes first. Expiration dates for laboratory-prepared stock and diluted standards shall be no later than the expiration date of the stock solution or material or the date calculated from the holding time allowed by the applicable analytical method, whichever comes first. Expiration dates for pure chemicals shall be established by the laboratory and be based on chemical stability, possibility of contamination, and environmental and storage conditions. Expired standard materials shall be either revalidated prior to use or discarded. Revalidation may be performed through assignment of a true value and error window statistically derived from replicate analyses of the material as compared to an unexpired standard. The laboratory shall label standard and QC materials with expiration dates.

A second source standard is used to independently confirm initial calibration. A second source standard is a standard purchased from a different vendor than the vendor supplying the material used in the initial calibration standards. The second source material can be used for the continuing calibration standards or for the LCS (but shall be used for one of the two). Two different lot numbers from the same vendor do not constitute a second source.

Supplies and Consumables

The laboratory shall inspect supplies and consumables prior to their use in analysis. The materials description in the methods of analysis shall be used as a guideline for establishing the acceptance criteria for these materials. Purity of reagents shall be monitored by analysis of LCSs. An inventory and storage system for these materials shall assure use before manufacturers' expiration dates and storage under safe and chemically compatible conditions.

PROCEDURES FOR AUDIT

The auditor should review both physical operation and documentation procedures within the laboratory. The auditor should provide the laboratory with a tentative schedule and request that a data package be made available for review during the audit. This data package should contain typical analyses including VOCs, SVOCs, TPH, OC Pesticides, PCBs, metals, and wet chemistry. Preferably it would be a MWH project. If the laboratory has not performed analysis for MWH, ask the laboratory to provide another data package which represents a typical project and the full range of analyses. The auditor should take the case narrative, results, chain of custody, and basic QC results from this package with them throughout the laboratory tour to ask the analysts questions and trace the documentation.

Basic Questions

It is recommended that the auditor ask the following questions as a minimum to familiarize themselves with the laboratory's operations:

1. Please walk me through your day? For example, how do you determine what samples are in-house and how you are going to prioritize your day?
2. Please show me how you handle quick TAT samples either due to holding time or project requirements.
3. How many people are in your department? How long have they been here? What is the turnover rate for your department?

Trace the project through each department. After all departments have been reviewed, the following items should be reviewed if they were not reviewed during the laboratory audit tour: SOPs, MDLs studies, calibration curves, recent audit letters and responses, and performance evaluation sample results.

ATTACHMENT 1 AUDIT CHECKLIST

ORGANIZATION

Item Description	Compliance	Comments
1. Does the laboratory have a QA Officer responsible for the quality system and its implementation?		
2. Is the QA Officer familiar with all the test procedures and QC requirements?		
3. Does the laboratory have documented protocols for training?		
4. What are the minimum experience requirements for the various managers and analysts?		
5. Is the analyst's performance audited and approved prior to work without close supervision by a senior chemist?		
6. Is there documented evidence of analyst proficiency for each test method performed?		
7. Does each department have appropriate checklists for reviewing information? Is the criteria specifically called out? Are the checklists current and appropriate? Are the checklists completely filled out? Obtain a copy for further review.		

FACILITIES

Item Description	Compliance	Comments
1. Does the laboratory have a security system?		
2. Is access to the analytical and sample storage areas controlled?		
3. Does the laboratory have adequate work space, ventilation, light, and access to stable power sources at workstations?		
4. Is the laboratory clean and organized?		
5. Is the laboratory free of dust, drifts, and temperature extremes?		
6. Is the reagent water free of contamination used for preparation of standards and samples? How is this documented? Are the criteria for acceptance clearly specified in the checklist? What is the frequency of monitoring the water?		
7. Is the conductivity of the water routinely checked and recorded daily?		
8. Is corrective action taken when the water does not meet the criteria?		
9. Are exhaust hoods provided to allow contamination-free work with VOCs and hazardous materials?		
10. Is the air flow of the hoods verified and recorded regularly? What is the frequency?		
11. Are adequate facilities, including cold storage, provided for separate storage of samples, reagents, extracts, solvents, reference materials, and standards to preserve their identity, concentration, purity, and stability?		
12. Does the laboratory have		

appropriate capacity to handle the contract load? Average number of samples per month?
13. Could the laboratory handle quick TAT samples?
14. Overall, is the laboratory acceptable for performing the work?

SAMPLE RECEIPT AND STORAGE

Item Description	Compliance	Comments
1. Are there adequate written procedures for receipt and storage, and dispersement for analysis and disposal?		
2. Do the written procedures accurately reflect procedures in use?		
3. Does the sample custodian use a checklist to document problems or deficiencies noted during sample log-in? Is sample temperature properly measured and recorded? Are pH values of aqueous samples checked and adjusted? How is this recorded? Obtain a copy of future review.		
4. Does a permanent record exist for sample log-in?		
5. Are samples assigned unambiguous sample ids? How are sample aliquots handled?		
6. Are corrective actions properly documented?		
7. Are clients notified if problems are noted? What is the average time from identification of problem to notification?		
8. Are there adequate facilities for sample storage? Are VOCs samples stored separately? Are water trip blanks stored with the associated soil samples for VOCs?		
9. Are temperature logs of refrigerators properly maintained? Are acceptable ranges used and posted?		
10. Are coolers and refrigerators locked when unattended?		
11. Is final disposition of samples documented?		

SAMPLE PREPARATION
GENERAL QUESTIONS FOR ORGANICS

Item Description	Compliance	Comments
1. Are SOPs available and adequate for sample preparation? Do the SOPs accurately reflect the procedures in use?		
2. Are all sample preparations conducted in the hood?		
3. How are samples batched? Are groups (up to a maximum of 20) which behave similarly with respect to procedures being employed? Is batching done over the same time period or continuous sequential time periods?		
4. Are method blanks, MS/MSDs, LCS, and laboratory duplicated performed? What is the frequency?		
5. Is a purified solid matrix used for method blanks for soils for VOCs?		
6. Is a purified sodium sulfate used for method blanks for SVOCs, pesticides, herbicides, and PCBs?		
7. Are clean up procedures used? What criteria are used to determine if clean up procedures are employed?		
8. Are uniquely numbered, bound, consecutively number page- logbooks used for sample preparation and well maintained? Are the forms or information completely filled out consistently?		
9. Are spiking solutions traceable to NIST or other reliable standards? Are certificates for analysis maintained?		
10. Are spiking solutions labeled properly with date of preparation, date of expiration, composition, concentration,		

and identity of preparer?
11. Have entries been made in permanent fashion and corrections made without obliterating original entry with initials and date of correction?
12. Are corrections reviewed and initialed by a supervisor?
13. Does the logbook contain the following information: Date, time, sample id, sample preparer, matrix, spiking standards (unique ids), pretreatment, volume/weight of sample and standards, final volume, and preparation method?
14. What is the average time from when the samples are delivered to the laboratory to when they are prepared and given to the analysts?

SAMPLE ANALYSIS
GENERAL QUESTIONS FOR ORGANICS

Item Description	Compliance	Comments
1. Are the manufacturer's operating manuals available to bench chemists?		
2. Is a permanent logbook kept for each instrument that summarizes instrument problems and servicing records? What type of information is maintained in the logbook?		
3. Is there calibration protocol available to bench chemists?		
4. What type of calibration is used? Are a minimum of 5 points used?		
5. Is acceptance criteria for linear is mean RSD for all analytes </= 20% or r>0.995 or non-linear is COD>/=0.990 (6 points used for 2^{nd} order and 7 points for 3^{rd} order)?		
6. Is calibration curve or calibration factor verified each working day?		
7. Are calibration results kept in a permanent logbook?		
8. Is MDL for each analyte and matrix type determined annually or whenever there is a significant change in instrument response?		
9. How is PQL determined? How is PQL verified and what frequency?		
10. What is the corrective action for method blank nonconformance?		
11. Is there any ambient or chronic laboratory contamination? If so, what levels?		
12. What is the corrective action for MS/MSD nonconformance?		
13. What is the corrective action for LCS nonconformance?		

14. What is the corrective action for surrogate nonconformance?
15. What is the corrective action for internal standard nonconformance?
16. What is the corrective action for RPD exceedances for MS/MSD or LCS pairs?
17. How are control limits determined? At what frequency?
18. Are standard solutions traceable to NIST or other reliable standards? Are certificates for analysis maintained?
19. Are standard solutions labeled properly with date of preparation, date of expiration, composition, concentration, and identity of preparer?
20. Have entries been made in permanent fashion and corrections made without obliterating original entry with initials and date of correction?
21. Are corrections reviewed and initialed by a supervisor?
22. Does the run logbook contain the following information: Date, time, sample id, sample analyst, matrix, standards (unique ids), pretreatment, volume/weight of sample used and standards, final concentration, and analytical method?
23. Are uniquely numbered, bound, consecutively number page- logbooks used for sample analysis and well maintained? Are the forms or information completely filled out consistently?
24. Are notebooks reviewed, initialed, and dated by supervisors on a regular basis?
25. Is the retention time window checked on a

quarterly basis or whenever a new column is installed?

26. What is the average time from when samples are delivered to the laboratory to when they are analyzed to when the data is reduced and reported?

27. How are historical data archived?

SAMPLE PREPARATION
GENERAL QUESTIONS FOR INORGANICS

Item Description	Compliance	Comments
1. Are SOPs available and adequate for sample preparation? Do the SOPs accurately reflect the procedures in use?		
2. Are all sample preparations conducted in the hood?		
3. How are samples batched? Are groups (up to a maximum of 20) which behave similarly with respect to procedures being employed? Is batching done over the same time period or continuous sequential time periods?		
4. Are method blanks, MS/MSDs, LCS, and laboratory duplicated performed? What is the frequency?		
5. Are uniquely numbered, bound, consecutively number page- logbooks used for sample preparation and well maintained? Are the forms or information completely filled out consistently?		
6. Are spiking solutions traceable to NIST or other reliable standards? Are certificates for analysis maintained?		
7. Are spiking solutions labeled properly with date of preparation, date of expiration, composition, concentration, and identity of preparer?		
8. Have entries been made in permanent fashion and corrections made without obliterating original entry with initials and date of correction?		
9. Are corrections reviewed and initialed by a supervisor?		
10. Does the logbook contain the following information: Date, time, sample id, sample		

preparer, matrix, spiking standards (unique ids), pretreatment, volume/weight of sample and standards, final volume, and preparation method?

11. What is the average time from when the samples are delivered to the laboratory to when the samples are prepared and then given to the analysts?

SAMPLE ANALYSIS
GENERAL QUESTIONS FOR INORGANICS

Item Description	Compliance	Comments
1. What grade are the gases and standards?		
2. Are manufacturer's operating manuals readily available to bench chemists?		
3. Is there calibration protocol available to bench chemists?		
4. Are calibrations results kept in permanent logbooks?		
5. Is a permanent logbook kept for each instrument that summarizes instrument problems and servicing records?		
6. Is the MDL for each element and matrix type determined annually or whenever there is a significant instrument change?		
7. How is PQL determined? How is PQL verified and what frequency?		
8. What is the corrective action for method blank nonconformance?		
9. Is there any ambient or chronic laboratory contamination? If so, what levels?		
10. What is the corrective action for MS/MSD nonconformance?		
11. What is the corrective action for LCS nonconformance?		
13. What is the corrective action for RPD exceedances for MS/MSD or LCS pairs?		
14. What are the criteria for post digest spikes and MSAs? When are they used?		
15. How are control limits determined? At what frequency?		
16. Are standard solutions traceable to NIST or other reliable standards?		

17. Are standard solutions labeled properly with date of preparation, date of expiration, composition, concentration, and identity of preparer?
18. Have entries been made in permanent fashion and corrections made without obliterating original entry with initials and date of correction?
19. Are corrections reviewed and initialed by a supervisor?

Analytical Method	Parameter	Preparatory Methods
8011	Ethylene dibromide (EDB) (water)	8011, 5030B
8015 (modified)	TPH volatile and extractable (water and soil)	(volatiles) 5030B, 5031, 5035 (extractables) 3510C, 3520C, 3545C, 3541, 3545, 3550B
8021B	Aromatic and halogenated volatile organics (water and soil)	3585, 5021, 5030B, 5035
8081A	Organochlorine pesticides (water and soil)	3510C, 3520C, 3540C, 3541, 3545, 3550B
8082	PCBs (water and soil)	3510C, 3520C, 3540C, 3541
8141A	Organophosphorus compounds (water and soil)	3510C, 3520C, 3540C, 3541, 3550B
8151A	Chlorinated herbicides (water and soil)	3510C, 3520C, 3540C, 3541, 3550B
8260B	Volatile organics (water and soil)	3585, 5021, 5030B, 5031, 5032, 5035
8270C	Semi-volatile organics (water and soil)	3510C, 3520C, 3540C, 3541, 3545, 3550B
8280A/8290	Dioxins and furans (water and soil)	(see analytical method)
8310	Polynuclear aromatic hydrocarbons (PAHs) (water and soil)	3510C, 3520C, 3540C, 3541, 3550B
8330	Explosive residues (water and soil)	3510C, 3520C, 3540C, 3541, 3550B
6010B	Trace metals by ICPES (water and soil)	3005A, 3010A, 3015, 3050B, 3051
6020	Trace metals by ICP-MS (water and soil)	3005A, 3010A, 3015, 3050B, 3051
7041	Antimony (water and soil)	(see analytical method), 3005A
7060A	Arsenic (water and soil)	(see analytical method), 3050B
7196A	Hexavalent chromium	3060A
7421	Lead (water and soil)	3015, 3020A, 3050B, 3051
7470A	Mercury (water)	(see analytical method)
7471A	Mercury (soil)	(see analytical method)
7740	Selenium (water and soil)	(see analytical method), 3050B
7841	Thallium (water and soil)	3015, 3020A, 3050B, 3051
7911	Vanadium (water and soil)	3015, 3020A, 3050B, 3051
9010B	Cyanide (water)	(see analytical method)
9012A	Cyanide (water)	(see analytical method)
9056	Common anions	N/A
TO-14	Volatile Organic Compounds in Ambient Air	N/A

QUALITY CONTROL FIELD AUDIT

Project Name:

Project Location:

Tasks Performed (Dates):

Date of Audit:

Type of Audit:

Auditor's Name/Title:

Onsite Personnel (Name/Title/Company):

Level of PPE Required:

Level of PPE Used:

Field Equipment

Instrument	Model	Calibration Check	Calibration Standard	Time/ Frequency
pH				
DO				
Redox (Eh)				
Cond.				
Thermometer				
Other:				

Type and Number of Samples Collected:

Sampling Procedures:

Analyses Requested:

Field Preservation:

Decontamination Procedures:

IDW Management:

Field Notes/COCs/Sampling Forms:

Auditor's Notes/Observations:

Corrective Actions Recommended:

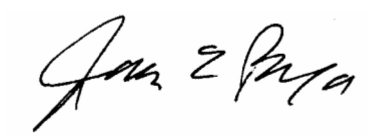
Appendix C – Laboratory Internal Chain of Custody Procedure

INTERNAL CHAIN OF CUSTODY

Friedman & Bruya, Inc.
Standard Operating Procedure

Revision Number 1
April 13, 2015

Approved by

Executive Committee: 

James E. Bruya

Quality Assurance Manager: 

Arina Podnozova

Document Control Number: 2

INTERNAL CHAIN OF CUSTODY

1.0 Purpose

The purpose of this standard operating procedure (SOP) is to define the additional procedures Friedman & Bruya (F&B) implements for projects requesting additional Internal Chain of Custody practices beyond F&B's standard sample handling protocols.

2.0 Scope

This SOP pertains to all projects requesting additional ICOC procedures be followed by F&B.

3.0 Internal Chain of Custody Overview

All projects and samples received by F&B are processed following the procedures outlined in the F&B Quality Assurance Manual (QAM) and SOPs. When additional sample security measures are requested, F&B can provide ICOC documentation, which completely describes sample locations from the time of sample receipt by F&B. F&B is a restricted access facility, but additional sample security measures are used for ICOC projects using a locked sample storage area.

4.0 Responsibilities

Documentation of sample condition upon receipt is governed through the F&B Sample Receiving SOP and QAM. Key staff involved include the Sample Receiving Technicians, Extraction Manager, and Project Leader. Review and oversight of ICOC activities are performed by the QA Officer, Laboratory Director and Executive Committee.

The Sample Receiving Technician is involved in the initial inspection and processing of samples as described in the F&B Sample Receiving SOP. The Extraction Manager directly oversees the activities of the Sample Receiving Technician.

The F&B Project Leader oversees the maintenance of the ICOC document and controls access to the secured sample storage area.

The Laboratory Director and Executive Committee provide oversight, primarily during final document review and review of internal and external audit findings to ensure that ICOC procedures are performed as defined by the F&B Quality System.

5.0 Procedure

5.1 Project samples should be delivered to F&B in a sealed container with intact Custody Seals showing the time, date and Sampler's signature.

5.2 Upon receipt of the project, the package is thoroughly inspected to ensure the integrity of the Custody Seal. If tampering is evident, the client will be immediately notified.

5.3 If the packaging is acceptable, the samples are processed according to the F&B Sample Receiving SOP.

5.4 A laboratory tracking document, or Internal Chain of Custody, is created to accompany the samples which accounts for the location and/or possession of the samples at all times.

5.5 The samples are then placed in a locked sample storage area until removal for analytical preparation. Access to the locked area is restricted to the Project Leader, Laboratory Director and Executive Committee.

5.6 All individuals involved in the handling of samples are required to sign and date the ICOC document when samples are removed and returned to the secure sample storage area. The purpose for sample removal is also documented.

5.7 The Project Leader is required to initial and date all entries associated with sample handling, in addition to the Sample Technicians.

END OF DOCUMENT

INTERNAL CHAIN OF CUSTODY

Project #:______________________________

Client:__________________________________

Date Received:___________________________

Sample Storage Location:__________________

F&B environmental chemists

Employee Signature	Time & Date	Project Leader Signature	Time & Date	Purpose

Project Leader Initials:________

NOTES:____

Appendix D - Laboratory Quality Procedures

METHOD 8082A

POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY

SW-846 is not intended to be an analytical training manual. Therefore, method procedures are written based on the assumption that they will be followed by individuals formally trained in at least the basic principles of chemical analysis and in the use of the subject technology.

In addition, SW-846 methods, with the exception of required method use for the analysis of method-defined parameters, are intended to be methods which contain general information on how to perform an analytical procedure or technique which a laboratory can use as a basic starting point for generating its own detailed standard operating procedure (SOP), either for its own general use or for a specific project application. The performance data included in this method are for guidance purposes only, and are not intended to be and must not be used as absolute QC acceptance criteria for purposes of laboratory accreditation.

1.0 SCOPE AND APPLICATION

1.1 This method may be used to determine the concentrations of polychlorinated biphenyls (PCBs) as Aroclors or as individual PCB congeners in extracts from solid, tissue, and aqueous matrices, using open-tubular, capillary columns with electron capture detectors (ECD) or electrolytic conductivity detectors (ELCD). The Aroclors and PCB congeners listed below have been determined by this method, using either a single- or dual column analysis system, and this method may be appropriate for additional congeners and Aroclors (see Sec. 1.4). The method also may be applied to other matrices such as oils and wipe samples, if appropriate sample extraction procedures are employed.

Compound	CAS Registry No.[a]	IUPAC #
Aroclor 1016	12674-11-2	-
Aroclor 1221	11104-28-2	-
Aroclor 1232	11141-16-5	-
Aroclor 1242	53469-21-9	-
Aroclor 1248	12672-29-6	-
Aroclor 1254	11097-69-1	-
Aroclor 1260	11096-82-5	-
2-Chlorobiphenyl	2051-60-7	1
2,3-Dichlorobiphenyl	16605-91-7	5
2,2',5-Trichlorobiphenyl	37680-65-2	18
2,4',5-Trichlorobiphenyl	16606-02-3	31
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	44
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	52
2,3',4,4'-Tetrachlorobiphenyl	32598-10-0	66
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	87
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	101
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	110
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	138
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	141

Compound	CAS Registry No.[a]	IUPAC #
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	151
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	153
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	170
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	180
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	183
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	187
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	206

[a]Chemical Abstract Service Registry No.

1.2 Aroclors are multi-component mixtures. When samples contain more than one Aroclor, a higher level of analyst expertise is required to attain acceptable levels of qualitative and quantitative analysis. The same is true of Aroclors that have been subjected to environmental degradation ("weathering") or degradation by treatment technologies. Such weathered multi-component mixtures may have significant differences in peak patterns compared to those of Aroclor standards.

1.3 The seven Aroclors listed in Sec. 1.1 are those that are commonly specified in EPA regulations. The quantitation of PCBs as Aroclors is appropriate for many regulatory compliance determinations, but is particularly difficult when the Aroclors have been weathered by long exposure in the environment. Therefore, this method provides procedures for the determination of a selected group of the 209 possible PCB congeners, as another means to measure the concentrations of weathered Aroclors. The 19 PCB congeners listed above have been tested by this method and were chosen for testing because many of them represent congeners specific to the common Aroclor formulations (see Table 6). These 19 PCB congeners do not represent the co-planar PCBs or the other PCBs of greatest toxicological significance. **The analytical procedures for these 19 congeners may be appropriate for the analysis of other congeners not specifically included in this method and may be used as a template for the development of such a procedure.** However, all 209 PCB congeners cannot be separated using the GC columns and procedures described in this method. If this procedure is expanded to encompass other congeners, then the analyst must either document the resolution of the congeners in question, or establish procedures for reporting the results of coeluting congeners that are appropriate for the intended application.

1.4 The PCB congener approach potentially affords greater quantitative accuracy when PCBs are known to be present. As a result, this method may be used to determine Aroclors, some PCB congeners, or "total PCBs," depending on regulatory requirements and project needs. The congener method is of particular value in determining weathered Aroclors. However, analysts should use caution when using the congener method when regulatory requirements are based on Aroclor concentrations. Also, this method is not appropriate as currently written for the determination of the co-planar PCB congeners at the very low (sub part per trillion) concentrations sometimes needed for risk assessment purposes.

1.5 Compound identification based on single-column analysis should be confirmed on a second column, or should be supported by at least one other qualitative technique. This method describes analytical conditions for a second gas chromatographic column that can be used to confirm the measurements made with the primary column. GC/MS (e.g., Method 8270) is also recommended as a confirmation technique, if sensitivity permits (also see Sec. 11.11 of this method). GC/AED may also be used as a confirmation technique, if sensitivity permits (see Method 8085).

1.6 This method includes a dual-column option that describes a hardware configuration in which two GC columns are connected to a single injection port and to two separate detectors. The option allows one injection to be used for dual-column simultaneous analysis.

1.7 The analyst must select columns, detectors and calibration procedures most appropriate for the specific analytes of interest in a study. Matrix-specific performance data must be established and the stability of the analytical system and instrument calibration must be established for each analytical matrix (e.g., hexane solutions from sample extractions, diluted oil samples, etc.). Example chromatograms and GC conditions are provided as guidance.

1.8 Prior to employing this method, analysts are advised to consult the base method for each type of procedure that may be employed in the overall analysis (e.g., Methods 3500, 3600, and 8000) for additional information on quality control procedures, development of QC acceptance criteria, calculations, and general guidance. Analysts also should consult the disclaimer statement at the front of the manual and the information in Chapter Two for guidance on the intended flexibility in the choice of methods, apparatus, materials, reagents, and supplies, and on the responsibilities of the analyst for demonstrating that the techniques employed are appropriate for the analytes of interest, in the matrix of interest, and at the levels of concern.

In addition, analysts and data users are advised that, except where explicitly specified in a regulation, the use of SW-846 methods is *not* mandatory in response to Federal testing requirements. The information contained in this method is provided by EPA as guidance to be used by the analyst and the regulated community in making judgments necessary to generate results that meet the data quality objectives for the intended application.

1.9 Use of this method is restricted to use by, or under the supervision of, personnel appropriately experienced and trained in the use of gas chromatographs (GCs) and skilled in the interpretation of gas chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method.

2.0 SUMMARY OF METHOD

2.1 A measured volume or weight of sample is extracted using the appropriate matrix-specific sample extraction technique.

2.1.1 Aqueous samples may be extracted at neutral pH with methylene chloride using either Method 3510 (separatory funnel), Method 3520 (continuous liquid-liquid extractor), Method 3535 (solid-phase extraction), or other appropriate technique or solvents.

2.1.2 Solid samples may be extracted with hexane-acetone (1:1) or methylene chloride-acetone (1:1) using Method 3540 (Soxhlet), Method 3541 (automated Soxhlet), Method 3545 (pressurized fluid extraction), Method 3546 (microwave extraction), Method 3550 (ultrasonic extraction), Method 3562 (supercritical fluid extraction), or other appropriate technique or solvents.

2.1.3 Tissue samples may be extracted using Method 3562 (supercritical fluid extraction), or other appropriate technique. The extraction techniques for other solid matrices (see Sec. 2.1.2) may be appropriate for tissue samples.

2.2 Extracts for PCB analysis may be subjected to a sequential sulfuric acid/potassium permanganate cleanup (Method 3665) designed specifically for these analytes. This cleanup technique will remove (destroy) many single component organochlorine or organophosphorus pesticides. Therefore, this method is not applicable to the analysis of those compounds. Instead, use Method 8081.

2.3 After cleanup, the extract is analyzed by injecting a measured aliquot into a gas chromatograph equipped with either a narrow- or wide-bore fused-silica capillary column and either an electron capture detector (GC/ECD) or an electrolytic conductivity detector (GC/ELCD).

2.4 The chromatographic data may be used to determine the seven Aroclors in Sec. 1.1, selected individual PCB congeners, or total PCBs (see Secs. 11.8 and 11.9).

3.0 DEFINITIONS

Refer to Chapter One and the manufacturer's instructions for definitions that may be relevant to this procedure.

4.0 INTERFERENCES

4.1 Solvents, reagents, glassware, and other sample processing hardware may yield artifacts and/or interferences to sample analysis. All of these materials must be demonstrated to be free from interferences under the conditions of the analysis by analyzing method blanks. Specific selection of reagents and purification of solvents by distillation in all-glass systems may be necessary. Refer to each method to be used for specific guidance on quality control procedures and to Chapter Four for general guidance on the cleaning of glassware. Also refer to Methods 3500, 3600, and 8000 for a discussion of interferences.

4.2 Interferences co-extracted from the samples will vary considerably from matrix to matrix. While general cleanup techniques are referenced or provided as part of this method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation. Sources of interference in this method can be grouped into four broad categories, as follows:

4.2.1 Contaminated solvents, reagents, or sample processing hardware.

4.2.2 Contaminated GC carrier gas, parts, column surfaces, or detector surfaces.

4.2.3 Compounds extracted from the sample matrix to which the detector will respond, such as single-component chlorinated pesticides, including the DDT analogs (DDT, DDE, and DDD).

NOTE: A standard of the DDT analogs should be injected to determine which of the PCB or Aroclor peaks may be subject to interferences on the analytical columns used. There may be substantial DDT interference with the last major Aroclor 1254 peak in some soil and sediment samples.

4.2.4 Coelution of related analytes -- All 209 PCB congeners cannot be separated using the GC columns and procedures described in this method. If this procedure is expanded to encompass other congeners, then the analyst must either document the resolution of the congeners in question or establish procedures for reporting the results of coeluting congeners that are appropriate for the intended application.

4.3 Interferences by phthalate esters introduced during sample preparation can pose a major problem in PCB determinations. Interferences from phthalate esters can best be minimized by avoiding contact with any plastic materials and checking all solvents and reagents for phthalate contamination.

4.3.1 Common flexible plastics contain varying amounts of phthalate esters which are easily extracted or leached from such materials during laboratory operations.

4.3.2 Exhaustive cleanup of solvents, reagents and glassware may be required to eliminate background phthalate ester contamination.

4.3.3 These materials can be removed prior to analysis using Method 3665 (sulfuric acid/permanganate cleanup).

4.4 Cross-contamination of clean glassware can routinely occur when plastics are handled during extraction steps, especially when solvent-wetted surfaces are handled. Glassware must be scrupulously cleaned.

4.4.1 Clean all glassware as soon as possible after use by rinsing with the last solvent used. This should be followed by detergent washing with hot water, and rinses with tap water and organic-free reagent water. Drain the glassware, and dry it in an oven at 130 °C for several hours, or rinse with methanol and drain. Store dry glassware in a clean environment.

CAUTION: Oven-drying of glassware used for PCB analysis can increase contamination because PCBs are readily volatilized in the oven and spread to other glassware. Therefore, exercise caution, and do not dry glassware from samples containing high concentrations of PCBs with glassware that may be used for trace analyses.

4.4.2 Other appropriate glassware cleaning procedures may be employed, such as using a muffle furnace at 430 °C for at least 30 min. However, analysts are advised not to place volumetric glassware in a muffle furnace, since the heat will burn off the markings on the glassware and may warp the glassware, changing its volume.

4.5 Sulfur (S_8) is readily extracted from soil samples and may cause chromatographic interferences in the determination of PCBs. Sulfur contamination should be expected with sediment samples. Sulfur can be removed through the use of Method 3660.

5.0 SAFETY

This method does not address all safety issues associated with its use. The laboratory is responsible for maintaining a safe work environment and a current awareness file of OSHA regulations regarding the safe handling of the chemicals listed in this method. A reference file of material safety data sheets (MSDSs) should be available to all personnel involved in these analyses.

6.0 EQUIPMENT AND SUPPLIES

The mention of trade names or commercial products in this manual is for illustrative purposes only, and does not constitute an EPA endorsement or exclusive recommendation for use. The products and instrument settings cited in SW-846 methods represent those products and settings used during method development or subsequently evaluated by the Agency. Glassware, reagents, supplies, equipment, and settings other than those listed in this manual may be employed provided that method performance appropriate for the intended application has been demonstrated and documented.

This section does not list common laboratory glassware (e.g., beakers and flasks).

6.1 Gas chromatograph -- An analytical system complete with gas chromatograph suitable for on-column and split-splitless injection and all necessary accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and recorder/integrator or data system. Electrolytic conductivity detectors (ELCDs) may also be employed if appropriate for project needs. If the dual-column option is employed, the gas chromatograph must be equipped with two separate detectors.

6.2 GC columns

This method describes procedures for both single-column and dual-column analyses. The single-column approach involves one analysis to determine that a compound is present, followed by a second analysis to confirm the identity of the compound (Sec. 11.11 describes how GC/MS confirmation techniques may be employed). The single-column approach may employ either narrow-bore ($\leq$ 0.32-mm ID) columns or wide-bore (0.53-mm ID) columns. The dual-column approach generally employs a single injection that is split between two columns that are mounted in a single gas chromatograph. The dual-column approach generally employs wide-bore (0.53-mm ID) columns, but columns of other diameters may be employed if the analyst can demonstrate and document acceptable performance for the intended application. A third alternative is to employ dual columns mounted in a single GC, but with each column connected to a separate injector and a separate detector.

The columns listed in this section were the columns used in developing the method. The listing of these columns in this method is not intended to exclude the use of other columns that are available or that may be developed. Laboratories may use these columns or other columns provided that the laboratories document method performance data (e.g., chromatographic resolution, analyte breakdown, and sensitivity) that are appropriate for the intended application.

6.2.1 Narrow-bore columns for single-column analysis (use both columns to confirm compound identifications unless another confirmation technique such as GC/MS is employed). Narrow-bore columns should be installed in split/splitless (Grob-type) injectors.

6.2.1.1 30-m x 0.25-mm or 0.32-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5 or equivalent), 1-µm film thickness.

6.2.1.2 30-m x 0.25-mm ID fused-silica capillary column chemically bonded with 35 percent phenyl methylpolysiloxane (DB-608, SPB-608, or equivalent), 2.5 µm coating thickness, 1-µm film thickness.

6.2.2 Wide-bore columns for single-column analysis (use two of the three columns listed to confirm compound identifications unless another confirmation technique such as GC/MS is employed). Wide-bore columns should be installed in 1/4-inch injectors, with deactivated liners designed specifically for use with these columns.

6.2.2.1 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 35 percent phenyl methylpolysiloxane (DB-608, SPB-608, RTx-35, or equivalent), 0.5-µm or 0.83-µm film thickness.

6.2.2.2 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 14% cyanopropylmethylpolysiloxane (DB-1701, or equivalent), 1.0-µm film thickness.

6.2.2.3 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5, SPB-5, RTx-5, or equivalent), 1.5-µm film thickness.

6.2.3 Wide-bore columns for dual-column analysis -- The three pairs of recommended columns are listed below.

6.2.3.1 Column pair 1

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5, SPB-5, RTx-5, or equivalent), 1.5-µm film thickness.

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 14% cyanopropylmethylpolysiloxane (DB-1701, or equivalent), 1.0-µm film thickness.

Column pair 1 is mounted in a press-fit Y-shaped glass 3-way union splitter (J&W Scientific, Catalog No. 705-0733) or a Y-shaped fused-silica connector (Restek, Catalog No. 20405), or equivalent.

NOTE: When connecting columns to a press-fit Y-shaped connector, a better seal may be achieved by first soaking the ends of the capillary columns in alcohol for about 10 sec to soften the polyimide coating.

6.2.3.2 Column pair 2

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5, SPB-5, RTx-5, or equivalent), 0.83-µm film thickness.

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 14% cyanopropylmethylpolysiloxane (DB-1701, or equivalent), 1.0-µm film thickness.

Column pair 2 is mounted in an 8-in. deactivated glass injection tee (Supelco, Catalog No. 2-3665M), or equivalent.

6.2.3.3 Column pair 3

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5, SPB-5, RTx-5, or equivalent), 1.5-µm film thickness.

30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 35 percent phenyl methylpolysiloxane (HP-608, DB-608, SPB-608, RTx-35, or equivalent), 0.5-µm film thickness.

Column pair 3 is mounted in separate injectors and separate detectors.

6.3 Column rinsing kit -- Bonded-phase column rinse kit (J&W Scientific, Catalog No. 430-3000), or equivalent.

6.4 Volumetric flasks -- 10-mL and 25-mL, for preparation of standards.

6.5 Analytical balance, capable of weighing to 0.0001 g.

7.0 REAGENTS AND STANDARDS.

7.1 Reagent-grade or pesticide-grade chemicals must be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination. Reagents should be stored in glass to prevent the leaching of contaminants from plastic containers.

NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at $\leq$6 °C in polytetrafluoroethylene (PTFE)-sealed containers in the dark. When a lot of standards is prepared, aliquots of that lot should be stored in individual small vials. All stock standard solutions must be replaced after one year, or sooner if routine QC (see Sec. 9.0) indicates a problem. All other standard solutions must be replaced after six months, or sooner if routine QC (see Sec. 9.0) indicates a problem.

7.2 Solvents used in the extraction and cleanup procedures (appropriate 3500 and 3600 series methods) include *n*-hexane, diethyl ether, methylene chloride, acetone, ethyl acetate, and isooctane (2,2,4-trimethylpentane) and the solvents must be exchanged to *n*-hexane or isooctane prior to analysis. Therefore, *n*-hexane and isooctane will be required in this procedure. All solvents should be pesticide grade in quality or equivalent, and each lot of solvent should be determined to be free of phthalates.

7.3 The following solvents may be necessary for the preparation of standards. All solvent lots must be pesticide grade in quality or equivalent and should be determined to be free of phthalates.

7.3.1 Acetone, $(CH_3)_2CO$

7.3.2 Toluene, $C_6H_5CH_3$

7.4 Organic-free reagent water -- All references to water in this method refer to organic-free reagent water as defined in Chapter One.

7.5 Standard solutions

The following sections describe the preparation of stock, intermediate, and working standards for the compounds of interest. This discussion is provided as an example, and other approaches and concentrations of the target compounds may be used, as appropriate for the intended application. See Method 8000 for additional information on the preparation of calibration standards.

7.6 Stock standard solutions (1000 mg/L) -- May be prepared from pure standard materials or can be purchased as certified solutions.

7.6.1 Prepare stock standard solutions by accurately weighing 0.0100 g of pure compound. Dissolve the compound in isooctane or hexane and dilute to volume in a 10-mL volumetric flask. If compound purity is 96 percent or greater, the weight can be used without correction to calculate the concentration of the stock standard solution.

7.6.2 Commercially-prepared stock standard solutions may be used at any concentration if they are certified by the manufacturer or by an independent source.

7.7 Calibration standards for Aroclors

7.7.1 A standard containing a mixture of Aroclor 1016 and Aroclor 1260 will include many of the peaks represented in the other five Aroclor mixtures. As a result, a multi-point initial calibration employing a mixture of Aroclors 1016 and 1260 at five concentrations should be sufficient to demonstrate the linearity of the detector response without the necessity of performing multi-point initial calibrations for each of the seven Aroclors. In addition, such a mixture can be used as a standard to demonstrate that a sample does not contain peaks that represent any one of the Aroclors. This standard can also be used to determine the concentrations of either Aroclor 1016 or Aroclor 1260, should they be present in a sample.

Prepare a minimum of five calibration standards containing equal concentrations of both Aroclor 1016 and Aroclor 1260 by dilution of the stock standard with isooctane or hexane. The concentrations should correspond to the expected range of concentrations found in real samples and should bracket the linear range of the detector. See Method 8000 for additional information regarding the preparation of calibration standards.

7.7.2 Single standards of each of the other five Aroclors are required to aid the analyst in pattern recognition. Assuming that the Aroclor 1016/1260 standards described in Sec. 7.7.1 have been used to demonstrate the linearity of the detector, these single standards of the remaining five Aroclors also may be used to determine the calibration factor for each Aroclor when a linear calibration model through the origin is chosen (see Sec. 11.4). Prepare a standard for each of the other Aroclors. The concentrations should generally correspond to the mid-point of the linear range of the detector, but lower concentrations may be employed at the discretion of the analyst based on project requirements.

7.7.3 Other standards (e.g., other Aroclors) and other calibration approaches (e.g., non-linear calibration for individual Aroclors) may be employed to meet project needs. When the nature of the PCB contamination is already known, use standards of those particular Aroclors. See Method 8000 for information on non-linear calibration approaches.

7.8 Calibration standards for PCB congeners

7.8.1 If results are to be determined for individual PCB congeners, then standards for the pure congeners must be prepared. The table in Sec. 1.1 lists 19 PCB congeners that have been tested by this method along with the IUPAC numbers designating these congeners. This procedure may be appropriate for other congeners as well, but the analyst must either document the resolution of the congeners in question or establish procedures for reporting the results of coeluting congeners that are appropriate for the intended application.

7.8.2 Stock standards may be prepared in a fashion similar to that described for the Aroclor standards, or may be purchased as commercially-prepared solutions. Stock standards should be used to prepare a minimum of five concentrations by dilution of the stock standard with isooctane or hexane. The concentrations should correspond to the expected range of concentrations found in real samples and should bracket the linear range of the detector.

7.9 Internal standard

7.9.1 When PCB congeners are to be determined, the use of an internal standard is highly recommended. Decachlorobiphenyl may be used as an internal standard, added to each sample extract prior to analysis, and included in each of the initial calibration standards.

7.9.2 When PCBs are to be determined as Aroclors, an internal standard is typically not used, and decachlorobiphenyl is employed as a surrogate (see Sec. 7.10).

7.9.3 When decachlorobiphenyl is an analyte of interest, as in some PCB congener analyses, see Sec. 7.10.3.

7.10 Surrogate standards

The performance of the method should be monitored using surrogate compounds. Surrogate standards are added to all samples, method blanks, matrix spikes, and calibration standards. The choice of surrogate compounds will depend on analysis mode chosen, e.g., Aroclors or congeners. The following compounds are recommended as surrogates. Other surrogates may be used, provided that the analyst can demonstrate and document performance appropriate for the data quality needs of the particular application.

7.10.1 When PCBs are to be determined as Aroclors, decachlorobiphenyl may be used as a surrogate, and is added to each sample prior to extraction. Prepare a solution of decachlorobiphenyl in acetone. The recommended spiking solution concentration is 5 mg/L. Tetrachloro-*m*-xylene also may be used as a surrogate for Aroclor analysis. If used, the recommended spiking solution concentration is 5 mg/L in acetone. (Other surrogate concentrations may be used, as appropriate for the intended application.)

7.10.2 When PCB congeners are to be determined, decachlorobiphenyl is recommended for use as an internal standard, and therefore it cannot also be used as a surrogate. Tetrachloro-*m*-xylene may be used as a surrogate for PCB congener analysis. The recommended spiking solution concentration is 5 mg/L in acetone. (Other surrogate concentrations may be used, as appropriate for the intended application.)

7.10.3 If decachlorobiphenyl is a target congener for the analysis, 2,2',4,4',5,5'-hexabromobiphenyl may be used as an internal standard or a surrogate.

7.11 DDT analog standard -- Used to determine if the commonly found DDT analogs (DDT, DDE, and DDD) elute at the same retention times as any of the target analytes (congeners or Aroclors). A single standard containing all three compounds should be sufficient. The concentration of the standard is left to the judgement of the analyst.

8.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

8.1 See the introductory material to Chapter Four, "Organic Analytes."

8.2 Extracts should be stored under refrigeration in the dark and should be analyzed within 40 days of extraction.

NOTE: The holding time above is a recommendation. PCBs are very stable in a variety of matrices, and holding times under the conditions listed above may be as long as a year.

9.0 QUALITY CONTROL

9.1 Refer to Chapter One for guidance on quality assurance (QA) and quality control (QC) protocols. When inconsistencies exist between QC guidelines, method-specific QC criteria take precedence over both technique-specific criteria and those criteria given in Chapter One, and technique-specific QC criteria take precedence over the criteria in Chapter One. Any effort involving the collection of analytical data should include development of a structured and systematic planning document, such as a Quality Assurance Project Plan (QAPP) or a Sampling and Analysis Plan (SAP), which translates project objectives and specifications into directions for those that will implement the project and assess the results. Each laboratory should maintain a formal quality assurance program. The laboratory should also maintain records to document the quality of the data generated. All data sheets and quality control data should be maintained for reference or inspection.

9.2 Refer to Method 8000 for specific determinative method QC procedures. Refer to Method 3500 for QC procedures to ensure the proper operation of the various sample preparation techniques. If an extract cleanup procedure is performed, refer to Method 3600 for the appropriate QC procedures. Any more specific QC procedures provided in this method will supersede those noted in Methods 8000, 3500, or 3600.

9.3 Quality control procedures necessary to evaluate the GC system operation are found in Method 8000 and include evaluation of retention time windows, calibration verification and chromatographic analysis of samples.

9.3.1 Include a calibration standard after each group of 20 samples (it is *recommended* that a calibration standard be included after every 10 samples to minimize the number of repeat injections) in the analysis sequence as a calibration check. Thus, injections of method blank extracts, matrix spike samples, and other non-standards are counted in the total. Solvent blanks, injected as a check on cross-contamination, need not be counted in the total. The response factors for the calibration should be within ±20 percent of the initial calibration (see Sec. 11.6.2). When this continuing calibration is out of this acceptance window, the laboratory should stop analyses and take corrective action.

9.3.2 Whenever quantitation is accomplished using an internal standard, internal standards must be evaluated for acceptance. The measured area of the internal standard must be no more than 50 percent different from the average area calculated during initial calibration. When the internal standard peak area is outside the limit, all samples that fall outside the QC criteria must be reanalyzed. The retention times of the internal standards must also be evaluated. A retention time shift of >30 sec necessitates reanalysis of the affected sample.

9.4 Initial demonstration of proficiency

9.4.1 Each laboratory must demonstrate initial proficiency with each sample preparation and determinative method combination it utilizes, by generating data of acceptable accuracy and precision for target analytes in a clean matrix. If an autosampler is used to perform sample dilutions, before using the autosampler to dilute samples, the laboratory should satisfy itself that those dilutions are of equivalent or better accuracy than is achieved by an experienced analyst performing manual dilutions. The laboratory must also repeat the demonstration of proficiency whenever new staff members are trained or significant changes in instrumentation are made. See Method 8000 for information on how to accomplish a demonstration of proficiency.

9.4.2 It is suggested that the QC reference sample concentrate (as discussed in Methods 8000 and Method 3500) contain PCBs as Aroclors at 10-50 mg/L in the concentrate for water samples, or PCBs as congeners at the same concentrations. A 1-mL volume of this concentrate spiked into 1 L of reagent water will result in a sample concentration of 10-50 µg/L. If Aroclors are not expected in samples from a particular source, then prepare the QC reference samples with a mixture of Aroclors 1016 and 1260. However, when specific Aroclors are known to be present or expected in samples, the specific Aroclors should be used for the QC reference sample. See Method 8000 for additional information on how to accomplish this demonstration. Other concentrations may be used, as appropriate for the intended application.

9.4.3 Calculate the average recovery and the standard deviation of the recoveries of the analytes in each of the four QC reference samples. Refer to Method 8000 for procedures for evaluating method performance.

9.5 Initially, before processing any samples, the analyst should demonstrate that all parts of the equipment in contact with the sample and reagents are interference-free. This is accomplished through the analysis of a method blank. As a continuing check, each time samples are extracted, cleaned up, and analyzed, and when there is a change in reagents, a method blank should be prepared and analyzed for the compounds of interest as a safeguard against chronic laboratory contamination. If a peak is observed within the retention time window of any analyte that would prevent the determination of that analyte, determine the source and eliminate it, if possible, before processing the samples. The blanks should be carried through all stages of sample preparation and analysis. When new reagents or chemicals are received, the laboratory should monitor the preparation and/or analysis blanks associated with samples for any signs of contamination. It is not necessary to test every new batch of reagents or chemicals prior to sample preparation if the source shows no prior problems. However, if reagents are changed during a preparation batch, separate blanks need to be prepared for each set of reagents.

9.6 Sample quality control for preparation and analysis

The laboratory must also have procedures for documenting the effect of the matrix on method performance (precision, accuracy, method sensitivity). At a minimum, this should include the analysis of QC samples including a method blank, a matrix spike, a duplicate, and a laboratory control sample (LCS) in each analytical batch and the addition of surrogates to each field sample and QC sample when surrogates are used. Any method blanks, matrix spike samples, and replicate samples should be subjected to the same analytical procedures (Sec. 11.0) as those used on actual samples.

9.6.1 Documenting the effect of the matrix should include the analysis of at least one matrix spike and one duplicate unspiked sample or one matrix spike/matrix spike duplicate pair. The decision on whether to prepare and analyze duplicate samples or a matrix spike/matrix spike duplicate must be based on a knowledge of the samples in the sample batch. If samples are expected to contain target analytes, then laboratories may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, the laboratories should use a matrix spike and matrix spike duplicate pair, spiked with the Aroclor 1016/1260 mixture. However, when specific Aroclors are known to be present or expected in samples, the specific Aroclors should be used for spiking. Consult Method 8000 for information on developing acceptance criteria for the MS/MSD.

9.6.2 A laboratory control sample (LCS) should be included with each analytical batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. The LCS is spiked with the same analytes at the same concentrations as the matrix spike, when appropriate. When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix. Consult Method 8000 for information on developing acceptance criteria for the LCS.

9.6.3 Also see Method 8000 for the details on carrying out sample quality control procedures for preparation and analysis. In-house acceptance criteria for evaluating method performance should be developed using the guidance found in Method 8000.

9.7 Surrogate recoveries

If surrogates are used, the laboratory should evaluate surrogate recovery data from individual samples versus the surrogate control limits developed by the laboratory. See Method 8000 for information on evaluating surrogate data and developing and updating surrogate limits. Procedures for evaluating the recoveries of multiple surrogates and the associated corrective actions should be defined in an approved project plan.

9.8 It is recommended that the laboratory adopt additional quality assurance practices for use with this method. The specific practices that are most productive depend upon the needs of the laboratory and the nature of the samples. Whenever possible, the laboratory should analyze standard reference materials and participate in relevant performance evaluation studies.

10.0 CALIBRATION AND STANDARDIZATION

See Sec. 11.0 for information on calibration and standardization.

11.0 PROCEDURE

11.1 Sample extraction

11.1.1 Refer to Chapter Two and Method 3500 for guidance in choosing the appropriate extraction procedure. In general, water samples are extracted at a neutral pH with methylene chloride using a separatory funnel (Method 3510), a continuous liquid-liquid extractor (Method 3520), solid-phase extraction (Method 3535), or other appropriate technique. Solid samples are extracted with hexane-acetone (1:1) or methylene chloride-acetone (1:1) using one of the Soxhlet extraction methods (Method 3540 or 3541), pressurized fluid extraction (Method 3545), microwave extraction (Method 3546), ultrasonic extraction (Method 3550), supercritical fluid extraction (Method 3562), or other appropriate technique or solvents. Tissue samples are extracted using supercritical fluid extraction (Method 3562) or other appropriate technique.

NOTE: The use of hexane-acetone generally reduces the amount of interferences that are extracted and improves signal-to-noise.

The choice of extraction solvent and procedure will depend on the analytes of interest. No single solvent or extraction procedure is universally applicable to all analyte groups and sample matrices. The analyst *must* demonstrate adequate performance for the analytes of interest, at the levels of interest, for any solvent system and extraction procedure employed, *including* those specifically listed in this method. At a minimum, such a demonstration will encompass the initial demonstration of proficiency described in Method 3500, using a clean reference matrix. Each new sample type must be spiked with the compounds of interest to determine the percent recovery. Method 8000 describes procedures that may be used to develop performance criteria for such demonstrations as well as for matrix spike and laboratory control sample results.

11.1.2 Reference materials, field-contaminated samples, or spiked samples should be used to verify the applicability of the selected extraction technique to each new sample type. Such samples should contain or be spiked with the compounds of interest in order to determine the percent recovery and the limit of detection for that sample type (see Chapter One). When other materials are not available and spiked samples are used, they should be spiked with the analytes of interest, either specific Aroclors or PCB congeners. When the presence of specific Aroclors is not anticipated, the Aroclor 1016/1260 mixture may be an appropriate choice for spiking. See Methods 3500 and 8000 for guidance on demonstration of initial method proficiency as well as guidance on matrix spikes for routine sample analysis.

11.1.3 The extraction techniques for solids may be applicable to wipe samples and other sample matrices not addressed in Sec. 11.1.1. The analysis of oil samples may need special sample preparation procedures that are not described here. Analysts should follow the steps described in Sec. 11.1.2 to verify the applicability of the sample preparation and extraction techniques for matrices such as wipes and oils.

11.2 Extract cleanup

Cleanup procedures may not be necessary for a relatively clean sample matrix, but most extracts from environmental and waste samples will require additional preparation before analysis. The specific cleanup procedure used will depend on the nature of the sample to be analyzed and the data quality objectives for the measurements. Refer to Methods 3600, 3660 and 3665 for general guidance on extract cleanup.

11.3 GC conditions

This method allows the analyst to choose between a single-column or a dual-column configuration in the injector port. The columns listed in this section were the columns used to develop the method performance data. Listing these columns in this method is not intended to exclude the use of other columns that are available or that may be developed. Wide-bore or narrow-bore columns may be used with either option. Laboratories may use either the columns listed in this method or other capillary columns or columns of other dimensions, provided that the laboratories document method performance data (e.g., chromatographic resolution, analyte breakdown, and sensitivity) that are appropriate for the intended application.

11.3.1 Single-column analysis

This capillary GC/ECD method allows the analyst the option of using 0.25-mm or 0.32-mm ID capillary columns (narrow-bore) or 0.53-mm ID capillary columns (wide-bore). Narrow-bore columns generally provide greater chromatographic resolution than wide-bore columns, although narrow-bore columns have a lower sample capacity. As a result, narrow-bore columns may be more suitable for relatively clean samples or for extracts that have been prepared with one or more of the clean-up options referenced in the method. Wide-bore columns (0.53-mm ID) may be more suitable for more complex environmental and waste matrices. However, the choice of the appropriate column diameter is left to the professional judgement of the analyst.

11.3.2 Dual-column analysis

The dual-column/dual-detector approach recommends the use of two 30-m x 0.53-mm ID fused-silica open-tubular columns of different polarities, thus, different selectivities towards the target analytes. The columns may be connected to an injection tee and separate electron capture detectors, or to both separate injectors and separate detectors. However, the choice of the appropriate column dimensions is left to the professional judgement of the analyst.

11.3.3 GC temperature programs and flow rates

11.3.3.1 Table 1 lists suggested GC operating conditions for the analysis of PCBs as Aroclors for single-column analysis, using either narrow-bore or wide-bore capillary columns. Table 2 lists suggested GC operating conditions for the dual-column analysis. Use the conditions in these tables as guidance and establish the GC temperature program and flow rate necessary to separate the analytes of interest.

11.3.3.2 When determining PCBs as congeners, difficulties may be encountered with coelution of congener 153 and other sample components. When determining PCBs as Aroclors, chromatographic conditions should be adjusted to give adequate separation of the characteristic peaks in each Aroclor (see Sec. 11.4.6).

11.3.3.3 Tables 3 and 4 summarize example retention times of up to 73 Aroclor peaks determined during dual-column analysis using the operating conditions listed in Table 2. These retention times are provided as guidance as to what may be achieved using the GC columns, temperature programs, and flow rates described in this method. Each laboratory must determine retention times and retention time windows for their specific application of the method. Note that the peak numbers used in these tables are *not* the IUPAC congener numbers, but represent the elution order of the peaks on these GC columns.

11.3.3.4 Once established, the same operating conditions must be used for the analysis of samples and standards.

11.4 Calibration

11.4.1 Prepare calibration standards using the procedures in Sec. 7.0. Refer to Method 8000 and Sec. 9.3 for proper calibration techniques for both initial calibration and calibration verification. When PCBs are to be determined as congeners, the use of internal standard calibration is highly recommended. Therefore, the calibration standards must contain the internal standard (see Sec. 7.9) at the same concentration as the sample extracts. When PCBs are to be determined as Aroclors, external standard calibration is generally used.

NOTE: Because of the sensitivity of the electron capture detector, always clean the injection port and column prior to performing the initial calibration.

11.4.2 When PCBs are to be quantitatively determined as congeners, an initial multi-point calibration must be performed that includes standards for all the target analytes (congeners). See Method 8000 for details on calibration options.

11.4.3 When PCBs are to be quantitatively determined as Aroclors, the initial calibration consists of two parts, described below.

11.4.3.1 As noted in Sec. 7.7.1, a standard containing a mixture of Aroclor 1016 and Aroclor 1260 will include many of the peaks represented in the other five Aroclor mixtures. Thus, such a standard may be used to demonstrate the linearity of the detector and that a sample does not contain peaks that represent any one of the Aroclors. This standard can also be used to determine the concentrations of either Aroclor 1016 or Aroclor 1260, should they be present in a sample. Therefore, an initial multi-point calibration is performed using the mixture of Aroclors 1016 and 1260 described in Sec. 7.7.1. See Method 8000 for guidance on the use of linear and non-linear calibrations.

11.4.3.2 Standards of the other five Aroclors are necessary for pattern recognition. When employing the traditional model of a linear calibration through the origin, these standards are also used to determine a single-point calibration factor for each Aroclor, assuming that the Aroclor 1016/1260 mixture in Sec. 11.4.3.1 has been used to describe the detector response. The standards for these five Aroclors should be analyzed before the analysis of any samples, and may be analyzed before or after the analysis of the five 1016/1260 standards in Sec. 11.4.3.1. For non-linear calibrations, see Sec. 11.4.3.3.

11.4.3.3 In situations where only a few Aroclors are of interest for a specific project, the analyst may employ a multi-point initial calibration of each of the Aroclors of interest (e.g., five standards of Aroclor 1232 if this Aroclor is of concern and linear calibration is employed) and not use the 1016/1260 mixture described in Sec. 11.4.3.1 or the pattern recognition standards described in 11.4.3.2. When non-linear calibration models are employed, more than five standards of each Aroclor of interest will be needed to adequately describe the detector response (see Method 8000).

11.4.4 Establish the GC operating conditions appropriate for the configuration (single-column or dual column, Sec. 11.3), using Tables 1 or 2 as guidance. Optimize the instrumental conditions for resolution of the target compounds and sensitivity. A final temperature of between 240 °C and 275 °C may be needed to elute decachlorobiphenyl. The use of injector pressure programming will improve the chromatography of late eluting peaks.

NOTE: Once established, the same operating conditions must be used for both calibrations and sample analyses.

11.4.5 A 2-µL injection of each calibration standard is recommended. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest.

11.4.6 Record the peak area (or height) for each congener or each characteristic Aroclor peak to be used for quantitation.

11.4.6.1 A minimum of 3 peaks must be chosen for each Aroclor, and preferably 5 peaks. The peaks must be characteristic of the Aroclor in question. Choose peaks in the Aroclor standards that are at least 25% of the height of the largest Aroclor peak. For each Aroclor, the set of 3 to 5 peaks should include at least one peak that is unique to that Aroclor. Use at least five peaks for the Aroclor 1016/1260 mixture, none of which should be found in both of these Aroclors.

11.4.6.2 Late-eluting Aroclor peaks are generally the most stable in the environment. Table 5 lists diagnostic peaks in each Aroclor, along with example retention times on two GC columns suitable for single-column analysis. Table 6 lists 13 specific PCB congeners found in Aroclor mixtures. Table 7 lists PCB congeners with example retention times on a DB-5 wide-bore GC column. Use these tables as guidance in choosing the appropriate peaks. Each laboratory must determine retention times and retention time windows for their specific application of the method.

11.4.7 When determining PCB congeners by the internal standard procedure, calculate the response factor (RF) for each congener in the calibration standards relative to the internal standard, decachlorobiphenyl, using the equation that follows.

$$RF = \frac{A_s \times C_{is}}{A_{is} \times C_s}$$

where:

A_s = Peak area (or height) of the analyte or surrogate.
A_{is} = Peak area (or height) of the internal standard.
C_s = Concentration of the analyte or surrogate, in µg/L.
C_{is} = Concentration of the internal standard, in µg/L.

11.4.8 When determining PCBs as Aroclors by the external standard technique, calculate the calibration factor (CF) for each characteristic Aroclor peak in each of the initial calibration standards (from either Sec. 11.4.3.1 or 11.4.3.2) using the equation below.

$$CF = \frac{\text{Peak Area (or Height) in the Standard}}{\text{Total Mass of the Standard Injected (in nanograms)}}$$

Using the equation above, a calibration factor will be determined for each characteristic peak, using the total mass of the Aroclor injected. These individual calibration factors are used to quantitate sample results by applying the factor for each individual peak to the area of that peak, as described in Sec. 11.9.

For a five-point calibration, five sets of calibration factors will be generated for the Aroclor 1016/1260 mixture, each set consisting of the calibration factors for each of the five (or more) peaks chosen for this mixture, e.g., there will be at least 25 separate calibration factors for the mixture. The single standard for each of the other Aroclors (see Sec. 11.4.3.1) will generate at least three calibration factors, one for each selected peak.

If a non-linear calibration model is employed, as described in Method 8000, then additional standards containing each Aroclor of interest will be employed, with a corresponding increase in the total number of calibration factors.

11.4.9 The response factors or calibration factors from the initial calibration are used to evaluate the linearity of the initial calibration, if a linear calibration model is used. This involves the calculation of the mean response or calibration factor, the standard deviation, and the relative standard deviation (RSD) for each congener or Aroclor peak.

When the Aroclor 1016/1260 mixture is used to demonstrate the detector response, the linear calibration models must be applied to the other five Aroclors for which only single standards are analyzed. If multi-point calibration is performed for individual Aroclors (see Sec. 11.4.3.3), use the calibration factors from those standards to evaluate linearity.

See Method 8000 for the specifics of the evaluation of the linearity of the calibration and guidance on performing non-linear calibrations. In general, non-linear calibrations also will consider each characteristic Aroclor peak separately.

11.5 Retention time windows

Absolute retention times are generally used for compound identification. When absolute retention times are used, retention time windows are crucial to the identification of target compounds, and should be established by one of the approaches described in Method 8000. Retention time windows are established to compensate for minor shifts in absolute retention times as a result of sample loadings and normal chromatographic variability. The width of the retention time window should be carefully established to minimize the occurrence of both false positive and false negative results. Tight retention time windows may result in false negatives and/or may cause unnecessary reanalysis of samples when surrogates or spiked compounds are erroneously not identified. Overly wide retention time windows may result in false positive results that cannot be confirmed upon further analysis. Analysts should consult Method 8000 for the details of establishing retention time windows. Other approaches to compound identification may be employed, provided that the analyst can demonstrate and document that the approaches are appropriate for the intended application. When PCBs are determined as congeners by an internal standard technique, absolute retention times may be used in conjunction with relative retention times (relative to the internal standard).

When conducting either Aroclor or congener analysis, it is important to determine that common single-component pesticides such as DDT, DDD, and DDE do not elute at the same retention times as the target congeners. There may be substantial DDT interference with the last major Aroclor 1254 peak in some soil and sediment samples. Therefore, in conjunction with determining the retention time windows of the congeners, the analyst should analyze a standard containing the DDT analogs. This standard need only be analyzed when the retention time windows are determined. It is not considered part of the routine initial calibration or calibration verification steps in the method, nor are there any performance criteria associated with the analysis of this standard.

If Aroclor analysis is performed and any of the DDT analogs elute at the same retention time as an Aroclor peak that was chosen for use in quantitation (see Sec. 11.4.6), then the analyst must either adjust the GC conditions to achieve better resolution, or choose another peak that is characteristic of that Aroclor and does not correspond to a peak from a DDT analog. If PCB congener analysis is performed and any of the DDT analogs elute at the same retention time as a PCB congener of interest, then the analyst must adjust the GC conditions to achieve better resolution.

11.6 Gas chromatographic analysis of sample extracts

11.6.1 The same GC operating conditions used for the initial calibration must be employed for the analysis of samples.

11.6.2 Verify calibration at least once each 12-hr shift by injecting calibration verification standards prior to conducting any sample analyses. A calibration standard must also be injected at intervals of not less than once every twenty samples (after every 10 samples is recommended to minimize the number of samples requiring reinjection when QC limits are exceeded) and at the end of the analysis sequence. For Aroclor analyses, the calibration verification standard should be a mixture of Aroclor 1016 and Aroclor 1260. The calibration verification process does not *require* analysis of the other Aroclor standards used for pattern recognition, but the analyst may wish to include a standard for one of these Aroclors after the 1016/1260 mixture used for calibration verification throughout the analytical sequence.

11.6.2.1 The calibration factor for each analyte calculated from the calibration verification standard (CF_v) should not exceed a difference of more than ±20 percent when compared to the mean calibration factor from the initial calibration curve. If a calibration approach other than the RSD method has been employed for the initial calibration (e.g., a linear model not through the origin, a non-linear calibration model, etc.), consult Method 8000 for the specifics of calibration verification.

$$\%\ \text{Difference} = \frac{\overline{CF} - CF_v}{\overline{CF}} \times 100$$

11.6.2.2 When internal standard calibration is used for PCB congeners, the response factor calculated from the calibration verification standard (RF_v) should not exceed a ±20 percent difference when compared to the mean response factor from the initial calibration. If a calibration approach other than the RSD method has been employed for the initial calibration (e.g., a linear model not through the origin, a non-linear calibration model, etc.), consult Method 8000 for the specifics of calibration verification.

$$\% \text{ Difference} = \frac{\overline{RF} - RF_v}{\overline{RF}} \times 100$$

11.6.2.3 If the calibration does not meet the ±20% limit on the basis of each compound, check the instrument operating conditions, and if necessary, restore them to the original settings, and inject another aliquot of the calibration verification standard. If the response for the analyte is still not within ±20%, then a new initial calibration must be prepared. See Sec. 11.6.6 for a discussion on the effects of a failing calibration verification standard on sample results.

11.6.3 Inject a measured aliquot of the concentrated sample extract. A 2-µL aliquot is suggested, however, other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume should be used for both the calibration standards and the sample extracts, unless the analyst can demonstrate acceptable performance using different volumes or conditions. Record the volume injected and the resulting peak size in area units.

11.6.4 Qualitative identifications of target analytes are made by examination of the sample chromatograms, as described in Sec. 11.7.

11.6.5 Quantitative results are determined for each identified analyte (Aroclors or congeners), using the procedures described in Secs. 11.8 and 11.9 for either the internal or the external calibration procedure (Method 8000). If the responses in the sample chromatogram exceed the calibration range of the system, dilute the extract and reanalyze. Peak height measurements are recommended over peak area when overlapping peaks cause errors in area integration.

11.6.6 Each sample analysis employing external standard calibration must be bracketed with an acceptable initial calibration, calibration verification standard(s) (each 12-hr analytical shift), or calibration standards interspersed within the samples. The results from these bracketing standards must meet the calibration verification criteria in Sec. 11.6.2.

Multi-level standards (mixtures or multi-component analytes) are highly recommended to ensure that detector response remains stable for all analytes over the calibration range.

When a calibration verification standard fails to meet the QC criteria, all samples that were injected after the last standard that met the QC criteria must be evaluated to prevent misquantitations and possible false negative results, and reinjection of the sample extracts may be required. More frequent analyses of standards will minimize the number of sample extracts that would have to be reinjected if the QC limits are violated for the standard analysis.

However, if the standard analyzed <u>after</u> a group of samples exhibits a response for an analyte that is <u>above</u> the acceptance limit, i.e., >20%, and the analyte was <u>not</u> detected in the specific samples analyzed during the analytical shift, then the extracts for those samples do not need to be reanalyzed, since the verification standard has demonstrated that the analyte would have been detected if it were present. In contrast, if an analyte above the QC limits <u>was</u> detected in a sample extract, then reinjection is necessary to ensure accurate quantitation.

If an analyte was <u>not</u> detected in the sample and the standard response is more than 20% <u>below</u> the initial calibration response, then reinjection is necessary. The purpose of this reinjection is to ensure that the analyte could be detected, if present, despite the change in the detector response, e.g., to protect against a false negative result.

11.6.7 Sample injections may continue for as long as the calibration verification standards and standards interspersed with the samples meet instrument QC requirements. It is *recommended* that standards be analyzed after every 10 samples (*required* after every 20 samples and at the end of a set) to minimize the number of samples that must be re-injected when the standards fail the QC limits. The sequence ends when the set of samples has been injected or when qualitative or quantitative QC criteria are exceeded.

11.6.8 The use of internal standard calibration techniques does not require that all sample results be bracketed with calibration verification standards. However, when internal standard calibration is used, the retention times of the internal standards and the area responses of the internal standards should be checked for each analysis. Retention time shifts of more than 30 sec from the retention time of the most recent calibration standard and/or changes in internal standard areas of more than -50 to +100% are cause for concern and must be investigated.

11.6.9 If the peak response is less than 2.5 times the baseline noise level, the validity of the quantitative result may be questionable. The analyst should consult with the source of the sample to determine whether further concentration of the sample is warranted.

11.6.10 Use the calibration standards analyzed during the sequence to evaluate retention time stability. If any of the standards fall outside their daily retention time windows, the system is out of control. Determine the cause of the problem and correct it.

11.6.11 If compound identification or quantitation is precluded due to interferences (e.g., broad, rounded peaks or ill-defined baselines are present), corrective action is warranted. Cleanup of the extract or replacement of the capillary column or detector may be necessary. The analyst may begin by rerunning the sample on another instrument to determine if the problem results from analytical hardware or the sample matrix. Refer to Method 3600 for the procedures to be followed in sample cleanup.

11.7 Qualitative identification

The identification of PCBs as either Aroclors or congeners using this method with an electron capture detector is based on agreement between the retention times of peaks in the sample chromatogram with the retention time windows established through the analysis of standards of the target analytes. See Method 8000 for information on the establishment of retention time windows.

Tentative identification of an analyte occurs when a peak from a sample extract falls within the established retention time window for a specific target analyte. Confirmation is necessary when the sample composition is not well characterized. See Method 8000 for information on confirmation of tentative identifications. See Sec. 11.11 of this procedure for information on the use of GC/MS as a confirmation technique.

When results are confirmed using a second GC column of dissimilar stationary phase, the analyst should check the agreement between the quantitative results on both columns once the identification has been confirmed. See Method 8000 for a discussion of such a comparison and appropriate data reporting approaches.

11.7.1 When simultaneous analyses are performed from a single injection (the dual-column GC configuration described in Sec. 11.3), it is not practical to designate one column as the analytical (primary) column and the other as the confirmation column. Since the calibration standards are analyzed on both columns, both columns must meet the calibration acceptance criteria. If the retention times of the peaks on both columns fall within the retention time windows on the respective columns, then the target analyte identification has been confirmed.

11.7.2 The results of a single column/single injection analysis may be confirmed, if necessary, on a second, dissimilar, GC column. In order to be used for confirmation, retention time windows must have been established for the second GC column. In addition, the analyst must demonstrate the sensitivity of the second column analysis. This demonstration must include the analysis of a standard of the target analyte at a concentration at least as low as the concentration estimated from the primary analysis. That standard may be either the individual congeners, individual Aroclor or the Aroclor 1016/1260 mixture.

11.7.3 When samples are analyzed from a source known to contain specific Aroclors, the results from a single-column analysis may be confirmed on the basis of a clearly recognizable Aroclor pattern. This approach should not be attempted for samples from unknown or unfamiliar sources or for samples that appear to contain mixtures of Aroclors. In order to employ this approach, the analyst must document:

- The peaks that were evaluated when comparing the sample chromatogram and the Aroclor standard.

- The absence of major peaks representing any other Aroclor.

- The source-specific information indicating that Aroclors are anticipated in the sample (e.g., historical data, generator knowledge, etc.).

This information should either be provided to the data user or maintained by the laboratory.

11.7.4 See Sec. 11.11 for information on GC/MS confirmation.

11.8 Quantitation of PCBs as congeners

11.8.1 The quantitation of PCB congeners is accomplished by the comparison of the sample chromatogram to those of the PCB congener standards, using the internal standard technique (see Method 8000). Calculate the concentration of each congener.

11.8.2 Depending on project requirements, the PCB congener results may be reported as congeners, or may be summed and reported as total PCBs. The analyst should use caution when using the congener method for quantitation when regulatory requirements are based on Aroclor concentrations. See Sec. 11.9.3.

11.8.3 The analytical procedures for these 19 congeners may be appropriate for the analysis of other congeners not specifically included in this method and may be used as a template for the development of such a procedure. However, all 209 PCB congeners cannot be separated using the GC columns and procedures described in this method. If this procedure is expanded to encompass other congeners, then the analyst must either document the resolution of the congeners in question or establish procedures for reporting the results of coeluting congeners that are appropriate for the intended application.

11.9 Quantitation of PCBs as Aroclors

The quantitation of PCB residues as Aroclors is accomplished by comparison of the sample chromatogram to that of the most similar Aroclor standard. A choice must be made as to which Aroclor is most similar to that of the residue and whether that standard is truly representative of the PCBs in the sample.

11.9.1 Use the individual Aroclor standards (not the 1016/1260 mixtures) to determine the pattern of peaks on Aroclors 1221, 1232, 1242, 1248, and 1254. The patterns for Aroclors 1016 and 1260 will be evident in the mixed calibration standards.

11.9.2 Once the Aroclor pattern has been identified, compare the responses of 3 to 5 major peaks in the single-point calibration standard for that Aroclor with the peaks observed in the sample extract. The amount of Aroclor is calculated using the individual calibration factor for each of the 3 to 5 characteristic peaks chosen in Sec. 11.4.6.1. and the calibration model (linear or non-linear) established from the multi-point calibration of the 1016/1260 mixture. Non-linear calibration may result in different models for each selected peak. A concentration is determined using each of the characteristic peaks, using the individual calibration factor calculated for that peak in Sec. 11.4.8, and then those 3 to 5 concentrations are averaged to determine the concentration of that Aroclor.

11.9.3 Weathering of PCBs in the environment and changes resulting from waste treatment processes may alter the PCBs to the point that the pattern of a specific Aroclor is no longer recognizable. Samples containing more than one Aroclor present similar problems. If the purpose of the analysis is <u>not</u> regulatory compliance monitoring on the basis of Aroclor concentrations, then it may be more appropriate to perform the analyses using the PCB congener approach described in this method. If results in terms of Aroclors <u>are</u> required, then the quantitation as Aroclors may be performed by measuring the total area of the PCB pattern and quantitating on the basis of the Aroclor standard that is most similar to the sample. Any peaks that are not identifiable as PCBs on the basis of retention times should be subtracted from the total area. When quantitation is performed in this manner, the problems should be fully described for the data user and the specific procedures employed by the analyst should be thoroughly documented.

11.10 Confirmation

Tentative identification of an analyte occurs when a peak from a sample extract falls within the daily retention time window. Confirmation is necessary when the sample composition is not well characterized. Confirmatory techniques such as gas chromatography with a dissimilar column or a mass spectrometer should be used. See Method 8000 for information on confirmation of tentative identifications.

When results are confirmed using a second GC column of dissimilar stationary phase, the analyst should check the agreement between the quantitative results on both columns once the identification has been confirmed. See Method 8000 for a discussion of such a comparison and appropriate data reporting approaches.

When the dual-column approach is employed, the target phenols are identified and confirmed when they meet the identification criteria on both columns.

11.11 GC/MS confirmation

GC/MS confirmation may be used in conjunction with either single-or dual-column analysis if the concentration is sufficient for detection by GC/MS.

11.11.1 Full-scan quadrupole GC/MS will normally require a higher concentration of the analyte of interest than full-scan ion trap or selected ion monitoring techniques. The concentrations will be instrument-dependent, but values for full-scan quadrupole GC/MS may be as high as 10 ng/µL in the final extract, while ion trap or SIM may only be a concentration of 1 ng/µL.

11.11.2 The GC/MS must be calibrated for the target analytes when it is used for quantitative analysis. If GC/MS is used only for confirmation of the identification of the target analytes, then the analyst must demonstrate that those PCBs identified by GC/ECD can be confirmed by GC/MS. This demonstration may be accomplished by analyzing a single-point standard containing the analytes of interest at or below the concentrations reported in the GC/ECD analysis. When using SIM techniques, the ions and retention times should be characteristic of the Aroclors to be confirmed.

11.11.3 GC/MS confirmation should be accomplished by analyzing the same extract used for GC/ECD analysis and the extract of the associated blank.

11.12 GC/AED confirmation by Method 8085 may be used in conjunction with either single-column or dual-column analysis if the concentration is sufficient for detection by GC/AED.

11.13 Chromatographic system maintenance as corrective action

When system performance does not meet the established QC requirements, corrective action is required, and may include one or more of the following.

11.13.1 Splitter connections

For dual columns which are connected using a press-fit Y-shaped glass splitter or a Y-shaped fused-silica connector, clean and deactivate the splitter port insert or replace with a cleaned and deactivated splitter. Break off the first few centimeters (up to 30 cm) of the injection port side of the column. Remove the columns and solvent backflush according to the manufacturer's instructions. If these procedures fail to eliminate the degradation problem, it may be necessary to deactivate the metal injector body and/or replace the columns.

11.13.2 Metal injector body

Turn off the oven and remove the analytical columns when the oven has cooled. Remove the glass injection port insert (instruments with on-column injection). Lower the injection port temperature to room temperature. Inspect the injection port and remove any noticeable foreign material.

11.13.2.1 Place a beaker beneath the injector port inside the oven. Using a wash bottle, rinse the entire inside of the injector port with acetone and then rinse it with toluene, catching the rinsate in the beaker.

11.13.2.2 Consult the manufacturer's instructions regarding deactivating the injector port body. Glass injection port liners may need deactivation with a silanizing solution containing dimethyldichlorosilane. After all metal surfaces inside the injector body have been thoroughly coated with the deactivation solution, rinse the injector body with toluene, methanol, acetone, then hexane. Reassemble the injector and replace the columns.

11.13.3 Column rinsing

Rinse the column with several column volumes of an appropriate solvent. Both polar and nonpolar solvents are recommended. Depending on the nature of the sample residues expected, the first rinse might be water, followed by methanol and acetone. Methylene chloride is a good final rinse and in some cases may be the only solvent necessary. Fill the column with methylene chloride and allow it to stand flooded overnight to allow materials within the stationary phase to migrate into the solvent. Afterwards, flush the column with fresh methylene chloride, drain the column, and dry it at room temperature with a stream of ultrapure nitrogen.

12.0 DATA ANALYSIS AND CALCULATIONS

See Secs. 11.6 through 11.9 for information regarding data analysis and calculations.

13.0 METHOD PERFORMANCE

13.1 Performance data and related information are provided in SW-846 methods only as examples and guidance. The data do not represent required performance goals for users of the methods. Instead, performance criteria should be developed on a project-specific basis, and the laboratory should establish in-house QC performance criteria for the application of this method. <u>These performance data are not intended to be and must not be used as absolute QC acceptance criteria for purposes of laboratory accreditation.</u>

13.2 The accuracy and precision obtainable with this method depend on the sample matrix, sample preparation technique, optional cleanup techniques, and calibration procedures used. Table 8 provides single laboratory recovery data for Aroclors spiked into clay and soil and extracted with automated Soxhlet. Table 9 provides multiple laboratory data on the precision and accuracy for Aroclors spiked into soil and extracted by automated Soxhlet. These data are provided for guidance purposes only.

13.3 During method performance studies, the concentrations determined as Aroclors were higher than those obtained using the congener method for the limited set of congeners listed in Sec. 1.1. In certain soils, interference prevented the measurement of congener 66. Recoveries of congeners from environmental reference materials ranged from 51 - 66% of the certified Aroclor values, illustrating the potential difficulties in using congener analysis to demonstrate compliance with Aroclor-based regulatory limits. These data are provided for guidance purposes only.

13.4 Tables 10 and 11 contain laboratory performance data for several PCB congeners using supercritical fluid extraction (Method 3562) on an HP 7680 to extract solid samples, including soils, sewage sludge, and fish tissue. Seven replicate extractions were performed on each sample. The method was performed using a variable restrictor and solid trapping material (Florisil). These data are provided for guidance purposes only. Sample analysis was performed by GC/ECD. The following solid samples were used for this study:

13.4.1 Two field-contaminated certified reference materials were extracted by a single laboratory. One of the materials (EC-5) was a lake sediment from Environment Canada. The other material (EC-1) was soil from a dump site and was provided by the National Science and Engineering Research Council of Canada. The average recoveries for EC-5 are based on the certified value for that sample. The average recoveries for EC-1 are based on the certified value of the samples or a Soxhlet value, if a certified value was unavailable for a specific analyte. These data are provided for guidance purposes only.

13.4.2 Four certified reference materials were extracted by two independent laboratories. The materials included a marine sediment from NIST (SRM 1941), a fish tissue from NIST (SRM 2974), a sewage sludge from BCR European Union (CRM 392), and a soil sample from BCR European Union (CRM 481). The average recoveries were based on the certified value of the samples or a Soxhlet value, if a certified value was unavailable for a specific analyte. These data are provided for guidance purposes only.

13.4.3 A weathered sediment sample from Michigan (Saginaw Bay) was extracted by a single laboratory. Soxhlet extractions were carried out on this sample and the SFE recovery is relative to that for each congener. The average recoveries were based on the certified value of the samples. Additional data are shown in the tables for some congeners for which no certified values were available. These data are provided for guidance purposes only.

13.5 Tables 12 through 14 contain single laboratory recovery data for Aroclor 1254 using solid-phase extraction (Method 3535). Recovery data at 2, 10, and 100 µg/L are presented. Results represent three replicate solid-phase extractions of spiked wastewaters. Two different wastewaters from each wastewater type were spiked. All of the extractions were performed using 90-mm C_{18} disks. These data are provided for guidance purposes only.

13.6 Single-laboratory data were developed for PCBs extracted by pressurized fluid extraction (Method 3545) from sewage sludge, a river sediment standard reference material (SRM 1939), and a certified soil reference material (CRM911-050). Certified values were available for five PCB congeners for the sewage sludge and for four congeners in SRM 1939. The soil reference material was certified for Aroclor 1254. All pressurized fluid extractions were conducted using hexane:acetone (1:1), at 100 °C, 1300-1500 psi, and a 5-min static extraction. Extracts were analyzed by GC/ECD. The data are presented in Tables 15 through 17 and are reported in detail in Reference 13. These data are provided for guidance purposes only.

13.7 Single-laboratory accuracy data were obtained for PCBs extracted by microwave extraction (Method 3546) from three reference materials, EC-1, EC-2, and EC-3, from Environment Canada. Natural soils, glass fiber, and sand samples were also used as matrices that were spiked with PCBs. Concentrations varied between 0.2 and 10 µg/g (total PCBs). All samples were extracted using 1:1 hexane:acetone. Extracts were analyzed by GC/ECD. Method blanks, spikes and spike duplicates were included for the low concentration spikes; matrix spikes were included for all other concentrations. The data are presented in Tables 18 through 20 and are reported in detail in Reference 14. These data are provided for guidance purposes only.

14.0 POLLUTION PREVENTION

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity and/or toxicity of waste at the point of generation. Numerous opportunities for pollution prevention exist in laboratory operations. The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation. When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option.

14.2 For information about pollution prevention that may be applicable to laboratories and research institutions consult *Less is Better: Laboratory Chemical management for Waste Reduction* available from the American Chemical Society, Department of Government Relations and Science Policy, 1155 16th Street, NW, Washington, DC, 20036, http://www.acs.org.

15.0 WASTE MANAGEMENT

The Environmental Protection Agency requires that laboratory waste management practices be conducted consistent with all applicable rules and regulations. The Agency urges laboratories to protect the air, water, and land by minimizing and controlling all releases from hoods and bench operations, complying with the letter and spirit of any sewer discharge permits and regulations, and by complying with all solid and hazardous waste regulations, particularly the hazardous waste identification rules and land disposal restrictions. For further information on waste management, consult *The Waste Management Manual for Laboratory Personnel* available from the American Chemical Society at the address listed in Sec. 14.2.

16.0 REFERENCES

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17.0 TABLES, DIAGRAMS, FLOW CHARTS, AND VALIDATION DATA

The following pages contain the tables and figures referenced by this method.

TABLE 1

SUGGESTED GC OPERATING CONDITIONS FOR PCBs AS AROCLORS
SINGLE-COLUMN ANALYSIS

Narrow-bore columns

Narrow-bore Column 1 -- 30-m x 0.25 or 0.32-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5 or equivalent), 1 µm film thickness.

Carrier gas (He)	16 psi
Injector temperature	225 °C
Detector temperature	300 °C
Initial temperature	100 °C, hold 2 min
Temperature program	100 °C to 160 °C at 15 °C/min, followed by 160 °C to 270 °C at 5 °C/min
Final temperature	270 °C

Narrow-bore Column 2 -- 30-m x 0.25-mm ID fused-silica capillary column chemically bonded with 35 percent phenyl methylpolysiloxane (DB-608, SPB-608, or equivalent) 25 µm coating thickness, 1 µm film thickness

Carrier gas (N_2)	20 psi
Injector temperature	225 °C
Detector temperature	300 °C
Initial temperature	160 °C, hold 2 min
Temperature program	160 °C to 290 °C at 5 °C/min
Final temperature	290 °C, hold 1 min

Wide-bore columns

Wide-bore Column 1 -- 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 35 percent phenyl methylpolysiloxane (DB-608, SPB-608, RTx-35, or equivalent), 0.5 µm or 0.83 µm film thickness.

Wide-bore Column 2 -- 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with 14% cyanopropylmethylpolysiloxane (DB-1701, or equivalent), 1.0 µm film thickness.

Carrier gas (He)	5-7 mL/min
Makeup gas (argon/methane [P-5 or P-10] or N_2)	30 mL/min
Injector temperature	250 °C
Detector temperature	290 °C
Initial temperature	150 °C, hold 0.5 min
Temperature program	150 °C to 270 °C at 5 °C/min
Final temperature	270 °C, hold 10 min

TABLE 1
(continued)

SUGGESTED GC OPERATING CONDITIONS FOR PCBs AS AROCLORS
SINGLE-COLUMN ANALYSIS

Wide-bore Columns (continued)

Wide-bore Column 3 -- 30-m x 0.53-mm ID fused-silica capillary column chemically bonded with SE-54 (DB-5, SPB-5, RTx-5, or equivalent), 1.5 μm film thickness.

Carrier gas (He)	6 mL/min
Makeup gas (argon/methane [P-5 or P-10] or N_2)	30 mL/min
Injector temperature	205 °C
Detector temperature	290 °C
Initial temperature	140 °C, hold 2 min
Temperature program	140 °C to 240 °C at 10 °C/min, hold 5 min at 240 °C, 240 °C to 265 °C at 5 °C/min
Final temperature	265 °C, hold 18 min

TABLE 2

SUGGESTED GC OPERATING CONDITIONS FOR PCBs AS AROCLORS
FOR THE DUAL-COLUMN METHOD OF ANALYSIS

Column 1 -- DB-1701 or equivalent, 30-m x 0.53-mm ID, 1.0 µm film thickness.

Column 2 -- DB-5 or equivalent, 30-m x 0.53-mm ID, 1.5 µm film thickness.

Carrier gas (He) flow rate	6 mL/min
Makeup gas (N_2) flow rate	20 mL/min
Temperature program	0.5 min hold
	150 °C to 190 °C, at 12 °C/min, 2 min hold
	190 °C to 275 °C, at 4 °C/min, 10 min hold
Injector temperature	250 °C
Detector temperature	320 °C
Injection volume	2 µL
Solvent	Hexane
Type of injector	Flash vaporization
Detector type	Dual ECD
Range	10
Attenuation	64 (DB-1701)/64 (DB-5)
Type of splitter	J&W Scientific press-fit Y-shaped inlet splitter

TABLE 3
(continued)

TABLE 3

EXAMPLE RETENTION TIMES OF AROCLORS
ON THE DB-5 COLUMN[a], DUAL-COLUMN ANALYSIS

Peak No.	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
1		5.85	5.85				
2		7.63	7.64	7.57			
3	8.41	8.43	8.43	8.37			
4	8.77	8.77	8.78	8.73			
5	8.98	8.99	9.00	8.94	8.95		
6	9.71			9.66			
7	10.49	10.50	10.50	10.44	10.45		
8	10.58	10.59	10.59	10.53			
9	10.90		10.91	10.86	10.85		
10	11.23	11.24	11.24	11.18	11.18		
11	11.88		11.90	11.84	11.85		
12	11.99		12.00	11.95			
13	12.27	12.29	12.29	12.24	12.24		
14	12.66	12.68	12.69	12.64	12.64		
15	12.98	12.99	13.00	12.95	12.95		
16	13.18		13.19	13.14	13.15		
17	13.61		13.63	13.58	13.58	13.59	13.59
18	13.80		13.82	13.77	13.77	13.78	
19	13.96		13.97	13.93	13.93	13.90	
20	14.48		14.50	14.46	14.45	14.46	
21	14.63		14.64	14.60	14.60		
22	14.99		15.02	14.98	14.97	14.98	
23	15.35		15.36	15.32	15.31	15.32	
24	16.01			15.96			
25			16.14	16.08	16.08	16.10	
26	16.27		16.29	16.26	16.24	16.25	16.26
27						16.53	
28			17.04		16.99	16.96	16.97
29			17.22	17.19	17.19	17.19	17.21
30			17.46	17.43	17.43	17.44	
31					17.69	17.69	
32				17.92	17.91	17.91	
33				18.16	18.14	18.14	
34			18.41	18.37	18.36	18.36	18.37
35			18.58	18.56	18.55	18.55	
36							18.68
37			18.83	18.80	18.78	18.78	18.79
38			19.33	19.30	19.29	19.29	19.29

TABLE 3
(continued)

Peak No.	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
39						19.48	19.48
40						19.81	19.80
41			20.03	19.97	19.92	19.92	
42						20.28	20.28
43					20.46	20.45	
44						20.57	20.57
45				20.85	20.83	20.83	20.83
46			21.18	21.14	21.12	20.98	
47					21.36	21.38	21.38
48						21.78	21.78
49				22.08	22.05	22.04	22.03
50						22.38	22.37
51						22.74	22.73
52						22.96	22.95
53						23.23	23.23
54							23.42
55						23.75	23.73
56						23.99	23.97
57							24.16
58						24.27	
59							24.45
60						24.61	24.62
61						24.93	24.91
62							25.44
63						26.22	26.19
64							26.52
65							26.75
66							27.41
67							28.07
68							28.35
69							29.00

[a] GC operating conditions are given in Table 2. All retention times in minutes and are provided for illustrative purposes only. Each laboratory must determine retention times and retention time windows for their specific application of the method.
[b] The peaks listed in this table are sequentially numbered in elution order for illustrative purposes only and are not isomer numbers.

TABLE 4

EXAMPLE RETENTION TIMES OF AROCLORS
ON THE DB-1701 COLUMN[a], DUAL-COLUMN ANALYSIS

Peak No.	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
1		4.45	4.45				
2		5.38					
3		5.78					
4		5.86	5.86				
5	6.33	6.34	6.34	6.28			
6	6.78	6.78	6.79	6.72			
7	6.96	6.96	6.96	6.90	6.91		
8	7.64			7.59			
9	8.23	8.23	8.23	8.15	8.16		
10	8.62	8.63	8.63	8.57			
11	8.88		8.89	8.83	8.83		
12	9.05	9.06	9.06	8.99	8.99		
13	9.46		9.47	9.40	9.41		
14	9.77	9.79	9.78	9.71	9.71		
15	10.27	10.29	10.29	10.21	10.21		
16	10.64	10.65	10.66	10.59	10.59		
17				10.96	10.95	10.95	
18	11.01		11.02	11.02	11.03		
19	11.09		11.10				
20	11.98		11.99	11.94	11.93	11.93	
21	12.39		12.39	12.33	12.33	12.33	
22			12.77	12.71	12.69		
23	12.92			12.94	12.93		
24	12.99		13.00	13.09	13.09	13.10	
25	13.14		13.16				
26						13.24	
27	13.49		13.49	13.44	13.44		
28	13.58		13.61	13.54	13.54	13.51	13.52
29				13.67		13.68	
30			14.08	14.03	14.03	14.03	14.02
31			14.30	14.26	14.24	14.24	14.25
32					14.39	14.36	
33			14.49	14.46	14.46		
34						14.56	14.56
35					15.10	15.10	
36			15.38	15.33	15.32	15.32	
37			15.65	15.62	15.62	15.61	16.61
38			15.78	15.74	15.74	15.74	15.79
39			16.13	16.10	16.10	16.08	
40							16.19
41						16.34	16.34

TABLE 4
(continued)

Peak No.	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
42						16.44	16.45
43						16.55	
44			16.77	16.73	16.74	16.77	16.77
45			17.13	17.09	17.07	17.07	17.08
46						17.29	17.31
47				17.46	17.44	17.43	17.43
48				17.69	17.69	17.68	17.68
49					18.19	18.17	18.18
50				18.48	18.49	18.42	18.40
51						18.59	
52						18.86	18.86
53				19.13	19.13	19.10	19.09
54						19.42	19.43
55						19.55	19.59
56						20.20	20.21
57						20.34	
58							20.43
59					20.57	20.55	
60						20.62	20.66
61						20.88	20.87
62							21.03
63						21.53	21.53
64						21.83	21.81
65						23.31	23.27
66							23.85
67							24.11
68							24.46
69							24.59
70							24.87
71							25.85
72							27.05
73							27.72

[a] GC operating conditions are given in Table 2. All retention times are in minutes and are provided for illustrative purposes only. Each laboratory must determine retention times and retention time windows for their specific application of the method.

[b] The peaks listed in this table are sequentially numbered in elution order for illustrative purposes only and are not isomer numbers.

TABLE 5

EXAMPLE RETENTION TIMES OF PEAKS DIAGNOSTIC OF PCBs
ON A 0.53-mm ID COLUMNS DURING SINGLE-COLUMN ANALYSIS

Peak No.[a]	RT on DB-608[b]	RT on DB-1701[b]	Aroclor[c]
I	4.90	4.66	1221
II	7.15	6.96	1221, 1232, 1248
III	7.89	7.65	1061, <u>1221</u>, 1232, 1242
IV	9.38	9.00	1016, 1232, 1242, 1248
V	10.69	10.54	<u>1016, 1232, 1242</u>
VI	14.24	14.12	<u>1248</u>, 1254
VII	14.81	14.77	1254
VIII	16.71	16.38	<u>1254</u>
IX	19.27	18.95	1254, 1260
X	21.22	21.23	<u>1260</u>
XI	22.89	22.46	1260

[a]Peaks are sequentially numbered in elution order and are not isomer numbers

[b]Temperature program: T_i = 150 °C, hold 30 sec; 5 °C/min to 275 °C.

[c]Underline indicates the largest peak in the pattern for that Aroclor

All retention times are in minutes and are provided for illustrative purposes only. Each laboratory must determine retention times and retention time windows for their specific application of the method.

TABLE 6

SPECIFIC PCB CONGENERS THAT ARE MAJOR COMPONENTS IN COMMON AROCLORS

		Aroclor						
Congener	IUPAC Number	1016	1221	1232	1242	1248	1254	1260
Biphenyl	--		X					
2-CB	1	X	X	X	X			
2,3-DCB	5	X	X	X	X	X		
3,4-DCB	12	X		X	X	X		
2,4,4'-TCB	28*	X		X	X	X	X	
2,2',3,5'-TCB	44			X	X	X	X	X
2,3',4,4'-TCB	66*					X	X	X
2,3,3',4',6-PCB	110						X	
2,3',4,4',5-PCB	118*						X	X
2,2',4,4',5,5'-HCB	153							X
2,2',3,4,4',5'-HCB	138							X
2,2',3,4,4',5,5'-HpCB	180							X
2,2',3,3',4,4',5-HpCB	170							X

*Apparent co-elution of: 28 with 31 (2,4',5-trichlorobiphenyl)
66 with 95 (2,2',3,5',6-pentachlorobiphenyl)
118 with 149 (2,2',3,4',5',6-hexachlorobiphenyl)

This table is not intended to illustrate all of the congeners that may be present in a given Aroclor, but rather to illustrate the major congener components.

TABLE 7
EXAMPLE RETENTION TIMES OF PCB CONGENERS ON THE DB-5 WIDE-BORE COLUMN

IUPAC Number	Retention Time (min)
1	6.52
5	10.07
18	11.62
31	13.43
52	14.75
44	15.51
66	17.20
101	18.08
87	19.11
110	19.45
151	19.87
153	21.30
138	21.79
141	22.34
187	22.89
183	23.09
180	24.87
170	25.93
206	30.70
209 (internal standard)	32.63

All data are provided for illustrative purposes only. Each laboratory must determine retention times and retention time windows for their specific application of the method.

TABLE 8

EXAMPLE SINGLE-LABORATORY RECOVERY DATA FOR THE EXTRACTION OF PCBs FROM CLAY AND SOIL BY AUTOMATED SOXHLET (METHOD 3541)[a]

Matrix	Aroclor	Spike Level (ppm)	Trial	Percent Recovery[b]
Clay	1254	5	1	87
			2	93
			3	94
			4	99
			5	79
			6	28
Clay	1254	50	1	65
			2	72
			3	97
			4	80
			5	50
			6	59
Clay	1260	5	1	87
			2	75
			3	61
			4	94
			5	97
			6	113
Clay	1260	50	1	74
			2	70
			3	92
			4	89
			5	90
			6	67

TABLE 8
(continued)

Matrix	Aroclor	Spike Level (ppm)	Trial	Percent Recovery[b]
Soil	1254	5	1	70
			2	89
			3	92
			4	83
			5	63
Soil	1254	50	1	84
			2	78
			3	92
			4	67
			5	82
			6	62
Soil	1260	5	1	84
			2	83
			3	82
			4	96
			5	94
			6	94
			7	98
Soil	1260	50	1	77
			2	69
			3	93
			4	82
			5	83
			6	76

[a]The operating conditions for the automated Soxhlet
Immersion time: 60 min
Reflux time: 60 min

[b]Multiple results from two different extractors

Data are taken from Reference 9
These data are provided for guidance purposes only.

TABLE 9

EXAMPLE MULTIPLE-LABORATORY PRECISION AND ACCURACY DATA
FOR THE EXTRACTION OF PCBs FROM SPIKED SOIL
BY AUTOMATED SOXHLET (METHOD 3541)

		Percent Recovery at Aroclor 1254 Spike Concentration (µg/kg)			Percent Recovery at Aroclor 1260 Spike Concentration (µg/kg)			Mean Recovery
		5	50	500	5	50	500	All Levels
	n	3	3		3	3		12
Lab 1	Mean	101.2	74.0		83.9	78.5		84.4
	S. D.	34.9	41.8		7.4	7.4		26.0
	n		6	6		6	6	24
Lab 2	Mean		56.5	66.9		70.1	74.5	67.0
	S. D.		7.0	15.4		14.5	10.3	13.3
	n	3	3		3	3		12
Lab 3	Mean	72.8	63.3		70.6	57.2		66.0
	S. D.	10.8	8.3		2.5	5.6		9.1
	n	6	6		6	6		24
Lab 4	Mean	112.6	144.3		100.3	84.8		110.5
	S. D.	18.2	30.4		13.3	3.8		28.5
	n		3	3		3	3	12
Lab 5	Mean		97.1	80.1		79.5	77.0	83.5
	S. D.		8.7	5.1		3.1	9.4	10.3
	n	2	3		3	4		12
Lab 6	Mean	140.9	127.7		138.7	105.9		125.4
	S. D.	4.3	15.5		15.5	7.9		18.4
	n	3	3		3	3		12
Lab 7	Mean	100.1	123.4		82.1	94.1		99.9
	S. D.	17.9	14.6		7.9	5.2		19.0
	n	3	3		3	3		12
Lab 8	Mean	65.0	38.3		92.8	51.9		62.0
	S. D.	16.0	21.9		36.5	12.8		29.1
	n	20	30	9	21	31	9	120
All	Mean	98.8	92.5	71.3	95.5	78.6	75.3	87.6
Labs	S. D.	28.7	42.9	14.1	25.3	18.0	9.5	29.7

Data are taken from Reference 7
These data are provided for guidance purposes only.

TABLE 10

EXAMPLE PERCENT RECOVERY (BIAS) OF PCBs IN VARIOUS SOILS
USING SUPERCRITICAL FLUID EXTRACTION (METHOD 3562)

PCB No.[a]	EC-1 Dump Site Soil Low #1	SRM 1941 Marine Sediment Low #2	EC-5 Lake Sediment Low #3	CRM 481[b] European Soil High #1	Saginaw Bay Sediment High #2	CRM 392 Sewage Sludge High #3	SRM 2974 Fish Tissue Mussel Low #4	Congener Mean
28	148.4	63.3	147.7	67.3	114.7	89.2	101.7	104.6
52	88.5	106.6	115.8	84.5	111.1	96.2	131.4	104.9
101	93.3	91.2	100.2	84.5	111.5	93.9	133.2	101.1
149	92.6	105.1	101.5	73.2	111.2		69.4	92.2
118	89.9	66.1	108.9	82.1	110.8	73.5	82.7	87.7
153	90.8	65.1	95.1	82.8	118.6	97.3	107.5	94.0
105[b]	89.1	72.6	96.6	83.4	111.8		79.4	88.8
138	90.1	57.4	97.9	76.9	126.9		73.1	87.1
128	90.8	69.9	101.2	65.9	87.6		62.5	79.7
156[b]	90.6	88.9	94.3	85.2	101.1		59.3	86.6
180	92.4	142.4	93.3	82.2	109.2	100.5	65.7	98.0
170	91.3	101.1	95.2	80.5			33.0	81.8
Matrix Mean	95.7	85.8	104.0	79.0	108.7	91.8	83.2	92.2

[a] Congeners which are either certified or have had Soxhlet confirmation.
[b] Congener 105 was not resolved from congener 132 and congener 156 was not resolved from congener 171 by the GC method used for samples EC-1 and EC-5.

TABLE 11

PRECISION (AS %RSD) OF PCBs EXTRACTED USING SUPERCRITICAL FLUID EXTRACTION (METHOD 3562)

PCB No.[a]	EC-1 Dump Site Soil Low #1	SRM 1941 Marine Sediment Low #2	EC-5 Lake Sediment Low #3	CRM 481 European Soil High #1	Saginaw Bay Sediment High #2	CRM 392 Sewage Sludge High #3	SRM 2974 Fish Tissue Mussel Low #4	Congener Mean
28	11.5	1.5	3.8	5.6	2.4	1.9	2.7	4.2
52	9.1	3.3	3.9	5.4	2.2	2.9	3.1	4.3
101	9.1	2.9	2.8	4.9	1.4	5.2	2.9	4.2
149	7.1	0.7	3.8	3.9	3.4		2.2	3.0
118	9.8	1.9	4.5	5.4	2.0	3.3	2.4	4.2
153	8.4	1.5	3.0	4.3	4.3	9.5	3.0	4.9
105[b]	6.6	3.7	2.7	4.3	2.7		2.5	3.2
138	9.2	1.8	3.1	4.7	2.3		2.9	3.4
128	6.0	5.3	3.3	4.9	2.8		3.3	3.7
156[b]	8.3	0.0	5.1	4.5	1.9		3.8	3.4
180	8.0	1.3	3.6	4.3	3.1	9.6	2.7	4.7
170	5.7	2.3	3.6	3.9	2.3		4.0	3.1
Matrix Mean	8.2	2.2	3.6	4.7	2.6	2.7	3.0	3.8

[a] Congeners which are either certified or have had Soxhlet confirmation.
[b] Congener 105 was not resolved from congener 132 and congener 156 was not resolved from congener 171 by the GC method used for samples EC-1 and EC-5.

These data are provided for guidance purposes only.

TABLE 12

EXAMPLE SINGLE-LABORATORY RECOVERY DATA FOR SOLID-PHASE EXTRACTION (METHOD 3535) OF AROCLOR 1254 FROM WASTEWATER MATRICES SPIKED AT 2 µg/L

Wastewater Type	Mean Conc. (µg/L)	Percent Recovery	Std. Dev. (µg/L)	RSD (%)
Chemical Industry	2.4	120	0.41	17.2
Chemical Industry	0.6	28	0.03	5.4
Paper Industry	3.0	150	0.56	18.5
Paper Industry	2.3	115	0.08	3.7
Pharmaceutical Industry	1.5	76	0.03	1.7
Pharmaceutical Industry	1.0	51	0.03	2.9
Refuse	0.5	27	0.04	6.7
Refuse	0.6	31	0.10	16.0
POTW	1.9	96	0.15	7.8
POTW	2.1	105	0.04	1.8

Results represent three replicate solid-phase extractions of spiked wastewaters. Two different wastewaters from each wastewater type were spiked. All extractions were performed using 90-mm C_{18} extraction disks.
These data are provided for guidance purposes only.

TABLE 13

EXAMPLE SINGLE-LABORATORY RECOVERY DATA FOR SOLID-PHASE EXTRACTION (METHOD 3535) OF AROCLOR 1254 FROM WASTEWATER MATRICES SPIKED AT 10 µg/L

Wastewater Type	Mean Conc. (µg/L)	Percent Recovery	Std. Dev. (µg/L)	RSD (%)
Chemical Industry	8.8	88	1.07	12.2
Chemical Industry	8.1	81	0.06	0.7
Paper Industry	8.9	89	0.71	7.9
Paper Industry	10.1	101	0.15	1.4
Pharmaceutical Industry	9.2	92	0.24	2.6
Pharmaceutical Industry	8.4	84	0.17	2.0
Refuse	8.8	88	0.49	5.6
Refuse	8.0	80	1.44	18.0
POTW	9.5	82	0.17	2.1
POTW	8.2	82	0.17	2.1

Results represent three replicate solid-phase extractions of spiked wastewaters. Two different wastewaters from each wastewater type were spiked. All extractions were performed using 90-mm C_{18} extraction disks.
These data are provided for guidance purposes only.

TABLE 14

EXAMPLE SINGLE-LABORATORY RECOVERY DATA
FOR SOLID-PHASE EXTRACTION (METHOD 3535) OF AROCLOR 1254
FROM WASTEWATER MATRICES SPIKED AT 100 µg/L

Wastewater Type	Mean Conc. (µg/L)	Percent Recovery	Std. Dev. (µg/L)	RSD (%)
Chemical Industry	81.7	82	1.46	1.8
Chemical Industry	89.7	90	0.66	0.7
Paper Industry	73.7	74	3.94	5.3
Paper Industry	95.3	95	1.89	2.0
Pharmaceutical Industry	86.4	86	1.95	2.3
Pharmaceutical Industry	79.2	79	3.92	4.9
Refuse	85.7	86	1.59	1.9
Refuse	71.5	72	1.61	2.2
POTW	87.8	88	1.76	2.0
POTW	80.6	81	0.40	0.5

Results represent three replicate solid-phase extractions of spiked wastewaters. Two different wastewaters from each wastewater type were spiked. All extractions were performed using 90-mm C_{18} extraction disks.
These data are provided for guidance purposes only.

TABLE 15

EXAMPLE SINGLE-LABORATORY PCB CONGENER DATA
FROM A SEWAGE SLUDGE SAMPLE EXTRACTED BY
PRESSURIZED FLUID EXTRACTION (METHOD 3545)

PCB No.	Mean Recovery (%)	%RSD	Certified Value (µg/kg)
52	114	4.7	163
101	143	7.4	161
138	110	3.9	193
153	110	5.8	198
180	160	7.5	207

Percent recoveries are the mean of six replicate extractions.

Data are taken from Reference 13.
These data are provided for guidance purposes only.

TABLE 16

EXAMPLE SINGLE-LABORATORY PCB CONGENER DATA
FROM A RIVER SEDIMENT REFERENCE MATERIAL
EXTRACTED BY PRESSURIZED FLUID EXTRACTION (METHOD 3545)

PCB No.	Mean Recovery (%)	%RSD	Certified Value (µg/kg)
101	89	3.7	780
138	122	2.3	570
153	62	4.1	370
180	112	5.9	180

Percent recoveries are the mean of six replicate extractions.
The river sediment reference material was SRM 1939.

Data are taken from Reference 13.
These data are provided for guidance purposes only.

TABLE 17

EXAMPLE SINGLE-LABORATORY AROCLOR 1254 DATA
FROM A SOIL REFERENCE MATERIAL
EXTRACTED BY PRESSURIZED FLUID EXTRACTION (METHOD 3545)

Replicate Extraction	Aroclor 1254 Concentration (µg/kg)
1	1290
2	1370
3	1280
4	1370
Mean	1330
%RSD	3.5%
Certified value	1340
Mean recovery (%)	99%

Data are taken from Reference 13.
These data are provided for guidance purposes only.

TABLE 18

EXAMPLE SINGLE-LABORATORY PCB HOMOLOGUE DATA BY MICROWAVE EXTRACTION (METHOD 3546) FROM A CERTIFIED GREAT LAKE SEDIMENT MATERIAL (EC-2)

	Microwave Extraction			Soxhlet Extraction		
PCB homologue	µg/kg	Peaks[a]	% RSD	µg/kg	Peaks[a]	% RSD
Trichlorobiphenyl	130	4	21.8	100	4	14.6
Tetrachlorobiphenyl	400	10	13.2	390	20	10.2
Pentachlorobiphenyl	310	9	1.9	300	9	8.7
Hexachlorobiphenyl	120	3	0.0	110	3	9.1

[a] Number of PCB peaks detected
Cl_3 to Cl_{10} homologues analyzed
n=3
Data are taken from Reference 14. These data are provided for guidance purposes only.

TABLE 19

EXAMPLE SINGLE-LABORATORY PCB HOMOLOGUE DATA BY MICROWAVE EXTRACTION (METHOD 3546) FROM A CERTIFIED HARBOR SEDIMENT MATERIAL (SRM-1944)

	Microwave Extraction			Soxhlet Extraction		
PCB homologue	µg/kg	Peaks[a]	% RSD	µg/kg	Peaks[a]	% RSD
Trichlorobiphenyl	450	8	10.1	360	6	5.8
Tetrachlorobiphenyl	580	12	3.9	580	11	6.0
Pentachlorobiphenyl	330	9	6.1	330	9	7.9
Hexachlorobiphenyl	260	3	12.4	240	3	5.1
Heptachlorobiphenyl	60	2	43.8	80	2	27.3

[a] Number of PCB peaks detected
Cl_3 to Cl_{10} homologues analyzed
n=3
Data are taken from Reference 14. These data are provided for guidance purposes only.

TABLE 20

EXAMPLE SINGLE-LABORATORY PCB DATA BY MICROWAVE EXTRACTION (METHOD 3546) FROM CERTIFIED GREAT LAKE SEDIMENT MATERIALS

Sediment	Total Aroclor Concentration (µg/kg)	Standard Deviation (µg/kg)	RSD (%)	n	Certified Value (µg/kg)
EC-1	1850	0.07	3.78	3	2000 ± 54
EC-2	1430	0.09	6.60	4	1160 ± 70
EC-3	670	0.02	3.12	3	660 ± 54

Sample size = 2 g extracted into a final volume of 4 mL

EC-2 and EC-3 certified values were only provisional values at the time the work was conducted. The data presented herein were part of the validation data package used to confirm the certified values.

Data are taken from Reference 14.
These data are provided for guidance purposes only.

FIGURE 1. Example GC/ECD chromatogram of the Aroclor 1016/1260 mixture analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.

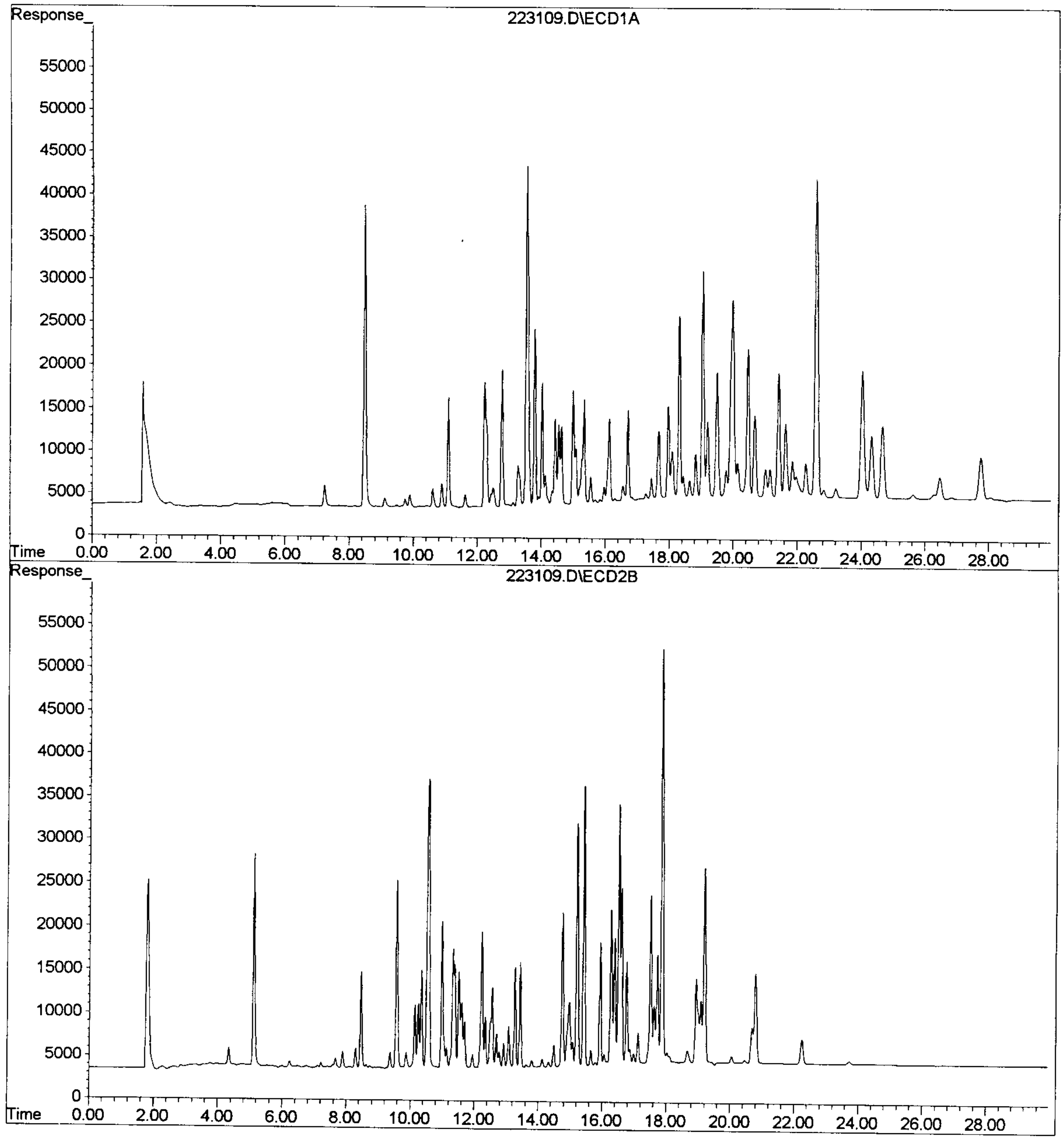


FIGURE 2. Example GC/ECD chromatogram of Aroclor 1221 analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.

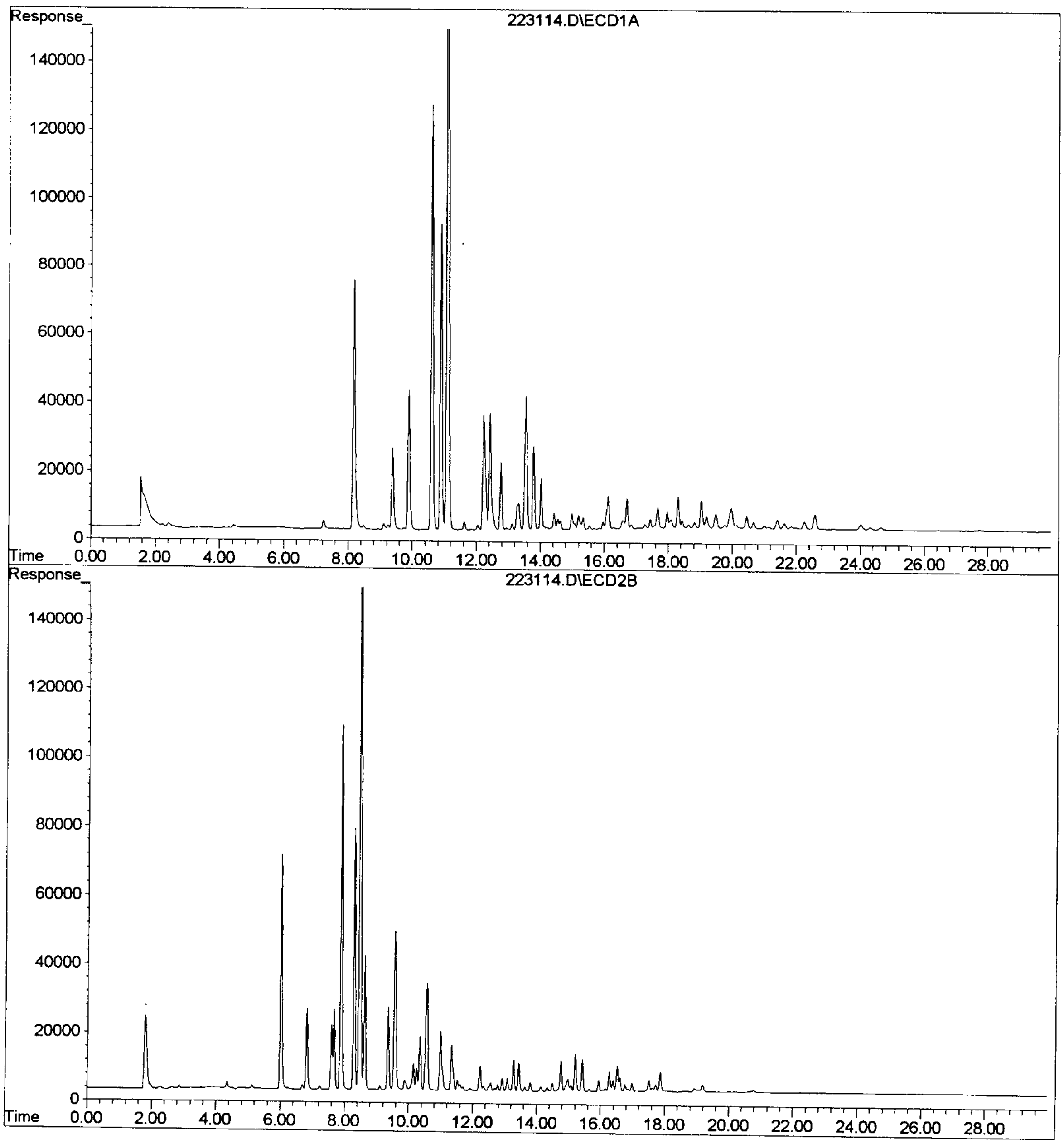


FIGURE 3. Example GC/ECD chromatogram of Aroclor 1232 analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.

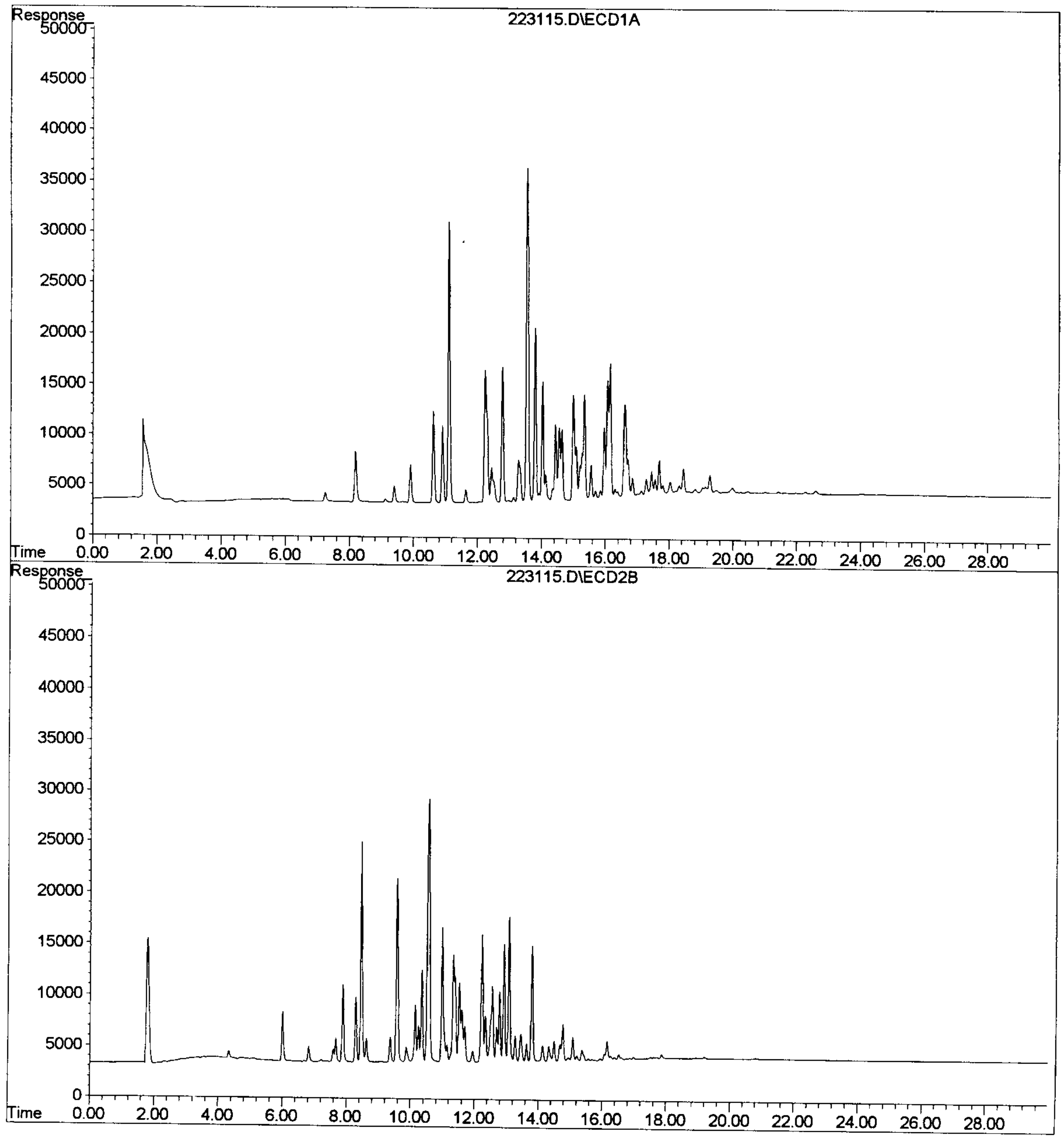


FIGURE 4. Example GC/ECD chromatogram of Aroclor 1242 analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.

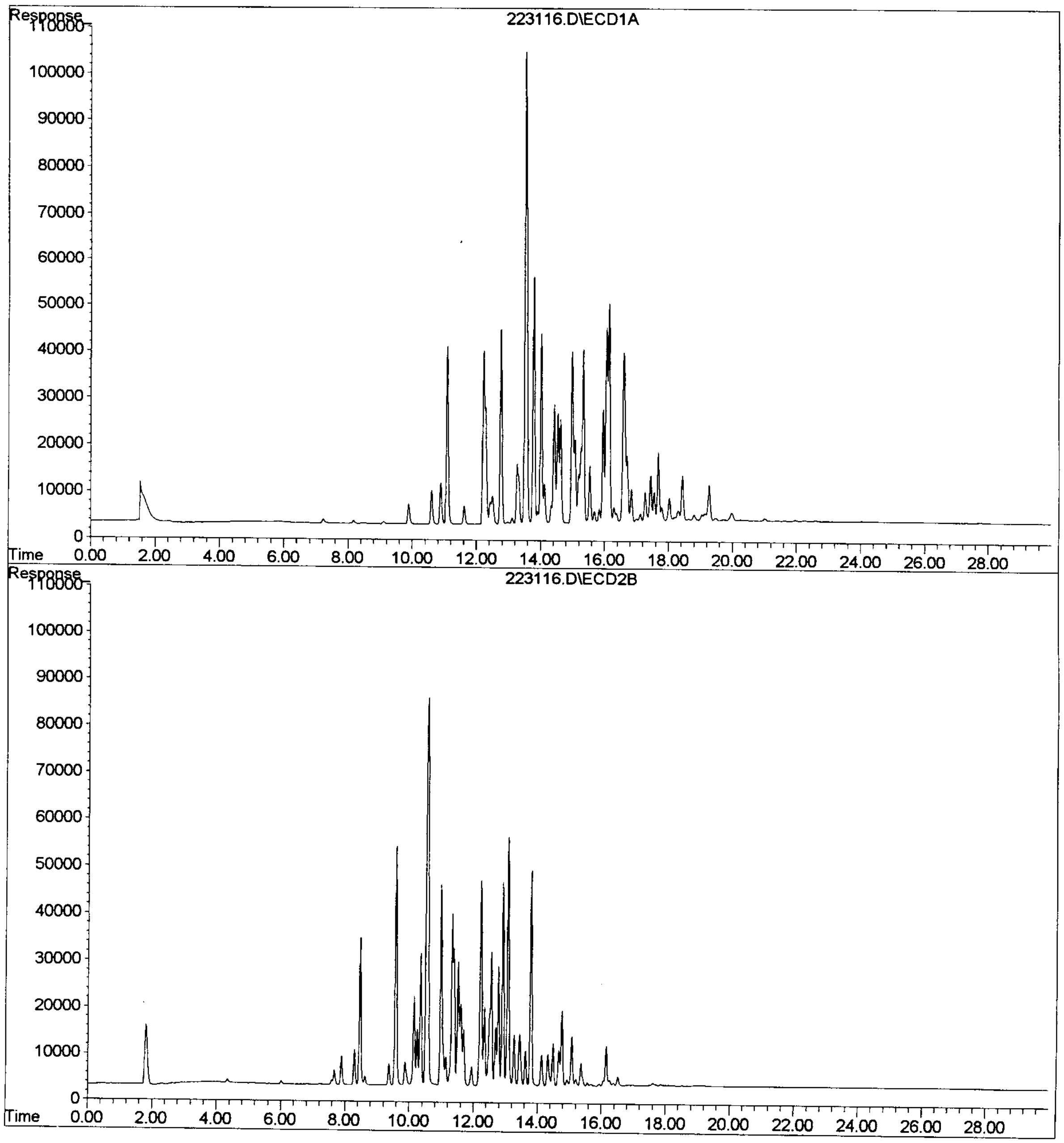


FIGURE 5. Example GC/ECD chromatogram of Aroclor 1248 analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.

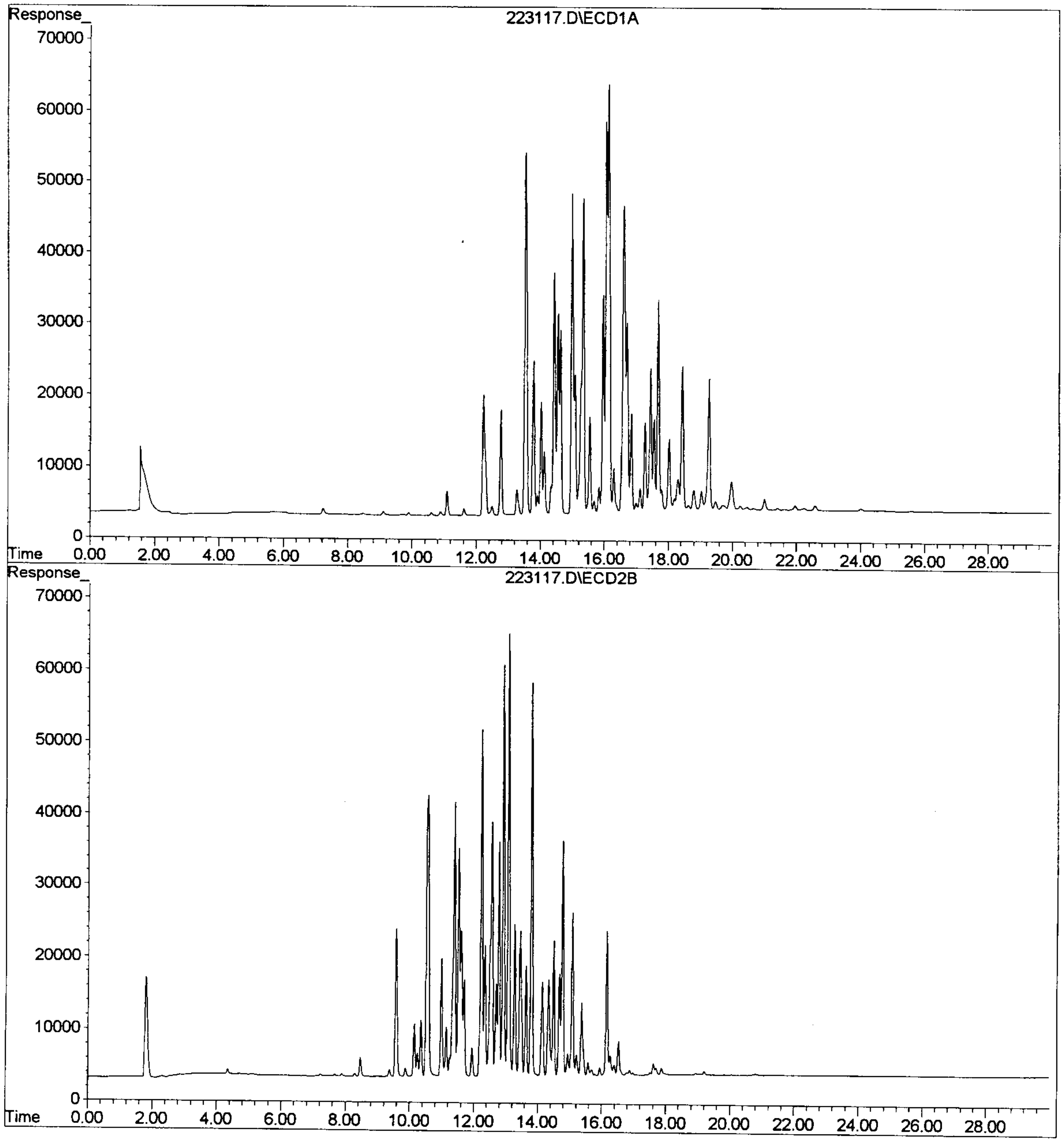
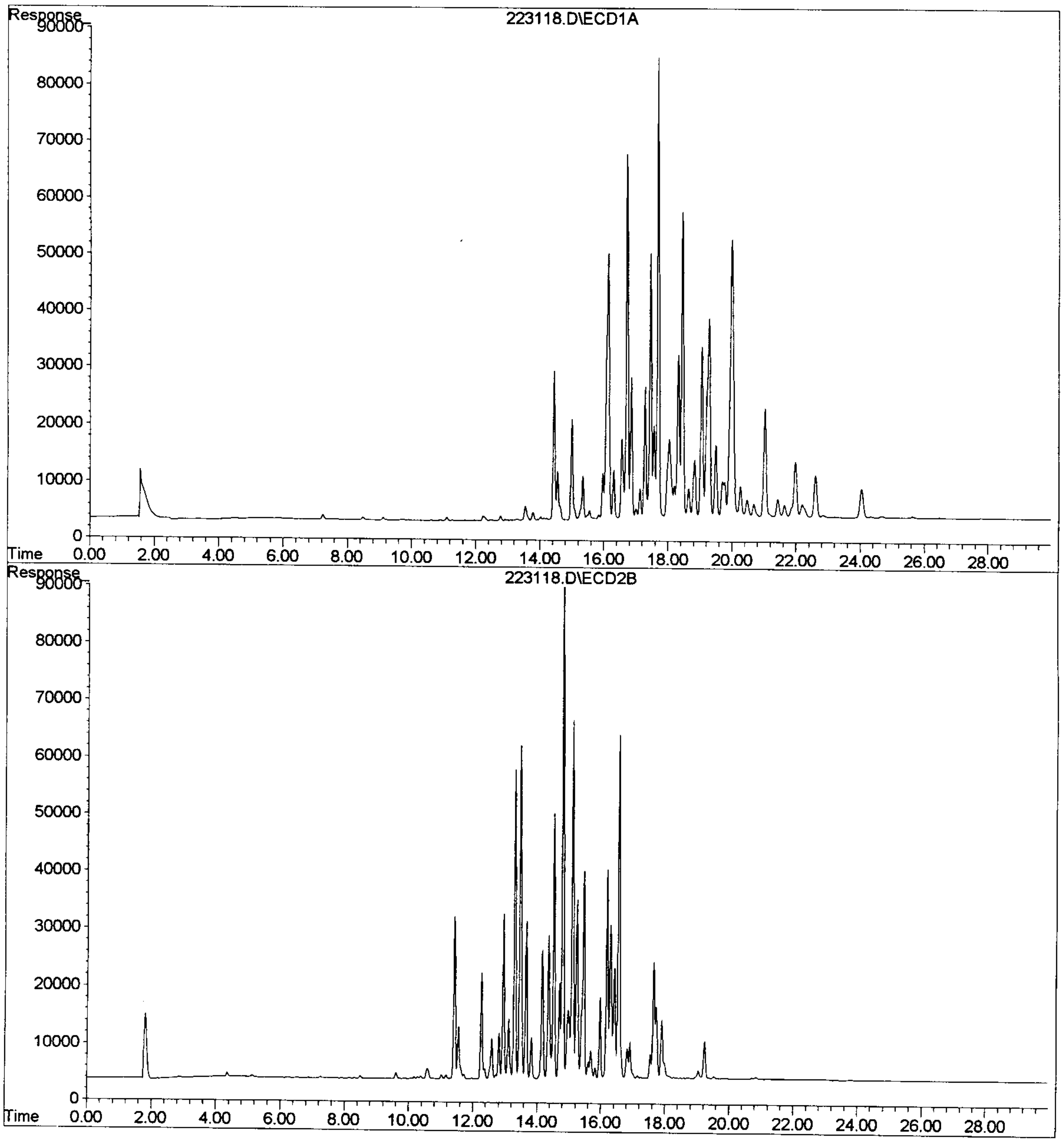


FIGURE 6. Example GC/ECD chromatogram of Aroclor 1254 analyzed on a Rtx-5/HP-608 column pair connected to separate injectors. The top trace is the Rtx-5 column (30-m x 0.53-mm ID, 1.5-µm film thickness) and the bottom trace is the HP-608 column (30-m x 0.53-mm ID, 0.5-µm film thickness). Temperature program: 150 °C (1.0 min hold) to 280 °C (17 min hold) at 8 °C/min.



Appendix B. Prior Reports

1 - Hazardous Materials Assessment, January 28, 2015, DLH Environmental Consulting2 - Geotechnical 2010

2- Geotechnical Data Report, September 24, 2010, Shannon & Wilson, Inc.

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DLH Environmental Consulting
2400 NW 80th Street, Seattle, Washington 98117
206-632-3123

January 28, 2015

Brandt Barnes
Construction Manager
MWH Americas, Inc.
2353 130th Ave NE
Suite 200- 520 Corporate Center
Bellevue, WA 98005

RE: Hazardous Materials Investigation
City of Anacortes Water Treatment Plant
MWH Job # 1009285.020101
P.O. #P1009285-102566-OM
14489 River Bend Road
Mount Vernon, WA 98273

Mr. Barnes,

Enclosed is the report documenting the findings of the hazardous materials assessment at the City of Anacortes Water Treatment Plant located in Mount Vernon, Washington.

The scope of work for the project was to collect concrete samples, paint samples, soil samples and asbestos samples of the areas that will require demolition. Analysis of the samples consisted of CAM 17 (metals including lead in paint), SVOC's (semi-volatile organic compounds), PAH's (polycyclic aromatic hydrocarbons), PCB's (poly-chlorinated biphenyl's) and asbestos.

Specifically, concrete wall samples were collected from the interior walls of the Sedimentation Basin (Area 1), interior and exterior walls of the Filter Basin (Area 2) and from the interior of the Clear Well inside of the Administration Building (Area 4).

Paint samples were collected from the concrete walls of Area 1, Area 2, from painted surfaces (walls interior and exterior) and equipment located inside of the Administration building.

Additional asbestos sampling was conducted at the Administration Building which included flooring material, roofing material, acoustical ceiling tiles and interior brick walls.

Based on laboratory data supplied by Friedman & Bruya, Inc. (project laboratory), high levels of PCB's were confirmed in the concrete walls associated with the Sedimentation (Area 1) and Filter (Area 2) basins and the soil along the exterior of the east side of the Sedimentation Basin (Area 1). Elevated PAH's were also confirmed in the soil sample and asbestos was determined to be in flooring materials in the administration building. The main issue regarding any future demolition will be based on the presence of PCB's as it is a regulated dangerous waste.

Results of the sampling data are located in Tables 1 – 4 and laboratory reports are located in Appendix B.

It has been a pleasure working for you on this project and I hope that if you have any other environmental concerns, you will not hesitate to contact me.

DLH Environmental Consulting

Donna Hewitt L.G.
AHERA Asbestos Inspector
Environmental Consultant

CITY OF ANACORTES WATER TREATMENT PLANT
HAZARDOUSE MATERIALS ASSESSMENT
MWH Job # 1009285.020101
14489 RIVER BEND ROAD
MOUNT VERNON, WA 98273

SUBMITTED TO:

BRANDT BARNES
CONSTRUCTION MANAGER
MWH AMERICAS, INC.
2353 130TH AVE NE
SUITE 200- 520 CORPORATE CENTER
BELLEVUE, WA 98005

CONTRACT PROJECT NUMBER

P.O. #P1009285-102566-OM

PREPARED BY:

DONNA HEWITT, L.G.
DLH ENVIRONMENTAL CONSULTING
2400 NW 80TH STREET PMB 114
SEATTLE, WASHINGTON 98117-4449

January 28, 2015

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1.0 PROJECT DESCRIPTION/SCOPE OF WORK

The City of Anacortes Water Treatment Plant has undergone recent upgrading and the old Sedimentation Basin (Area 1), Filter Basin (Area 2) and parts of the Administration Building (Area 4) are scheduled for demolition. Prior to demolition work DLH Environmental Consulting was retained to conduct a hazardous Assessment of the areas that will require demolition.

On January 12, and January 16, 2015 Donna Hewitt of DLH Environmental Consulting (DLH) collected a total of 4 concrete wall samples, 2 composite soil samples, 9 paint samples for lead and 15 building materials for asbestos samples.

2.0 METHODS OF INVESTIGATION

Large pieces of concrete were collected from the interior and exterior walls of both the Sediment and Filter basin and from the interior of the Clear Well (Admin Building). In addition DLH collected two 3-point composite soil samples from the exterior of the Sediment Basin.

The soil samples were placed directly into sterilized glassware sample jars furnished by the project laboratory Friedman & Bruyah, Inc. of Seattle, Washington. In an effort to minimize the loss of any volatile hydrocarbons that may have been present in the soil, the samples were stored in an iced chest until delivered to the laboratory. Concrete and paint samples were placed in zip lock bags. All building materials collected for asbestos analysis were placed in double Zip Lock bags per sampling requirements.

All EPA-established sample-handling protocols, including chain of custody procedures, were observed during the course of the project. Laboratory results and chain of custody forms are located in Appendix B.

3.0 RESULTS OF INVESTIGATION

TABLE 1- CONCRETE WALL SAMPLES

Sample Number	Location	Analysis	Results IN PPM	Comments
Filter Basin INT	Interior wall of Filter Basin Area 2	CAM 17 (metals) SVOC's PAH's PCB's	**Pb-20.3 ppm, As-30.9** See below * BC **Total 130 ppm**	BC = below cleanup levels based on soils
Filter Basin EXT	Exterior wall of Filter basin Area 2	CAM 17 (metals) SVOC's PAH's PCB's	Pb-8.34 ppm, As-11.6, See below * BC **Total 3,900 ppm**	
Sediment Basin	Interior wall of sediment basin Area 1	CAM 17 (metals) SVOC's PAH's PCB's	**Pb-23.2 ppm, As-40.5** See below * ND **Total 540 ppm**	ND= None Detected
Clear Well	Interior wall of clear well in Administration Building Area 4	CAM 17 (metals) SVOC's PAH's PCB's	**Pb-18.7 ppm, As-56.9** BC ND **Total 1.4 ppm**	

PCB's were detected in ALL of the concrete samples.

***Semivolatile compounds (SVOC's) were inconclusive due to dilution requirements. This may be due to the presence of PCB's and the mixing agents added to the PCB's.**

TABLE 2: 3-POINT COMPOSITE SOIL SAMPLES

Sample Number	Location	Analysis	Results in Parts Per Million (PPM)	Comments
Soil-01	Along east side wall of the exterior of the Sedimentation Basin Area 1	CAM 17 (metals) SVOC's PAH's PCB's	Pb-4.14 ppm, As -5.43 ppm Below cleanup **TEM= 0.8299 ppm** **Total 33 ppm - AC**	AC- Above Method B cleanup levels for soils BC=Below cleanup levels TEM cleanup level is 0.137 ppm* PCB's in soils
Soil-02	Same as above- Along east side wall of the exterior of the Sedimentation Basin Area 1	ARCHIVED	NA	NA

*** WDOE TEM calculations (Appendix C) per WAC173-340-708(8) were used for Method B Soil Cleanup Levels. The cleanup level is 0.137 ppm (mg/kg).**

Method A cleanup tables are located in Appendix C.

TABLE 3: PAINT SAMPLES FOR LEAD

Sample Number	Location	Analysis EPA-200.8	Results
Pb-01	Administration Building exterior metal door (blue).	Lead (Pb)	< 10 ppm
Pb-02	Concrete retaining wall outside and adjacent to the staircase of the south end of the administration building (in front of parking area). Blue and Pink	Lead (Pb)	**41.8 ppm**
Pb-03	Interior wall of the administration building on concrete block (beige)	Lead (Pb)	**61.3 ppm**
Pb-04	Admin Bldg.- second floor storage room floor multiple layers and colors	Lead (Pb)	**2,420 ppm**
Pb-05	Admin Bldg. - second floor paint on brick walls (beige ceramic).	Lead (Pb)	**< 10 ppm**
Pb-06	Admin Bldg.-second floor Alum room (green)	Lead (Pb)	**3,400 ppm**
Pb-07	Admin Bldg. -1st floor pump room pipes (blue)	Lead (Pb)	**21,800 ppm**
Pb-08	Admin Bldg.- 1st floor (sub floor) pipes (brown)	Lead (Pb)	**554 ppm**
Pb-09	Exterior south wall of Filter Basin on concrete (Blue and Pink)	Lead (Pb)	< 10 ppm

Comments: Any amount of detectable lead paint on a surface in the state of Washington is regulated by Labors and Industries for worker protection. Abatement consisting of cutting, torching or demolition of materials with lead paint will require a worker protection Exposure Assessment prior to any demolition work.

TABLE 4: ASBESTOS ANALYSIS OF BUILDING MATERIALS

Sample Number	Location	Material	Analysis	Results
ACM-01a, 01b	Admin Bldg-2nd floor storage room	9"x9" asbestos floor tile (beige), original flooring material on second floor. This has been covered with sheet vinyl flooring in other areas.	PLM – Bulk	**3-4% Chrysotile in black mastic only**
ACM- 02a, 02b	Admin Bldg-2nd floor office	Sheet vinyl flooring underlain by 9x9 flooring	PLM – Bulk	None detected
ACM-03a, 03b	Admin Bldg-2nd floor lunch room and lab	Sheet vinyl flooring underlain by 9x9 flooring	PLM – Bulk	None Detected
ACM-04	Admin Bldg-2nd floor lunch room and lab	Acoustical ceiling tile (older)	PLM – Bulk	None Detected
ACM-05	Admin Bldg-2nd floor lunch room and lab and in additional office areas	Acoustical Ceiling tile (new)	PLM – Bulk	None Detected
ACM-06a, 06b	Admin Bldg-2nd floor	Painted brick walls	PLM – Bulk	None Detected
ACM-07	Admin Bldg.- roof	Torch down roofing material and insulation (multi-layers)	PLM – Bulk	None Detected
ACM-08	Admin Bldg.-roof	Torch down roof with silver painted patch	PLM – Bulk	None Detected
ACM-09	Admin Bldg.-roof	Torch down roof patch	PLM – Bulk	None Detected
ACM-ADMIN-ENTRY-1, ADMIN-ENTRY-2	Admin Bldg.-main entry and stairs to upper 2nd floor landing	Vinyl flooring on concrete, single original layer	PLM – Bulk	None Detected

Additional building materials; The Administration building is constructed with concrete block and brick walls. The interior has decorative brick walls and only small amounts of plywood located in the electrical panel room. The aluminum windows do not have caulking, and bathroom walls and floors are ceramic tile.

Exemptions: The plywood walls were not removed to inspect behind the electrical panels for possible asbestos-containing materials such as cement asbestos board or insulation.

4.0 CONCLUSIONS

Based on laboratory analytical results:

- PCB levels in the concrete samples collected and analyzed are all above the allowable EPA and WDOE limits and will require permitted disposal. PCB's are considered a dangerous waste. It is possible that the PCB's were used as a coating on the interior and exterior of the concrete walls. Therefore it might be possible to remove the coating and re-test the concrete to ascertain that the PCB's are not a part of the mixture of the concrete.

- High levels of arsenic and lead were also noted in the concrete filter basin interior, sediment basin interior and clear well samples. This may also be due to a coating. According to one source at one time a paint coating mixture of arsenic and lead (3/1) was used in the agricultural arena for vermin management.

- PCB and PAH levels in the soil sample collected and analyzed are above the allowable cleanup limits for EPA and WDOE (PCB's) and WDOE - Method B-Soils for PAH's . The soils will have to be disposed of as dangerous waste material.

- Due to the presence of lead paint on piping and other equipment a Lead Paint Exposure Assessment under Labor and Industries regulations for the worker protection in the State of Washington will have to be conducted prior to any demolition of equipment.

- Asbestos-containing material in the form of tile- floor mastic will require permitted abatement prior to building demolition.

5.0 RECCOMENDATIONS

- Waste Management, Inc. (WM) is the company in Washington that can provide you with disposal options. It is recommended that they be contacted and a copy of this report given to the assigned manager to help assist with the disposal options for both the concrete and soil. www.wastemanagement.com. Mr. Michael McQuarrie is the contact person at this point in time. He can be reached at 360-913-4781 or mmcquarr@wm.com

- Due to the fact that PCB's are a highly regulated dangerous waste both the WDOE and the EPA will need to be notified and any remediation and/or disposal options would need to be discussed and most likely permitted through them.

- Additional soil sampling and analysis for PCB's and PAH's would be recommended to fully characterize the extent of contamination. Soil samples from the lower limits of the sediment and filter basins would be required. A Geoprobe is recommended due to access and minimizing the disturbance of already impacted soil. It is recommended that all PCB and PAH impacted soil be removed and disposed of prior to the demolition of any concrete.

- A LEAD Paint Exposure Assessment prior to any equipment demolition is recommended in order to satisfy Washington State Department of Labor and Industries worker protection requirements. MED/TOX Northwest can provide these services. Jon Havlock can be reached at: 206-730-0610 or www.medtoxnorthwest.com

- An Asbestos- Demolition Survey/Report may be required by the City of Mt. Vernon prior to building demolition. AHERA asbestos sampling has been conducted as a part of this project. A final asbestos report covering the requirements for a Demolition survey is recommended. Once the final report is complete a site walkthrough is recommended with abatement contractors. All asbestos containing material will require removal prior to building demolition.

6.0 LIMITATIONS

This report has been prepared for specific applications to this project in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area.

Recommendations and conclusions contained in this report are based on evaluation of technical information made available and reviewed during the course of this survey. Our work product and judgments rendered meet the standard of care of our profession at this time. Conclusions are based on site conditions and the analysis of samples taken from the site on January 12th and January 16th, 2015. This assessment covers the areas where concrete, paint, building materials for asbestos and soil samples were collected and is based on information supplied by MWH Constructors, Construction Manager Mr. Brandt C. Barnes and Laboratory data supplied by Friedman & Bruya, Inc.

DLH Environmental Consulting has no control over the accuracy of information provided by outside consultants, contractors, and agencies and, therefore, disclaims responsibility for any inaccuracies incurred. Also, DLH Environmental Consulting accepts no responsibility for verifying compliance with government for hazardous material and waste use or storage at the subject facility.

This report is for the exclusive use of MWH Global, Inc. and their representatives. If new information becomes available as a result of future site work, which may include excavations, borings, studies, etc., DLH Environmental Consulting reserves the right to reevaluate the contents of this report.

APPENDIX A

SITE FIGURES

SITE PHOTOGRAPHS

SITE LOCATION

VICINITY MAP

CIVIL GENERAL NOTES

GENERAL

1. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
2. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL DEBRIS FROM DEMOLITION AT CONTRACTOR'S EXPENSE.
3. ALL BUILDING COORDINATES ARE TO OUTSIDE CORNER OF COLUMN OR BUILDING.
4. THE CONTRACTOR SHALL DISPOSE OF ALL NON-ORGANIC WASTES SUCH AS OLD GUNITE, PIPING, ROCK RUBBLE ETC.,. AT AN APPROVED LANDFILL OR OTHER SUITABLE DISPOSAL SITES AT THE CONTRACTOR'S EXPENSE.
5. CONTRACTOR SHALL RESTORE ALL SURVEY MONUMENTS THAT ARE DAMAGED OR DESTROYED DURING CONSTRUCTION.

UTILITIES

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES IN AND AROUND THE AREAS OF NEW CONSTRUCTION. THE CONTRACTOR SHALL POTHOLE FOR EXISTING UTILITIES PRIOR TO SUBMITTAL OF SHOP DRAWINGS FOR POINTS OF CONNECTIONS.
2. THE CONTRACTOR SHALL PROTECT ALL REMAINING EXISTING UTILITIES.
3. LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS AND SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT UTILITY LINES WHETHER SHOWN OR NOT SHOWN.
4. PRIOR TO ANY CONNECTION TO AN EXISTING UTILITY, THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY OWNER.
5. PRIOR TO ANY EXCAVATION IN THE VICINITY OF ANY EXISTING UNDERGROUND FACILITIES, INCLUDING ALL WATER, SEWER, STORM DRAIN, GAS, PETROLEUM PRODUCTS, OR OTHER PIPELINES; ALL BURIED ELECTRIC POWER, COMMUNICATIONS, OR TELEVISION CABLES; ALL TRAFFIC SIGNAL AND STREET LIGHTING FACILITIES; AND ALL ROADWAY, STATE HIGHWAY, AND RAILROAD RIGHTS-OF-WAY, THE CONTRACTOR SHALL NOTIFY THE RESPECTIVE AUTHORITIES REPRESENTING THE OWNERS OR AGENCIES RESPONSIBLE FOR SUCH FACILITIES NOT LESS THAN 3 DAYS NOR MORE THAN 7 DAYS PRIOR TO EXCAVATION SO THAT A REPRESENTATIVE OF SAID OWNERS OR AGENCIES CAN BE PRESENT DURING SUCH WORK IF THEY SO DESIRE. IN THE CASE OF THE UNDERGROUND UTILITY SERVICE ALERT CENTER, THIS NOTICE WILL GIVE THEM TIME TO MARK THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL ALSO NOTIFY THE REGIONAL OR LOCAL UNDERGROUND SERVICE ALERT COMPANY AT LEAST 3 DAYS, BUT NO MORE THAN 7 DAYS, PRIOR TO SUCH EXCAVATION.

PIPING

1. THE CONTRACTOR SHALL COMPLY WITH THE STATE DEPARTMENT OF HEALTH SERVICES CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS.
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 30 INCHES OF COVER ON ALL PIPELINES UNLESS OTHERWISE SHOWN OR DIRECTED.
3. STRAIGHT SLOPES SHALL BE MAINTAINED BETWEEN INVERT ELEVATIONS SHOWN OR SPECIFIED.
4. THE CONTRACTOR SHALL ADJUST ALL VALVE BOXES, PULL BOXES AND MANHOLES TO FINISHED GRADE UNLESS OTHERWISE SHOWN OR SPECIFIED. MANHOLES IN OPEN FIELDS SHALL BE SET ONE FOOT ABOVE GRADE. APPROXIMATE RIM ELEVATIONS ARE SHOWN ON DRAWINGS.
5. ALL PIPE TRENCHING AND BACKFILL SHALL BE IN ACCORDANCE WITH DETAILS. THE PIPING SHOWN ON THESE PLANS SHALL BE RESTRAINED JOINT DESIGN AT ALL SLEEVE TYPE COUPLINGS.
6. ANY EXISTING PROPERTY CORNERS, RIGHT-OF-WAY MARKERS AND SURVEY MONUMENTS TO BE REMOVED OR DISTURBED BY CONSTRUCTION SHALL BE FIRST LOCATED AND REFERENCED BY A SURVEYOR LICENSED BY THE STATE OF WASHINGTON AND SHALL BE RESTORED TO THEIR ORIGINAL LOCATION AFTER CONSTRUCTION COMPLETED.
7. EXISTING FACILITIES AND UTILITIES ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. DIMENSIONS, ELEVATIONS AND LOCATIONS SHOWN ARE APPROXIMATE AND TAKEN FROM EXISTING UTILITIES RECORDS. THE PLANS DO NOT SHOW ALL EXISTING FACILITIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO TAKE NOTE OF THE ACTUAL FIELD CONDITIONS DURING THE SITE VISIT DURING THE BIDDING PERIOD. SEE APPENDIX D FOR SITE PHOTOS.
8. PRIOR ANY EXCAVATION THE CONTRACTOR SHALL HAVE ALL UTILITIES AFFECTED BY THE WORK LOCATED. THE CONTRACTOR SHALL USE THE "ONE CALL" CENTER AT 1-800-424-5555 AND OTHER METHODS AS NECESSARY TO DETERMINE THE LOCATIONS OF UTILITIES AT LEAST 48 HOURS IN ADVANCE OF ANY EXCAVATION.
9. OVERHEAD UTILITIES LINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXTENT OF HAZARDS OR IMPACTS ON CONSTRUCTION ACTIVITIES CREATED BY OVERHEAD OR BURIED UTILITIES AND FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, MEET WITH UTILITY OWNER TO DETERMINE THE EXTENT OF HAZARDS AND TAKE WHATEVER PRECAUTIONS AND REMEDIAL MEASURES THAT MAY BE REQUIRED TO PROTECT PERSONS AND PROPERTY AND TO AVOID DISRUPTION OF SERVICE. SEE SPECIFICATIONS.
10. FORTY-EIGHT (48) HOUR ADVANCE NOTICE SHALL BE GIVEN TO ALL PROPERTY OWNERS TO INFORM THEM OF CONSTRUCTION ACTIVITIES THAT MAY AFFECT DRIVEWAY ACCESS.
11. CONTRACTOR'S CONSTRUCTION AREA SHALL BE LIMITED TO THE AREAS SHOWN.
12. ALL ELEVATIONS ARE IN FEET.

CIVIL GENERAL NOTES - CONTINUED

EROSION CONTROL

1. THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR WORK DURING THE CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION.
a. ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER (SEE LANDSCAPE PLANS FOR FINAL GROUNDCOVER).
b. ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.
c. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS OR AS REQUIRED BY THE CITY, DISTRICT, OR OTHER REGULATORY AUTHORITY. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (E.G. HYDROSEEDING, MULCHING OF STRAW, SAND BAGGING, DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS INTO EXISTING PUBLIC STREETS, WATERWAYS, OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS.
2. SEE DRAWING ES-1 AND ES-2 AND SPECIFICATION 015725 FOR ADDITIONAL EROSION CONTROL REQUIREMENTS.

SURVEY AND CONTROL

BASIS OF BEARINGS:

WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE, NAD 83/91

VERTICAL DATUM:

NAVD88

HORIZONTAL AND VERTICAL CONTROL FOR ANACORTES WATER TREATMENT PLAN-MOUNT VERNON LINE

COORDINATES AND DISTANCES ARE GRID, WASHINGTON STATE PLANE NORTH ZONE, NAD 83/91, (SUPERSEDED CONTROL) BASED ON G.P.S. STATIC TIES TO WASHINGTON DEPARTMENT OF HIGHWAYS MONUMENTS

GP29009-11: N 533,297.253, E 1,290,994.913, ELEV. = 45.378 FEET (NAVD88)
GP29009-34, N. 526,660.029, E. 1,293,035.738, ELEV. =122.234 FEET (NAVD88)
GP29528-73, N. 525,429.205, E. 1,302,122.057, ELEV. = 25.561 FEET (NAVD88)

PERMITTING

XXXXXX
XXXX

XXXXX
XXXXX

Contacts

1. ANACORTES, CITY OF:
PUBLIC WORKS REPRESENTATIVES:

MATT REYNOLDS, P.E. ASSISTANT CITY ENGINEER (360) 293-1951

JAMES LEBLACE, WTP MANAGER (360) 428-1590

2. CONSTRUCTION MANAGER

BRANDT BARNES (206)-601-7390

LIST OF DRAWINGS

SHEET NUMBER	TITLE
GENERAL	
G-1	COVER SHEET
G-2	VICINITY MAP, LIST OF DRAWINGS AND GENERAL NOTES
G-3	SYMBOLS & ABBREVIATIONS
G-4	EXISTING SITE PLAN
DEMOLITION	
D-1	OVERALL DEMOLITION PLAN
D-2	SEDIMENTATION BASIN DEMOLITION PLAN & SECTION
D-3	DEMOLITION NOTES AND DETAILS
EROSION & SEDIMENT CONTROL	
ES-1	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
ES-2	EROSION & SEDIMENT CONTROL NOTES AND DETAILS
ES-3	EROSION CONTROL DETAILS-I
ES-4	EROSION CONTROL DETAILS-II
CIVIL	
GC-1	GENERAL CIVIL DETAILS - I
C-1	SITE GRADING AND RESTORATION PLAN

SCALE
DATE
DESIGNED S. RADFORD
DRAWN A. FRISK
CHECKED C. HARRIS

DESIGN DEVELOPMENT PHASE - 8/5/13

NOT FOR CONSTRUCTION
This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

MWH
Bellevue Washington

CITY OF ANACORTES
WTP DEMOLITION & SALVAGE PROJECT

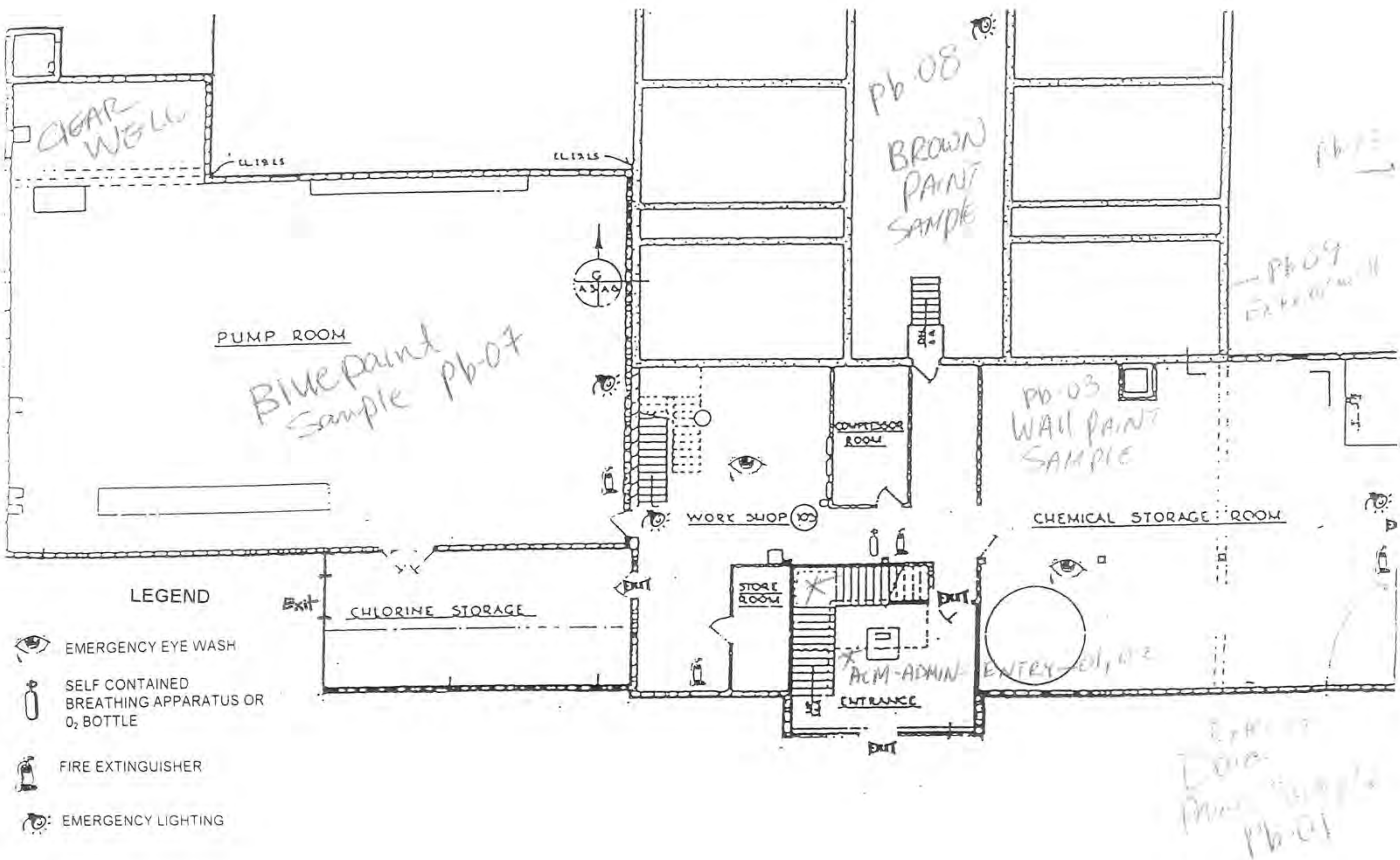
LOCATION MAP, VICINITY MAP, LIST OF DRAWINGS AND GENERAL NOTES

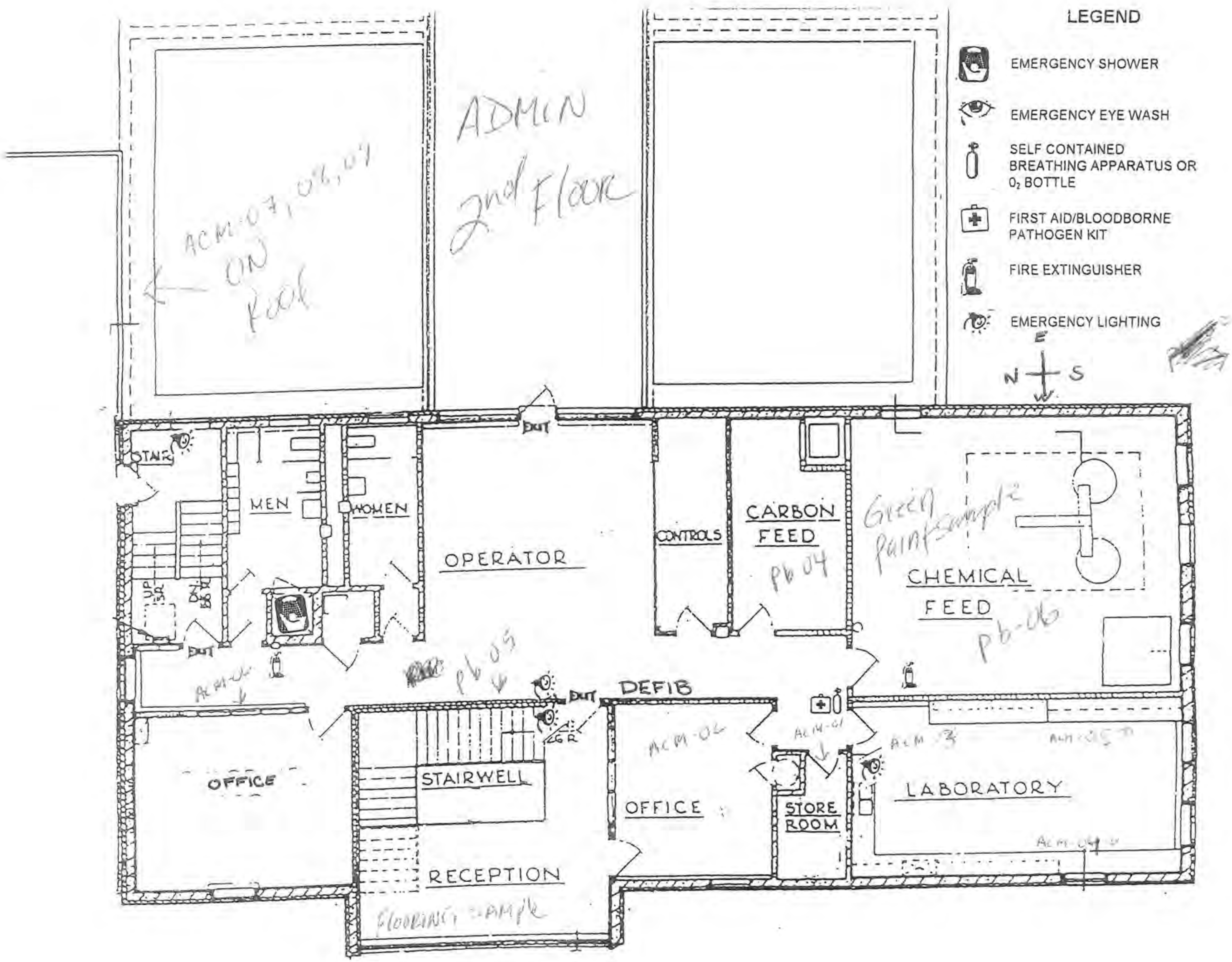
G-2

COPY


HAZARDOUS MATERIAL INVESTIGATION AREAS
SEDIMENTATION BASIN-AREA 1
SOIL SAMPLE 3pt Composite
FILTER BASIN-AREA 2
ADMIN. BUILDING AREA-4
Concrete Clearwell
Concrete Sediment basin
Concrete Filter basin INT, EXT
CHLORINE ROOM AREA-3
© 5/14/2013 sky-pix.com

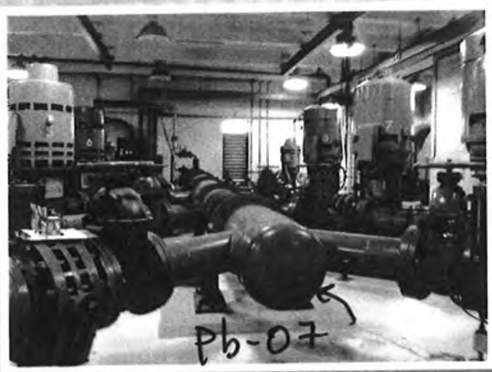
ADMIN - 1st Floor



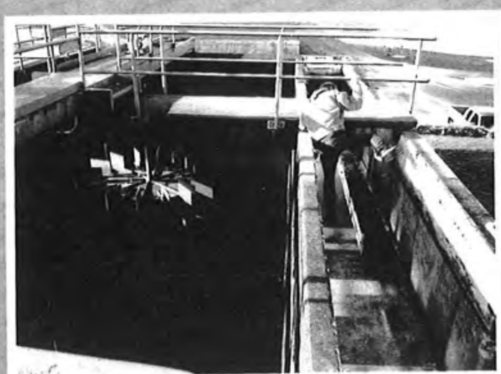

LEGEND
EMERGENCY SHOWER
EMERGENCY EYE WASH
SELF CONTAINED BREATHING APPARATUS OR O_2 BOTTLE
FIRST AID/BLOODBORNE PATHOGEN KIT
FIRE EXTINGUISHER
EMERGENCY LIGHTING
E
N
S
W
ADMIN 2nd Floor
ACM-07, 08, 09 ON Roof
STAIR
MEN
WOMEN
OPERATOR
CONTROLS
CARBON FEED
Pb 04
Green Paint sample 2
CHEMICAL FEED
Pb-06
EXIT
DEFIB
Pb 05
ACM-01
ACM-02
ACM-03
OFFICE
STAIRWELL
STORE ROOM
LABORATORY
RECEPTION
Flooring sample

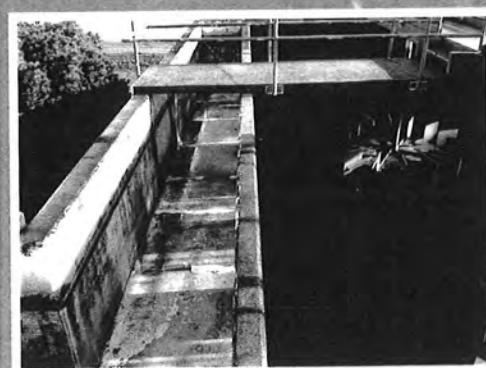

Admin
Bathroo
Walls
Floor

ACM-08

ACM - 07
Roofing
ACM-09

Pb-07

Pb-09

Pb-04


Sediment basin


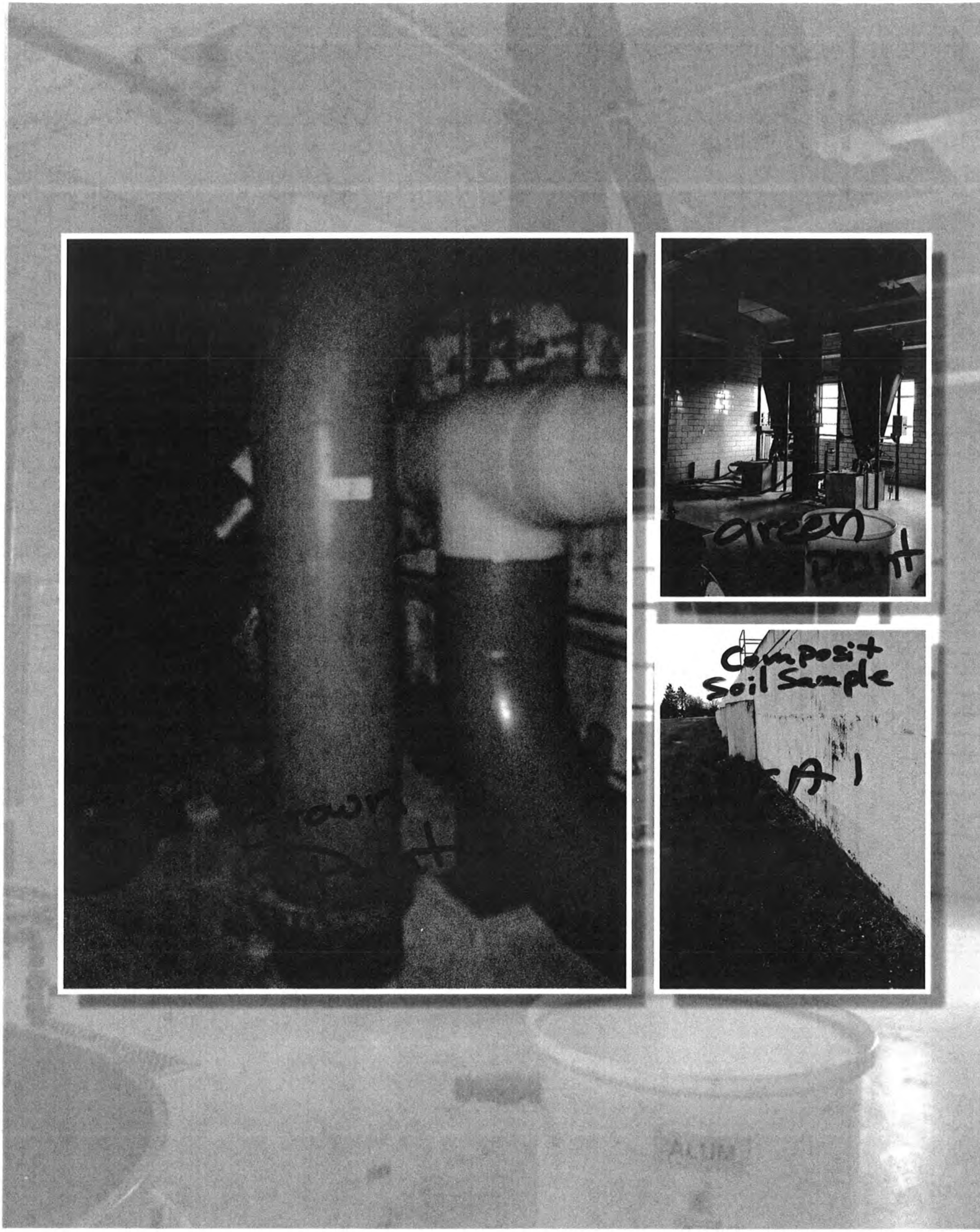
Filter basin
Wall
Filterbasin
Ext

Concrete
clear
well

Filter
Basin
Pb-09

Filter basin
int


Pb-01
admin bldg
paint
paint on concrete
Pb-02
admin bldg
entry flooring
admin bldg floorig
ACM-02
ACM-01
Pb-03
#3
wall paint admin bldg
Pb-05
admin bldg
ceramic wall brick
03
02
ACM-03
ACM-02
admin bldg flooring
ACM-05
*
ACM-04
acoustical tile
ACM-06
06
admin bldg
ceramic wall brick


green Plant
Composit Soil Sample
A 1
ALUM

APPENDIX B

LABORATORY REPORTS

CHAIN OF CUSTODY FORMS

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

January 27, 2015

Donna Hewitt, Project Manager
DLH Environmental Consulting
2400 NW 80th St., 114
Seattle, WA 98117-4449

Dear Ms. Hewitt:

Included are the results from the testing of material submitted on January 12, 2015 from the Anacortes H2O Treatment Plant Demo, F&BI 501137 project. There are 42 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 have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures

c: Gregory.S.Harris@mwhglobal.com
Invoice to mwhamericasinvoices@mwhglobal.com
DLH0127R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 12, 2015 by Friedman & Bruya, Inc. from the DLH Environmental Consulting Anacortes H2O Treatment Plant Demo, F&BI 501137 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	DLH Environmental Consulting
501137 -01	ACM-01a
501137 -02	ACM-01b
501137 -03	ACM-02a
501137 -04	ACM-02b
501137 -05	ACM-03a
501137 -06	ACM-03b
501137 -07	ACM-04
501137 -08	ACM-05
501137 -09	ACM-06a
501137 -10	ACM-06b
501137 -11	ACM-07
501137 -12	ACM-08
501137 -13	ACM-09
501137 -14	Pb-01
501137 -15	Pb-02
501137 -16	Pb-03
501137 -17	Pb-04
501137 -18	Pb-05
501137 -19	Pb-06
501137 -20	Pb-07
501137 -21	Pb-08
501137 -22	Pb-09
501137 -23	Filter basin Int
501137 -24	Filter basin Ext
501137 -25	Sediment basin
501137 -26	Clear Well
501137 -27	Soil-01
501137 -28	Soil-02

Several compounds in the 8270D laboratory control sample and laboratory control sample duplicate failed the acceptance criteria. The data were flagged accordingly.

Selenium failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-01	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-14
Date Analyzed:	01/21/15	Data File:	501137-14.067
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-02	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-15
Date Analyzed:	01/21/15	Data File:	501137-15.068
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	41.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-03	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-16
Date Analyzed:	01/21/15	Data File:	501137-16.069
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	61.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-04	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-17
Date Analyzed:	01/21/15	Data File:	501137-17.070
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	2,420

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-05	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-18
Date Analyzed:	01/21/15	Data File:	501137-18.071
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-06	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-19
Date Analyzed:	01/21/15	Data File:	501137-19.072
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	3,440

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-07	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-20
Date Analyzed:	01/21/15	Data File:	501137-20.073
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	21,800

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-08	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-21
Date Analyzed:	01/21/15	Data File:	501137-21.075
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	554

Analysis For Total Metals By EPA Method 200.8

Client ID:	Pb-09	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-22
Date Analyzed:	01/21/15	Data File:	501137-22.076
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	DLH Environmental Consulting
Date Received:	Not Applicable	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	I5-031 mb
Date Analyzed:	01/21/15	Data File:	I5-031 mb.064
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Filter basin Int	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-23
Date Analyzed:	01/15/15	Data File:	501137-23.055
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	94	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	17.1
Chromium	14.1
Cobalt	4.88
Nickel	25.9
Copper	28.5
Zinc	60.5
Arsenic	30.9
Selenium	<1
Molybdenum	1.37
Silver	<1
Cadmium	<1
Antimony	12.3
Barium	80.1
Thallium	<1
Lead	20.3
Manganese	171
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Filter basin Ext	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-24
Date Analyzed:	01/15/15	Data File:	501137-24.056
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	88	60	125
Indium	89	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	13.3
Chromium	10.4
Cobalt	4.01
Nickel	20.9
Copper	24.9
Zinc	288
Arsenic	11.6
Selenium	<1
Molybdenum	1.76
Silver	<1
Cadmium	<1
Antimony	4.63
Barium	105
Thallium	<1
Lead	8.34
Manganese	177
Mercury	1.22

Analysis For Total Metals By EPA Method 200.8

Client ID:	Sediment basin	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-25
Date Analyzed:	01/15/15	Data File:	501137-25.057
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	88	60	125
Indium	90	60	125
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	13.8
Chromium	16.0
Cobalt	4.61
Nickel	17.4
Copper	31.3
Zinc	81.0
Arsenic	40.5
Selenium	<1
Molybdenum	1.81
Silver	<1
Cadmium	<1
Antimony	21.9
Barium	56.4
Thallium	<1
Lead	23.2
Manganese	213
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Clear Well	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-26
Date Analyzed:	01/15/15	Data File:	501137-26.058
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	92	60	125
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	16.5
Chromium	14.7
Cobalt	5.32
Nickel	22.7
Copper	37.8
Zinc	105
Arsenic	56.9
Selenium	<1
Molybdenum	2.77
Silver	<1
Cadmium	<1
Antimony	27.2
Barium	66.5
Thallium	<1
Lead	18.7
Manganese	151
Mercury	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Soil-01	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-27
Date Analyzed:	01/15/15	Data File:	501137-27.035
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Indium	92	60	125
Holmium	103	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	23.7
Chromium	14.4
Cobalt	6.16
Nickel	22.0
Copper	19.7
Zinc	19.7
Arsenic	5.43
Selenium	<1
Molybdenum	<1
Silver	<1
Cadmium	<1
Antimony	<1
Barium	53.2
Thallium	<1
Lead	4.14
Manganese	181
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	DLH Environmental Consulting
Date Received:	Not Applicable	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	I5-023 mb
Date Analyzed:	01/15/15	Data File:	I5-023 mb.026
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	88	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Beryllium	<1
Vanadium	<1
Chromium	<1
Cobalt	<1
Nickel	<1
Copper	<5
Zinc	<5
Arsenic	<1
Selenium	<1
Molybdenum	<1
Silver	<1
Cadmium	<1
Antimony	<1
Barium	<1
Thallium	<1
Lead	<1
Manganese	<1
Mercury	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Filter basin Int	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-23 1/5
Date Analyzed:	01/15/15	Data File:	011515.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	50	150
Benzo(a)anthracene-d12	109	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.023
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:	Filter basin Ext	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-24 1/250
Date Analyzed:	01/15/15	Data File:	011526.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 d	50	150
Benzo(a)anthracene-d12	93 d	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.5
Acenaphthylene	<0.5
Acenaphthene	<0.5
Fluorene	<0.5
Phenanthrene	<0.5
Anthracene	<0.5
Fluoranthene	<0.5
Pyrene	<0.5
Benz(a)anthracene	<0.5
Chrysene	<0.5
Benzo(a)pyrene	<0.5
Benzo(b)fluoranthene	0.68
Benzo(k)fluoranthene	<0.5
Indeno(1,2,3-cd)pyrene	<0.5
Dibenz(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Sediment basin	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-25 1/50
Date Analyzed:	01/15/15	Data File:	011525.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	149 d	50	150
Benzo(a)anthracene-d12	97 d	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
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:	Clear Well	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-26 1/5
Date Analyzed:	01/15/15	Data File:	011514.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	97	50	150

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:	Soil-01	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-27 1/5
Date Analyzed:	01/15/15	Data File:	011512.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	107	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	0.40
Fluorene	0.15
Phenanthrene	1.0
Anthracene	0.26
Fluoranthene	1.2
Pyrene	1.1
Benz(a)anthracene	0.62
Chrysene	0.61
Benzo(a)pyrene	0.60
Benzo(b)fluoranthene	0.74
Benzo(k)fluoranthene	0.19
Indeno(1,2,3-cd)pyrene	0.34
Dibenz(a,h)anthracene	0.087
Benzo(g,h,i)perylene	0.30

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	DLH Environmental Consulting
Date Received:	Not Applicable	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	05-098 mb 1/5
Date Analyzed:	01/15/15	Data File:	011507.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	98	50	150

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Filter basin Int	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-23 1/10
Date Analyzed:	01/20/15	Data File:	012012.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	2 d	56	115
Phenol-d6	5 d	54	113
Nitrobenzene-d5	85 d	31	164
2-Fluorobiphenyl	73 d	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	112 d	24	188

Compounds:	Concentration mg/kg (ppm)
Phenol	<1
Bis(2-chloroethyl) ether	<0.1
2-Chlorophenol	<1
1,3-Dichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1
1,2-Dichlorobenzene	<0.1
Benzyl alcohol	310 ve
Bis(2-chloroisopropyl) ether	<0.1
2-Methylphenol	<1
Hexachloroethane	<0.1
N-Nitroso-di-n-propylamine	<0.1
3-Methylphenol + 4-Methylphenol	<2
Nitrobenzene	<0.1
Isophorone	<0.1
2-Nitrophenol	<1
2,4-Dimethylphenol	<1
Benzoic acid	<5
Bis(2-chloroethoxy)methane	<0.1
2,4-Dichlorophenol	<1
1,2,4-Trichlorobenzene	<0.1
Hexachlorobutadiene	<0.1
4-Chloroaniline	<10
4-Chloro-3-methylphenol	<1
2-Methylnaphthalene	<0.1
Hexachlorocyclopentadiene	<0.3
2,4,6-Trichlorophenol	<1
2,4,5-Trichlorophenol	<1
2-Chloronaphthalene	<0.1
2-Nitroaniline	<0.5
Dimethyl phthalate	<1
2,6-Dinitrotoluene	<0.5
3-Nitroaniline	<10
2,4-Dinitrophenol	<3
Dibenzofuran	<0.1
2,4-Dinitrotoluene	<0.5
4-Nitrophenol	<3
Diethyl phthalate	<1
4-Chlorophenyl phenyl ether	<0.1
N-Nitrosodiphenylamine	<0.1
4-Nitroaniline	<10
4,6-Dinitro-2-methylphenol	<3
4-Bromophenyl phenyl ether	<0.1
Hexachlorobenzene	<0.1
Pentachlorophenol	<1
Carbazole	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<1.6
Di-n-octyl phthalate	<1

Needed to be diluted due to
Benzyl Alcohol

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Filter basin Int	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-23 1/1000
Date Analyzed:	01/22/15	Data File:	012204.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 d	56	115
Phenol-d6	0 d	54	113
Nitrobenzene-d5	0 d	31	164
2-Fluorobiphenyl	100 d	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	100 d	24	188

Compounds:	Concentration mg/kg (ppm)
Phenol	<100
Bis(2-chloroethyl) ether	<10
2-Chlorophenol	<100
1,3-Dichlorobenzene	<10
1,4-Dichlorobenzene	<10
1,2-Dichlorobenzene	<10
Benzyl alcohol	540
Bis(2-chloroisopropyl) ether	<10
2-Methylphenol	<100
Hexachloroethane	<10
N-Nitroso-di-n-propylamine	<10
3-Methylphenol + 4-Methylphenol	<200
Nitrobenzene	<10
Isophorone	<10
2-Nitrophenol	<100
2,4-Dimethylphenol	<100
Benzoic acid	<500
Bis(2-chloroethoxy)methane	<10
2,4-Dichlorophenol	<100
1,2,4-Trichlorobenzene	<10
Hexachlorobutadiene	<10
4-Chloroaniline	<1,000
4-Chloro-3-methylphenol	<100
2-Methylnaphthalene	<10
Hexachlorocyclopentadiene	<30
2,4,6-Trichlorophenol	<100
2,4,5-Trichlorophenol	<100
2-Chloronaphthalene	<10
2-Nitroaniline	<50
Dimethyl phthalate	<100
2,6-Dinitrotoluene	<50
3-Nitroaniline	<1,000
2,4-Dinitrophenol	<300
Dibenzofuran	<10
2,4-Dinitrotoluene	<50
4-Nitrophenol	<300
Diethyl phthalate	<100
4-Chlorophenyl phenyl ether	<10
N-Nitrosodiphenylamine	<10
4-Nitroaniline	<1,000
4,6-Dinitro-2-methylphenol	<300
4-Bromophenyl phenyl ether	<10
Hexachlorobenzene	<10
Pentachlorophenol	<100
Carbazole	<100
Di-n-butyl phthalate	<100
Benzyl butyl phthalate	<100
Bis(2-ethylhexyl) phthalate	<160
Di-n-octyl phthalate	<100

Re-Run w/Dilution
MATRIX EFFECT - Could be due to [illegible]
Diluted -

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Filter basin Ext	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-24 1/75
Date Analyzed:	01/20/15	Data File:	012014.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	40 d	56	115
Phenol-d6	61 d	54	113
Nitrobenzene-d5	69 d	31	164
2-Fluorobiphenyl	78 d	47	133
2,4,6-Tribromophenol	16 d	35	141
Terphenyl-d14	115 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<7.5	2,4,6-Trichlorophenol	<7.5
Bis(2-chloroethyl) ether	<0.75	2,4,5-Trichlorophenol	<7.5
2-Chlorophenol	<7.5	2-Chloronaphthalene	<0.75
1,3-Dichlorobenzene	<0.75	2-Nitroaniline	<3.7
1,4-Dichlorobenzene	<0.75	Dimethyl phthalate	<7.5
1,2-Dichlorobenzene	<0.75	2,6-Dinitrotoluene	<3.7
Benzyl alcohol	<7.5	3-Nitroaniline	<75
Bis(2-chloroisopropyl) ether	<0.75	2,4-Dinitrophenol	<22
2-Methylphenol	<7.5	Dibenzofuran	<0.75
Hexachloroethane	<0.75	2,4-Dinitrotoluene	<3.7
N-Nitroso-di-n-propylamine	<0.75	4-Nitrophenol	<22
3-Methylphenol + 4-Methylphenol	<15	Diethyl phthalate	<7.5
Nitrobenzene	<0.75	4-Chlorophenyl phenyl ether	<0.75
Isophorone	<0.75	N-Nitrosodiphenylamine	<0.75
2-Nitrophenol	<7.5	4-Nitroaniline	<75
2,4-Dimethylphenol	<7.5	4,6-Dinitro-2-methylphenol	<22
Benzoic acid	<37	4-Bromophenyl phenyl ether	<0.75
Bis(2-chloroethoxy)methane	<0.75	Hexachlorobenzene	<0.75
2,4-Dichlorophenol	<7.5	Pentachlorophenol	<7.5
1,2,4-Trichlorobenzene	<0.75	Carbazole	<7.5
Hexachlorobutadiene	<0.75	Di-n-butyl phthalate	<7.5
4-Chloroaniline	<75	Benzyl butyl phthalate	<7.5
4-Chloro-3-methylphenol	<7.5	Bis(2-ethylhexyl) phthalate	<12
2-Methylnaphthalene	<0.75	Di-n-octyl phthalate	<7.5
Hexachlorocyclopentadiene	<2.2		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Sediment basin	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-25 1/50
Date Analyzed:	01/20/15	Data File:	012013.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	4 d	56	115
Phenol-d6	25 d	54	113
Nitrobenzene-d5	65 d	31	164
2-Fluorobiphenyl	71 d	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	108 d	24	188

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

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Clear Well	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-26
Date Analyzed:	01/20/15	Data File:	012010A.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	15 ip	56	115
Phenol-d6	51 ip	54	113
Nitrobenzene-d5	93	31	164
2-Fluorobiphenyl	94	47	133
2,4,6-Tribromophenol	2 ip	35	141
Terphenyl-d14	113	24	188

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

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Soil-01	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	501137-27 1/10
Date Analyzed:	01/20/15	Data File:	012011.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	79 d	56	115
Phenol-d6	73 d	54	113
Nitrobenzene-d5	80 d	31	164
2-Fluorobiphenyl	84 d	47	133
2,4,6-Tribromophenol	63 d	35	141
Terphenyl-d14	98 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<1	2,4,6-Trichlorophenol	<1
Bis(2-chloroethyl) ether	<0.1	2,4,5-Trichlorophenol	<1
2-Chlorophenol	<1	2-Chloronaphthalene	<0.1
1,3-Dichlorobenzene	<0.1	2-Nitroaniline	<0.5
1,4-Dichlorobenzene	<0.1	Dimethyl phthalate	<1
1,2-Dichlorobenzene	<0.1	2,6-Dinitrotoluene	<0.5
Benzyl alcohol	<1	3-Nitroaniline	<10
Bis(2-chloroisopropyl) ether	<0.1	2,4-Dinitrophenol	<3
2-Methylphenol	<1	Dibenzofuran	<0.1
Hexachloroethane	<0.1	2,4-Dinitrotoluene	<0.5
N-Nitroso-di-n-propylamine	<0.1	4-Nitrophenol	<3
3-Methylphenol + 4-Methylphenol	<2	Diethyl phthalate	<1
Nitrobenzene	<0.1	4-Chlorophenyl phenyl ether	<0.1
Isophorone	<0.1	N-Nitrosodiphenylamine	<0.1
2-Nitrophenol	<1	4-Nitroaniline	<10
2,4-Dimethylphenol	<1	4,6-Dinitro-2-methylphenol	<3
Benzoic acid	<5	4-Bromophenyl phenyl ether	<0.1
Bis(2-chloroethoxy)methane	<0.1	Hexachlorobenzene	<0.1
2,4-Dichlorophenol	<1	Pentachlorophenol	<1
1,2,4-Trichlorobenzene	<0.1	Carbazole	<1
Hexachlorobutadiene	<0.1	Di-n-butyl phthalate	<1
4-Chloroaniline	<10	Benzyl butyl phthalate	<1
4-Chloro-3-methylphenol	<1	Bis(2-ethylhexyl) phthalate	<1.6
2-Methylnaphthalene	<0.1	Di-n-octyl phthalate	<1
Hexachlorocyclopentadiene	<0.3		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	DLH Environmental Consulting
Date Received:	Not Applicable	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/20/15	Lab ID:	05-141 mb
Date Analyzed:	01/20/15	Data File:	012009.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	95	54	113
Nitrobenzene-d5	97	31	164
2-Fluorobiphenyl	99	47	133
2,4,6-Tribromophenol	96	35	141
Terphenyl-d14	122	24	188

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Filter basin Int	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-23 1/5000
Date Analyzed:	01/16/15	Data File:	28.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	130
Aroclor 1260	<20
Aroclor 1262	<20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Filter basin Ext	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-24 1/15000
Date Analyzed:	01/17/15	Data File:	30.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<60
Aroclor 1232	<60
Aroclor 1016	<60
Aroclor 1242	<60
Aroclor 1248	<60
Aroclor 1254	1,300
Aroclor 1260	1,200
Aroclor 1262	1,400

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Sediment basin	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-25 1/5000
Date Analyzed:	01/17/15	Data File:	32.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	540
Aroclor 1260	<20
Aroclor 1262	<20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Clear Well	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-26 1/50
Date Analyzed:	01/16/15	Data File:	27.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	1.4
Aroclor 1260	<0.2
Aroclor 1262	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Soil-01	Client:	DLH Environmental Consulting
Date Received:	01/12/15	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	501137-27 1/50
Date Analyzed:	01/16/15	Data File:	26.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 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	11
Aroclor 1260	10
Aroclor 1262	12

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	DLH Environmental Consulting
Date Received:	Not Applicable	Project:	Anacortes H2O Treatment Plant Demo
Date Extracted:	01/14/15	Lab ID:	05-094 mb 1/5
Date Analyzed:	01/14/15	Data File:	07.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	68	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

Date of Report: 01/27/15
Date Received: 01/12/15
Project: Anacortes H2O Treatment Plant Demo, F&BI 501137

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	105	107	80-120	2

Date of Report: 01/27/15
Date Received: 01/12/15
Project: Anacortes H2O Treatment Plant Demo, F&BI 501137

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

Laboratory Code: 501155-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Antimony	mg/kg (ppm)	20	<1	97	95	54-116	2
Arsenic	mg/kg (ppm)	10	2.83	76	70	70-118	8
Barium	mg/kg (ppm)	50	127	89	82	60-141	8
Beryllium	mg/kg (ppm)	5	<1	130	131	67-138	1
Cadmium	mg/kg (ppm)	10	<1	107	107	83-116	0
Chromium	mg/kg (ppm)	50	19.9	83	83	57-128	0
Cobalt	mg/kg (ppm)	20	10.5	91	86	69-115	6
Copper	mg/kg (ppm)	50	9.19	87	88	57-120	1
Lead	mg/kg (ppm)	50	9.35	103	104	59-148	1
Manganese	mg/kg (ppm	20	1,450	0 b	0 b	15-180	0 b
Mercury	mg/kg (ppm	10	<1	101	103	50-150	2
Molybdenum	mg/kg (ppm)	20	<1	97	95	81-118	2
Nickel	mg/kg (ppm)	25	10.8	88	85	69-112	3
Selenium	mg/kg (ppm)	5	<1	54 vo	51 vo	64-117	6
Silver	mg/kg (ppm)	10	<1	101	99	73-122	2
Thallium	mg/kg (ppm)	5	<1	107	109	68-121	2
Vanadium	mg/kg (ppm)	30	36.6	67	70	47-123	4
Zinc	mg/kg (ppm)	50	21.8	71	68	55-129	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Antimony	mg/kg (ppm)	20	109	69-114
Arsenic	mg/kg (ppm)	10	93	83-113
Barium	mg/kg (ppm)	50	108	85-116
Beryllium	mg/kg (ppm)	5	160 vo	69-146
Cadmium	mg/kg (ppm)	10	104	54-114
Chromium	mg/kg (ppm)	50	108	78-121
Cobalt	mg/kg (ppm)	20	115	81-122
Copper	mg/kg (ppm)	50	103	82-119
Lead	mg/kg (ppm)	50	108	80-120
Manganese	mg/kg (ppm)	20	122	72-125
Mercury	mg/kg (ppm)	10	102	70-130
Molybdenum	mg/kg (ppm)	20	96	86-116
Nickel	mg/kg (ppm)	25	103	82-122
Selenium	mg/kg (ppm)	5	100	84-115
Silver	mg/kg (ppm)	10	99	81-116
Thallium	mg/kg (ppm)	5	115	77-123

Vanadium	mg/kg (ppm)	30	113	76-120
Zinc	mg/kg (ppm)	50	82	81-120

Date of Report: 01/27/15
Date Received: 01/12/15
Project: Anacortes H2O Treatment Plant Demo, F&BI 501137

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 501137-27 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	90	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	97	50-150
Acenaphthene	mg/kg (ppm)	0.17	0.33	102 b	50-150
Fluorene	mg/kg (ppm)	0.17	0.13	101 b	50-150
Phenanthrene	mg/kg (ppm)	0.17	0.85	116 b	50-150
Anthracene	mg/kg (ppm)	0.17	0.21	98 b	50-150
Fluoranthene	mg/kg (ppm)	0.17	0.98	184 b	50-150
Pyrene	mg/kg (ppm)	0.17	0.94	186 b	50-150
Benz(a)anthracene	mg/kg (ppm)	0.17	0.52	178 b	50-150
Chrysene	mg/kg (ppm)	0.17	0.51	163 b	50-150
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.62	104 b	50-150
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.16	185 b	50-150
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.50	175 b	50-150
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.28	140 b	50-150
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.073	104 b	50-150
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.25	105 b	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)
Naphthalene	mg/kg (ppm)	0.17	88	89	70-130	1
Acenaphthylene	mg/kg (ppm)	0.17	94	95	70-130	1
Acenaphthene	mg/kg (ppm)	0.17	91	91	70-130	0
Fluorene	mg/kg (ppm)	0.17	95	95	70-130	0
Phenanthrene	mg/kg (ppm)	0.17	89	89	70-130	0
Anthracene	mg/kg (ppm)	0.17	88	89	70-130	1
Fluoranthene	mg/kg (ppm)	0.17	96	98	70-130	2
Pyrene	mg/kg (ppm)	0.17	102	97	70-130	5
Benz(a)anthracene	mg/kg (ppm)	0.17	95	97	70-130	2
Chrysene	mg/kg (ppm)	0.17	98	98	70-130	0
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	98	59-118	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	107	104	70-130	3
Benzo(a)pyrene	mg/kg (ppm)	0.17	91	94	63-105	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	97	103	47-126	6
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	100	107	49-128	7
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	92	96	51-119	4

Date of Report: 01/27/15
Date Received: 01/12/15
Project: Anacortes H2O Treatment Plant Demo, F&BI 501137

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	99	100	51-119	1
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	98	99	60-112	1
2-Chlorophenol	mg/kg (ppm)	0.33	100	101	59-114	1
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	102	102	62-113	0
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	100	101	61-114	1
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	102	103	61-113	1
Benzyl alcohol	mg/kg (ppm)	0.33	85	83	50-119	2
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.33	95	97	59-113	2
2-Methylphenol	mg/kg (ppm)	0.33	108	113	58-115	5
Hexachloroethane	mg/kg (ppm)	0.33	105	104	63-114	1
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	106	108	62-114	2
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	101	103	54-120	2
Nitrobenzene	mg/kg (ppm)	0.33	102	105	59-114	3
Isophorone	mg/kg (ppm)	0.33	100	102	61-113	2
2-Nitrophenol	mg/kg (ppm)	0.33	107	113	59-114	5
2,4-Dimethylphenol	mg/kg (ppm)	0.33	87	96	54-107	10
Benzoic acid	mg/kg (ppm)	0.5	108	122	43-150	12
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	99	101	60-114	2
2,4-Dichlorophenol	mg/kg (ppm)	0.33	103	106	57-118	3
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	103	106	56-112	3
Hexachlorobutadiene	mg/kg (ppm)	0.33	99	101	60-116	2
4-Chloroaniline	mg/kg (ppm)	0.66	43	32	10-126	29 vo
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	104	104	59-115	0
2-Methylnaphthalene	mg/kg (ppm)	0.33	105	107	60-115	2
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	83	98	41-107	17
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	100	105	47-119	5
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	106	110	61-121	4
2-Chloronaphthalene	mg/kg (ppm)	0.33	97	100	58-114	3
2-Nitroaniline	mg/kg (ppm)	0.33	105	109	55-119	4
Dimethyl phthalate	mg/kg (ppm)	0.33	108	109	58-116	1
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	115	118	57-119	3
3-Nitroaniline	mg/kg (ppm)	0.66	77	62	10-143	22 vo
2,4-Dinitrophenol	mg/kg (ppm)	0.33	103	109	40-122	6
Dibenzofuran	mg/kg (ppm)	0.33	104	108	56-115	4
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	110	113	53-126	3
4-Nitrophenol	mg/kg (ppm)	0.33	95	98	40-124	3
Diethyl phthalate	mg/kg (ppm)	0.33	112	113	57-116	1
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	104	106	54-119	2
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	92	94	54-113	2
4-Nitroaniline	mg/kg (ppm)	0.66	83	85	47-109	2
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	102	107	57-108	5
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	101	104	56-116	3
Hexachlorobenzene	mg/kg (ppm)	0.33	102	104	57-115	2
Pentachlorophenol	mg/kg (ppm)	0.33	93	102	45-123	9
Carbazole	mg/kg (ppm)	0.33	96	106	57-116	10
Di-n-butyl phthalate	mg/kg (ppm)	0.33	112	117	56-118	4
Benzyl butyl phthalate	mg/kg (ppm)	0.33	110	115	56-122	4
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	112	114	56-125	2
Di-n-octyl phthalate	mg/kg (ppm)	0.33	121 vo	122 vo	58-120	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/27/15
Date Received: 01/12/15
Project: Anacortes H2O Treatment Plant Demo, F&BI 501137

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

Laboratory Code: 501154-09 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	73	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	68	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	86	83	70-130	4
Aroclor 1260	mg/kg (ppm)	0.8	84	83	70-130	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.

January 19, 2015

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

Michael Erdahl
FRIEDMAN & BRUYA, INC.
3012 16th Ave. West
Seattle, WA 98119

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1500794.00

Dear Mr. Erdahl,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

NVL LABS

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: FRIEDMAN & BRUYA, INC.
Address: 3012 16th Ave. West
Seattle, WA 98119

Attention: Mr. Michael Erdahl
Project Location: N-A

Batch #: 1500794.00
Client Project #: 501137 PO No.-D-363
Date Received: 1/13/2015
Samples Received: 13
Samples Analyzed: 13
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15004081 **Client Sample #: ACM-01a**
Location: N-A

Layer	Description	Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	Gray/brown vinyl tile	Vinyl/Binder, Mineral grains	Cellulose 2%	None Detected ND
Layer 2 of 2	Black asphaltic mastic	Asphalt/Binder, Binder/Filler	Cellulose 4% Synthetic fibers 2%	Chrysotile 4%

Lab ID: 15004082 **Client Sample #: ACM-01b**
Location: N-A

Layer	Description	Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	Gray/brown vinyl tile	Vinyl/Binder, Mineral grains	Cellulose 1%	None Detected ND
Layer 2 of 2	Black asphaltic mastic	Asphalt/Binder, Binder/Filler	Cellulose 3% Synthetic fibers 2%	Chrysotile 3%

Lab ID: 15004083 **Client Sample #: ACM-02a**
Location: N-A

Layer	Description	Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	Gray rubbery material	Rubber/Binder	None Detected ND	None Detected ND

Sampled by: Client
Analyzed by: Lori Tseng Date: 01/19/2015
Reviewed by: Nick Ly Date: 01/19/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: FRIEDMAN & BRUYA, INC.
Address: 3012 16th Ave. West
Seattle, WA 98119

Attention: Mr. Michael Erdahl
Project Location: N-A

Batch #: 1500794.00
Client Project #: 501137 PO No.-D-363
Date Received: 1/13/2015
Samples Received: 13
Samples Analyzed: 13
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 2 **Description:** White soft mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose	2%	None Detected ND
	Synthetic fibers	1%	

Lab ID: 15004084 **Client Sample #: ACM-02b**
Location: N-A

Layer 1 of 2 **Description:** Gray rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Rubber/Binder	None Detected	ND	None Detected ND

Layer 2 of 2 **Description:** Yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	Cellulose	5%	None Detected ND

Lab ID: 15004085 **Client Sample #: ACM-03a**
Location: N-A

Layer 1 of 4 **Description:** Gray vinyl

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Binder/Filler	None Detected	ND	None Detected ND

Layer 2 of 4 **Description:** Beige soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	Cellulose	5%	None Detected ND

Layer 3 of 4 **Description:** Gray vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Mineral grains	Cellulose	2%	None Detected ND

Sampled by: Client
Analyzed by: Lori Tseng **Date:** 01/19/2015
Reviewed by: Nick Ly **Date:** 01/19/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

1500794

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 NVL

PROJECT NAME/NO.	PO#
501137	D-363

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME
☒ Standard (1 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Asbestos				Notes
ACM -01a		1/12/15		bulk material								X				
-01b																
-02a																
-02b																
-03a																
-03b																
-04																
-05																
-06a																
-06b																
-07																
-08																
-09																

CC/[illegible]

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: [signature]	Michael Erdahl	Friedman & Bruya	1/13/15	2:27
Received by:	Maxwell R	[signature]	1/13/15	1545 FedEx
Relinquished by: Ana Wrzel Lori Tseng	Lori Tseng	NVL	1/19/15	1500
Received by:				

(NP) ~~501138~~ 501137

CHAIN OF CUSTODY

ME 01/12/15

Page # 1 of 3

Send Report To Donna Hewitt

Company DLH Environmental Consulting

Address 2400 NW 80th st #114

City, State, ZIP Seattle, WA 98117

Phone # 206-632-3123 ~~Fax #~~ dlhenvironmental@aol.com

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes H2O treatment plant demo

PO #

REMARKS Asbestos 600R-93/116 Bulk PLM

TURNAROUND TIME
- [x] 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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Asbestos						Notes
ACM-01a	01	1/12/15		Bulk Asbestos Material	1							X						
-01b	02											X						
-02a	03											X						
-02b	04											X						
-03a	05											X						
-03b	06											X						
-04	07											X						
-05	08											X						
-06a	09											X						
-06b	10											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:		Donna Hewitt	DLH	1/12/15	
Received by:		A. Podnozova	FBI	1/12/15	3:45PM
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 12 °C

50113?

CHAIN OF CUSTODY

ME 01/12/15

Aty

Send Report To Donna Hewitt

Company DLH Environmental Consulting

Address 2400 NW 90th st #114

City, State, ZIP Seattle, WA 98117

Phone # 206-632-3123 ~~Fax #~~ dlhenvironmental@aol.com

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes H2O treatment plant demo

PO #

REMARKS

Page # 2 of 3

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Asbestos	Pb					Notes
ACM-07	11	1/12/15		Bulk Asbestos material								X						
-08	12											X						
-09	13											X						
Pb-01	14			PAINT	1								X					
02	15												X					
03	16												X					
04	17												X					
05	18												X					
06	19												X					
07	20												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:		Donna Hewitt	DLH	1/12/15	
Received by:		A. Podnozova	FBI	1/12/15	3:45PM
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 12 °C

January 20, 2015

NVL
LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

Donna Hewitt
DLH Environmental Consulting
2400 NW 80th Street #114
Seattle, WA 98117

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1500929.00

Dear Ms. Hewitt,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Cell: 206.914.4646
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

1500929

Client DLH Environmental Consulting
Street 2400 NW 80th Street #114
Seattle, WA 98117

NVL Batch Number
Client Job Number ANACORTES
Total Samples 2
Turn Around Time 1 Hr 6 Hrs ☒ 3 Days ☐ 10 Days
2 Hrs 1 Day 4 Days
☐ 4 Hrs ☐ 2 Days ☐ 5 Days
Please call for TAT less than 24 Hrs

Project Manager Ms. Donna Hewitt
Project Location ANACORTES

Email address dlhenvironmental@aol.com
Phone: (206) 632-3123 **Fax:**
Cell: (206) 632-3123 (206) 781-0023

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other
☒ **Asbestos Bulk** ☒ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM BULK
☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS	**Det. Limit**	**Matrix**		**RCRA Metals**	☐ All 8	**Other Metals**
☐ Total Metals	☐ FAA (ppm	☐ Air Filter	☐ Paint Chips in %	☐ Arsenic (As)	☐ Lead (Pb)	☐ **All 3**
☐ TCLP	☐ ICP (ppm)	Drinking water	☐ Paint Chips in cn	☐ Barium (Ba)	☐ Mercury (Hg)	☐ Copper (Cu)
☐ Cr 6	☐ GFAA (ppl	Dust/wipe (Area)	☐ Waste Water	☐ Cadmium (Cd)	☐ Selenium (Se)	☐ Nickel (Ni)
		☐ Soil	☐ Other	☐ Chromium (Cr)	☐ Silver (Ag)	☐ Zinc (Zn)

☐ **Other Types of Analysis** Fiberglass ☐ Nuisance Dust ☐ Other (Specify) ____________
Silica Respirable Dust

Condition of Package: Good Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	**Lab ID**	**Client Sample Number**	**Comments (e.g Sample are, Sample Volume, etc)**	**A/R**
1		ACM-ADMIN ENTRY-1		
2		" " " -2		
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Donna Hewitt	[signature]	DLH	1/14/15	12:45
Relinquished by	Donna Hew	[signature]	DLH	1/16/15	2:20
Received by	J. Shearer	[signature]	NVL	1/16/15	1420
Analyzed by	Dhafar H.	[signature]	NM	1/20/15	930
Results Called by					
Results ~~Faxed~~ Emailed by	Dhafar H.	[signature]	NM	1/20/15	14:30

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

APPENDIX C

SUPPLEMENTAL DATA

Table 740-1
Method A Soil Cleanup Levels for Unrestricted Land Uses.[a]

Hazardous Substance	CAS Number	Cleanup Level
Arsenic	7440-38-2	20 mg/kg[b]
Benzene	71-43-2	0.03 mg/kg[c]
Benzo(a)pyrene	50-32-8	0.1 mg/kg[d]
Cadmium	7440-43-9	2 mg/kg[e]
Chromium		
Chromium VI	18540-29-9	19 mg/kg[f1]
Chromium III	16065-83-1	2,000 mg/kg[f2]
DDT	50-29-3	3 mg/kg[g]
Ethylbenzene	100-41-4	6 mg/kg[h]
Ethylene dibromide (EDB)	106-93-4	0.005 mg/kg[i]
Lead	7439-92-1	250 mg/kg[j]
Lindane	58-89-9	0.01 mg/kg[k]
Methylene chloride	75-09-2	0.02 mg/kg[l]
Mercury (inorganic)	7439-97-6	2 mg/kg[m]
MTBE	1634-04-4	0.1 mg/kg[n]
Naphthalenes	91-20-3	5 mg/kg[o]
PAHs (carcinogenic)		See benzo(a)pyrene[d]
PCB Mixtures		1 mg/kg[p]
Tetrachloroethylene	127-18-4	0.05 mg/kg[q]
Toluene	108-88-3	7 mg/kg[r]
Total Petroleum Hydrocarbons[s]		
[Note: Must also test for and meet cleanup levels for other petroleum components--see footnotes!]		
Gasoline Range Organics		
Gasoline mixtures without benzene and the total of ethyl benzene, toluene and xylene are less than 1% of the gasoline mixture		100 mg/kg
All other gasoline mixtures		30 mg/kg
Diesel Range Organics		2,000 mg/kg
Heavy Oils		2,000 mg/kg
Mineral Oil		4,000 mg/kg
1,1,1 Trichloroethane	71-55-6	2 mg/kg[t]
Trichloroethylene	79-01-6	0.03 mg/kg[u]
Xylenes	1330-20-7	9 mg/kg[v]

Footnotes:

a **Caution on misusing this table.** This table has been developed for specific purposes. It is intended to provide conservative cleanup levels for sites undergoing routine cleanup actions or for sites with relatively few hazardous substances, and the site qualifies under WAC 173-340-7491 for an exclusion from conducting a simplified or site-specific terrestrial ecological evaluation, or it can be demonstrated using a terrestrial ecological evaluation under WAC 173-340-7492 or 173-340-7493 that the values in this table are ecologically protective for the site. This table may not be appropriate for defining cleanup levels at other sites. For these reasons, the values in this table should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in this table do not necessarily mean the soil must be restored to these levels at a site. The level of restoration depends on the remedy selected under WAC 173-340-350 through 173-340-390.

b **Arsenic.** Cleanup level based on direct contact using Equation 740-2 and protection of ground water for drinking water use using the procedures in WAC 173-340-747(4), adjusted for natural background for soil.

c **Benzene.** Cleanup level based on protection of ground water for drinking water use, using the procedures in WAC 173-340-747(4) and (6).

d **Benzo(a)pyrene.** Cleanup level based on direct contact using Equation 740-2. If other carcinogenic PAHs are suspected of being present at the site, test for them and use this value as the total concentration that all carginogenic PAHs must meet using the toxicity equivalency methodology in WAC 173-340-708(8).

e **Cadmium.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4), adjusted for the practical quantitation limit for soil.

f1 **Chromium VI.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

f2 **Chromium III.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). Chromium VI must also be tested for and the cleanup level met when present at a site.

g **DDT (dichlorodiphenyltrichloroethane).** Cleanup level based on direct contact using Equation 740-2.

h **Ethylbenzene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

i **Ethylene dibromide (1,2 dibromoethane or EDB).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4) and adjusted for the practical quantitation limit for soil.

j **Lead.** Cleanup level based on preventing unacceptable blood lead levels.

k **Lindane.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4), adjusted for the practical quantitation limit.

l **Methylene chloride (dichloromethane).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

m **Mercury.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

n **Methyl tertiary-butyl ether (MTBE).** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

o **Naphthalenes.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). This is a total value for naphthalene, 1-methyl naphthalene and 2-methyl naphthalene.

p **PCB Mixtures.** Cleanup level based on applicable federal law (40 C.F.R. 761.61). This is a total value for all PCBs.

q **Tetrachloroethylene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

r **Toluene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

s **Total Petroleum Hydrocarbons (TPH).**
TPH cleanup values have been provided for the most common petroleum products encountered at contaminated sites. Where there is a mixture of products or the product composition is unknown, samples must be tested using both the NWTPH-Gx and NWTPH-Dx methods and the lowest applicable TPH cleanup level must be met.

- **Gasoline range organics** means organic compounds measured using method NWTPH-Gx. Examples are aviation and automotive gasoline. The cleanup level is based on protection of ground water for noncarcinogenic effects during drinking water use using the procedures described in WAC 173-340-747(6). Two cleanup levels are provided. The lower value of 30 mg/kg can be used at any site. When using this lower value, the soil must also be tested for and meet the benzene soil cleanup level. The higher value of 100 mg/kg can only be used if the soil is tested and found to contain no benzene and the total of ethyl benzene, toluene and xylene are less than 1% of the gasoline mixture. No interpolation between these cleanup levels is allowed. In both cases, the soil cleanup level for any other carcinogenic components of the petroleum [such as EDB and EDC], if present at the site, must also be met. Also, in both cases, soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes, naphthalene, and MTBE], also must be met if these substances are found to exceed ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for gasoline releases.
- **Diesel range organics** means organic compounds measured using method NWTPH-Dx. Examples are diesel, kerosene, and #1 and #2 heating oil. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10). The soil cleanup level for any carcinogenic components of the petroleum [such as benzene and PAHs], if present at the site, must also be met. Soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes and naphthalenes], also must be met if these substances are found to exceed the ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for diesel releases.
- **Heavy oils means** organic compounds measured using NWTPH-Dx. Examples are #6 fuel oil, bunker C oil, hydraulic oil and waste oil. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10) and assuming a product composition similar to diesel fuel. The soil cleanup level for any carcinogenic components of the petroleum [such as benzene, PAHs and PCBs], if present at the site, must also be met. Soil cleanup levels for any noncarcinogenic components [such as toluene, ethylbenzene, xylenes and naphthalenes], also must be met if found to exceed the ground water cleanup levels at the site. See Table 830-1 for the minimum testing requirements for heavy oil releases.
- **Mineral oil** means non-PCB mineral oil, typically used as an insulator and coolant in electrical devices such as transformers and capacitors, measured using NWTPH-Dx. The cleanup level is based on preventing the accumulation of free product on the ground water, as described in WAC 173-340-747(10). Sites using this cleanup level must also analyze soil samples and meet the soil cleanup level for PCBs, unless it can be demonstrated that: (1) The release originated from an electrical device that was manufactured after July 1, 1979; or (2) oil containing PCBs was never used in the equipment suspected as the source of the release; or (3) it can be documented that the oil released was recently tested and did not contain PCBs. Method B must be used for releases of oils containing greater than 50 ppm PCBs. See Table 830-1 for the minimum testing requirements for mineral oil releases.

t **1,1,1 Trichloroethane.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

u **Trichloroethylene.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4).

v **Xylenes.** Cleanup level based on protection of ground water for drinking water use, using the procedures described in WAC 173-340-747(4). This is a total value for all xylenes.

WDOE - METHOD B PAH CALCULATIONS
FOR SOIL CLEAN UP

CPAH	Toxicity equivalent factor TEF)	Lab result SC-4-1 (mg/kg)	TEF 1		
Benzo(a)anthracene	0.1	0.62	0.062		
Benzo(b)fluoranthene	0.1	0.74	0.074		
Benzo(k)fluoranthene	0.1	0.19	0.019		
Benzo(a)pyrene	1	0.6	0.6		
Chrysene	0.01	0.61	0.0061		
Dibenzo(a,h)anthracene	0.4	0.087	0.0348		
Indeno(1,2,3-cd)pyrene	0.1	0.34	0.034		
total (compare to 0.137)			**0.8299**		

*if non-detect, use 1/2 the "U" value

B(a)P Cleanup Level (a)	0.137 mg/kg

based on MTCA method B

DLH - SOIL SAMPLE # SOIL-01

United States
Environmental Protection Agency
Office of Solid Waste
Washington, DC 20460
January 2008

Polycyclic Aromatic Hydrocarbons (PAHs)

What are PAHs?

Short for polycyclic aromatic hydrocarbons, PAHs describe chemicals that are often found together in groups of two or more. PAHs are found naturally in the environment but they can also be man-made. In their purest form, PAHs are solid and range in appearance from colorless to white or pale yellow-green. PAHs are created when products like coal, oil, gas, and garbage are burned but the burning process is not complete. Although PAHs can exist in over 100 different combinations, the National Waste Minimization Program defines this group using the Toxic Release Inventory reporting category for polycyclic aromatic compounds.

Chemicals included in this category, by name and CAS number, are:

1. Benzo(a)anthracene, 56-55-3
2. Benzo(a)phenanthrene (chrysene), 218-01-9
3. Benzo(a)pyrene, 50-32-8
4. Benzo(b)fluoranthene, 205-99-2
5. Benzo(j)fluoranthene, 205-82-3
6. Benzo(k)fluoranthene, 207-08-9
7. Benzo(j,k)fluorene (fluoranthene), 206-44-0
8. Benzo(r,s,t)pentaphene, 189-55-9
9. Dibenz(a,h)acridine, 226-36-8
10. Dibenz(a,j)acridine, 224-42-0
11. Dibenzo(a,h)anthracene, 53-70-3
12. Dibenzo(a,e)fluoranthene, 5385-75-1
13. Dibenzo(a,e)pyrene, 192-65-4
14. Dibenzo(a,h)pyrene, 189-64-0
15. Dibenzo(a,l)pyrene, 191-30-0
16. 7H-Dibenzo(c,g)carbazole, 194-59-2
17. 7,12-Dimethylbenz(a)anthracene, 57-97-6
18. Indeno(1,2,3-cd)pyrene 193-39-5
19. 3-Methylcholanthrene, 56-49-5
20. 5-Methylchrysene, 3697-24-3
21. 1-Nitropyrene, 5522-43-0

It should be noted that some PAHs are listed individually on EPA's Priority Chemical list. They are:

1. Acenaphthene, 83-32-9
2. Acenaphtylene, 208-96-8
3. Anthracene, 120-12-7
4. Benzo(g,h,i)perylene, 191-24-2
5. Fluorene, 86-73-7
6. Phenanthrene, 85-01-8
7. Pyrene, 129-00-0

Why are PAHs bad actors?

PAHs are a concern because they are persistent. Because they do not burn very easily, they can stay in the environment for long periods of time. Individual PAHs vary in behavior. Some can turn into a vapor in the air very easily. Most do not break down easily in the water.

What are PAHs used for?

Most PAHs are used to conduct research. However, some PAHs are used to make dyes, plastics, and pesticides. Some are even used in medicines.

How can PAHs enter and leave your body?

One of the most common ways PAHs can enter the body is through breathing contaminated air. PAHs get into your lungs when you breathe them. If you live near a hazardous waste site where PAHs are disposed, you are likely to breathe PAHs. If you eat or drink food and water contaminated with PAHs, you could be exposed. Exposure to PAHs can also occur if your skin contacts PAH-contaminated soil or products like heavy oils, coal tar, roofing tar, or creosote. Creosote is an oily liquid found in coal tar and is used to preserve wood. Once in your body, PAHs can spread and target fat tissues. Target organs include the kidneys and liver. However, PAHs will leave your body through urine and feces in a matter of days.

How can you be exposed to PAHs?

You can be exposed to PAHs in the environment, in your home, and in the workplace. Because PAHs exist naturally in the environment and are man-made, you can be exposed in a number of ways. Fumes from vehicle exhaust, coal, coal tar, asphalt, wildfires, agricultural burning and hazardous waste sites are all sources of exposure.

You could be exposed to PAHs by breathing cigarette and tobacco smoke, eating foods grown in contaminated soil, or by eating meat or other food that you grilled. Grilling and charring food actually increases the amount of PAHs in the food.

If you work in a plant that makes coal tar, asphalt and aluminum, or that burns trash, you can be exposed to PAHs. You can also be exposed if you work in a facility that uses petroleum or coal, or where wood, corn, and oil are burned.

How can PAHs affect your health?

A number of PAHs have caused tumors in laboratory animals that were exposed to PAHs through their food, from breathing contaminated air, and when it was applied to their skin. When pregnant mice ate high doses of a PAH (benzo(a)pyrene) they experienced reproductive problems. In addition, the offspring of the pregnant mice showed birth defects and a decrease in their body weight. Other effects include damage to the skin, body fluids, and the immune system. However, these effects have not been seen in humans.

Is there a medical test to determine if you have been exposed to PAHs?

There is a test that can measure the presence of PAH in your urine. This test can only tell you if you have been exposed; but it can't reveal how harmful the effects of the exposure will be. This test would have to be performed in a laboratory that has special equipment to detect the PAHs. Another test currently being developed will be able to measure PAHs in your body tissue and blood.

What are the medical treatments in cases of exposure?

Most exposures to PAHs happen every day at very low levels in the air we breathe and the foods we eat. Treatment for a short-term exposure is unlikely. Contact your doctor if you experience symptoms of PAHs poisoning.

What levels of exposure have resulted in harmful health effects?

There is no information available from studies on humans to tell what effects can result from being exposed to individual PAHs at certain levels. However, breathing PAHs and skin contact seem to be associated with cancer in humans. Animal studies showed that mice exposed to 308 parts per million (ppm) of PAHs (specifically benzo (a) pyrene) in food for 10 days (short term exposure) caused birth defects. Mice exposed to 923 ppm of benzo (a) pyrene in food for months caused problems in the liver and blood.

Where can I get more information?

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, N.E., E-29
Atlanta, Georgia 30333

References

1. Agency for Toxic Substances and Disease

Registry (ATSDR), Public Health Statement, *Polycyclic Aromatic Hydrocarbons, December 1990.* U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA, December 1990.

2. United States Environmental Protection Agency, Office of Environmental Information, *Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category*, EPA 260-B-01-03, Washington, DC, August 2001.

Geotechnical Data Report
Anacortes Water Treatment Plant
Mount Vernon, Washington

September 24, 2010

Submitted To:
Mr. Greg Pierson
HDR Engineering, Inc.
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21-1-20464-004

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GEOTECHNICAL DATA REPORT
ANACORTES WATER TREATMENT PLANT
MOUNT VERNON, WASHINGTON

1.0 INTRODUCTION

This geotechnical data report presents the results of subsurface explorations and geotechnical laboratory testing for the proposed improvements at the Anacortes Water Treatment Plant in Mount Vernon, Washington. We provided our services in general accordance with our proposal dated July 19, 2010, which was authorized by Mr. Greg Pierson on September 13, 2010.

2.0 SITE AND PROJECT DESCRIPTION

The Anacortes Water Treatment Plant is located next to the Skagit River, on River Bend Road in Mount Vernon, Washington, as shown in the Vicinity Map, Figure 1. The Site and Exploration Plan, Figure 2, shows the approximate layout of the site. River Bend Road runs along the west side of the site, on top of a dike that parallels the Skagit River. Another dike connects to the River Bend Road dike and encircles the site. The dikes are about 10 to 15 feet high.

The project site within the dikes is generally level, at an Elevation of about 30 feet (NAVD 88). A paved driveway extends down from River Bend Road to the middle of the site, where a parking area, storage structures, plant facilities, and maintenance buildings are located. On the eastern part of the site are three structures, which were constructed in 1969 and 1970: the Control Room/Administration Building, the Filter Building, and the Sedimentation Basin.

The Control Room/Administration Building is a two-story structure supported on timber piles that extend to around Elevation -20 feet.

The footprint of the Sedimentation Basin was preloaded with about 14 feet of compacted soil between July and November 1969. Shannon & Wilson, Inc. reviewed settlement monitoring data for this preload fill, and observed that the preload settled about 3 inches over a period of about two months.

Five new structures are proposed at the site, as shown in Figure 2:

- **High Service Pump Station.** This two-story building will be located west of the Control Room/Administration Building, and will have a first floor elevation of about 26 feet.
- **Chemical Facility.** This one-story building will be located west of the Pretreatment Facility and will have a floor elevation of about 44 feet and a basement level at an

elevation of about 39 feet. Approximately 11 feet of fill will be placed below the footprint of this structure.

- **Pretreatment Facility and Filtration Facility**. These structures will be located in the yard area on the southern portion of the site. They will consist of three major structural cast-in-place concrete components:
  - Pre-treatment basins with wall heights of 30 feet, maximum water depths of 25 feet, and bottom slabs at about Elevation 14 feet. The east and south walls of these basins will retain about 28 feet of structural fill.
  - Filter cells in a structure with a wall height of 23 feet, a maximum water depth of 19.5 feet, and a bottom slab about Elevation 21 feet. The south wall of this structure will retain about 21 feet of structural fill.
  - A filter gallery between the pre-treatment basins and the filter cells with a wall height of 30 feet and a bottom slab at about Elevation 14 feet. A portion of the east and south walls of this structure will retain about 28 feet of structural fill.
- **Finished Water Storage Tank**. This cylindrical storage tank will be located north of the proposed Membrane Filtration Building, be about 110 feet in diameter, and have a base elevation of about 30 feet.
- **Decant Pump Station**. A well about 20 feet deep will be located below a pump house.
- **Standby Generators.** A series of new electrical generators will be located on an embankment about 12 feet high. The top of the embankment will be at Elevation 42 feet.

3.0 SUBSURFACE EXPLORATIONS

We drilled and sampled eight new soil borings and reviewed seven previous soil borings. The new boring locations were chosen based on the proposed structure layout at the time of drilling; this layout has subsequently changed. Borings RB-1, RB-2, and RB-4 through RB-7 range in depth from 95 to 110 feet, boring RB-8 was drilled to a depth of 30 feet, and boring RB-3 was terminated at a depth of 5 feet after encountering a concrete slab obstruction that apparently was part of a previous water storage tank. Borings B-1 through B-7 were drilled in 1965 to depths between 48 and 170 feet. Figure 2 shows the approximate locations of the borings. Boring B-1/1A was drilled at the water intake structure on the opposite side of the Skagit River and is not shown in Figure 2. We estimated the boring locations by measuring from existing features and transposing from existing site plans. The boring locations and elevations should be considered approximate.

Appendix A, Subsurface Explorations, describes the methodology and procedures used for locating, drilling, and sampling the explorations. Figures A-2 through A-9 in Appendix A show the logs for the borings completed for this report and Figures A-10 through A-16 show the logs for the borings completed in 1965.

4.0 LABORATORY TESTING

We performed geotechnical laboratory tests on selected samples retrieved from the borings and used these tests to determine soil index and engineering properties. The soil tests included visual classification, natural water content, grain size analyses, resistivity tests, and Atterberg limit tests. The Shannon & Wilson soils laboratory conducted the tests except for the soil resistivity tests, which were conducted by AMTEST Laboratories of Kirkland, Washington. Appendix B, Geotechnical Laboratory Testing Procedures and Results, describes the test methods and summarizes the test results. The boring logs in Appendix A also show the natural water content and fines contents. The results of the resistivity tests indicate that the soil exhibits mild to no corrosion potential.

5.0 SUBSURFACE CONDITIONS

Based on the soils encountered in the subsurface explorations, the site is primarily underlain by loose to dense alluvial sand, silt, and gravel. The borings encountered the following generalized subsurface conditions, which are illustrated in Figures 3 and 4, Generalized Subsurface Profiles A-A' and B-B':

- Ground surface (Elevation 29 to 35 feet) to elevation 10 to -6 feet; very loose to loose, slightly silty to silty, fine sand; thickness ranges from 22 to 38 feet.
- Elevation 10 to -6 feet to Elevation -18 to -36; medium dense to dense, trace to slightly silty sand; thickness ranges from 23 to 40 feet.
- Elevation -18 to -36 to Elevation -61 to -68 feet; medium dense to dense, slightly silty to silty sand; thickness ranges from 30 to 50 feet.
- Elevation -61 to -68 feet to bottom of borings; dense to very dense, sandy gravel.

Borings RB-5, RB-6, and RB-7 encountered 4 to 12 feet of medium stiff to very stiff silt above the dense sandy gravel. Boring RB-6 also encountered a very soft silt pocket between Elevation -27 and -33 feet mean sea level. We note that the subsurface conditions are relatively consistent between borings; therefore, borings RB-1, RB-6, and RB-7 are generally representative of the subsurface conditions beneath the Pretreatment/Filtration Facility and the Chemical Facility.

The explorations encountered groundwater between Elevation 12 and 15 feet (depths of 17 to 20 feet) in February 2009 and April 1965, as shown in Subsurface Profiles A-A' and B-B'. The groundwater elevation likely fluctuates seasonally and is expected to be coincident with the water level in the Skagit River adjacent to the project site. Thus, groundwater levels are expected to be at or below the proposed excavation depths of the pretreatment basins and filter gallery if excavation occurs during the summer months. Groundwater levels are expected to be up to several feet above the proposed excavations if excavation occurs during winter or spring months, especially during flooding of the Skagit River.

Construction of some of the proposed structures could require excavation below groundwater. Dewatering should be accomplished as necessary so that construction, i.e., excavation, form work, concrete placement, and backfilling, can be done in the dry. During construction, groundwater should be maintained at least 2 feet below the level of the excavation to prevent a blowout and/or heaving conditions, and to provide a firm and dry working surface. Groundwater levels and the extent of required dewatering will vary depending on weather and time of year. The contractor should install at least one groundwater monitoring well (and more as necessary) to characterize the groundwater conditions for dewatering system design. The contractor should employ a licensed hydrogeologist to design a dewatering system, and a licensed dewatering contractor to select and operate the dewatering system. The contractor should keep the dewatering system in operation until the dead load of the structure exceeds possible buoyant uplift forces on the structure.

6.0 LIMITATIONS

The results of subsurface explorations and geotechnical laboratory testing contained in this report are based on site conditions as they existed during drilling and further assume that the explorations are representative of the subsurface conditions at the Anacortes Water Treatment Plant project; that is, the subsurface conditions everywhere are not significantly different from those disclosed by the explorations. Within the limitations of the scope, schedule, and budget, the data presented in this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no other warranty, either express or implied.

If, during construction, subsurface conditions different from those encountered in the field explorations are observed or appear to be present, we should be advised at once so that we could review these conditions and reconsider our recommendations where necessary.

This report was prepared for the exclusive use of HDR and other members of the design team. It should be made available to prospective contractors for information on factual data only, and not as a warranty of subsurface conditions such as those interpreted from the exploration logs and presented in the discussions of subsurface conditions included in this report.

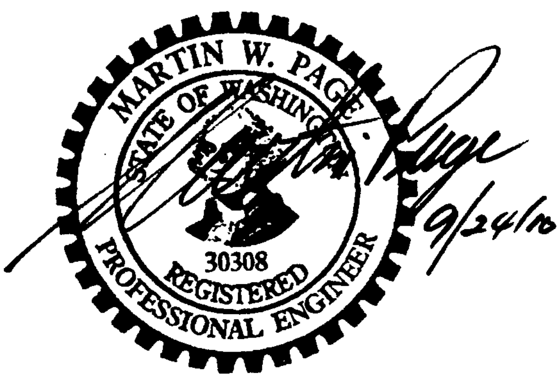
Unanticipated soil conditions are commonly encountered and cannot fully be determined merely by taking soil samples from a limited number of soil borings. Such unexpected conditions frequently require that additional expenditures be made to attain properly constructed projects. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

The scope of our geotechnical services did not include any environmental assessment or evaluation regarding the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, or air on or below the site, or any evaluation for disposal of contaminated soils or groundwater should any be encountered, except as noted in this report.

Shannon & Wilson, Inc. has prepared a document, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our reports. This document is included in this report as Appendix C.

SHANNON & WILSON, INC.

Jeremy N. Butkovich, P.E.
Senior Engineer



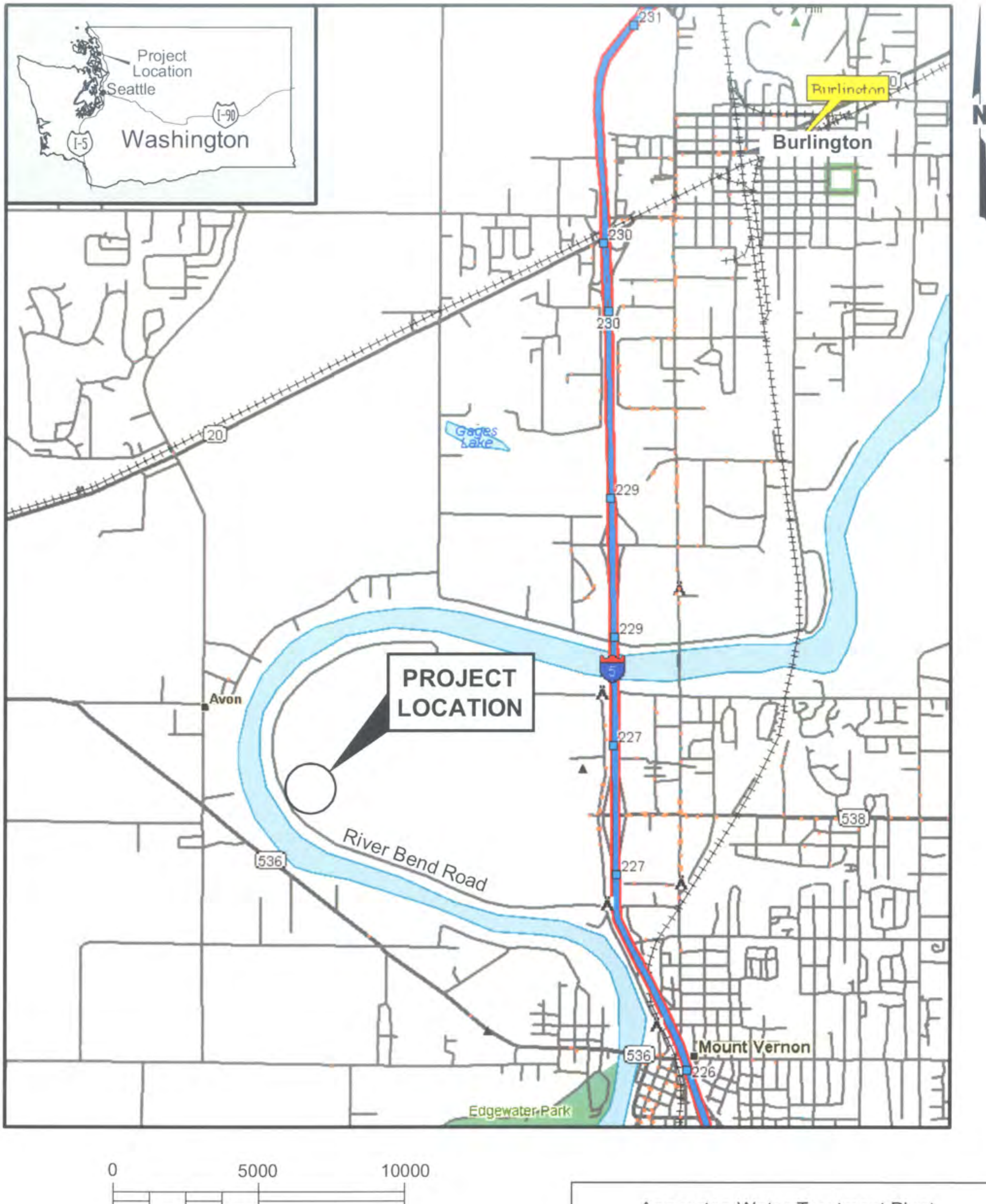
Martin W. Page, P.E., L.E.G.
Senior Associate
Geotechnical Engineer, LEED AP

JNB:MWP:TMG/jnb

TABLE 1
INTERNATIONAL BUILDING CODE 2009
PARAMETERS FOR SEISMIC DESIGN OF STRUCTURES

Spectral Response Acceleration (SRA) and Site Coefficients	Peak Ground Acceleration	Short Period	1-Second Period
Mapped SRA(2,3)	PGA = 0.561	$S_s = 1.403$	$S_1 = 0.725$
Site Coefficients (Site Class D)	n/a(1)	$F_a = 1.00$	$F_v = 1.52$
Design SRA(2,4)	$SD_{pga} = 0.374$	$SD_s = 0.935$	$SD_1 = 0.483$

Notes:
(1) International Building Code (IBC) 2009 does not explicitly include peak ground acceleration (PGA) as a design parameter. We calculated the design SD_{pga} by following IBC 2009 procedures for constructing the design response spectrum.
(2) Mapped SRA and Design SRA values are in units of gravity.
(3) The Mapped SRA values are based on regional probabilistic ground motion studies conducted by the U.S. Geological Survey (2008) and Frankel and others (2002).
(4) The design seismic event corresponds to a magnitude 7.0 earthquake located about 1 mile from the project site.



NOTE

Map adapted from Delorme Street Atlas USA ®2003.

Anacortes Water Treatment Plant Mount Vernon, Washington
VICINITY MAP
September 2010   21-1-20464-004
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants   **FIG. 1**

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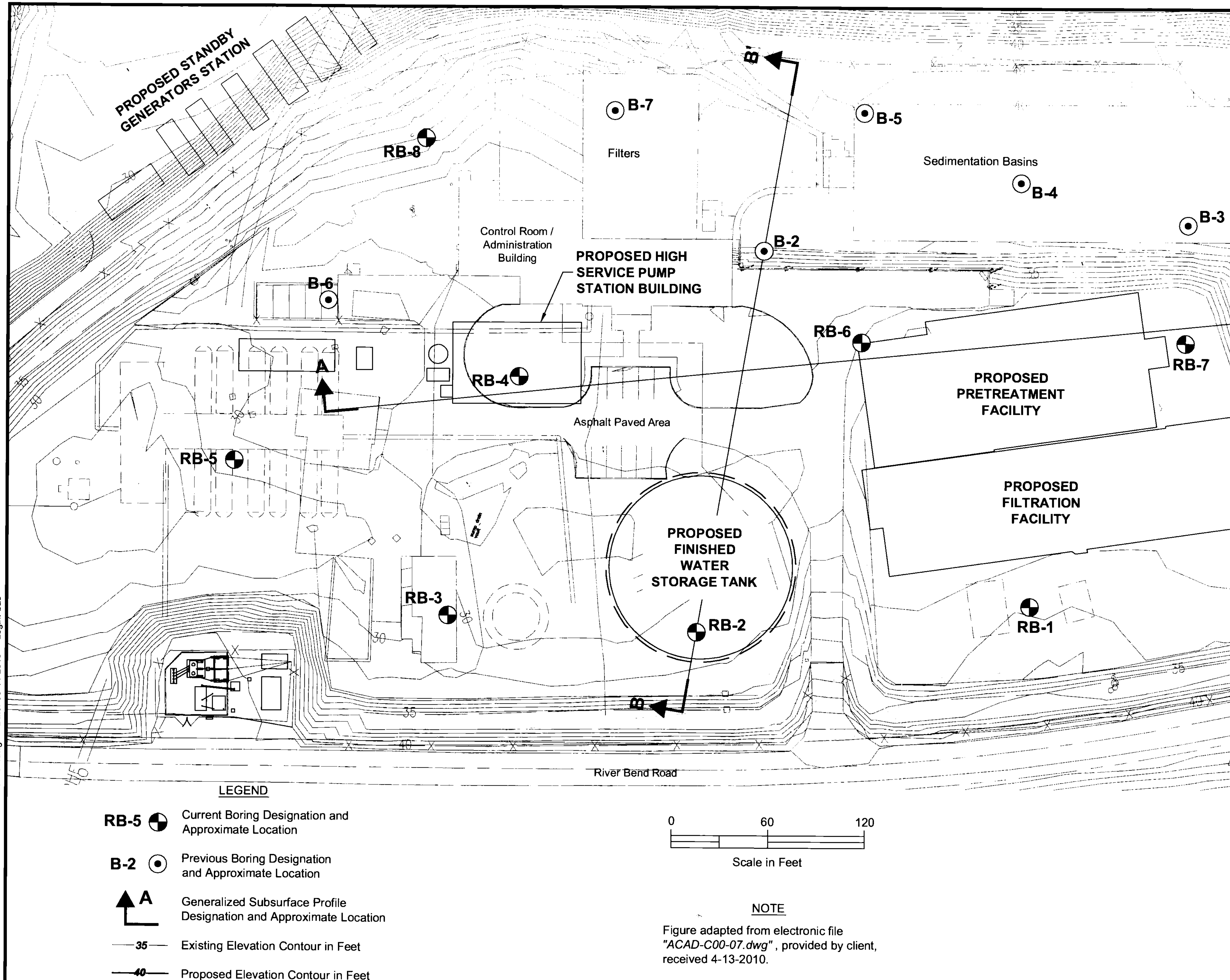


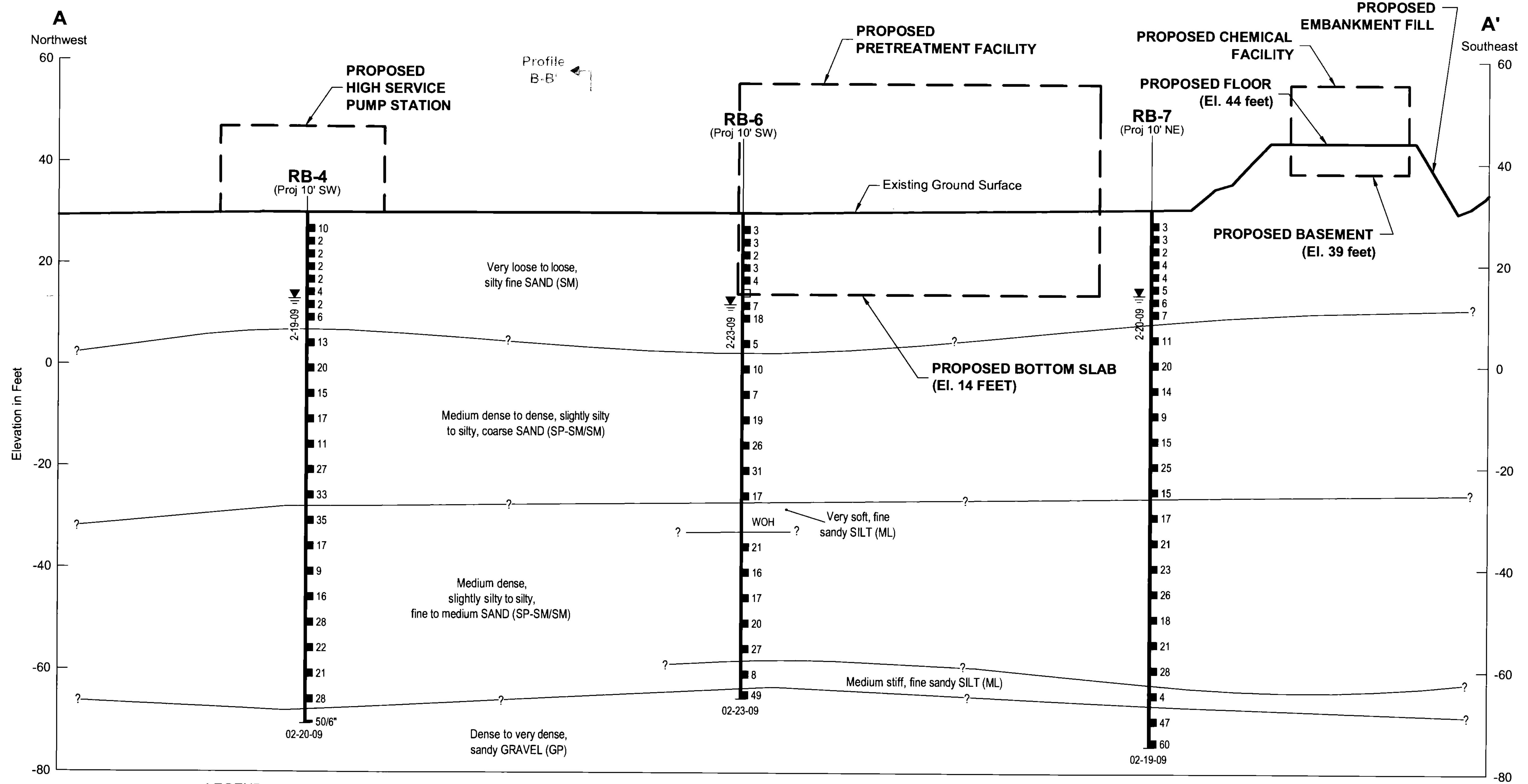
Anacortes Water Treatment Plant
Mount Vernon, Washington

SITE AND EXPLORATION PLAN

September 2010 21-1-20464-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 2



LEGEND

RB-4 ← Boring Designation
(Proj 10' NE) ← Projected Distance and Direction
Groundwater Level and Date Observed
21 ← Standard Penetration Test Blows/Foot
WOH ← Standard Penetration Test Weight of Hammer
? ——— ? Approximate Geologic Contact
← Bottom of Boring
2-20-09 ← Date of Completion

0 50 100
Horizontal Scale in Feet

0 20 40
Vertical Scale in Feet

Vertical Exaggeration = 2.5X

NOTES

1. **RB-4**: Boring by Shannon & Wilson, February 2009
2. This profile is generalized and based on interpretations of field explorations. Variations between conditions depicted on this profile and the actual conditions may exist.

Anacortes Water Treatment Plant
Mount Vernon, Washington

GENERIZED SUBSURFACE PROFILE A-A'

September 2010 | 21-1-20464-004

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FIG. 3

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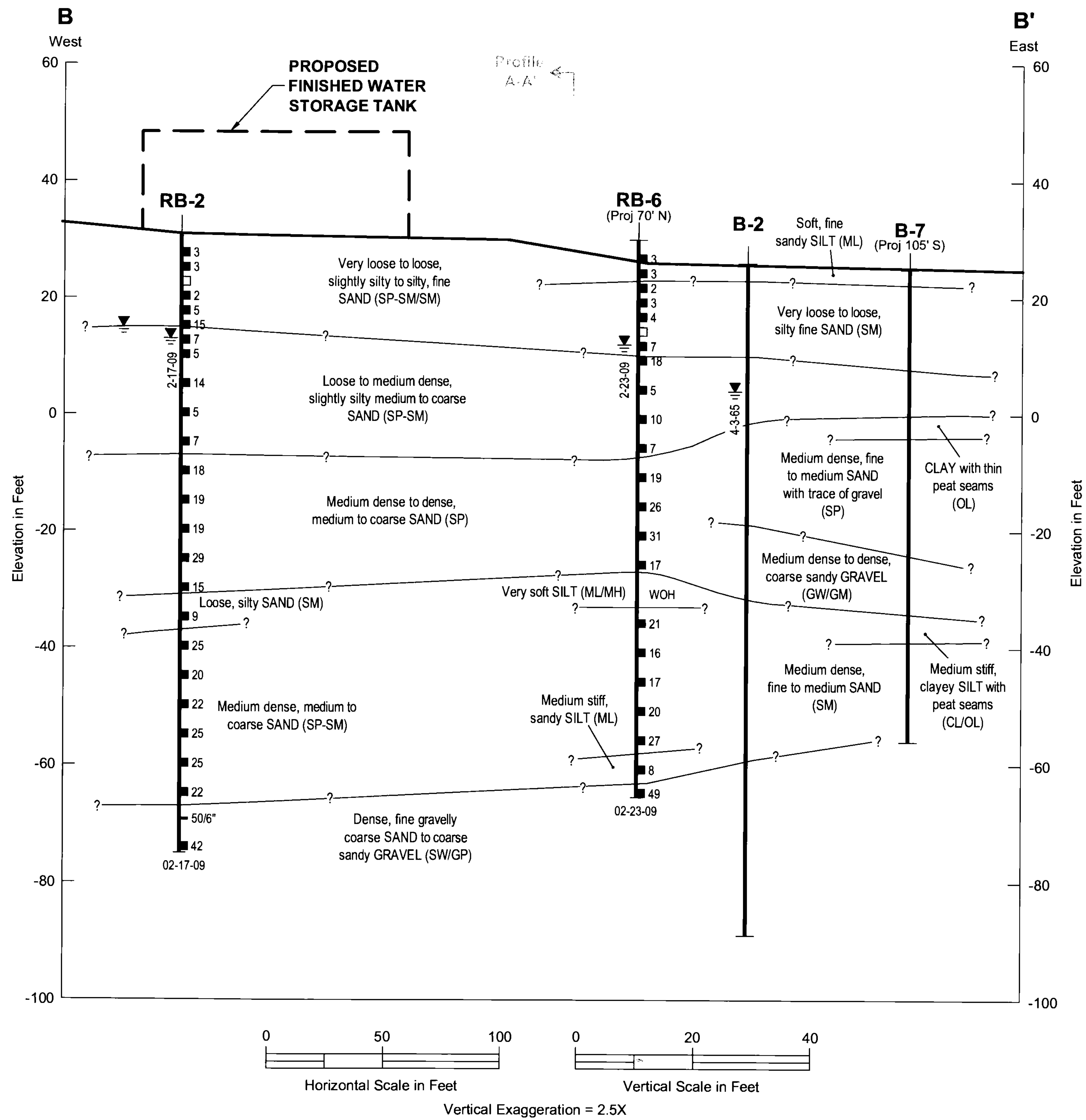

LEGEND

RB-4 — Boring Designation
(Proj 10' NE) — Projected Distance and Direction
21 — Standard Penetration Test Blows/Foot
WOH — Standard Penetration Test Weight of Hammer
?——? Approximate Geologic Contact
2-19-09 — Groundwater Level and Date Observed
— Bottom of Boring
2-20-09 — Date of Completion

NOTES

1. **B-1:** Boring by Shannon & Wilson, April 1965
   RB-4: Boring by Shannon & Wilson, February 2009
2. This profile is generalized and based on interpretations of field explorations. Variations between conditions depicted on this profile and the actual conditions may exist.

Anacortes Water Treatment Plant Mount Vernon, Washington	
GENERIZED SUBSURFACE PROFILE B-B'	
September 2010	21-1-20464-004
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	**FIG. 4**

Filename: J:\211\20464-004\21-1-20464-004 Profiles.dwg Date: 09-14-2010 Login: Bert Cripe

APPENDIX A

SUBSURFACE EXPLORATIONS

APPENDIX A

SUBSURFACE EXPLORATIONS

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FIGURES

APPENDIX A

SUBSURFACE EXPLORATIONS

A.1 INTRODUCTION

The field explorations for this study consisted of drilling eight borings during February 16 to 24, 2008, and reviewing six borings drilled by Shannon & Wilson in 1965. The approximate exploration locations were determined by taping from existing site features, and reviewing previous site plans; the locations are shown in Figure 2 included in the main text of this report. The Unified Soil Classification System, as described in Figure A-1, was used to classify the soils encountered in the explorations.

A.2 BORINGS

Eight borings, designated RB-1 through RB-8, were drilled to evaluate the subsurface conditions across the project site. Borings RB-1, RB-2, and RB-4 through RB-7 range in depth from 95 to 110 feet; boring RB-8 was drilled to a depth of 30 feet; and boring RB-3 was terminated at a depth of 5 feet because of a concrete slab. The boring logs are presented as Figures A-2 through A-9.

The borings were drilled by Gregory Drilling, Inc. of Renton, Washington, using a truck-mounted drill rig. The borings were drilled under subcontract to Shannon & Wilson, Inc., using mud-rotary drilling techniques. The mud-rotary method consists of drilling the subsurface soils and removing the cuttings by circulation of a bentonite/water mix drilling mud. A settling tank at the ground surface collected the cuttings while the mud was recirculated into the boring. A Shannon & Wilson field representative observed the drilling operations, collected soil samples, and prepared logs of the borings.

The samples from the borings were obtained in conjunction with the Standard Penetration Test (SPT). SPTs were performed in general accordance with the ASTM International Designation: D 1586, generally at 2.5- to 5-foot intervals. This test consists of driving a 2-inch outside-diameter, split-spoon sampler a total distance of 18 inches into the bottom of the boring with a 140-pound hammer falling 30 inches. The number of blows required to cause the last 12 inches of penetration is termed the Standard Penetration Resistance (N-value). The penetration resistances were recorded by our field representative and are plotted on the boring logs. These values provide a means for evaluating the relative density or compactness of cohesionless (granular) soils and the consistency (stiffness) of cohesive soils as described in Figure A-1.

The split-spoon sampler used during the penetration testing recovers a disturbed sample of the soil, which is useful for identification purposes. The samples were sealed in jars and returned to our laboratory for testing.

A.3 PREVIOUS BORINGS

Shannon & Wilson, Inc. performed six soil borings during March 29 to April 9, 1965, to aid in the design of the buildings currently at the project site. The borings, designated B-1 through B-7, range in depth from 48 and 115 feet. The boring logs are presented as Figures A-10 through A-16.

The borings were drilled using hollow-stem auger (HSA) drilling techniques. HSA drilling consists of advancing continuous-flight augers to remove soil from the borehole. Soil samples are taken from the bottom of the boring by removing the center rod and lowering a split-spoon sampler through the hollow stem.

Shannon & Wilson, Inc. (S&W), uses a soil classification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following page. Soil descriptions are based on visual-manual procedures (ASTM D 2488-93) unless otherwise noted.

S&W CLASSIFICATION OF SOIL CONSTITUENTS

- MAJOR constituents compose more than 50 percent, by weight, of the soil. Major consituents are capitalized (i.e., SAND).
- Minor constituents compose 12 to 50 percent of the soil and precede the major constituents (i.e., silty SAND). Minor constituents preceded by "slightly" compose 5 to 12 percent of the soil (i.e., slightly silty SAND).
- Trace constituents compose 0 to 5 percent of the soil (i.e., slightly silty SAND, trace of gravel).

MOISTURE CONTENT DEFINITIONS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

ABBREVIATIONS

ATD	At Time of Drilling
Elev.	Elevation
ft	feet
FeO	Iron Oxide
MgO	Magnesium Oxide
HSA	Hollow Stem Auger
ID	Inside Diameter
in	inches
lbs	pounds
Mon.	Monument cover
N	Blows for last two 6-inch increments
NA	Not applicable or not available
NP	Non plastic
OD	Outside diameter
OVA	Organic vapor analyzer
PID	Photo-ionization detector
ppm	parts per million
PVC	Polyvinyl Chloride
SS	Split spoon sampler
SPT	Standard penetration test
USC	Unified soil classification
WOH	Weight of hammer
WOR	Weight of drill rods
WLI	Water level indicator

GRAIN SIZE DEFINITION

DESCRIPTION	SIEVE NUMBER AND/OR SIZE
FINES	< #200 (0.08 mm)
SAND*	
- Fine	#200 to #40 (0.08 to 0.4 mm)
- Medium	#40 to #10 (0.4 to 2 mm)
- Coarse	#10 to #4 (2 to 5 mm)
GRAVEL*	
- Fine	#4 to 3/4 inch (5 to 19 mm)
- Coarse	3/4 to 3 inches (19 to 76 mm)
COBBLES	3 to 12 inches (76 to 305 mm)
BOULDERS	> 12 inches (305 mm)

* Unless otherwise noted, sand and gravel, when present, range from fine to coarse in grain size.

RELATIVE DENSITY / CONSISTENCY

COARSE-GRAINED SOILS		FINE-GRAINED SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
0 - 4	Very loose	Under 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
Over 50	Very dense	15 - 30	Very stiff
		Over 30	Hard

WELL AND OTHER SYMBOLS

Bent. Cement Grout	Surface Cement Seal
Bentonite Grout	Asphalt or Cap
Bentonite Chips	Slough
Silica Sand	Bedrock
PVC Screen	
Vibrating Wire	

Anacortes Water Treatment Plant
Mount Vernon, Washington

SOIL CLASSIFICATION AND LOG KEY

March 2009 21-20464-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 1 of 2

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(From ASTM D 2487-98 & 2488-93)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL	TYPICAL DESCRIPTION
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Clean Gravels *(less than 5% fines)*	GW	Well-graded gravels, gravels, gravel/sand mixtures, little or no fines.
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines *(more than 12% fines)*	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Clean Sands *(less than 5% fines)*	SW	Well-graded sands, gravelly sands, little or no fines
			SP	Poorly graded sand, gravelly sands, little or no fines
		Sands with Fines *(more than 12% fines)*	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML	Inorganic silts of low to medium plasticity, rock flour, sandy silts, gravelly silts, or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		Organic	OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH	Inorganic silts, micaceous or diatomaceous fine sands or silty soils, elastic silt
			CH	Inorganic clays or medium to high plasticity, sandy fat clay, or gravelly fat clay
		Organic	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat, humus, swamp soils with high organic content (see ASTM D 4427)

NOTE: No. 4 size = 5 mm; No. 200 size = 0.075 mm

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, slightly silty fine SAND)* are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, silty CLAY/clayey SILT; GW/SW, sandy GRAVEL/gravelly SAND)* indicate that the soil may fall into one of two possible basic groups.

Anacortes Water Treatment Plant
Mount Vernon, Washington

SOIL CLASSIFICATION AND LOG KEY

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FIG. A-1
Sheet 2 of 2

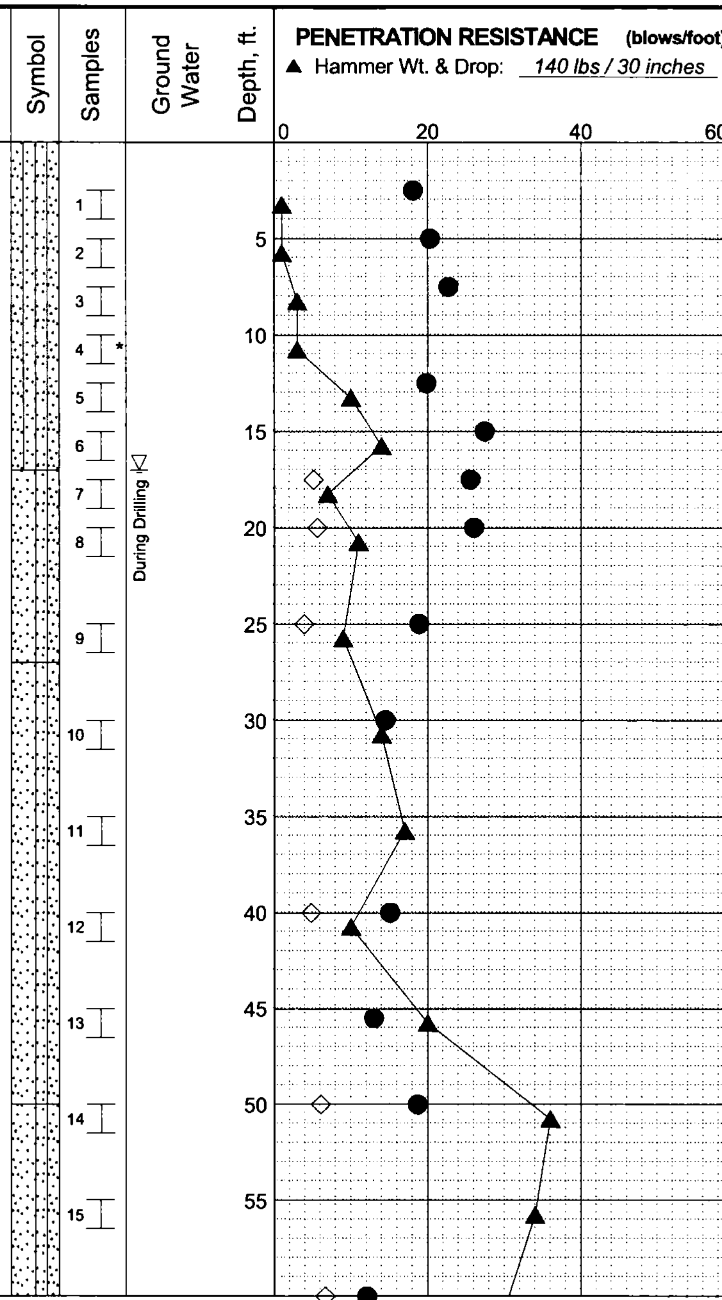
Total Depth:	110 ft.	Northing:		Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 32 ft.	Easting:		Drilling Company:	Gregory	Rod Diam.:	2"
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.
Very loose to medium dense, brown, silty, fine to medium sand; moist; SM.	
Loose, dark gray, slightly silty, medium to coarse SAND, trace of gravel; wet; SP-SM.	17.0
Medium dense, dark gray, slightly silty, medium to coarse SAND, trace of gravel; wet; SP-SM.	27.0
Medium dense to dense, dark gray, slightly silty, gravelly, coarse SAND; wet; SP-SM.	50.0

CONTINUED NEXT SHEET



LEGEND

* Sample Not Recovered

Split Spoon

Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-1

March 2009 21-20464-003

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FIG. A-2
Sheet 1 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	*110 ft.*	Northing:		Drilling Method:	*Mud Rotary*	Hole Diam.:	*6 in.*
Top Elevation:	*~ 32 ft.*	Easting:		Drilling Company:	*Gregory*	Rod Diam.:	*2"*
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

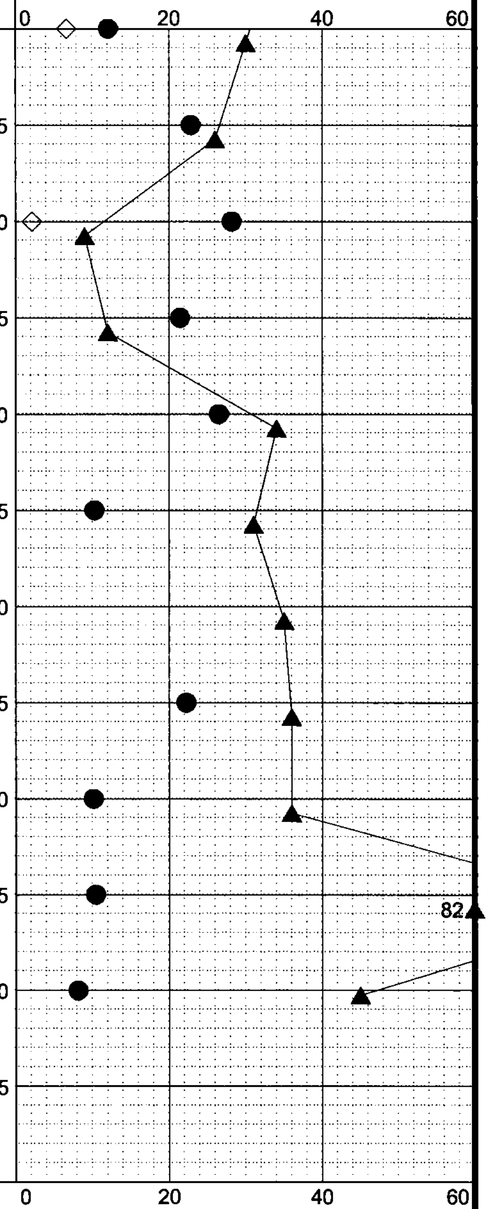
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.	Samples
		16, 17
Loose to medium dense, fine to medium SAND, trace of silt; wet; SP.	68.0	18, 19
Dense, dark gray, medium to coarse SAND; trace of silt; wet; SP.	78.0	20, 21, 22, 23
Dense to very dense, dark gray, silty, coarse, sandy fine GRAVEL; wet; GM.	100.0	24, 25
BOTTOM OF BORING COMPLETED 2/16/2009	110.0	26

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



◇ % Fines (<0.075mm)
● % Water Content

LEGEND

* Sample Not Recovered
⌶ Split Spoon
⊻ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-1

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FIG. A-2
Sheet 2 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

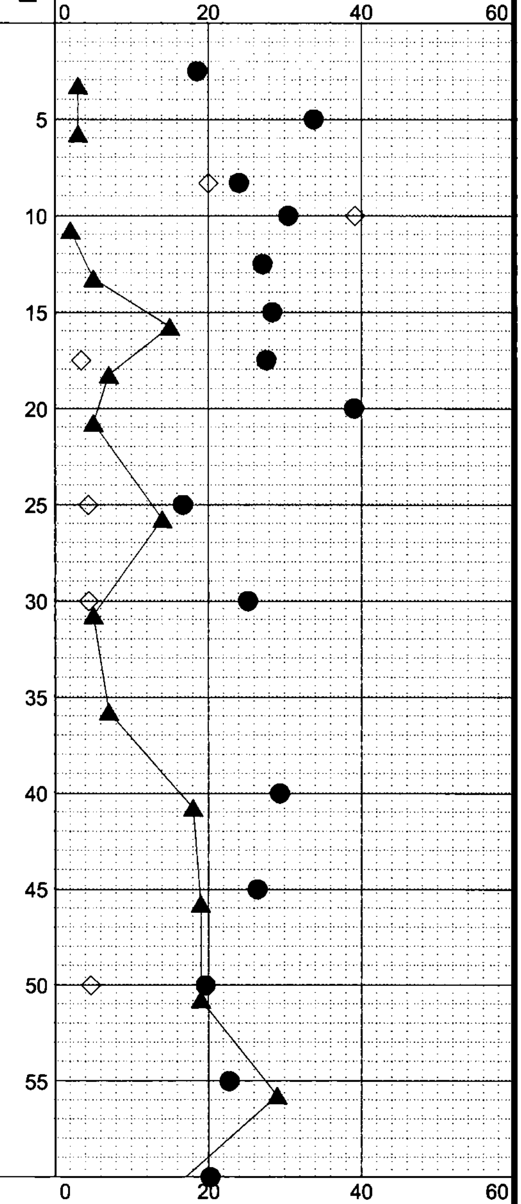
Total Depth:	106 ft.	Northing:		Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 35 ft.	Easting:		Drilling Company:	Gregory	Rod Diam.:	2"
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	Samples	Ground Water
Very loose, brown, silty, fine SAND; moist; SM.			1, 2, 3, 4, 5, 6	
Loose, dark gray, medium to coarse SAND, trace of silt; wet; SP-SM.	16.0		7, 8, 9, 10, 11	During Drilling
Medium dense, dark gray, medium to coarse SAND, trace of silt; wet; SP.	38.0		12, 13, 14, 15	

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered

Split Spoon

Thin Wall Sample

Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-2

March 2009 21-20464-003

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FIG. A-3
Sheet 1 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

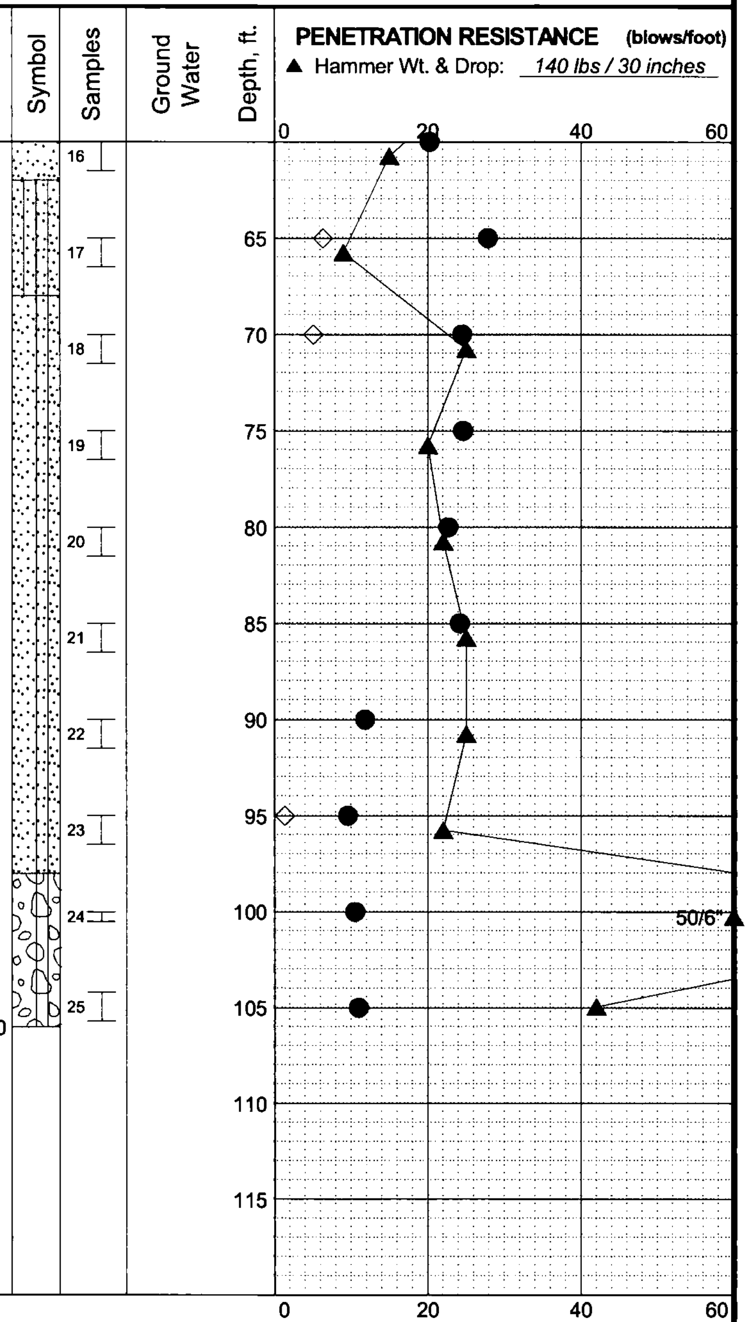
Total Depth:	*106 ft.*	Northing:		Drilling Method:	*Mud Rotary*
Top Elevation:	*~ 35 ft.*	Easting:		Drilling Company:	*Gregory*
Vert. Datum:		Station:		Drill Rig Equipment:	
Horiz. Datum:		Offset:		Other Comments:	

Hole Diam.: *6 in.*
Rod Diam.: *2"*
Hammer Type:

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.
Loose, dark gray, silty, fine SAND; wet; SM.	62.0
Medium dense, dark gray, slightly silty, medium SAND; wet; SP-SM.	68.0
Dense to very dense, dark gray, slightly silty, medium to coarse, sandy, fine GRAVEL; wet; GP-GM.	98.0
BOTTOM OF BORING COMPLETED 2/17/2009	106.0



LEGEND

- * Sample Not Recovered
- Split Spoon
- Thin Wall Sample
- Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-2

March 2009 21-20464-003

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FIG. A-3
Sheet 2 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	*5 ft.*	Northing:		Drilling Method:	*Mud Rotary*	Hole Diam.:	*6 in.*
Top Elevation:	*~ 30 ft.*	Easting:		Drilling Company:	*Gregory*	Rod Diam.:	*2"*
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

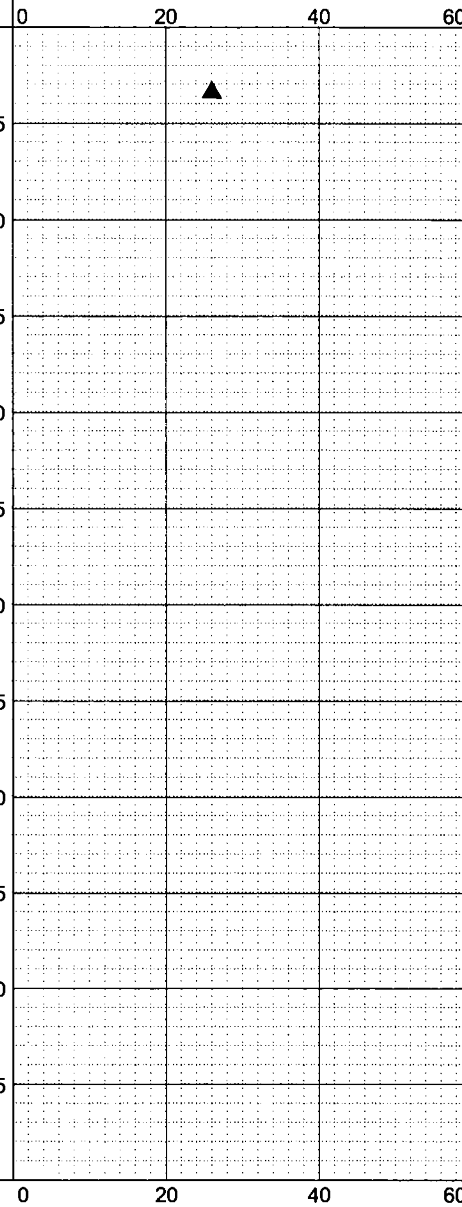
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Medium dense, brown, silty, fine to medium SAND, trace of coarse sand; moist; SP-SM.	5.0		1	None Observed During Drilling	5
BOTTOM OF BORING COMPLETED 2/17/2009 Note: Boring terminated because of concrete slab at 5 feet.					

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- Ɪ Split Spoon

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-3

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FIG. A-4

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: LKD

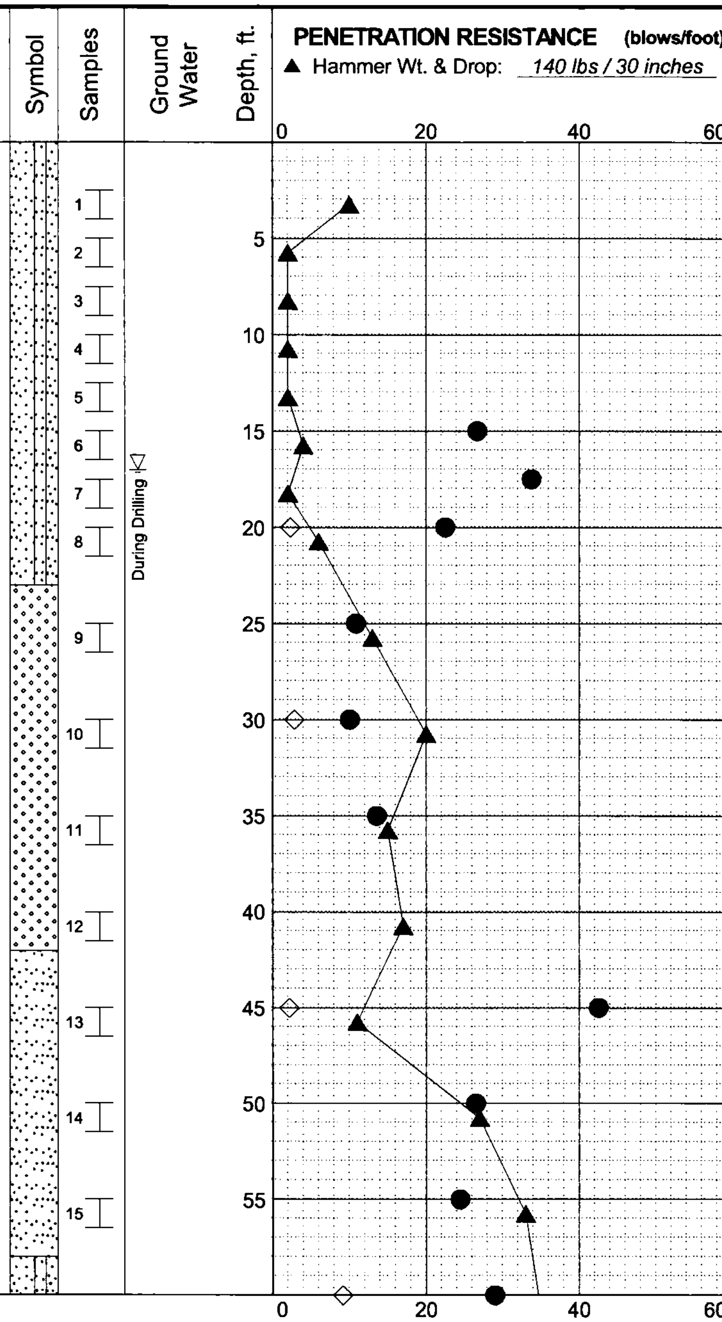
Total Depth:	*100.5 ft.*	Northing:		Drilling Method:	*Hollow Stem Auger*	Hole Diam.:	*6 in.*
Top Elevation:	*~ 30 ft.*	Easting:		Drilling Company:	*Gregory*	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.
Very loose, brown, slightly silty to silty, fine SAND; moist to dry (wet below groundwater table); SP-SM/SM.	23.0
Medium dense, dark gray, slightly silty, fine gravelly medium to coarse SAND; wet; SW.	42.0
Medium dense to dense, dark gray, trace to slightly silty, gravelly, medium to coarse SAND; wet; SP.	58.0

CONTINUED NEXT SHEET



LEGEND

* Sample Not Recovered

Split Spoon

Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-4

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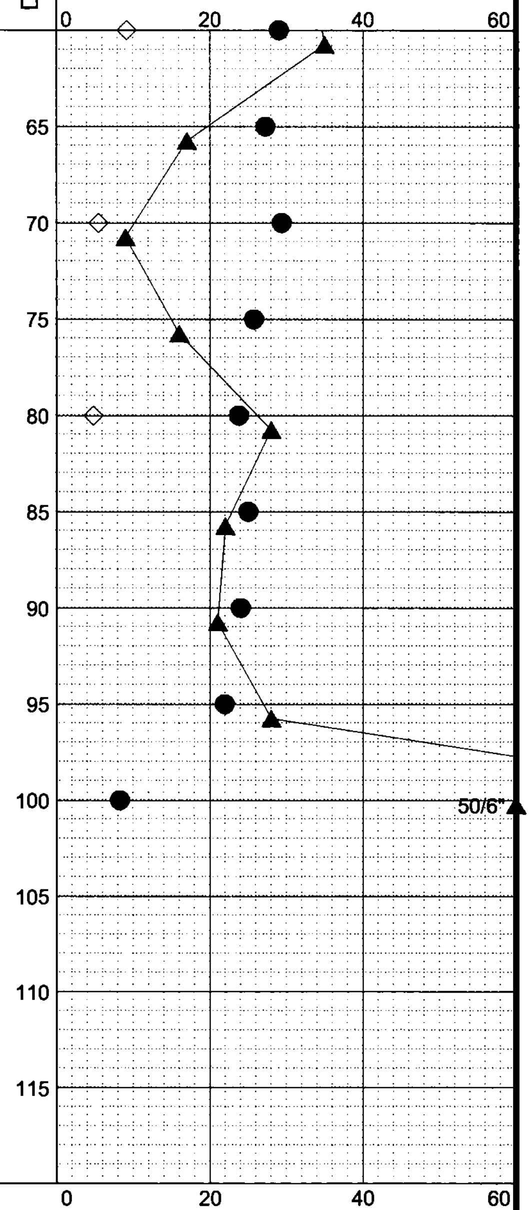
FIG. A-5
Sheet 1 of 2

Total Depth:	100.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger
Top Elevation:	~ 30 ft.	Easting:		Drilling Company:	Gregory
Vert. Datum:		Station:		Drill Rig Equipment:	
Horiz. Datum:		Offset:		Other Comments:	

Hole Diam.: 6 in.
Rod Diam.:
Hammer Type:

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	Samples	Ground Water
Dense, dark gray, slightly silty, fine SAND; wet; SP-SM.			16	
Loose to medium dense, dark gray, slightly gravelly, slightly silty to silty, fine SAND; wet; SP-SM/SM.	63.0		17, 18	
Medium dense, dark gray, slightly silty to silty, medium SAND; wet; SP-SM/SM.	73.0		19, 20, 21, 22, 23	
Dense, dark gray, clayey, coarse, sandy, fine GRAVEL; wet; GP.	98.0		24	
BOTTOM OF BORING COMPLETED 2/20/2009	100.5			

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered
Split Spoon
Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-4

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FIG. A-5
Sheet 2 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	*95.5 ft.*	Northing:		Drilling Method:	*Mud Rotary*	Hole Diam.:	*6 in.*
Top Elevation:	*~ 29 ft.*	Easting:		Drilling Company:	*Gregory*	Rod Diam.:	*2"*
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

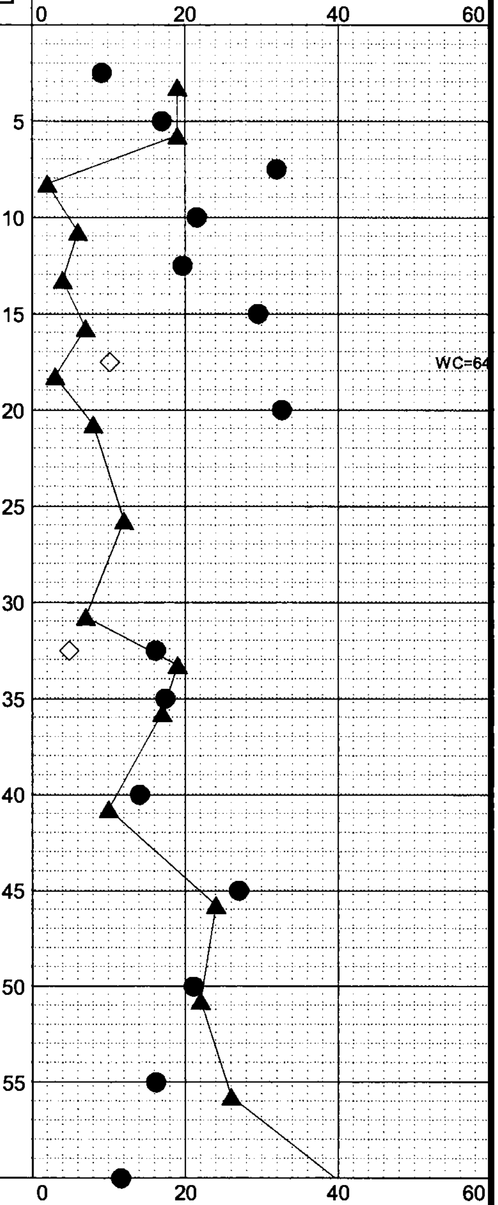
Soil Description	Depth, ft.	Samples
Medium dense, brown, silty, fine SAND; moist; SM.		1, 2
Very loose to loose, brown to dark gray, silty, fine SAND; moist (wet below groundwater table); SM.	6.0	3, 4, 5, 6, 7, 8, 9*, 10*
Loose to medium dense, dark gray, silty, fine, gravelly, coarse SAND to coarse, sandy, fine GRAVEL; wet; SP-SM/GP.	32.0	11, 12, 13
Medium dense, dark gray, silty, fine to medium SAND; wet; SM.	43.0	14, 15
Medium dense to dense, slightly silty to silty, fine gravelly, medium to coarse SAND; wet; SP-SM/SM.	54.0	16

Ground Water: During Drilling ⊻

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

* Sample Not Recovered

⌶ Split Spoon

⊻ Ground Water Level ATD

◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

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Mount Vernon, Washington

LOG OF BORING RB-5

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FIG. A-6
Sheet 1 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/20/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	*95.5 ft.*	Northing:		Drilling Method:	*Mud Rotary*	Hole Diam.:	*6 in.*
Top Elevation:	*~ 29 ft.*	Easting:		Drilling Company:	*Gregory*	Rod Diam.:	*2"*
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

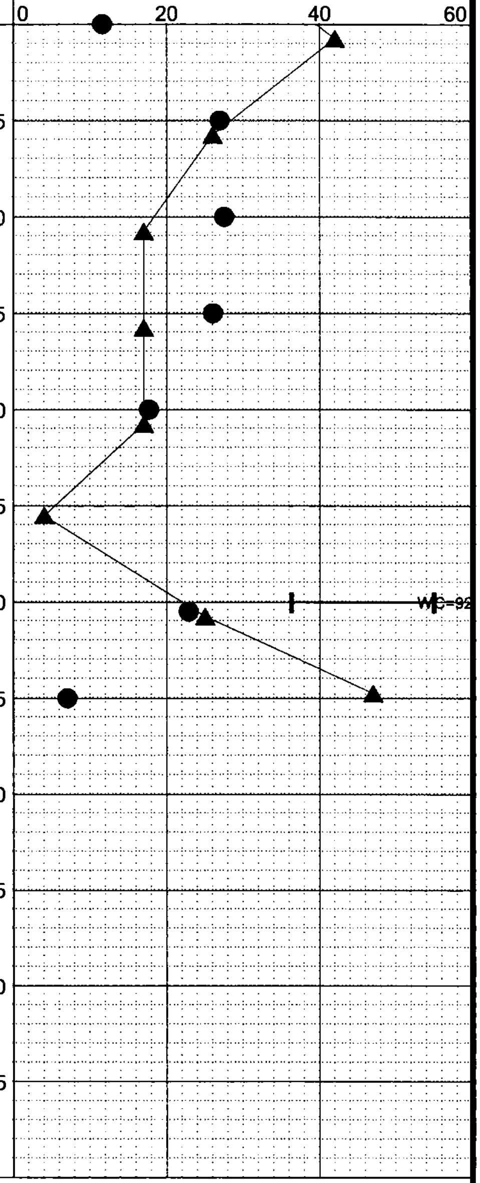
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.	Samples
		17
Medium dense, dark gray, silty, fine SAND; wet; SM.	63.0	18, 19, 20, 21
Medium stiff, dark gray-brown, fine sandy SILT; wet; ML.	82.0	22
Very stiff, gray-brown, slightly clayey SILT, trace of fine sand; wet; MH.	87.0	23
Dense, dark gray, clayey, coarse, sandy fine GRAVEL; wet; GP.	94.0	24
BOTTOM OF BORING COMPLETED 2/24/2009	95.5	

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*



LEGEND

- * Sample Not Recovered
- Split Spoon
- Ground Water Level ATD

◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit —●— Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-5

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FIG. A-6

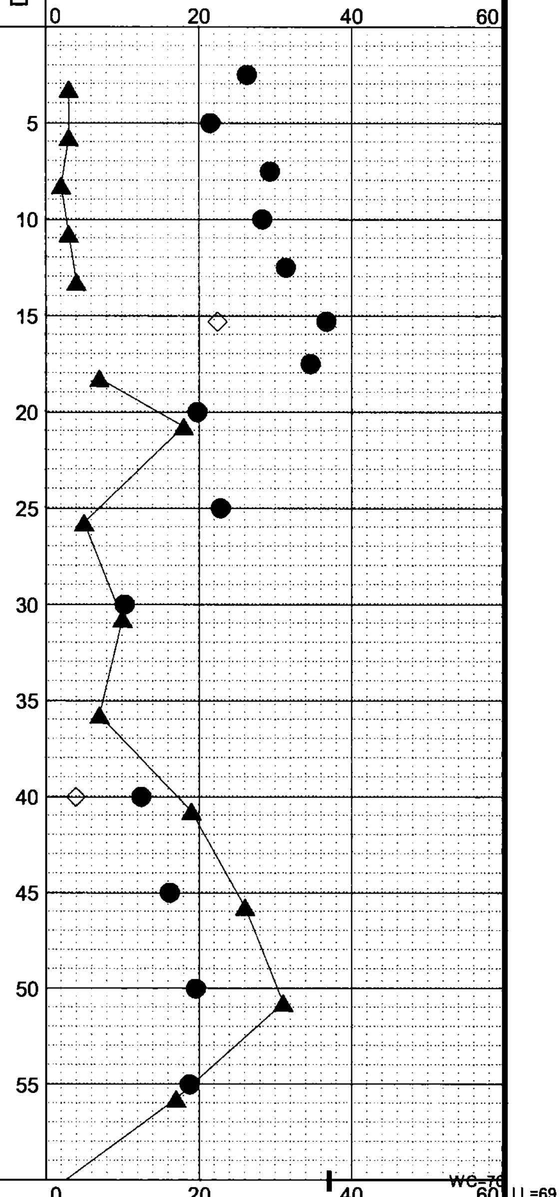
MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/20/09 Log: YHC Rev: JNB Typ: CLP

Total Depth: 95.5 ft.	Northing:	Drilling Method: Mud Rotary	Hole Diam.: 6 in.
Top Elevation: ~ 30 ft.	Easting:	Drilling Company: Gregory	Rod Diam.: 2"
Vert. Datum:	Station:	Drill Rig Equipment:	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Samples	Ground Water
Very loose, brown, silty, fine SAND to fine sandy SILT; moist; SM/ML.		1, 2	
Very loose to loose, brown, silty, fine SAND; moist (wet below groundwater table); SM.	7.0	3, 4, 5, 6, 7	During Drilling ∇
Loose to medium dense, dark gray, slightly silty to silty, medium to coarse SAND; wet; SP-SM/SM.	19.0	8, 9	
Loose, dark gray, silty, slightly gravelly to gravelly, medium to coarse SAND; wet; SW.	28.0	10, 11*	
Medium dense, dark gray, silty, slightly gravelly to gravelly, medium to coarse SAND, trace of silt; wet; SP.	38.0	12, 13	
Dense, dark gray, slightly silty, medium to coarse SAND; wet; SP-SM.	48.0	14	
Medium dense, dark gray, silty, fine to medium SAND; wet; SM.	52.0	15	
Very soft, dark brown, clayey SILT, trace of fine sand; wet; MH.	57.0		

CONTINUED NEXT SHEET

PENETRATION RESISTANCE (blows/foot)
▲ Hammer Wt. & Drop: 140 lbs / 30 inches



◇ % Fines (<0.075mm)
● % Water Content
Plastic Limit ├─●─┤ Liquid Limit
Natural Water Content

LEGEND

* Sample Not Recovered
Split Spoon
Thin Wall Sample
∇ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-6

March 2009 21-20464-003

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FIG. A-7
Sheet 1 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	95.5 ft.	Northing:		Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 30 ft.	Easting:		Drilling Company:	Gregory	Rod Diam.:	2"
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

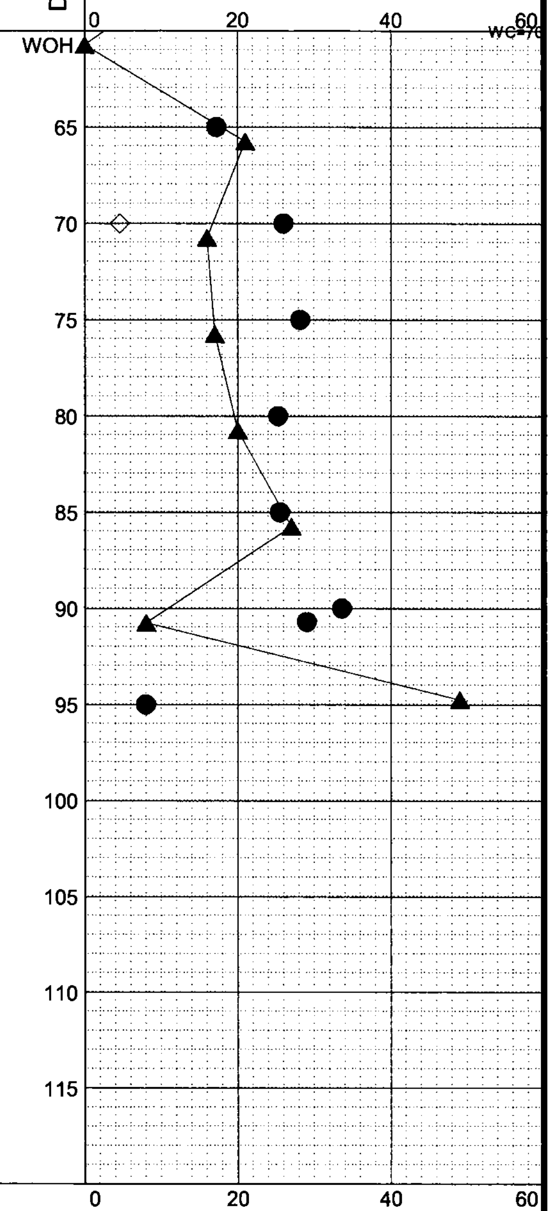
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

SOIL DESCRIPTION	Depth, ft.	Samples
		16
Medium dense, dark gray, slightly silty to silty, fine to medium SAND; wet; SP-SM/SM.	63.0	17, 18, 19, 20, 21
Medium stiff, blue-gray to dark gray, slightly fine sandy SILT to silty, fine SAND; wet; SM/ML.	88.0	22
Dense, dark gray, slightly silty, gravelly, coarse SAND; wet; SW.	93.0	23
BOTTOM OF BORING COMPLETED 2/23/2009	95.5	

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



◇ % Fines (<0.075mm)

● % Water Content

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

LEGEND

* Sample Not Recovered

⌶ Split Spoon

Ⅱ Thin Wall Sample

⊻ Ground Water Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-6

March 2009 21-20464-003

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FIG. A-7
Sheet 2 of 2

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP

Total Depth:	105.7 ft.	Northing:		Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation:	~ 31 ft.	Easting:		Drilling Company:	Gregory	Rod Diam.:	2"
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION

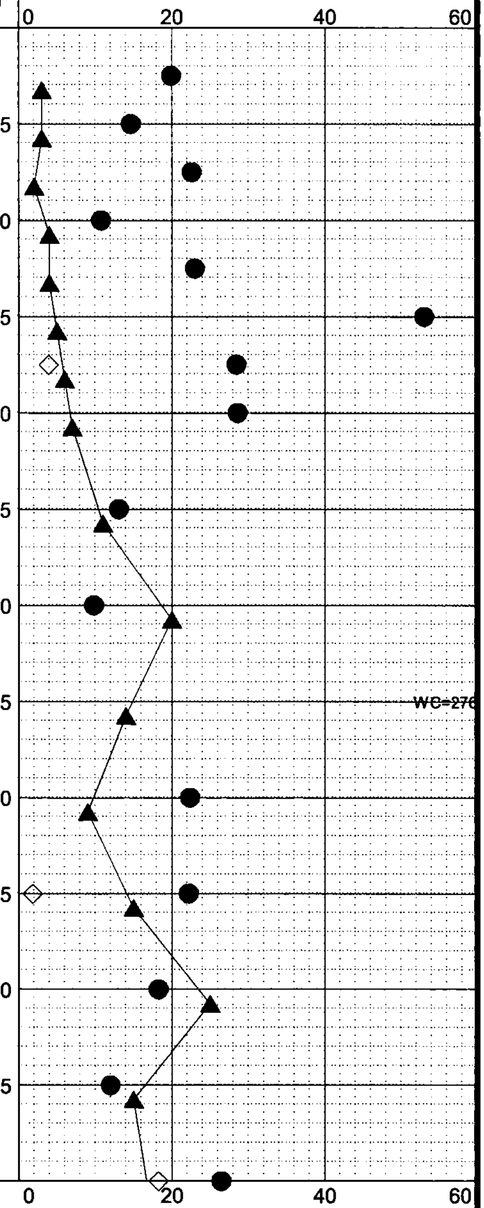
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.
Very loose to loose, brown to dark brown, silty, fine SAND; moist; SM.	22.0
Medium dense, dark gray, fine gravelly, coarse SAND; wet; SW.	38.0
Loose, dark gray, fine gravelly, coarse SAND; wet; SW.	43.0
Medium dense, dark gray, fine gravelly, coarse SAND; wet; SW.	57.0

Symbol | Samples: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | Ground Water: During Drilling

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



CONTINUED NEXT SHEET

LEGEND

- * Sample Not Recovered
- Split Spoon
- Ground Water Level ATD
- ◇ % Fines (<0.075mm)
- ● % Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-7

March 2009 21-20464-003

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FIG. A-8
Sheet 1 of 2

Total Depth: 105.7 ft.	Northing:	Drilling Method:	Mud Rotary	Hole Diam.:	6 in.
Top Elevation: ~ 31 ft.	Easting:	Drilling Company:	Gregory	Rod Diam.:	2"
Vert. Datum:	Station:	Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:	Offset:	Other Comments:			

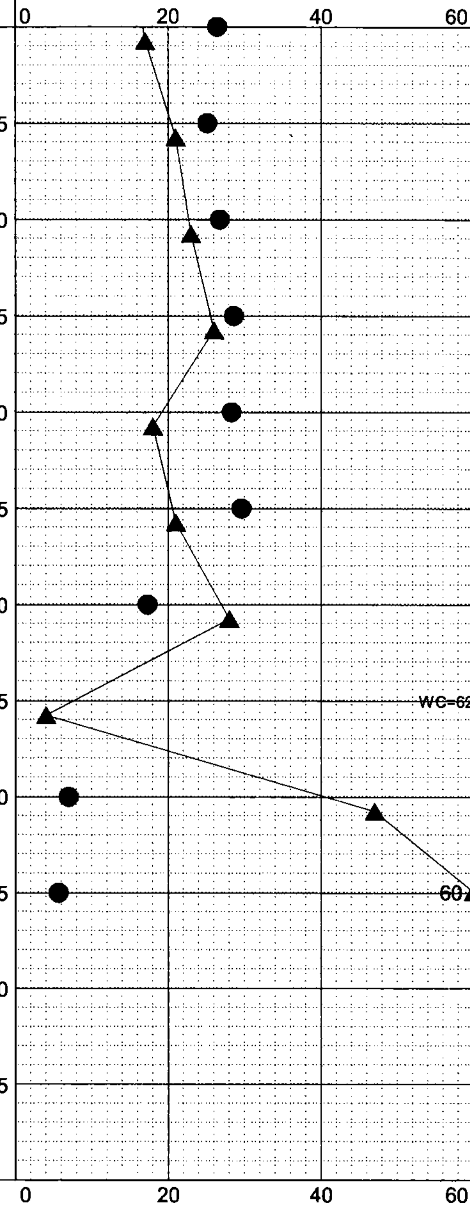
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Soil Description	Depth, ft.	Samples
Medium dense, dark gray, slightly silty to silty, fine to medium SAND; moist to wet; SP-SM/SM.		16, 17, 18, 19, 20, 21
Medium dense, dark gray, medium to coarse SAND, trace of gravel and silt; wet; SP.	87.0	22
Medium stiff, gray, slightly sandy SILT; wet; ML.	94.0	23
Dense, gray, silty, coarse, sandy GRAVEL (3/4- to 1-inch); wet; GP.	98.0	24, 25
BOTTOM OF BORING COMPLETED 2/19/2009	105.7	

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered

⌶ Split Spoon

⊻ Ground Water Level ATD

◇ % Fines (<0.075mm)

● % Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-7

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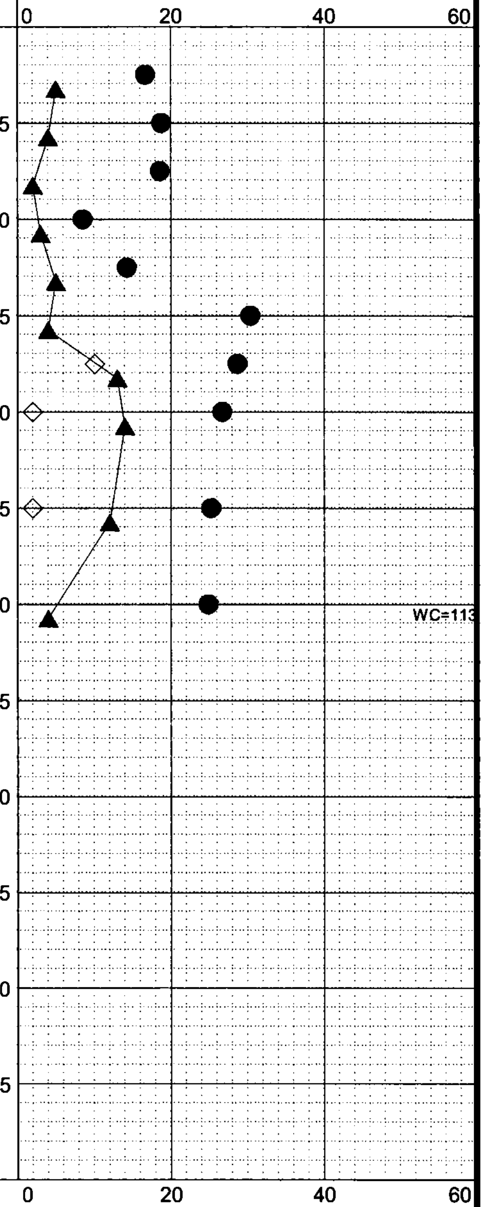
FIG. A-8
Sheet 2 of 2

Total Depth:	31.5 ft.	Northing:		Drilling Method:	Hollow Stem Auger	Hole Diam.:	6 in.
Top Elevation:	~ 33 ft.	Easting:		Drilling Company:	Gregory	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:		Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	Samples	Ground Water
Very loose to loose, brown, slightly silty to silty, fine to medium SAND; moist to dry (wet below groundwater table); SP-SM/SM.			1, 2, 3, 4, 5, 6	
Medium dense, dark gray, slightly silty to silty, fine to medium SAND; wet; SP-SM/SM.	17.0		7, 8	During Drilling
Medium dense, dark gray, slightly silty to silty, fine to medium SAND; wet; SP-SM.	26.0		9	
Soft, dark brown to gray, silty PEAT; PT. - 1 inch of gray silt at bottom of sample	30.5		10	
BOTTOM OF BORING COMPLETED 2/19/2009	31.5			

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches



LEGEND

* Sample Not Recovered

Split Spoon

Ground Water Level ATD

◇ % Fines (<0.075mm)

● % Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. USCS designation is based on visual-manual classification and selected lab testing.

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING RB-8

March 2009 21-20464-003

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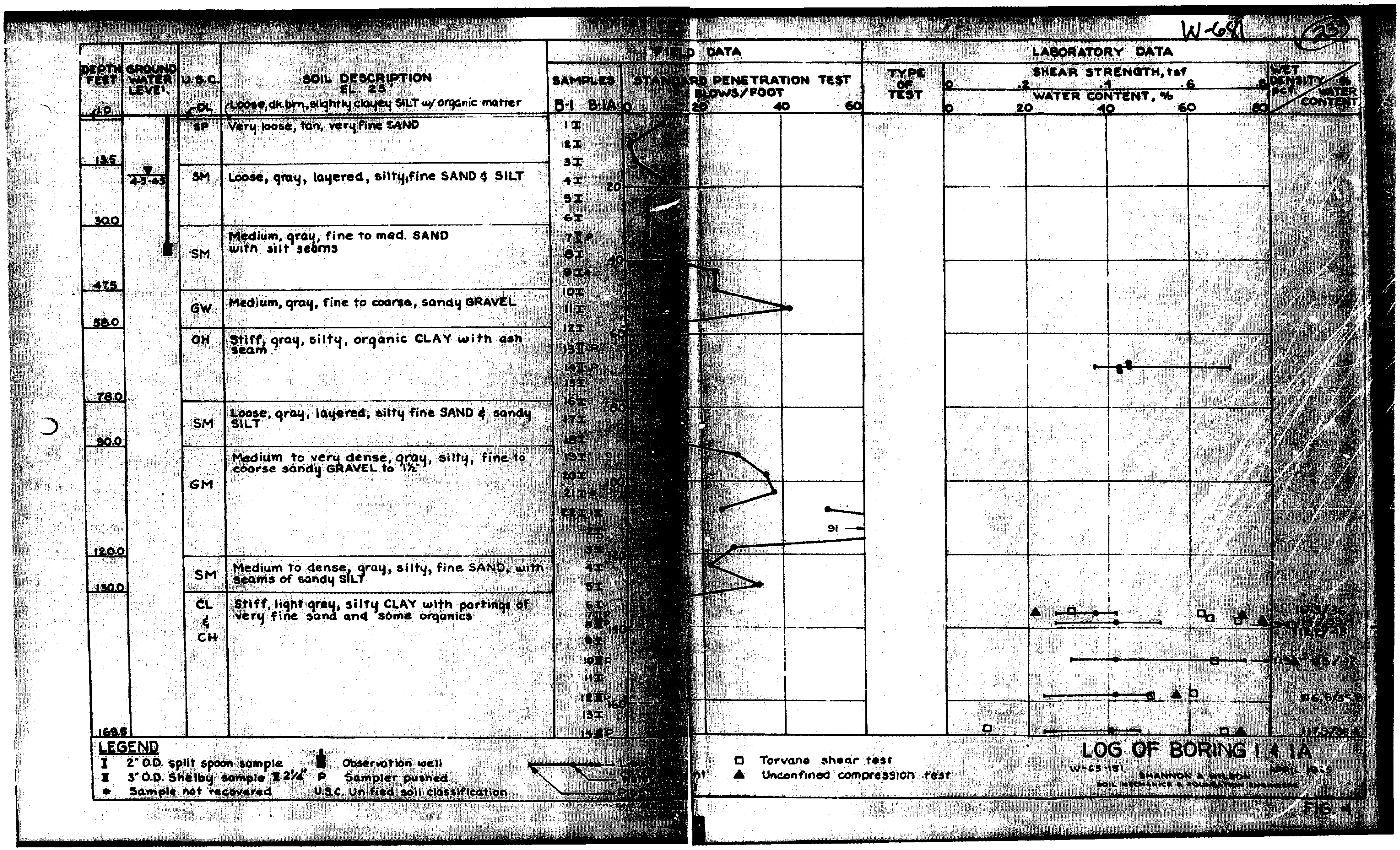
FIG. A-9

MASTER LOG E 21-20464.GPJ SHAN WIL.GDT 3/18/09 Log: YHC Rev: JNB Typ: CLP



W-681

FIELD DATA | LABORATORY DATA

EL. 25'

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION
1.0		OL	Loose, dk. brn, slightly clayey SILT w/ organic matter
		SP	Very loose, tan, very fine SAND
13.5	4-3-65	SM	Loose, gray, layered, silty, fine SAND & SILT
30.0		SM	Medium, gray, fine to med. SAND with silt seams
47.5		GW	Medium, gray, fine to coarse, sandy GRAVEL
58.0		OH	Stiff, gray, silty, organic CLAY with ash seam
78.0		SM	Loose, gray, layered, silty fine SAND & sandy SILT
90.0		GM	Medium to very dense, gray, silty, fine to coarse sandy GRAVEL to 1½"
120.0		SM	Medium to dense, gray, silty, fine SAND, with seams of sandy SILT
130.0		CL & CH	Stiff, light gray, silty CLAY with partings of very fine sand and some organics
169.5			

SAMPLES B-1 B-1A; STANDARD PENETRATION TEST BLOWS/FOOT 0 20 40 60; TYPE OF TEST; SHEAR STRENGTH, tsf 0 .2 .4 .6 .8; WATER CONTENT, % 0 20 40 60 80; WET DENSITY pcf / % WATER CONTENT

117.5/36; 113/41; 116.8/35.2; 117.5/35.4

LEGEND

- I 2" O.D. split spoon sample
- II 3" O.D. Shelby sample II 2¼"
- * Sample not recovered
- Observation well
- P Sampler pushed
- U.S.C. Unified soil classification
- Liquid limit / Water content / Plastic limit
- □ Torvane shear test
- ▲ Unconfined compression test

LOG OF BORING 1 & 1A

W-65-151 SHANNON & WILSON SOIL MECHANICS & FOUNDATION ENGINEERS APRIL 1965

FIG. 4

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-1/1A

March 2009 | 21-1-20464-003

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FIG. A-10

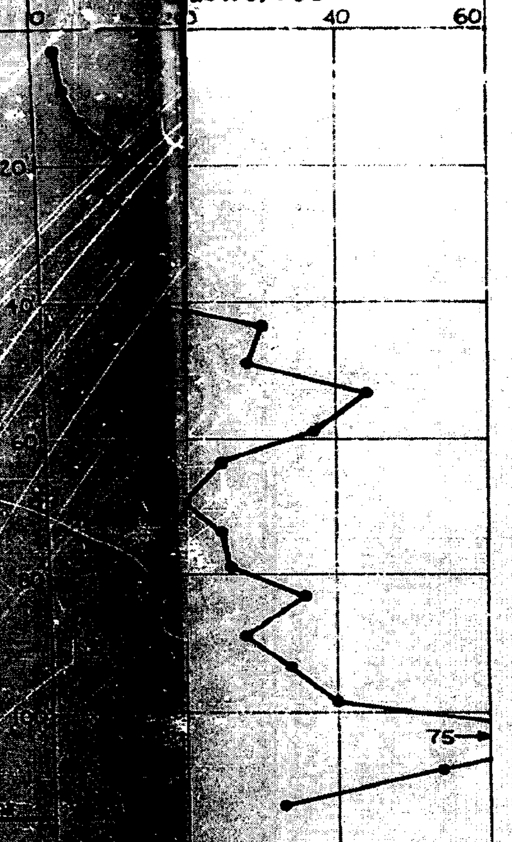
W-681

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL. 26.0'	SAMPLES
3.3		ML	Loose, tan, fine sandy SILT	1 I
27.0	4-3-65	SM to GM	Loose, tan, clean, fine to medium SAND, with random wood fragments	2 I, 3 I, 4 I, 5 I
35.0		GW	Medium, gray, fine to coarse, sandy GRAVEL to 1"	6 I, 7 I
44.5		SW	Medium, gray, fine to med. SAND with trace gravel to 1¼"	8 I, 9 I
58.0		GW	Dense, gray, fine to coarse sandy GRAVEL to 1½"	10 I, 11 I, 12 I
85.0		SM	Medium, gray, fine SAND with thin seams of gravel	13 I, 14 I, 15 I, 16 I, 17 I
98.0		GW	Dense, gray, fine to coarse sandy GRAVEL	18 I, 19 I, 20 I
114.5		SP	Dense, gray, fine to coarse SAND with thin seams of gravel	21 I, 22 I, 23 I

FIELD DATA

STANDARD PENETRATION TEST

BLOWS/FOOT



LEGEND

U.S.C.	Unified soil classification
I	2" O.D. split spoon sample
*	Sample not recovered
▮	Observation well

LOG OF BORING 2

W-65-151 APRIL 1965

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Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-2

March 2009 21-1-20464-003

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FIG. A-11

W-681

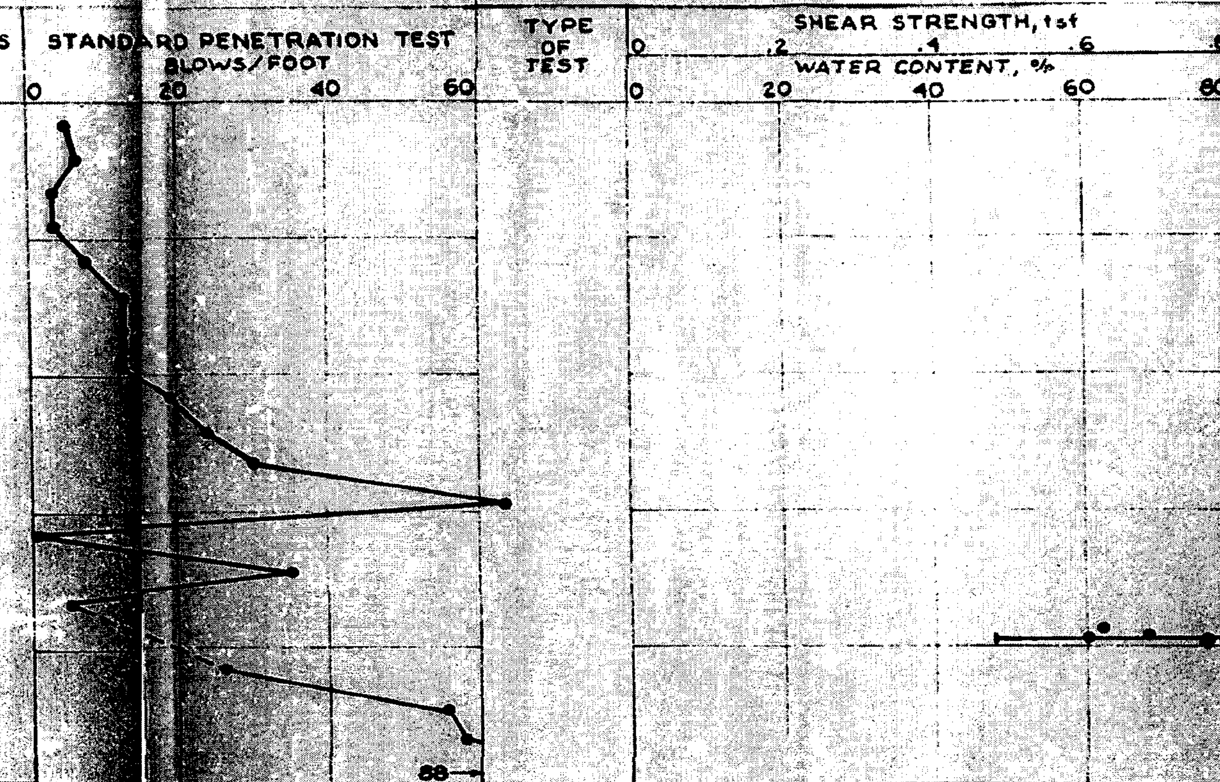
25

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL. 26.5'
3.0		ML	Loose, tan SILT
25.0	4-3-65	SP	Loose, tan, fine SAND with few thin, fine sandy SILT seams and trace of gravel
58.0		SW	Medium gray fine to coarse SAND with gravel to 3/4"
62.5		GM	Dense, gray, silty, fine to coarse sandy GRAVEL w/
72.5		SP	Dense, fine SAND
83.5		OH	Medium, gray, organic CLAY with seams of silt & peat
88.0		SP	Dense, gray, fine SAND
99.0		GM	Very dense, silty, fine to coarse sandy GRAVEL to 1½"

FIELD DATA

SAMPLES: 1I, 2I, 3I, 4I, 5I, 6I, 7I, 8I, 9I, 10I, 11I, 12I, 13I, 14I, 15I, 16IIP, 17I, 18I*, 19I, 20I

LABORATORY DATA



LEGEND

U.S.C. Unified soil classification

I 2" O.D. split spoon sample

II 3" O.D. Shelby sample

P Sampler pushed

* Sample not recovered

Observation well

Liquid limit
Water content
Plastic limit

LOG OF BORING 3

W-65-151 APRIL, 1965

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FIG. 6

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-3

March 2009 21-1-20464-003

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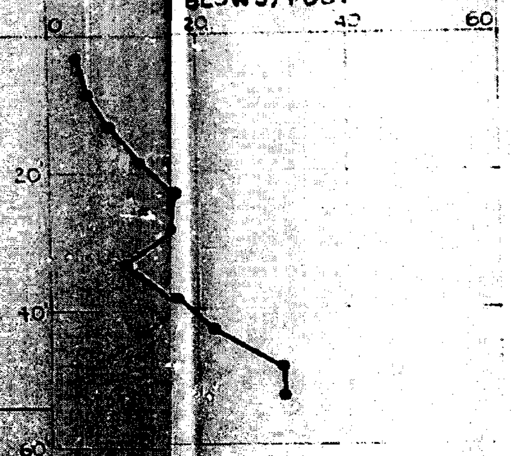
FIG. A-12

W-681 (26)

FIELD DATA

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL. 25.5'	SAMPLES
3.0		ML	Loose, tan, organic, fine sandy SILT	1 I
		SM	Loose, tan, fine SAND with sandy SILT seams to 6"	2 I 3 I 4 I
21.0		SW	Med., gray, fine to coarse SAND w/some gravel to ½"	5 I
27.5		GW & SP & Pt	Medium, gray, clean, fine to coarse sandy GRAVEL with seams of fine sand and peat	6 I 7 I 8 I 9 I 10 I 11 I
54.0				

STANDARD PENETRATION TEST
BLOWS/FOOT



LEGEND

U.S.C. Unified soil classification

I 2" O.D. split spoon sample

* Sample not recovered

LOG OF BORING 4

W-65-151 APRIL, 1965

SHANNON & WILSON

FIG. 7

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-4

March 2009 21-1-20464-003

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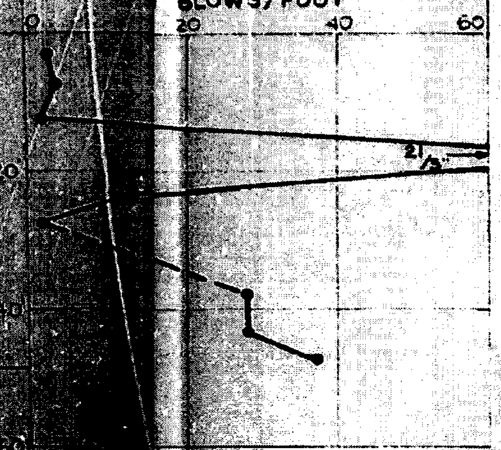
FIG. A-13

W-681

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL. 23.5'	SAMPLES
2.0		ML	Loose, tan, fine sandy SILT	1 I
16.0		SM	Loose, tan, fine SAND with sandy silt and trace gravel	2 I, 3 I
27.0		SP	Medium, gray, fine to coarse SAND with trace gravel to ¾", random wood fragments	4 I, 5 I
30.0		OL	Blue-gray, soft CLAY, few fine sand partings & peat seams	6 I
		SM	Medium, gray, slightly silty, fine SAND	7 II P, 8 I
47.0		SW	Dense, gray, gravelly (to ¾"), fine to coarse SAND	9 I*, 10 I
±48.5				

FIELD DATA

STANDARD PENETRATION TEST BLOWS/FOOT



LEGEND

U.S.C.	Unified soil classification
I	2" O.D. split spoon sample
*	Sample not recovered
II	3" O.D. Shelby sample
P	Sampler pushed

LOG OF BORING 5

W-65-151 APRIL 1965

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Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-5

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FIG. A-14

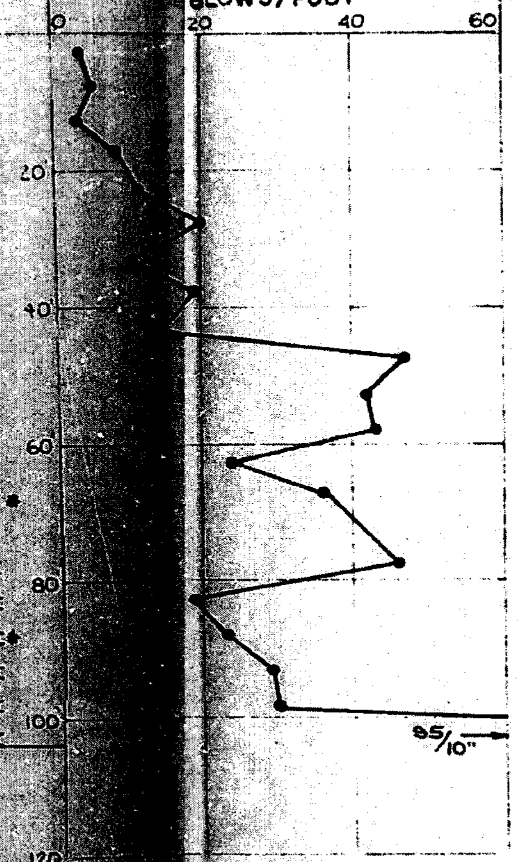
W-681

(25)

DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL 28.0'	SAMPLES
2.4		ML	Loose, tan, fine sandy SILT	1 I
		SM	Loose, tan, fine SAND with seams of silt and fragments of wood	2 I, 3 I, 4 I
21.0	▼			5 I
		GW	Medium, gray, fine to coarse sandy GRAVEL to 1½", with wood fragments	6 I, 7 I, 8 I, 9 I
43.5				
		SP	Dense, gray, fine SAND with trace of gravel to 1¼"	10 I, 11 I, 12 I, 13 I, 14 I*, 15 I, 16 I, 17 I*, 18 I, 19 I
96.0				
103.5		SP	Dense, gray, gravelly (to 1¼") fine SAND	20 I

FIELD DATA

STANDARD PENETRATION TEST BLOWS/FOOT



LEGEND

U.S.C.	Unified soil classification
I	2" O.D. split spoon sample
*	Sample not recovered
▮	Observation well

LOG OF BORING 6

W-65-151 APRIL, 1965

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FIG. 9

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-6

March 2009 21-1-20464-003

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FIG. A-15

W-681

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DEPTH FEET	GROUND WATER LEVEL	U.S.C.	SOIL DESCRIPTION EL. 24.5'	SAMPLES
2.7		ML	Loose, tan SILT	1 I
17.5		SM	Loose, tan, very fine SAND, few seams of sandy SILT	2 I, 3 I
24.0		SP	Loose, fine gravelly, fine to coarse SAND with random wood fragments	4 I, 5 I
28.0		OL	Med., lt blue-gray CLAY with few thin peat seams	6 I
54.0		SP	Medium, gray, fine to medium SAND with random peat fragments and traces of fine gravel	7 I, 8 I, 9 I, 10 I, 11 I
60.0		GM	Dense, gray, silty, fine to coarse, sandy GRAVEL to ½"	12 I
63.5		CL & OL	Med., dk gray, clayey SILT & CLAY with peat seams	13 I
79.0		SM	Medium to dense, gray, fine SAND with few thin seams clayey silt	14 I, 15 I, 16 I

FIELD DATA — STANDARD PENETRATION TEST BLOWS/FOOT

LEGEND

U.S.C.	Unified soil classification
I	2" O.D. split spoon sample
*	Sample not recovered

LOG OF BORING 7

W-65-151 APRIL, 1965

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SOIL MECHANICS & FOUNDATION ENGINEERS

FIG. 10

Anacortes Water Treatment Plant
Mount Vernon, Washington

LOG OF BORING B-7

March 2009 21-1-20464-003

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FIG. A-16

APPENDIX B

GEOTECHNICAL LABORATORY TESTING PROCEDURES AND RESULTS

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

TABLE OF CONTENTS

Page

FIGURES

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

B.1 INTRODUCTION

This appendix contains descriptions of the procedures and the results of the geotechnical laboratory tests performed on soil samples obtained from the current soil borings. The samples were tested to evaluate the basic index and physical properties of the soils. Visual classification, natural water content, grain-size analyses, and Atterberg limit testing were performed at the Shannon & Wilson, Inc. laboratory in Seattle in March 2009. Resistivity testing was performed by AMTEST Laboratories of Kirkland, Washington, in March 2009.

B.2 VISUAL CLASSIFICATION

The soil samples recovered from the borings were visually reclassified in our laboratory using a system based on ASTM International (ASTM) Designation: D-2487, Standard Test Method for Classification of Soil for Engineering Purposes, and ASTM Designation: D-2488, Standard Recommended Practice for Description of Soils (Visual-Manual Procedure). This visual classification method allows for convenient and consistent comparison of soils from widespread geographic areas. With this method, the soils can be classified by using the Unified Soil Classification System. The individual sample classifications have been incorporated into the boring logs presented in Appendix A.

B.3 WATER CONTENT DETERMINATION

The water content of soil samples recovered from the borings was determined in general accordance with ASTM Designation: D-2216, Standard Method of Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures. Comparison of water content of a soil with its index properties can be useful in characterizing soil unit weight, consistency, compressibility, and strength. The water content is plotted on the boring logs presented in Appendix A.

B.4 GRAIN SIZE ANALYSIS

Grain size analyses were performed on selected samples of granular soil in general accordance with ASTM Designation: D-422, Standard Method for Particle-Size Analysis of Soils. The general procedures to determine the grain size distribution of a soil include sieve analysis, hydrometer analysis, and combined analysis. For this project, only sieve analyses were performed.

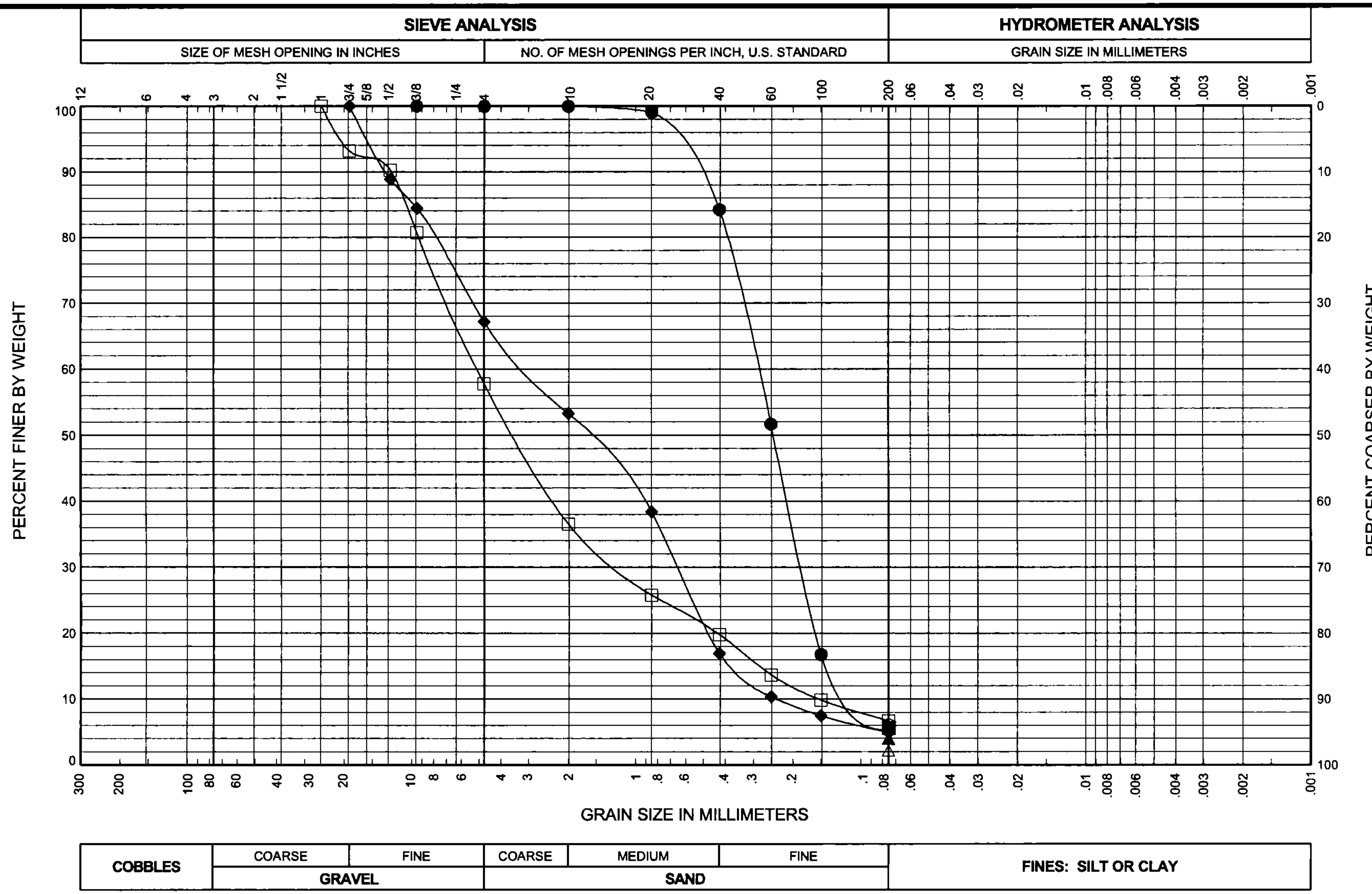
Grain size distribution is used to assist in classifying soils and evaluating their potential to be used as backfill, and to provide correlation with soil properties. The results of the grain size analyses are plotted on the grain size distribution curves presented in Figures B-1 through B-7.

B.5 ATTERBERG LIMIT DETERMINATION

Atterberg limits were determined on selected samples of fine-grained soils obtained in the borings in general accordance with ASTM D 4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils. The Atterberg limits include Liquid Limit (LL), Plastic Limit (PL), and Plasticity Index (LL – PL = PI). They are generally used to assist in classification of soils, to indicate soil consistency (when compared with natural water content), and to provide correlation to soil properties including compressibility and strength. The results of the Atterberg limits determinations are shown in the boring log and are shown graphically in the plasticity chart presented in Figure B-8.

B.6 RESISTIVITY TESTING

Resistivity testing was performed on selected samples obtained from the soil borings. Soil resistivity is used to evaluate the corrosion potential of soil. The AMTEST Laboratories testing report for the soil resistivity testing is attached to this Appendix.



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-1, S-7	17.5	SP-SM	Brown, slightly silty, fine to medium SAND	5.2	25.6			
■ RB-1, S-8	20.0	SP-SM	Brown, slightly silty SAND, trace of gravel	5.6	26.0			
▲ RB-1, S-9	25.0	SP	Gray SAND, trace of silt	3.9	18.9			
◆ RB-1, S-12	40.0	SP	Gray, gravelly SAND, trace of silt	4.9	15.1			
○ RB-1, S-14	50.0	SP-SM	Gray, slightly silty, gravelly SAND	6.1	18.7			
□ RB-1, S-16	60.0	SW-SM	Gray, slightly silty, gravelly SAND	6.7	12.1			
△ RB-1, S-18	70.0	SP	Gray SAND, trace of silt	2.1	28.2			

Anacortes Water Treatment Plant
Mount Vernon, Washington

GRAIN SIZE DISTRIBUTION
BORING RB-1

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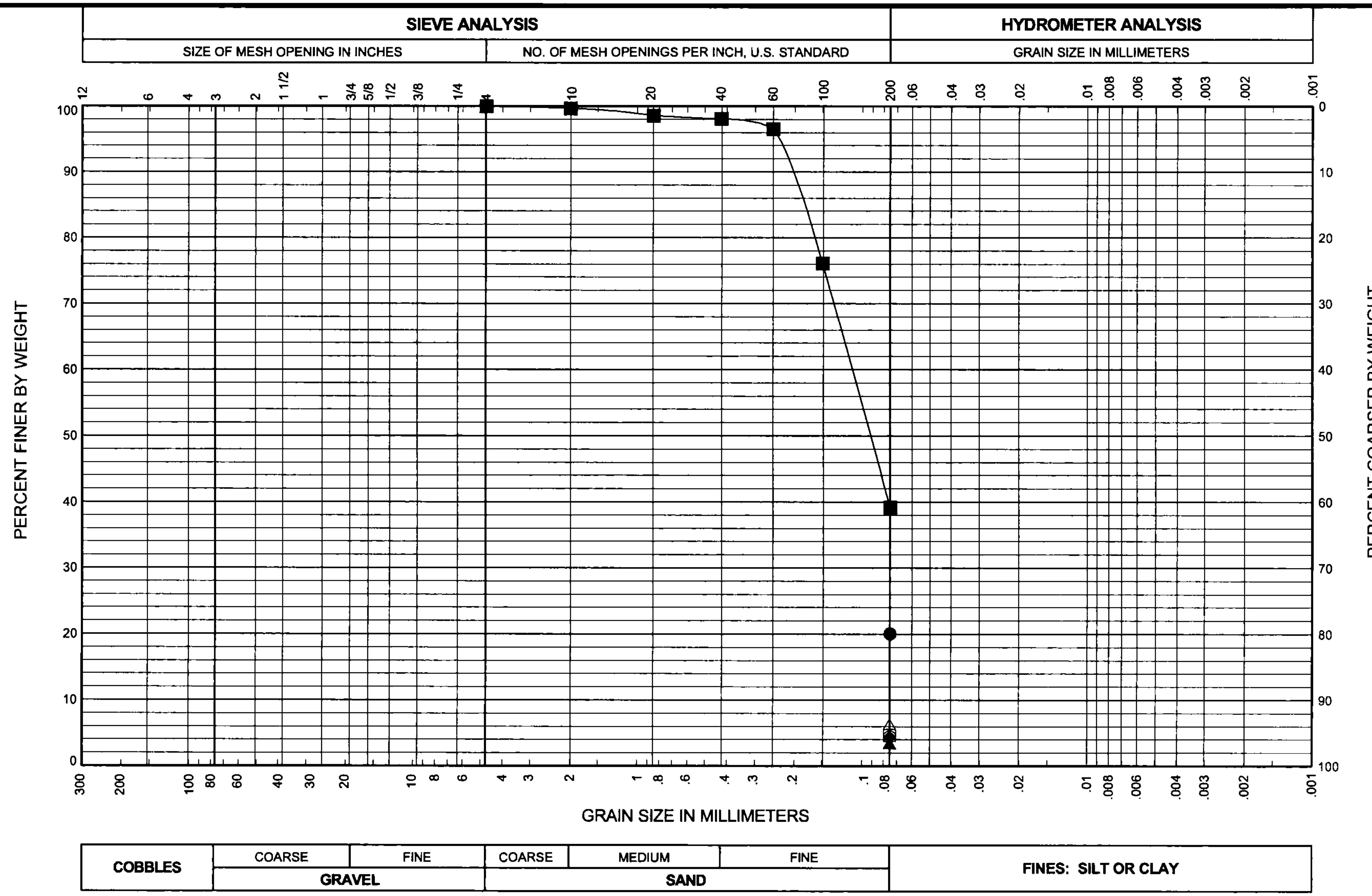
FIG. B-1

FIG. B-1



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-2, S-3	8.3	SM	Gray-brown, silty, fine SAND; trace of organics	20.0	24.0			
■ RB-2, S-4	10.0	SM	Brown, silty, fine SAND	39.2	30.4			
▲ RB-2, S-7	17.5	SP	Brown SAND, trace of silt	3.4	27.6			
◆ RB-2, S-9	25.0	SP	Brown, gravelly SAND, trace of silt	4.3	16.7			
○ RB-2, S-10	30.0	SP	Gray SAND, trace of silt and gravel	4.4	25.2			
□ RB-2, S-14	50.0	SP	Gray, slightly gravelly SAND, trace of silt	4.7	19.6			
△ RB-2, S-17	65.0	SP-SM	Gray, slightly silty SAND	6.3	27.8			

Anacortes Water Treatment Plant
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GRAIN SIZE DISTRIBUTION
BORING RB-2

March 2009 21-20464-003

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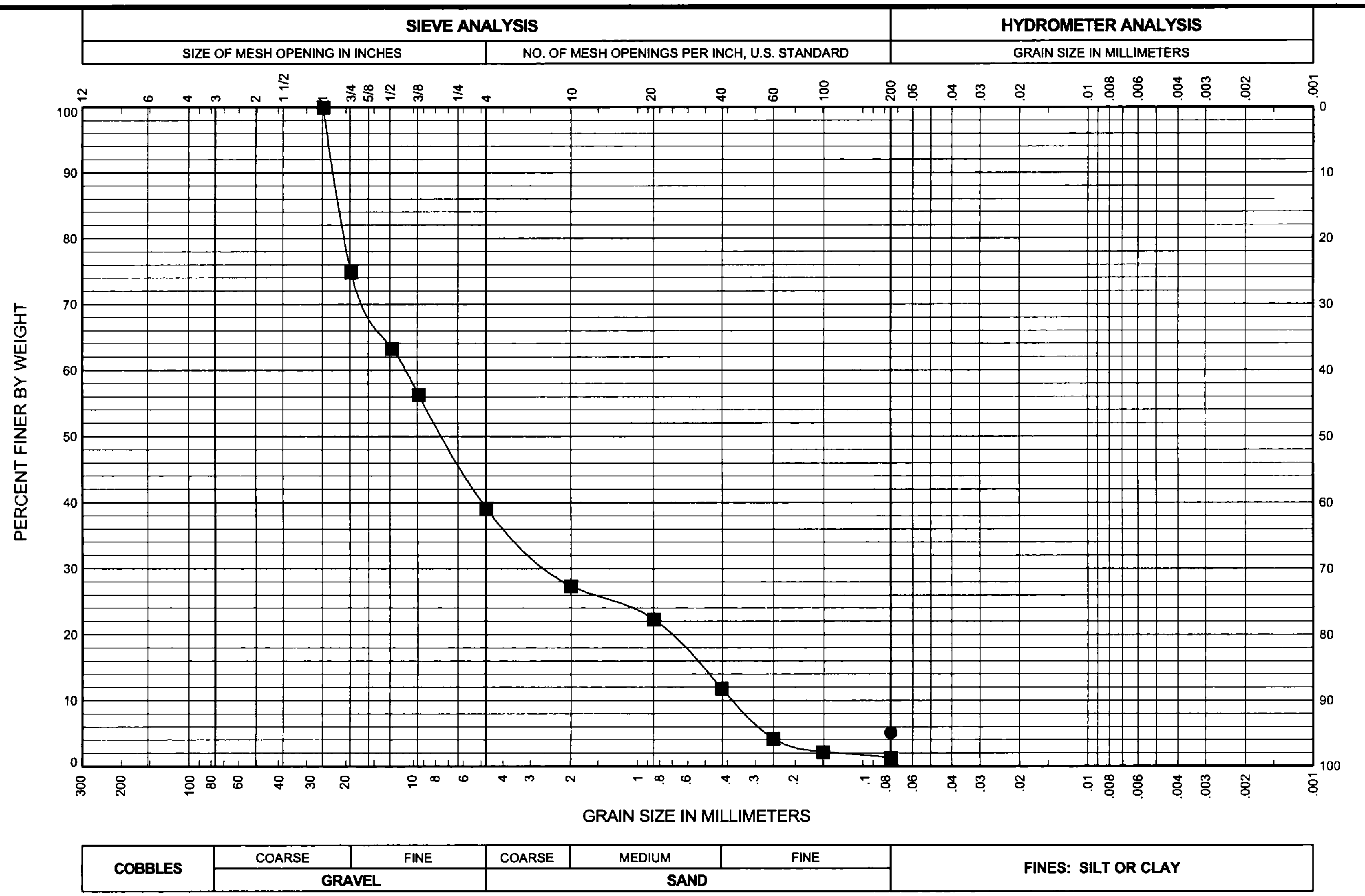
FIG. B-2
Sheet 1 of 2



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-2, S-18	70.0	SP-SM	Gray, slightly silty SAND	5.1	24.5			
■ RB-2, S-23	95.0	GW	Gray, sandy GRAVEL, trace of silt	1.3	9.6			

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GRAIN SIZE DISTRIBUTION BORING RB-2

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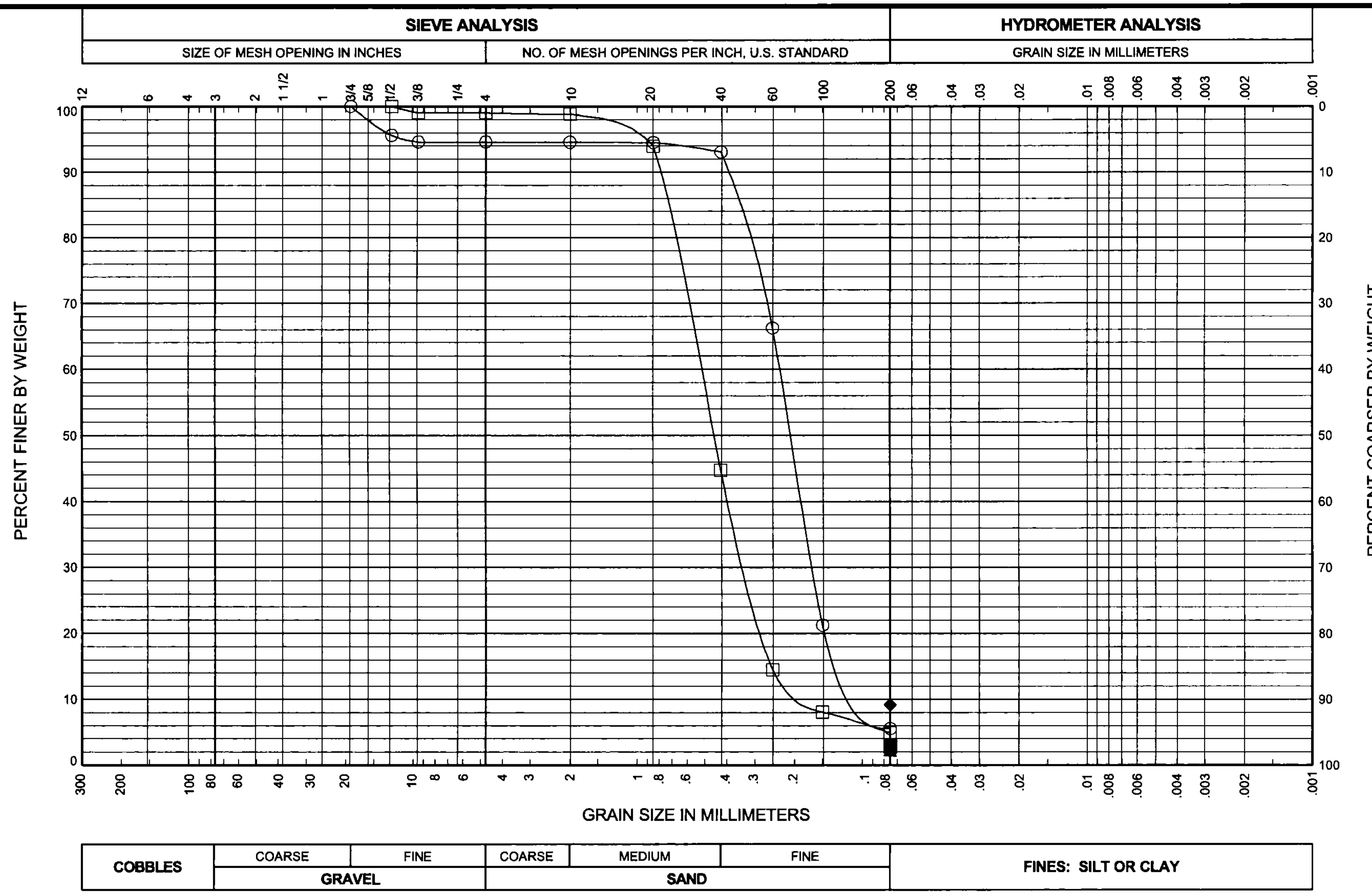
FIG. B-2
Sheet 2 of 2

FIG. B-2



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-4, S-8	20.0	SP	Dark brown SAND, trace of silt	2.3	22.5			
■ RB-4, S-10	30.0	GP	Gray-brown, sandy GRAVEL, trace of silt	2.9	10.0			
▲ RB-4, S-13	45.0	SP	Gray-brown, gravelly SAND, trace of silt	2.2	42.5			
◆ RB-4, S-16	60.0	SP-SM	Gray, slightly silty SAND	9.1	29.0			
○ RB-4, S-18	70.0	SP-SM	Gray, slightly gravelly, slightly silty, fine SAND; trace of wood fragments	5.5	29.4			
□ RB-4, S-20	80.0	SP	Gray, fine to medium SAND, trace of silt and gravel	4.9	23.8			

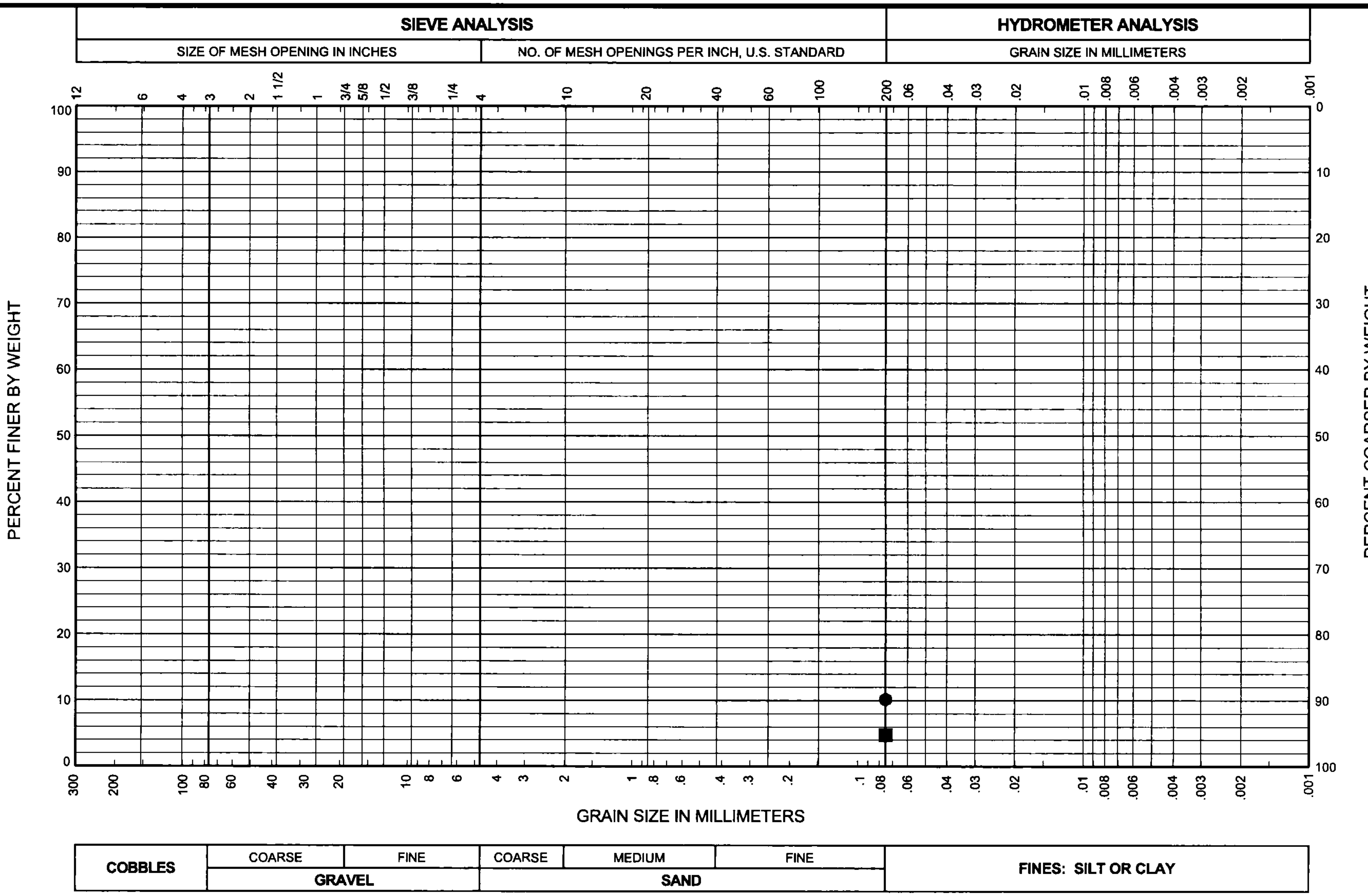
Anacortes Water Treatment Plant
Mount Vernon, Washington

GRAIN SIZE DISTRIBUTION BORING RB-4

March 2009 21-20464-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. B-3



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-5, S-7	17.5	SP-SM	Brown, slightly silty SAND, trace of clay; numerous organics	10.1	64.1			
■ RB-5, S-11	32.5	GP	Gray, sandy GRAVEL, trace of silt	4.8	16.2			

Anacortes Water Treatment Plant
Mount Vernon, Washington

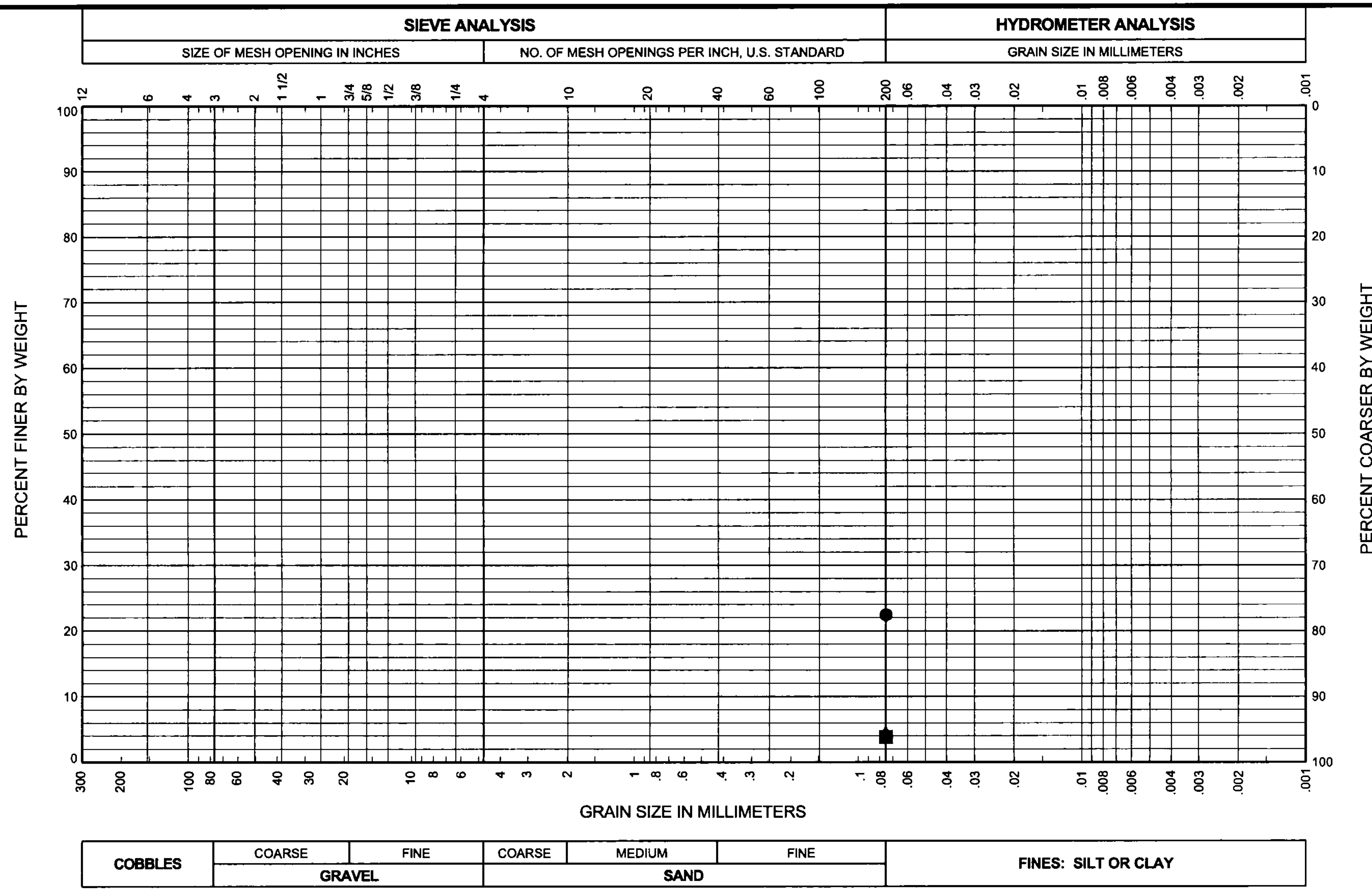
GRAIN SIZE DISTRIBUTION BORING RB-5

March 2009 21-20464-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. B-4

FIG. B-4



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-6, S-6	15.3	SM	Gray-brown, silty, fine SAND; trace of organics	22.4	36.7			
■ RB-6, S-12	40.0	SP	Gray-brown, slightly gravelly SAND, trace of silt	3.9	12.5			
▲ RB-6, S-18	70.0	SP	Gray SAND, trace of silt	4.6	26.0			

Anacortes Water Treatment Plant
Mount Vernon, Washington

GRAIN SIZE DISTRIBUTION BORING RB-6

March 2009 21-20464-003

SHANNON & WILSON, INC.
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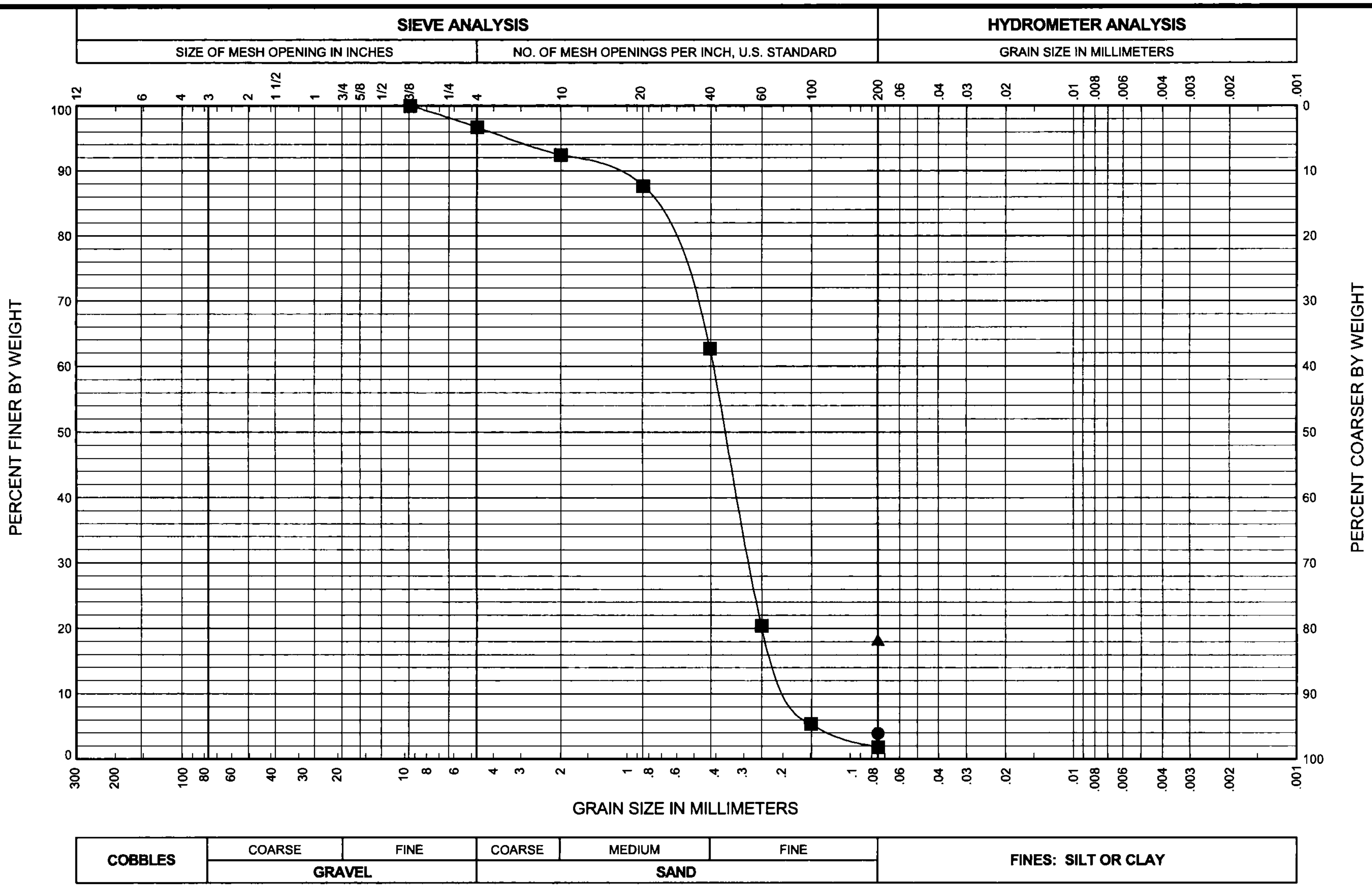
FIG. B-5

FIG. B-5



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-7, S-7	17.5	SP	Gray-brown, fine to medium SAND, trace of silt	3.9	28.4			
■ RB-7, S-13	45.0	SP	Gray-brown SAND, trace of gravel and silt	1.9	22.2			
▲ RB-7, S-16	60.0	SM	Gray-brown, silty, fine SAND	18.3	26.5			

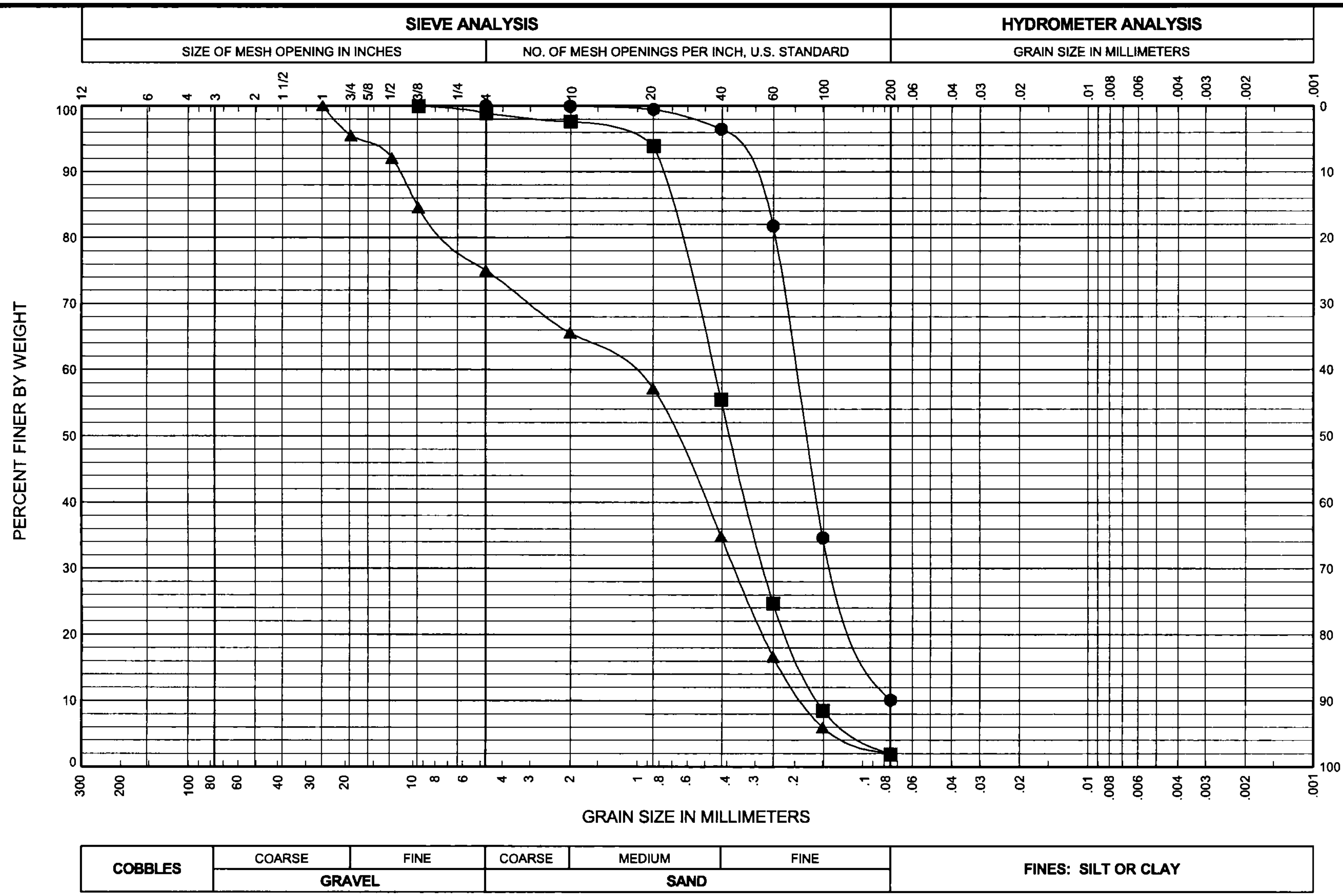
Anacortes Water Treatment Plant
Mount Vernon, Washington

GRAIN SIZE DISTRIBUTION
BORING RB-7

March 2009 21-20464-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. B-6



BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SAMPLE DESCRIPTION	FINES %	NAT. W.C. %	LL %	PL %	PI %
● RB-8, S-7	17.5	SP-SM	Gray-brown, slightly silty, fine SAND; numerous organics	10.1	28.6			
■ RB-8, S-8	20.0	SP	Gray, fine to medium SAND, trace of silt and gravel	2.0	26.7			
▲ RB-8, S-9	25.0	SP	Gray, gravelly SAND, trace of silt	2.0	25.2			

Anacortes Water Treatment Plant
Mount Vernon, Washington

GRAIN SIZE DISTRIBUTION BORING RB-8

March 2009

21-20464-003

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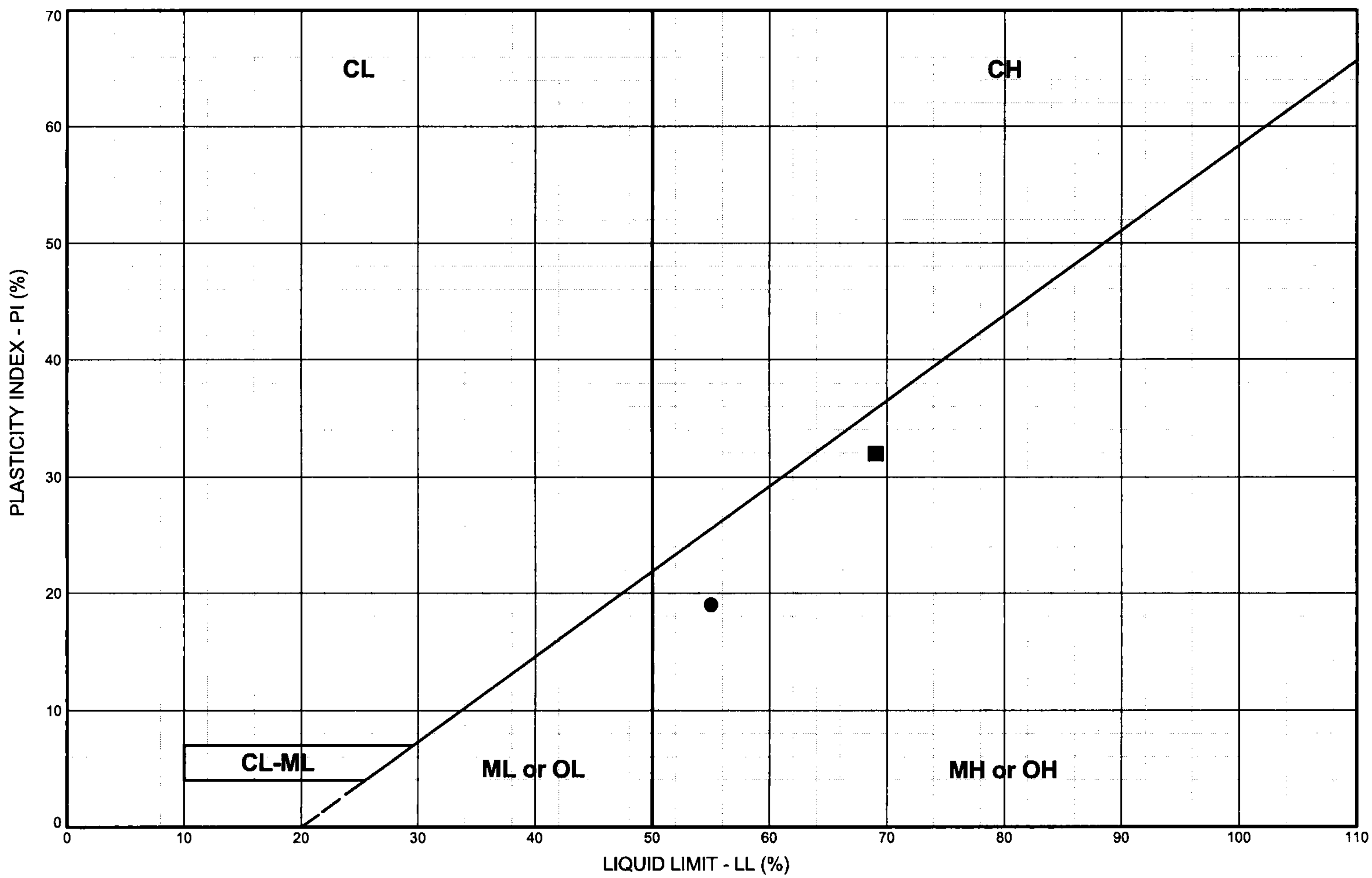
Geotechnical and Environmental Consultants

FIG. B-7

FIG. B-7



LEGEND

CL: Low plasticity inorganic clays; sandy and silty clays

CH: High plasticity inorganic clays

ML or OL: Inorganic and organic silts and clayey silts of low plasticity

MH or OH: Inorganic and organic silts and clayey silts of high plasticity

CL-ML: Silty clays and clayey silts

BORING AND SAMPLE NO.	DEPTH (feet)	U.S.C.S. SYMBOL	SOIL CLASSIFICATION	LL %	PL %	PI %	NAT. W.C. %	PASS. #200, %
● RB-5, S-23	90.0	MH	Gray-brown, slightly clayey SILT, trace of fine sand	55	36	19	91.7	
■ RB-6, S-16	60.0	MH	Gray-brown, clayey SILT, trace of fine sand; numerous organics	69	37	32	69.7	

Anacortes Water Treatment Plant
Mount Vernon, Washington

PLASTICITY CHART

March 2009 21-20464-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. B-8

AMTEST
L A B O R A T O R I E S

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Mar 10 2009
Shannon & Wilson
400 N 34th St
Suite 100
Seattle, WA 98103
Attention: Martin Page

Dear Martin Page:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
S-1	Soil	09-A003725	CONV
S-2	Soil	09-A003726	CONV
S-3	Soil	09-A003727	CONV
S-4	Soil	09-A003728	CONV
S-5	Soil	09-A003729	CONV

Your samples were received on Tuesday, March 3, 2009. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Method Detection Limits (MDL's), as opposed to Practical Quantitation Limits (PQL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 21-1-20464-003

BACT = Bacteriological	MET = Metals	NUT=Nutrients	MIN=Minerals
CONV = Conventionals	ORG = Organics	DEM=Demand	APC=Aerobic Plate Count
TC=Total Coliforms			

AMTEST Identification Number 09-A003728
Client Identification S-4
Sampling Date 02/19/09

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Resistivity	19000	ohms cm			ASTM G-57	SL	03/05/09

AMTEST Identification Number 09-A003729
Client Identification S-5
Sampling Date 02/19/09

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Resistivity	13000	ohms cm			ASTM G-57	SL	03/05/09

Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

Professional Analytical Services

ANALYSIS REPORT

Shannon & Wilson
400 N 34th St
Seattle, WA 98103
Attention: Martin Page
Project #: 21-1-20464-003
All results reported on an as received basis.

Date Received: 03/03/09
Date Reported: 3/10/09

AMTEST Identification Number 09-A003725
Client Identification S-1
Sampling Date 02/19/09

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Resistivity	33000	ohms cm			ASTM G-57	SL	03/05/09

AMTEST Identification Number 09-A003726
Client Identification S-2
Sampling Date 02/19/09

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Resistivity	50000	ohms cm			ASTM G-57	SL	03/05/09

AMTEST Identification Number 09-A003727
Client Identification S-3
Sampling Date 02/19/09

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Resistivity	19000	ohms cm			ASTM G-57	SL	03/05/09

APPENDIX C

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL REPORT

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

Appendix C1. Initial Investigation Field Documentation

1 - Field Corrective Actions - Initial Investigation
2 - Sedimentation Basin PCB Sample Photolog - All Samples
3 - Filtration Basin PCB Sample Photolog - All Samples
4 - Clearwell and Wastewell PCB Sample Photolog - All Samples
5 - Administration Bldg. PCB Sample Photolog - All Samples

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: Privileged and Confidential - Field Corrective Action #1
Date: Tuesday, July 07, 2015 2:15:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: In accordance with Section 3.1.2 of the Sampling Plan, the XRF is to be used to identify locations with >100 mg/kg Pb, for location of bulk paint chip sampling.

Deviation: The XRF provides results in mg/cm^2 which cannot be converted to a mass-based measurement. XRF measurements were collected and recorded throughout the facility. The HUD standard for lead-based paint is >1 mg/cm2. Sample locations were determined based upon paint characteristics (color, location, substrate) with corresponding XRF readings recorded for comparison with analytical results. Not all bulk sample locations correspond to a HUD threshold LBP location. The bulk sample locations were instead chosen to fully represent a majority of paint characteristics present at the site.

This deviation affects waste characterization data for Total Lead and TCLP metals. No PCB sample analysis is impacted.

Richard Malcolm

Richard Malcolm, P.E.
Supervising Engineer
MWH Americas, Inc.

60 Altadena Drive
Pittsburgh, PA 15228
(412) 668-0153
Cell (412) 680-9854

From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #2
Date: Tuesday, July 07, 2015 10:55:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Joint material samples AB-JOINT-01, AB-JOINT-02, AB-JOINT-03, along with one duplicate are to be collected.

Deviation: Inspection of the joints between the concrete T-beams in the Administration Building revealed no flexible joint material to be sampled. The AB-JOINT-XX samples will be eliminated.

This deviation affects PCB building material data.

Richard Malcolm

Richard Malcolm, P.E.
Supervising Engineer
MWH Americas, Inc.

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From:	Richard Malcolm
To:	Norman Cira; Bradly Toth
Subject:	RE: Privileged and Confidential - Field Corrective Action #3
Date:	Tuesday, July 07, 2015 10:57:00 PM

Correction – This is Field Corrective Action #3

From: Richard Malcolm
Sent: Tuesday, July 07, 2015 10:56 PM
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #2

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Joint material samples AB-JOINT-01, AB-JOINT-02, AB-JOINT-03, along with one duplicate are to be collected.

Deviation: Inspection of the joints between the concrete T-beams in the Administration Building revealed no flexible joint material to be sampled. The AB-JOINT-XX samples will be eliminated.

This deviation affects PCB building material data.

Richard Malcolm

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #4
Date: Wednesday, July 08, 2015 9:20:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan did not include collection of wipe samples from interior surfaces of the Admin Building.

Deviation: Per the discussion with Intertox, Inc. add three wipe samples to be collected from interior window sills of the Admint Building. Samples to be analyzed for PCBs and identified as:

- AB-WINWIPE-01
- AB-WINWIPE-02
- AB-WINWIPE-03

This deviation increases the number of samples to be analyzed for PCBs.

Richard Malcolm

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Supervising Engineer
MWH Americas, Inc.

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #5
Date: Wednesday, July 08, 2015 9:22:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan did not include collection of caulk samples from the Sedimentation Basin expansion joint.

Deviation: Per the discussion with Intertox, Inc. add up to three caulk samples to be collected from the Sedimentation Basin expansion joint area. Samples to be analyzed for PCBs and identified as:

- SB-CAULK-01
- SB-CAULK-02
- SB-CAULK-03

This deviation increases the number of samples to be analyzed for PCBs.

Richard Malcolm

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MWH Americas, Inc.

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Cell (412) 680-9854

From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #6
Date: Thursday, July 09, 2015 10:58:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: A total of 5 sediment samples were to be collected from the Clearwell.

Deviation: One additional Clearwell sediment sample (CW-SED-06) was added in order to collect scale from a pump header.

This deviation increases the number of samples to be analyzed for PCBs.

Richard Malcolm

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Cell (412) 680-9854

From:	Richard Malcolm
To:	Norman Cira; Bradly Toth
Subject:	RE: Privileged and Confidential - Field Corrective Action #7
Date:	Thursday, July 09, 2015 10:54:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Perform permit-required confined space entry into Wastewater Flume

Deviation: Per discussion with Anacortes WTP Operator, changed wastewater sampling location to the Wastewater Well. The Wastewater Flume confined space entry would be difficult due to pump well prior to flume entrance. Additionally, the flume appeared to be rather dry and contained little accumulated sediment deposits. Wastewater Well provided two bays with accumulated sediment that would be more representative of sediment from wastewater pumped to lagoons and collected during settling.

Due to the size of the Wastewater Well, this deviation decreased the number of concrete samples and increased the number of sediment samples (Field Corrective Action #8).

Richard Malcolm

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #8
Date: Thursday, July 09, 2015 11:03:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan required collection of 8 concrete samples and 2 sediment samples from the Wastewater Flume.

Deviation: Due to the change of wastewater sample location from the Wastewater Flume to the Wastewater Well, the following changes in sample numbers were incorporated:

- Two fewer concrete samples were collected. A total of 6 concrete samples was collected due to the size of the Wastewater flume. This included 5 vertical wall samples and one horizontal sample on a perimeter ledge.
- Two additional sediment samples were collected. A total of 4 sediment samples was collected due to the large accumulation of sediment in the Wastewater Well.

This deviation decreases the number of concrete samples and increases the number of sediment samples to be analyzed for PCBs.

Richard Malcolm

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MWH Americas, Inc.

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Cell (412) 680-9854

From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #9
Date: Friday, July 10, 2015 6:57:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan did not include wipe samples from steel components.

Deviation: Two additional wipe samples were collected from steel flocculator plates for PCB analysis. The samples are identified as:

- SB-STEELWIPE-01
- SB-STEELWIPE-02

This deviation decreases the number of concrete samples and increases the number of sediment samples to be analyzed for PCBs.

Richard Malcolm

Richard Malcolm, P.E.
Supervising Engineer
MWH Americas, Inc.

60 Altadena Drive
Pittsburgh, PA 15228
(412) 668-0153
Cell (412) 680-9854

From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #10
Date: Monday, July 13, 2015 8:45:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan did not include multiple sealant samples from each expansion joint sampling location.

Deviation: Four additional sealant samples were collected from the expansion joint in the West half of the Sedimentation Basin, and additional samples are anticipated in the East half of the Sedimentation Basin. All additional samples are to be analyzed for PCBs. The additional samples are named with A-B-C identifiers to indicate layers of sealant, with A being deepest and on top of primary sealant. The samples are identified as:

- SB-SEALA-01
- SB-SEALB-01
- SB-SEALC-01
- SB-SEALC-02 (Layers B and C type sealant were not encountered in Location #2)
- SB-SEAL (A-C)-03
- SB-SEAL (A-C)-04

This deviation increases the number of sealant samples to be analyzed for PCBs.

Richard Malcolm

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #11
Date: Tuesday, July 14, 2015 7:49:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan required collection of 16 interior coating samples from the Sedimentation Basin and one QC duplicate.

Deviation: No coating was observed in the primary Sedimentation Basin Bays or the Flocculator Bays. The Sedimentation Basin overflow troughs had a thin layer of white paint. The paint was well adhered to the concrete and was not able to be collected in sufficient sample volume via hand scraping. Two samples were collected; however, scraping yielded concrete chips and dust, which were included in the sample volume collected. Due to the difficulty in extracting sample volume and the high potential for contaminating samples with the underlying concrete substrate, 14 interior coating samples and one QC duplicate were eliminated.

This deviation decreases the number of Sedimentation Basin interior coating samples to be analyzed for PCBs.

Richard Malcolm

Richard Malcolm, P.E.
Supervising Engineer
MWH Americas, Inc.

60 Altadena Drive
Pittsburgh, PA 15228
(412) 668-0153
Cell (412) 680-9854

From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: RE: Privileged and Confidential - Field Corrective Action #12
Date: Tuesday, July 14, 2015 7:52:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: Sampling Plan included collection of 6 paint chip samples for analysis of total lead and TCLP RCRA metals.

Deviation: One additional paint chip sample was collected from the exterior paint on the concrete block storage building. The additional sample will be analyzed for total lead and TCLP RCRA metals. The sample is identified as:

- PC-07

This deviation increases the number of paint chip samples to be analyzed for total lead and TCLP RCRA metals.

Richard Malcolm

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 1 **Sample ID:** SB-EXPC-01 **Sample Date:** 7/7/2015 **Sample Location:** E side; N-49'SE **Sample Result:** 21,000 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 2 **Sample ID:** SB-EXPC-02 **Sample Date:** 7/7/2015 **Sample Location:** E side; N-99' SE **Sample Result:** 27,000 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 3

Sample ID: SB-EXPC-03

Sample Date: 7/7/2015

Sample Location: E side; SE-40'NW

Sample Result: 34,000

Units - Analyte: mg/kg - PCB

Photograph ID: 4

Sample ID: SB-EXPC-04

Sample Date: 7/7/2015

Sample Location: S Side; S-13'NE

Sample Result: 10,400

Units - Analyte: mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 5

Sample ID:
SB-EXPC-05

Sample Date:
7/7/2015

Sample Location:
W side; S-62'NW

Sample Result:
21,300

Units - Analyte:
mg/kg - PCB

Photograph ID: 6

Sample ID:
SB-EXPC-06

Sample Date:
7/7/2015

Sample Location:
W side; S-127'NW

Sample Result:
11,100

Units - Analyte:
mg/kg - PCB

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Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 7

Sample ID: SB-EXPC-07

Sample Date: 7/7/2015

Sample Location: W side; NW-6'SE

Sample Result: 28,000

Units - Analyte: mg/kg - PCB

Photograph ID: 8

Sample ID: SB-EXPC-08

Sample Date: 7/7/2015

Sample Location: N side; NStairCorn-11'S

Sample Result: 11,500

Units - Analyte: mg/kg - PCB

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 9	
Sample ID: SB-INPC-01	
Sample Date: 7/13/2015	
Sample Location: W side overflow trough	
Sample Result: 1,600	
Units - Analyte: mg/kg - PCB	

Photograph ID: 10	
Sample ID: SB-INPC-02	
Sample Date: 7/14/2015	
Sample Location: E side overflow trough	
Sample Result: 20,000	
Units - Analyte: mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 11

Sample ID:
SB-CONC-01

Sample Date:
7/10/2015

Sample Location:
Flocculator Basin - East Side

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 12

Sample ID:
SB-CONC-02

Sample Date:
7/10/2015

Sample Location:
Flocculator Basin - East Side

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 13 **Sample ID:** SB-CONC-03 **Sample Date:** 7/10/2015 **Sample Location:** Flocculator Basin - West Side **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 14 **Sample ID:** SB-CONC-04 **Sample Date:** 7/10/2015 **Sample Location:** Flocculator Basin - West Side **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 15 **Sample ID:** SB-CONC-05 **Sample Date:** 7/13/2015 **Sample Location:** W Side; 1st bay; E1/2; collector wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 16 **Sample ID:** SB-CONC-06 **Sample Date:** 7/13/2015 **Sample Location:** W Side; 1st bay; E1/2; side wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 17

Sample ID: SB-CONC-07

Sample Date: 7/13/2015

Sample Location: W Side; 2nd bay; W1/2; floor

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 18

Sample ID: SB-CONC-08

Sample Date: 7/13/2015

Sample Location: W Side; 2nd bay; W1/2; side wall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 19

Sample ID:
SB-CONC-09

Sample Date:
7/13/2015

Sample Location:
W Side; 3rd bay; W1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 20

Sample ID:
SB-CONC-10

Sample Date:
7/13/2015

Sample Location:
W Side; 3rd bay; W1/2; side wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 21

Sample ID:
SB-CONC-11

Sample Date:
7/13/2015

Sample Location:
W Side; 4th bay; E1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 22

Sample ID:
SB-CONC-12

Sample Date:
7/13/2015

Sample Location:
W Side; 4th bay; E1/2; side wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 23 **Sample ID:** SB-CONC-13 **Sample Date:** 7/13/2015 **Sample Location:** W Side; 5th bay; E1/2; floor **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 24 **Sample ID:** SB-CONC-14 **Sample Date:** 7/13/2015 **Sample Location:** W Side; 5th bay; E1/2; side wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 25

Sample ID:
SB-CONC-15

Sample Date:
7/13/2015

Sample Location:
W Side; 6th bay; W1/2; center column

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 26

Sample ID:
SB-CONC-16

Sample Date:
7/13/2015

Sample Location:
W Side; 6th bay; W1/2; side wall

Sample Result:
<0.4

Units - Analyte:
mg/kg - PCB

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 27

Sample ID:
SB-CONC-17

Sample Date:
7/13/2015

Sample Location:
W Side; 7th bay; W1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 28

Sample ID:
SB-CONC-18

Sample Date:
7/13/2015

Sample Location:
W Side; 7th bay; W1/2; endwall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 29

Sample ID: SB-CONC-19

Sample Date: 7/13/2015

Sample Location: W Side; overflow trough; floor

Sample Result: 83

Units - Analyte: mg/kg - PCB

Photograph ID: 30

Sample ID: SB-CONC-20

Sample Date: 7/13/2015

Sample Location: W Side; overflow trough; int wall

Sample Result: 71

Units - Analyte: mg/kg - PCB

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 31

Sample ID:
SB-CONC-21

Sample Date:
7/13/2015

Sample Location:
W Side; overflow trough; side wall (paint)

Sample Result:
260

Units - Analyte:
mg/kg - PCB

Photograph ID: 32

Sample ID:
SB-CONC-22

Sample Date:
7/13/2015

Sample Location:
W Side; overflow trough; floor

Sample Result:
61

Units - Analyte:
mg/kg - PCB

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 33 **Sample ID:** SB-CONC-23 **Sample Date:** 7/13/2015 **Sample Location:** E Side; collector pit wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 34 **Sample ID:** SB-CONC-24 **Sample Date:** 7/13/2015 **Sample Location:** E Side; 1st bay; W1/2; center wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 35 **Sample ID:** SB-CONC-25 **Sample Date:** 7/13/2015 **Sample Location:** E Side; 2nd bay; W1/2; floor **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 36 **Sample ID:** SB-CONC-26 **Sample Date:** 7/13/2015 **Sample Location:** E Side; 2nd bay; W1/2; sidewall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 37	
Sample ID: SB-CONC-27	
Sample Date: 7/13/2015	
Sample Location: E Side; 3rd bay; E1/2; floor	
Sample Result: <0.2	
Units - Analyte: mg/kg - PCB	

Photograph ID: 38	
Sample ID: SB-CONC-28	
Sample Date: 7/13/2015	
Sample Location: E Side; 3rd bay; E1/2; sidewall	
Sample Result: <0.2	
Units - Analyte: mg/kg - PCB	

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 39

Sample ID:
SB-CONC-29

Sample Date:
7/13/2015

Sample Location:
E Side; 4th bay; E1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 40

Sample ID:
SB-CONC-30

Sample Date:
7/13/2015

Sample Location:
E Side; 4th bay; E1/2; center wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 41

Sample ID:
SB-CONC-31 (Note: Sample completion photo missing)

Sample Date:
7/13/2015

Sample Location:
E Side; 5th bay;E1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 42

Sample ID:
SB-CONC-32

Sample Date:
7/14/2015

Sample Location:
E Side; 5th bay; E1/2; sidewall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

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Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 43

Sample ID:
SB-CONC-33

Sample Date:
7/14/2015

Sample Location:
E Side; 6th bay; W1/2; floor

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 44

Sample ID:
SB-CONC-34

Sample Date:
7/14/2015

Sample Location:
E Side; 6th bay; W1/2; center wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 45

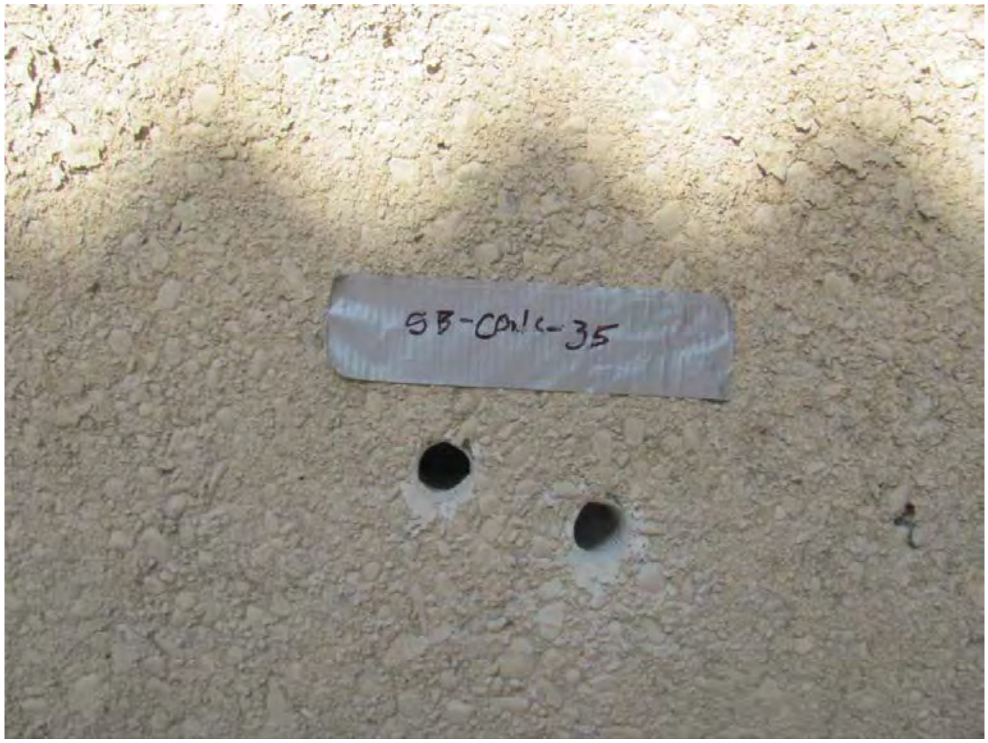
Sample ID: SB-CONC-35

Sample Date: 7/14/2015

Sample Location: E Side; 7th bay; W1/2; side wall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB



Photograph ID: 46

Sample ID: SB-CONC-36

Sample Date: 7/14/2015

Sample Location: E Side; 7th bay; W1/2; end wall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

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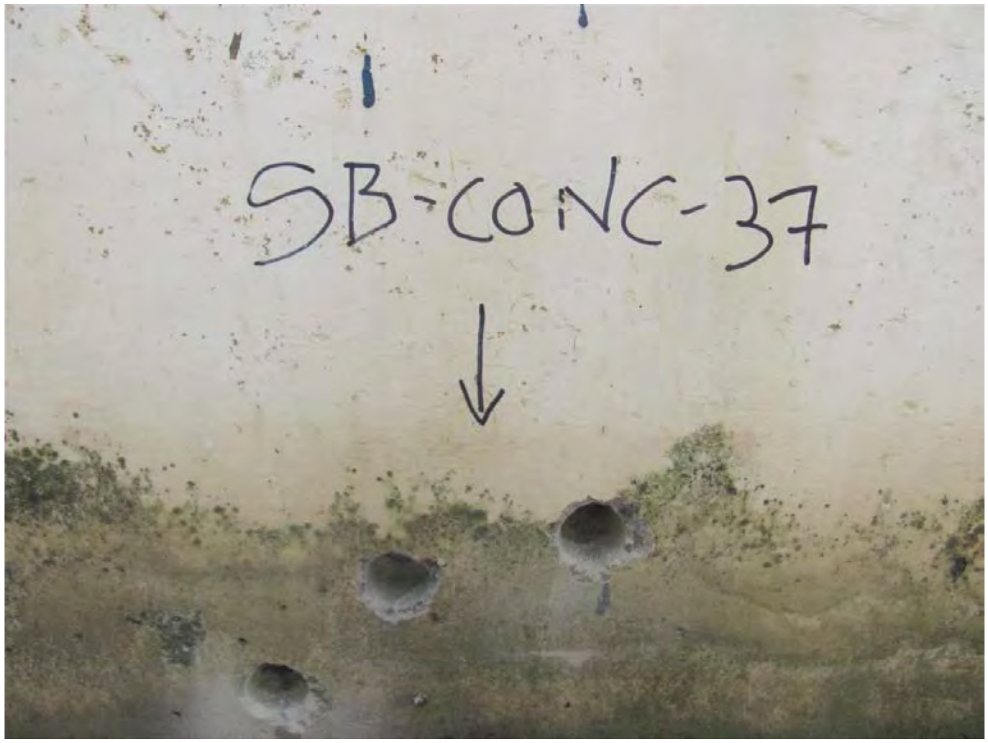
Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 47 **Sample ID:** SB-CONC-37 **Sample Date:** 7/14/2015 **Sample Location:** E Side; overflow trough; side wall (paint) **Sample Result:** 260 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 48 **Sample ID:** SB-CONC-38 **Sample Date:** 7/14/2015 **Sample Location:** E Side; overflow trough; floor (cross chute) **Sample Result:** 22 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 49

Sample ID: SB-CONC-39

Sample Date: 7/14/2015

Sample Location: E Side; overflow trough; int wall

Sample Result: 48

Units - Analyte: mg/kg - PCB

Photograph ID: 50

Sample ID: SB-CONC-40

Sample Date: 7/14/2015

Sample Location: E Side; overflow trough; floor

Sample Result: 65

Units - Analyte: mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 51 **Sample ID:** SB-SED-01 **Sample Date:** 7/10/2015 **Sample Location:** North Bay - East Side **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 52 **Sample ID:** SB-SED-02 **Sample Date:** 7/10/2015 **Sample Location:** North Bay - West Side **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 53 **Sample ID:** SB-SED-03 **Sample Date:** 7/10/2015 **Sample Location:** West Side; Collecctor Sump **Sample Result:** 0.25 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 54 **Sample ID:** SB-SED-04 **Sample Date:** 7/10/2015 **Sample Location:** West Side; Center Wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 55 **Sample ID:** SB-SED-05 **Sample Date:** 7/10/2015 **Sample Location:** West Side; Floor **Sample Result:** 6.1 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 56 **Sample ID:** SB-SED-06 **Sample Date:** 7/13/2015 **Sample Location:** East Side; Floor **Sample Result:** 5.5 **Units - Analyte:** mg/kg - PCB	No Photo Applicable

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Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 57

Sample ID:
SB-SED-07

Sample Date:
7/13/2015

Sample Location:
East Side; Collector Sump

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 58

Sample ID:
SB-SED-08

Sample Date:
7/13/2015

Sample Location:
East Side; Center Wall

Sample Result:
0.31

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 59

Sample ID:
SB-SED-09

Sample Date:
7/14/2015

Sample Location:
W Side; overflow trough

Sample Result:
1,900

Units - Analyte:
mg/kg - PCB

No Photo Applicable

Photograph ID: 60

Sample ID:
SB-SED-10

Sample Date:
7/14/2015

Sample Location:
E Side; overflow trough

Sample Result:
1,800

Units - Analyte:
mg/kg - PCB

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 61

Sample ID: SB-SEAL-01

Sample Date: 7/13/2015

Sample Location: W Side; E-1/2; expansion joint

Sample Result: 13,000

Units - Analyte: mg/kg - PCB

Photograph ID: 62

Sample ID: SB-SEALA-01

Sample Date: 7/13/2015

Sample Location: W Side; E-1/2; expansion joint

Sample Result: 470

Units - Analyte: mg/kg - PCB

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 63	
Sample ID: SB-SEALB-01	
Sample Date: 7/13/2015	
Sample Location: W Side; E-1/2; expansion joint	
Sample Result: 1,100	
Units - Analyte: mg/kg - PCB	
Photograph ID: 64	
Sample ID: SB-SEALC-01	
Sample Date: 7/13/2015	
Sample Location: W Side; E-1/2; expansion joint	
Sample Result: 1,500	
Units - Analyte: mg/kg - PCB	

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 65 **Sample ID:** SB-CORK-01 **Sample Date:** 7/13/2015 **Sample Location:** W Side; E-1/2; expansion joint **Sample Result:** 1,100 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 66 **Sample ID:** SB-SEAL-02 (RESIN) **Sample Date:** 7/13/2015 **Sample Location:** W Side; W-1/2; expansion joint **Sample Result:** 850 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 67	
Sample ID: SB-SEALC-02	
Sample Date: 7/13/2015	
Sample Location: W Side; W-1/2; expansion joint	
Sample Result: 5,600	
Units - Analyte: mg/kg - PCB	
Photograph ID: 68	No Photo Applicable
Sample ID: SB-CORK-02	
Sample Date: 7/13/2015	
Sample Location: W Side; W-1/2; expansion joint	
Sample Result: <1	
Units - Analyte: mg/kg - PCB	

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Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 69

Sample ID: SB-SEALA-03

Sample Date: 7/14/2015

Sample Location: E Side; W1/2; expansion joint

Sample Result: 120

Units - Analyte: mg/kg - PCB

Photograph ID: 70

Sample ID: SB-SEALB-03

Sample Date: 7/14/2015

Sample Location: E Side; W1/2; expansion joint

Sample Result: 38,000

Units - Analyte: mg/kg - PCB

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 71

Sample ID:
SB-SEALC-03

Sample Date:
7/14/2015

Sample Location:
E Side; W1/2; expansion joint

Sample Result:
1,700

Units - Analyte:
mg/kg - PCB

Photograph ID: 72

Sample ID:
SB-CORK-03 (Note: Sample collected from material that had fallen to floor)

Sample Date:
7/14/2015

Sample Location:
E Side; W1/2; expansion joint

Sample Result:
<1

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 73

Sample ID:
SB-SEAL-04 (adhered to SB-CORK-04)

Sample Date:
7/14/2015

Sample Location:
E Side; W1/2; expansion joint

Sample Result:
8.7

Units - Analyte:
mg/kg - PCB

Photograph ID: 74

Sample ID:
SB-CORK-04 (adhered to SB-SEAL-04)

Sample Date:
7/14/2015

Sample Location:
E Side; W1/2; expansion joint

Sample Result:
1

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 75

Sample ID:
SB-CAULK-01

Sample Date:
7/13/2015

Sample Location:
W Side; overflow trough; expansion joint

Sample Result:
5,230

Units - Analyte:
mg/kg - PCB

Photograph ID: 76

Sample ID:
SB-CAULK-02

Sample Date:
7/14/2015

Sample Location:
E Side; W1/2; expansion joint

Sample Result:
3.6

Units - Analyte:
mg/kg - PCB

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Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Sedimentation Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 77

Sample ID: SB-CAULK-03

Sample Date: 7/14/2015

Sample Location: W Side; overflow trough; expansion joint

Sample Result: 480

Units - Analyte: mg/kg - PCB

Photograph ID: 78

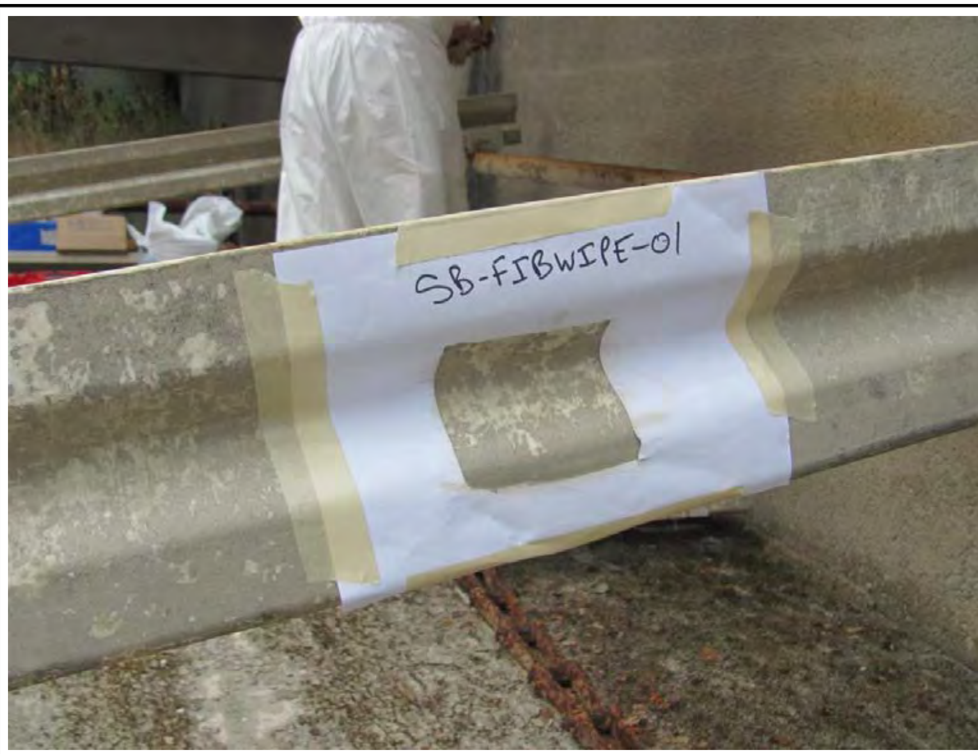
Sample ID: SB-FIBWIPE-01

Sample Date: 7/13/2015

Sample Location: West Side

Sample Result: <10

Units - Analyte: ug/100 cm2 - PCB



Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 79

Sample ID:
SB-FIBWIPE-02

Sample Date:
7/13/2015

Sample Location:
East Side

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

Photograph ID: 80

Sample ID:
SB-STEELWIPE-01 (Note: Photo incorrectly identifies sample as Fiber Wipe. This is a steel mixer)

Sample Date:
7/10/2015

Sample Location:
North Bay - East Side

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Sedimentation Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 81	
Sample ID: SB-STEELWIPE-02 (Note: Photo incorrectly identifies sample as Fiber Wipe. This is a steel mixer)	
Sample Date: 7/10/2015	
Sample Location: North Bay - West Side	
Sample Result: <10	
Units - Analyte: ug/100 cm2 - PCB	

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 1

Sample ID:
FB-EXPC-01

Sample Date:
7/7/2015

Sample Location:
N side; NW-7'NE

Sample Result:
25,000

Units - Analyte:
mg/kg - PCB

Photograph ID: 2

Sample ID:
FB-EXPC-02

Sample Date:
7/7/2015

Sample Location:
N side; N-29'SW

Sample Result:
35,000

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 3	
Sample ID: FB-EXPC-03	
Sample Date: 7/7/2015	
Sample Location: E side; SE-17'NW	
Sample Result: 25,000	
Units - Analyte: mg/kg - PCB	

Photograph ID: 4	
Sample ID: FB-EXPC-04	
Sample Date: 7/7/2015	
Sample Location: S side; S-26'NW	
Sample Result: 26,000	
Units - Analyte: mg/kg - PCB	

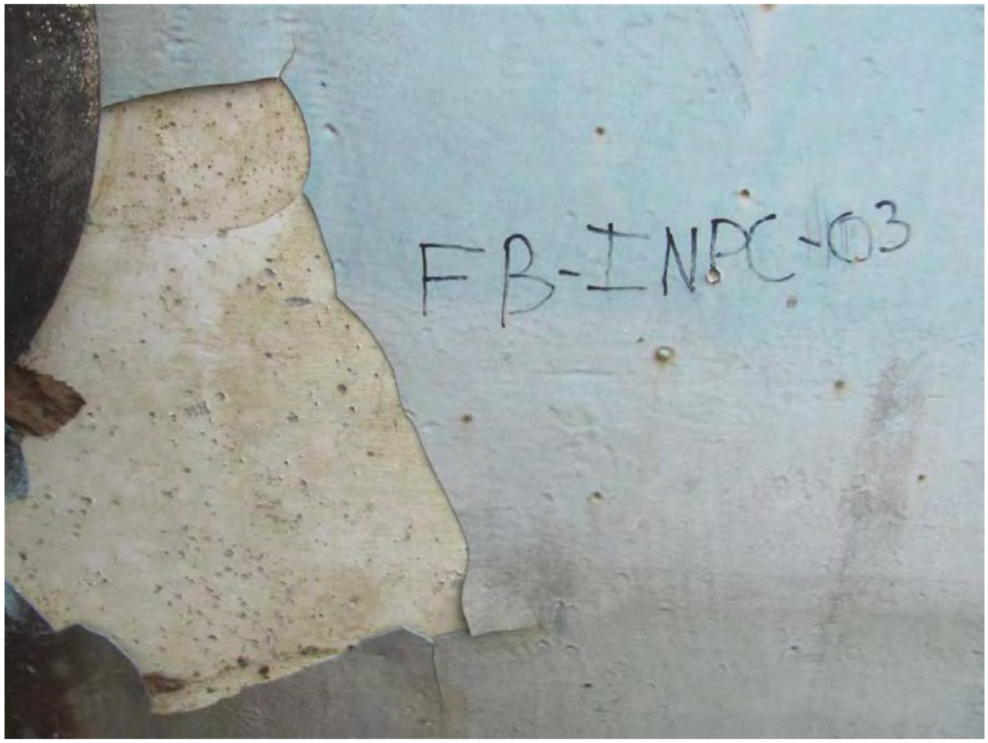
Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 5 **Sample ID:** FB-INPC-01 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-1ST N CELL **Sample Result:** 1,070 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 6 **Sample ID:** FB-INPC-02 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-1ST S CELL **Sample Result:** 8 **Units - Analyte:** mg/kg - PCB	

MWH

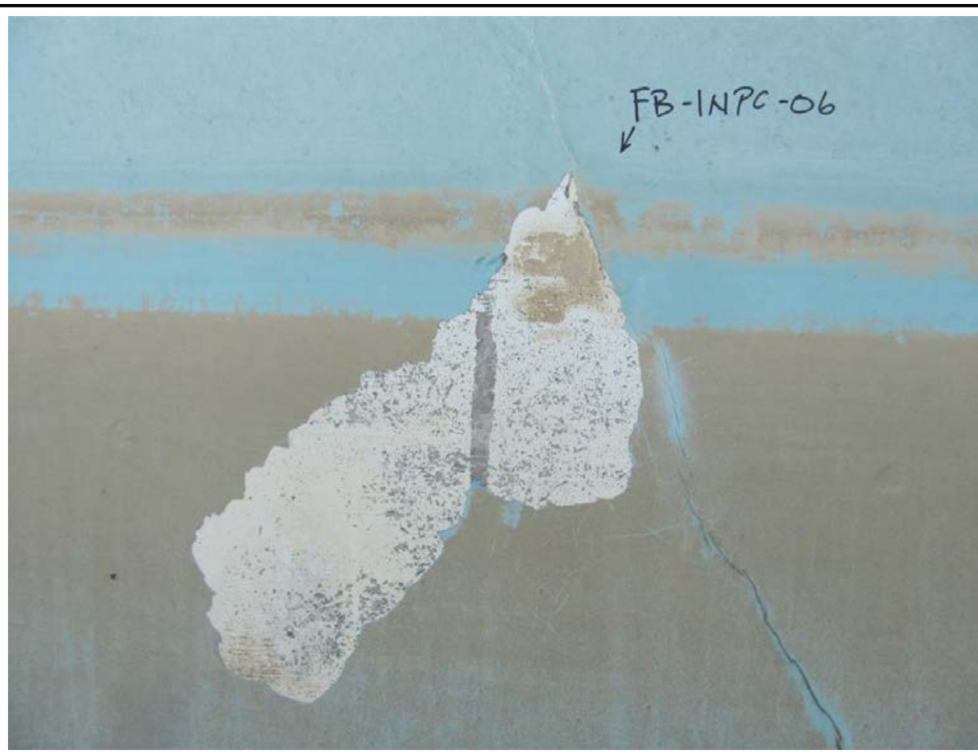
Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 7 **Sample ID:** FB-INPC-03 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-2ND N CELL **Sample Result:** 330 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 8 **Sample ID:** FB-INPC-04 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-2ND S CELL **Sample Result:** 4,070 **Units - Analyte:** mg/kg - PCB	

MWH **Photographic Log**

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 9 **Sample ID:** FB-INPC-05 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD S CELL **Sample Result:** 0.3 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 10 **Sample ID:** FB-INPC-06 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD N CELL **Sample Result:** 810 **Units - Analyte:** mg/kg - PCB	

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 11

Sample ID: FB-CONC-01

Sample Date: 7/8/2015

Sample Location: E1/2-1ST S CELL

Sample Result: 233

Units - Analyte: mg/kg - PCB

Photograph ID: 12

Sample ID: FB-CONC-02

Sample Date: 7/8/2015

Sample Location: E1/2-1ST N CELL

Sample Result: 160

Units - Analyte: mg/kg - PCB

MWH **Photographic Log**

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 13

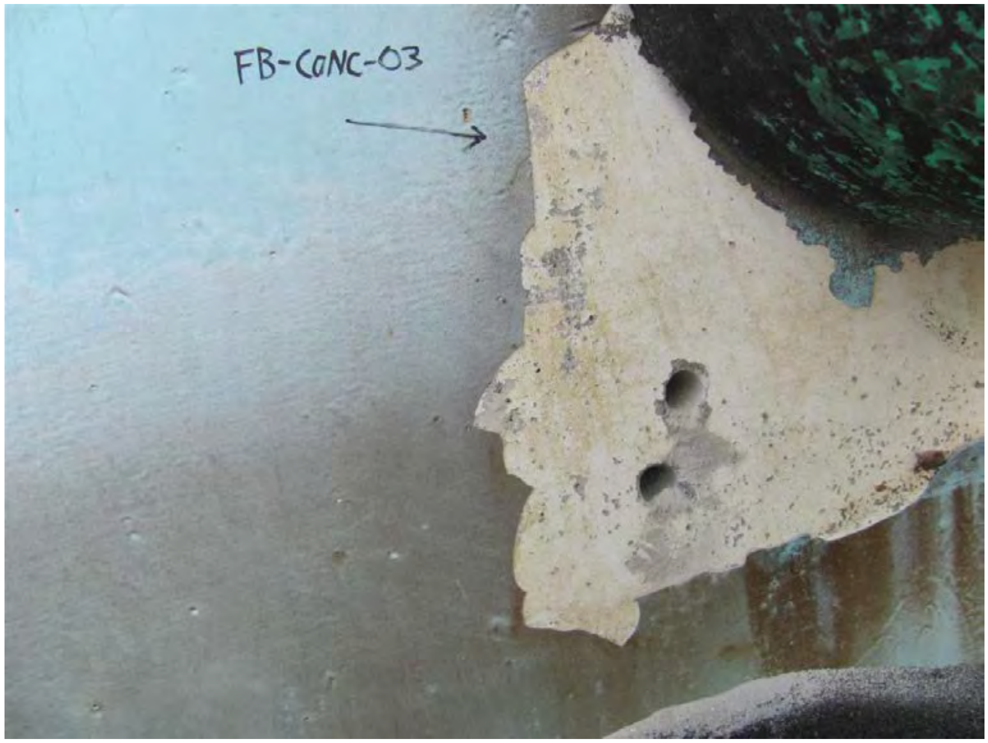
Sample ID:
FB-CONC-03

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND N CELL

Sample Result:
180

Units - Analyte:
mg/kg - PCB



Photograph ID: 14

Sample ID:
FB-CONC-04

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND S CELL

Sample Result:
135

Units - Analyte:
mg/kg - PCB

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 15

Sample ID: FB-CONC-05

Sample Date: 7/8/2015

Sample Location: W1/2-3RD S CELL

Sample Result: 70

Units - Analyte: mg/kg - PCB

Photograph ID: 16

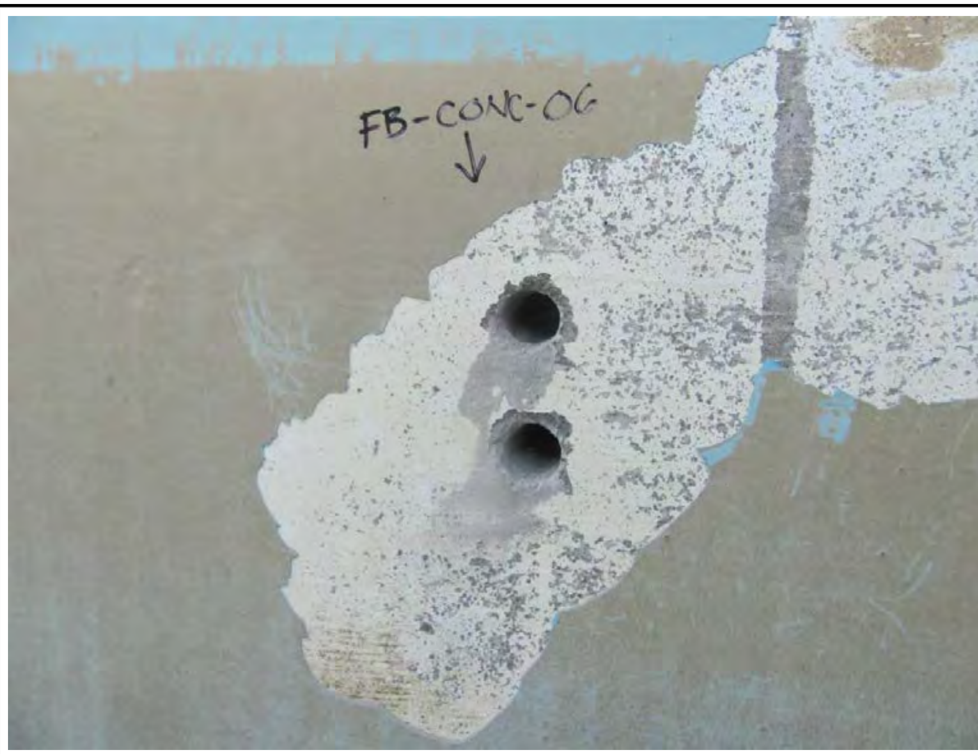
Sample ID: FB-CONC-06

Sample Date: 7/8/2015

Sample Location: W1/2-3RD N CELL

Sample Result: 64

Units - Analyte: mg/kg - PCB



Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 17

Sample ID:
FB-PGCONC-01

Sample Date:
7/14/2015

Sample Location:
Pipe Gallery Floor

Sample Result:
0.52

Units - Analyte:
mg/kg - PCB

Photograph ID: 18

Sample ID:
FB-PGCONC-02

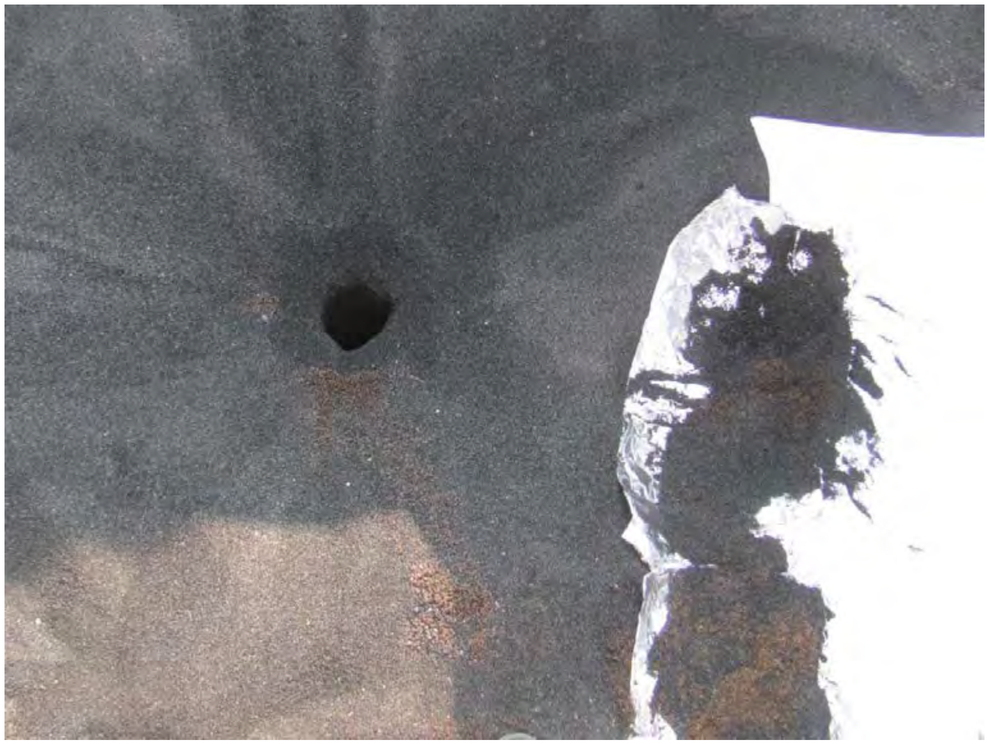
Sample Date:
7/14/2015

Sample Location:
Pipe Gallery Wall

Sample Result:
180

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 19 **Sample ID:** FB-ANTH-01 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-1ST S CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 20 **Sample ID:** FB-ANTH-02 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-1ST N CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Filtration Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 21

Sample ID:
FB-ANTH-03

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND N CELL

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 22

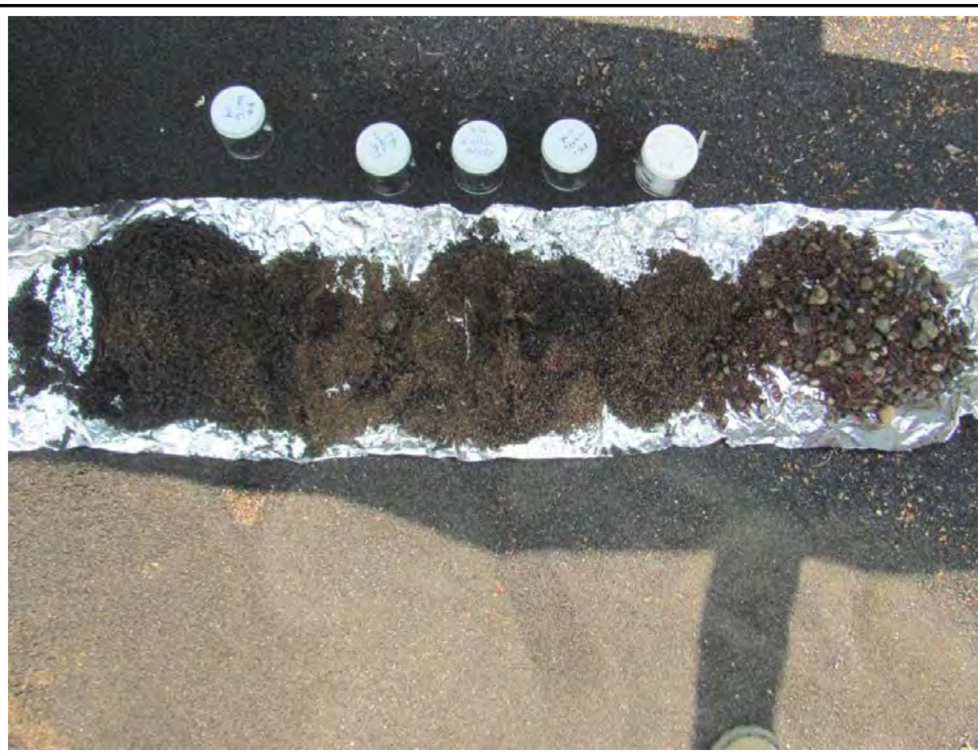
Sample ID:
FB-ANTH-04

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND S CELL

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB



Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 23	
Sample ID: FB-ANTH-05	
Sample Date: 7/8/2015	
Sample Location: W1/2-3RD S CELL	
Sample Result: <0.2	
Units - Analyte: mg/kg - PCB	

Photograph ID: 24	No Photo Applicable
Sample ID: FB-ANTH-06	
Sample Date: 7/8/2015	
Sample Location: W1/2-3RD N CELL	
Sample Result: <0.2	
Units - Analyte: mg/kg - PCB	

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Filtration Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 25

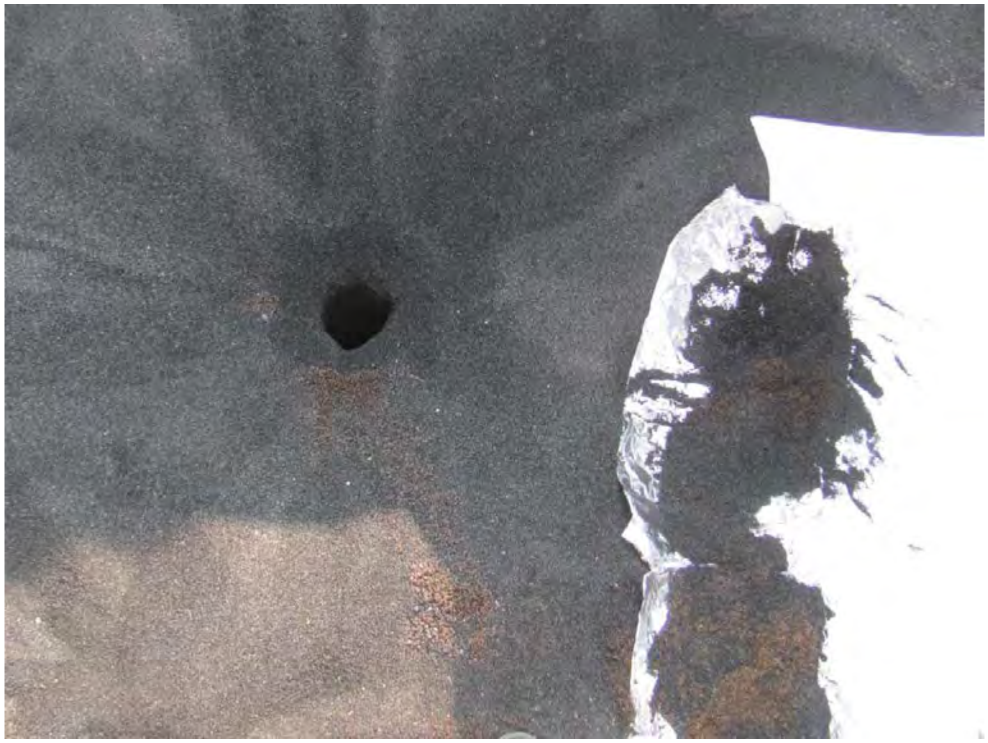
Sample ID:
FB-SAND-01

Sample Date:
7/8/2015

Sample Location:
E1/2-1ST S CELL

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB



Photograph ID: 26

Sample ID:
FB-SAND-02

Sample Date:
7/8/2015

Sample Location:
E1/2-1ST N CELL

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 27

Sample ID: FB-SAND-03

Sample Date: 7/8/2015

Sample Location: E1/2-2ND N CELL

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 28

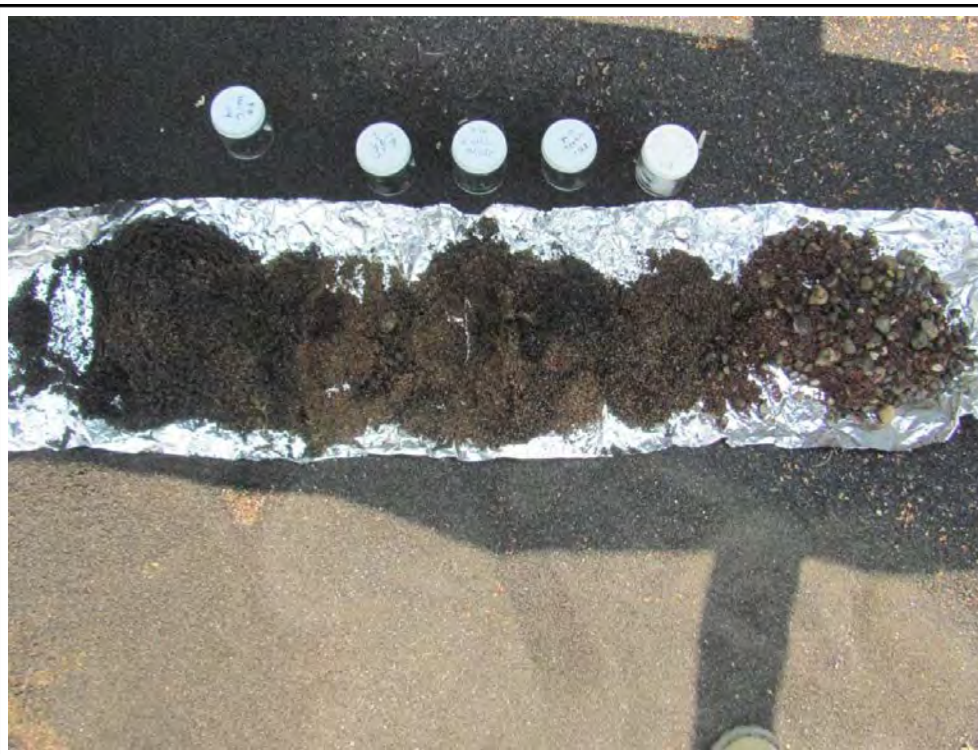
Sample ID: FB-SAND-04

Sample Date: 7/8/2015

Sample Location: E1/2-2ND S CELL

Sample Result: <0.2

Units - Analyte: mg/kg - PCB



MWH **Photographic Log**

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 29 **Sample ID:** FB-SAND-05 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD S CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 30 **Sample ID:** FB-SAND-06 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD N CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	No Photo Applicable

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 31

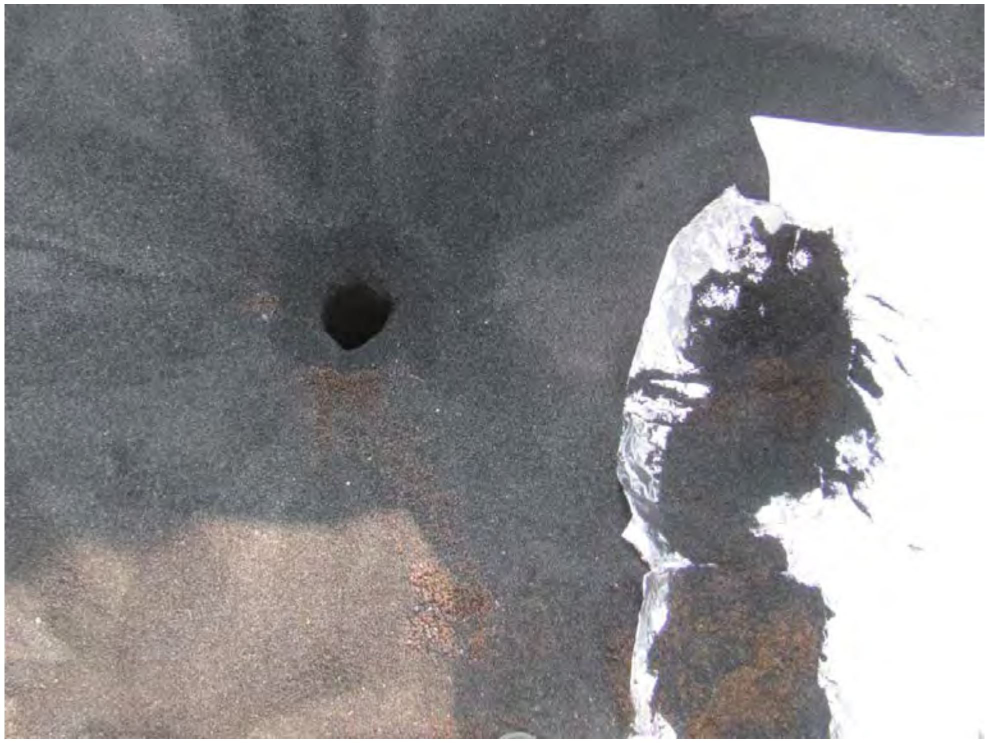
Sample ID: FB-BED-01

Sample Date: 7/8/2015

Sample Location: E1/2-1ST S CELL

Sample Result: 0.22

Units - Analyte: mg/kg - PCB



Photograph ID: 32

Sample ID: FB-BED-02

Sample Date: 7/8/2015

Sample Location: E1/2-1ST N CELL

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 33 **Sample ID:** FB-BED-03 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-2ND N CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 34 **Sample ID:** FB-BED-04 **Sample Date:** 7/8/2015 **Sample Location:** E1/2-2ND S CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 35 **Sample ID:** FB-BED-05 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD S CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 36 **Sample ID:** FB-BED-06 **Sample Date:** 7/8/2015 **Sample Location:** W1/2-3RD N CELL **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	No Photo Applicable

MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Filtration Basin	Site Location:	Mt. Vernon, WA

Photograph ID: 37

Sample ID: FB-FIBWIPE-01

Sample Date: 7/8/2015

Sample Location: E1/2-1ST S CELL

Sample Result: <10

Units - Analyte: ug/100 cm2 - PCB

Photograph ID: 38

Sample ID: FB-FIBWIPE-02

Sample Date: 7/8/2015

Sample Location: E1/2-1ST N CELL

Sample Result: <10

Units - Analyte: ug/100 cm2 - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 39

Sample ID:
FB-FIBWIPE-03

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND N CELL

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

Photograph ID: 40

Sample ID:
FB-FIBWIPE-04

Sample Date:
7/8/2015

Sample Location:
E1/2-2ND S CELL

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Filtration Basin**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 41

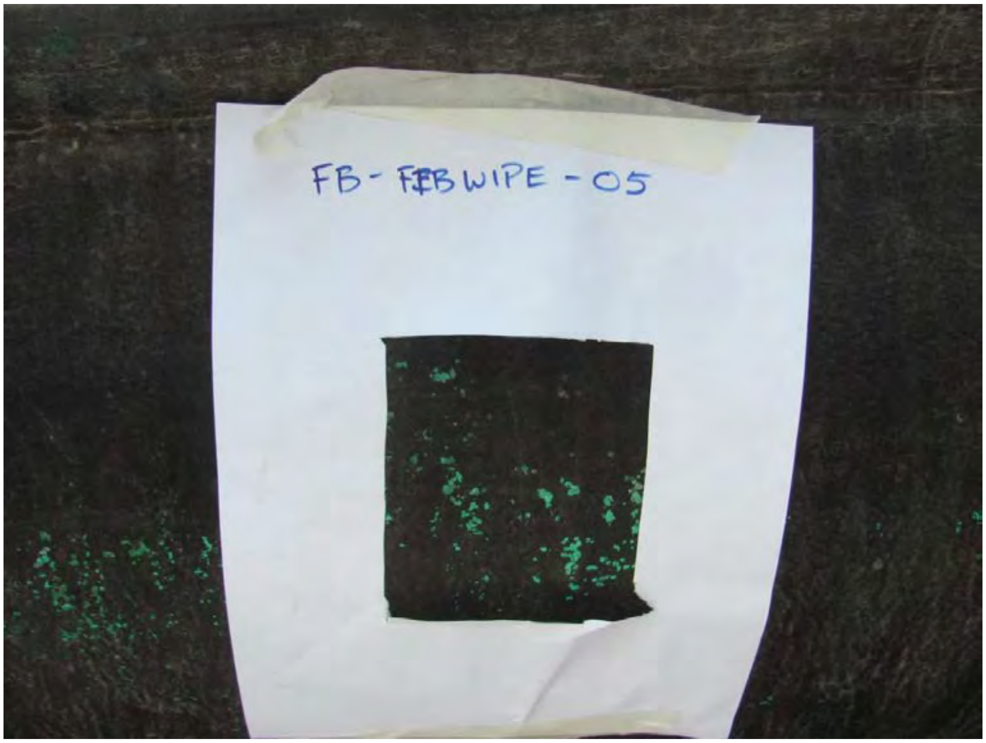
Sample ID: FB-FIBWIPE-05

Sample Date: 7/8/2015

Sample Location: W1/2-3RD S CELL

Sample Result: <10

Units - Analyte: ug/100 cm2 - PCB



Photograph ID: 42

Sample ID: FB-FIBWIPE-06

Sample Date: 7/8/2015

Sample Location: W1/2-3RD N CELL

Sample Result: <10

Units - Analyte: ug/100 cm2 - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 1	
Sample ID: CW-BAF-01	
Sample Date: 7/9/2015	
Sample Location: Clearwell redwood baffle	
Sample Result: <1	
Units - Analyte: mg/kg - PCB	

Photograph ID: 2	
Sample ID: CW-BAF-02	
Sample Date: 7/9/2015	
Sample Location: Clearwell redwood baffle	
Sample Result: <1	
Units - Analyte: mg/kg - PCB	

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 3	
Sample ID: CW-BAF-03	
Sample Date: 7/9/2015	
Sample Location: Clearwell redwood baffle	
Sample Result: <1	
Units - Analyte: mg/kg - PCB	

Photograph ID: 4	No Photo Applicable
Sample ID: CW-CONC-01	
Sample Date: 7/9/2015	
Sample Location: West wall of pump bay at ladder entrance	
Sample Result: <0.2	
Units - Analyte: mg/kg - PCB	

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Clear Well and Waste Well	Site Location:	Mt. Vernon, WA

Photograph ID: 5

Sample ID: CW-CONC-02

Sample Date: 7/9/2015

Sample Location: Baffle area north sidewall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 6

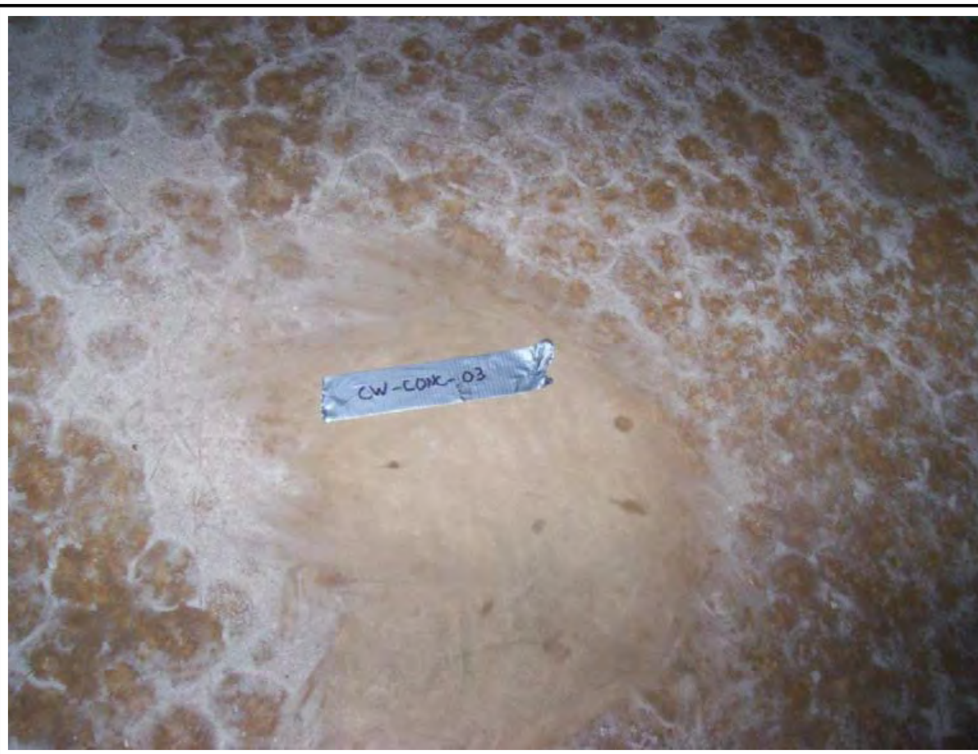
Sample ID: CW-CONC-03

Sample Date: 7/9/2015

Sample Location: Baffle area floor

Sample Result: <0.2

Units - Analyte: mg/kg - PCB



MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Clear Well and Waste Well	Site Location:	Mt. Vernon, WA

Photograph ID: 7

Sample ID: CW-CONC-04

Sample Date: 7/9/2015

Sample Location: Baffle area floor

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 8

Sample ID: CW-CONC-05

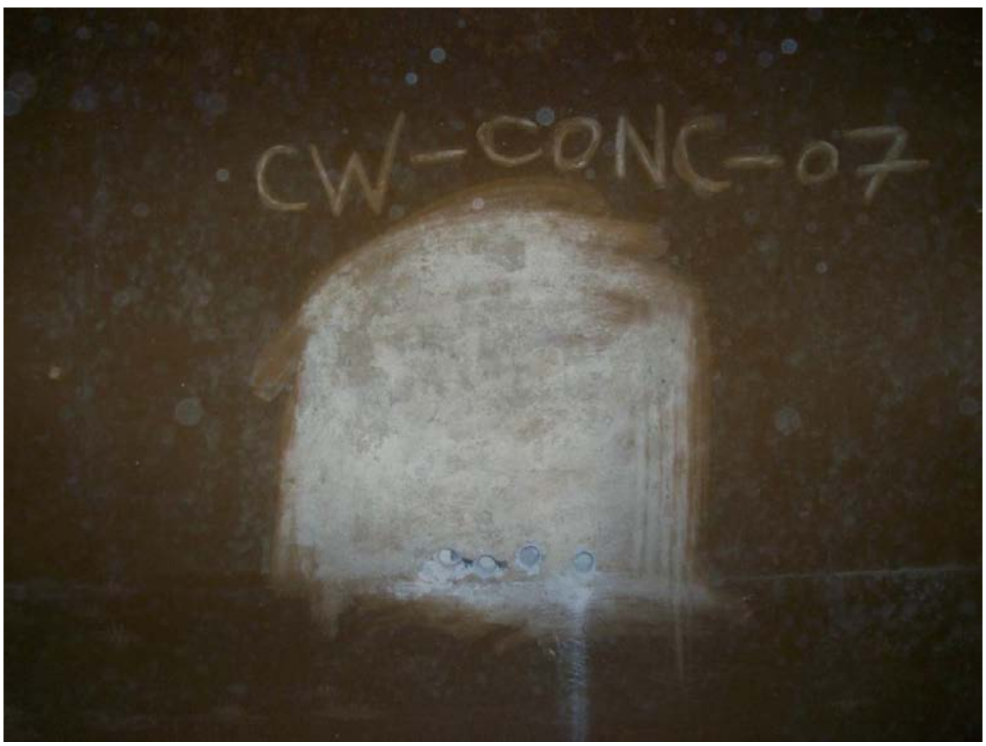
Sample Date: 7/9/2015

Sample Location: Edge of pump bay

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 9 **Sample ID:** CW-CONC-06 **Sample Date:** 7/9/2015 **Sample Location:** North wall of pump bay **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 10 **Sample ID:** CW-CONC-07 **Sample Date:** 7/9/2015 **Sample Location:** West wall of baffle area **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 11

Sample ID: CW-CONC-08

Sample Date: 7/9/2015

Sample Location: Baffle area floor

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 12

Sample ID: CW-CONC-09

Sample Date: 7/9/2015

Sample Location: Baffle column

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 13

Sample ID:
CW-CONC-10

Sample Date:
7/9/2015

Sample Location:
Pump bay low side wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 14

Sample ID:
CW-SED-01

Sample Date:
7/9/2015

Sample Location:

Sample Result:
6.4

Units - Analyte:
mg/kg - PCB

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 15

Sample ID:
CW-SED-02

Sample Date:
7/9/2015

Sample Location:

Sample Result:
7.6

Units - Analyte:
mg/kg - PCB

Photograph ID: 16

Sample ID:
CW-SED-03

Sample Date:
7/9/2015

Sample Location:

Sample Result:
11

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 17

Sample ID:
CW-SED-04

Sample Date:
7/9/2015

Sample Location:

Sample Result:
5.1

Units - Analyte:
mg/kg - PCB

Photograph ID: 18

Sample ID:
CW-SED-05

Sample Date:
7/9/2015

Sample Location:

Sample Result:
6.2

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 19

Sample ID:
CW-SED-06

Sample Date:
7/9/2015

Sample Location:
Scale on pump header

Sample Result:
0.38

Units - Analyte:
mg/kg - PCB

Photograph ID: 20

Sample ID:
WF-CONC-01

Sample Date:
7/9/2015

Sample Location:
Waste well west side wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 21

Sample ID:
WF-CONC-02

Sample Date:
7/9/2015

Sample Location:
Waste well west side wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 22

Sample ID:
WF-CONC-03

Sample Date:
7/9/2015

Sample Location:
Waste well horizontal ledge

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

No Photo Applicable

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 23

Sample ID: WF-CONC-04

Sample Date: 7/9/2015

Sample Location: Waste well south wall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Photograph ID: 24

Sample ID: WF-CONC-05

Sample Date: 7/9/2015

Sample Location: Waste well east wall

Sample Result: <0.2

Units - Analyte: mg/kg - PCB

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Clear Well and Waste Well	Site Location:	Mt. Vernon, WA

Photograph ID: 25 **Sample ID:** WF-CONC-06 **Sample Date:** 7/9/2015 **Sample Location:** Waste well center dividing wall **Sample Result:** <0.2 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 26 **Sample ID:** WF-SED-01 **Sample Date:** 7/9/2015 **Sample Location:** Waste well at center dividing wall **Sample Result:** 0.26 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 27

Sample ID:
WF-SED-02

Sample Date:
7/9/2015

Sample Location:
Waste well at center dividing wall

Sample Result:
<0.2

Units - Analyte:
mg/kg - PCB

Photograph ID: 28

Sample ID:
WF-SED-03

Sample Date:
7/9/2015

Sample Location:
Waste well at center dividing wall

Sample Result:
3.4

Units - Analyte:
mg/kg - PCB

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Clear Well and Waste Well**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 29	No Photo Applicable
Sample ID: WF-SED-04	
Sample Date: 7/9/2015	
Sample Location:	
Sample Result: 0.49	
Units - Analyte: mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 1

Sample ID:
AB-SEAL-01

Sample Date:
7/7/2015

Sample Location:
Glaze; Interior; 1st Floor Loobby; 3rd Window N of door

Sample Result:
500

Units - Analyte:
mg/kg - PCB

Photograph ID: 2

Sample ID:
AB-SEAL-02

Sample Date:
7/7/2015

Sample Location:
Glaze; Exterior; 1st Floor Lobby; 1st Window S of door

Sample Result:
47

Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 3	
Sample ID: AB-SEAL-03	
Sample Date: 7/7/2015	
Sample Location: Glaze; Interior; 2nd Floor Lobby; 3rd Window N of wall	
Sample Result: 91	
Units - Analyte: mg/kg - PCB	

Photograph ID: 4	
Sample ID: AB-SEAL-04	
Sample Date: 7/7/2015	
Sample Location: Glaze; Exterior; 2nd Floor Control Room; 2nd Window S of door	
Sample Result: 6.6	
Units - Analyte: mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 5

Sample ID:
AB-SEAL-05

Sample Date:
7/7/2015

Sample Location:
Glaze; Interior; 2nd Floor Control Room; 1st Window S of door

Sample Result:
410

Units - Analyte:
mg/kg - PCB

Photograph ID: 6

Sample ID:
AB-SEAL-06

Sample Date:
7/7/2015

Sample Location:
Caulk; Interior; 1st Floor interior door to Pump Room

Sample Result:
640

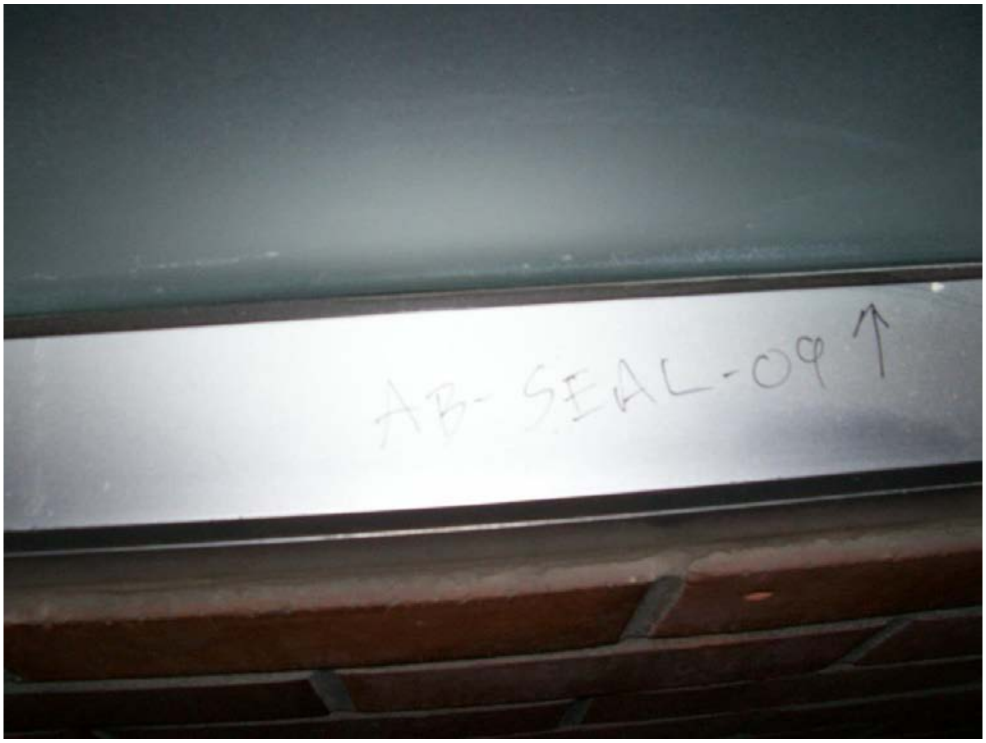
Units - Analyte:
mg/kg - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 7	
Sample ID: AB-SEAL-07	
Sample Date: 7/14/2015	
Sample Location: Caulk; Interior; Window in N stair	
Sample Result: 260	
Units - Analyte: mg/kg - PCB	

Photograph ID: 8	No Photo Applicable
Sample ID: AB-SEAL-08	
Sample Date: 7/7/2015	
Sample Location: Caulk; Interior; 2nd Floor Control Room; Door to Lobby	
Sample Result: 17.8	
Units - Analyte: mg/kg - PCB	

Client:	Foster Pepper PLLC	Project:	Privileged and Confidential Sampling
Site Name:	Anacortes WTP - Admin Bldg	Site Location:	Mt. Vernon, WA

Photograph ID: 9 **Sample ID:** AB-SEAL-09 **Sample Date:** 7/14/2015 **Sample Location:** Glaze; Interior; Window to office in lobby **Sample Result:** 53 **Units - Analyte:** mg/kg - PCB	
Photograph ID: 10 **Sample ID:** AB-SEAL-10 **Sample Date:** 7/14/2015 **Sample Location:** Glaze; Exterior; Window in 2nd floor lab **Sample Result:** 9.6 **Units - Analyte:** mg/kg - PCB	

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 11

Sample ID:
AB-WINDOW WIPE-01

Sample Date:
7/10/2015

Sample Location:
Interior; 2nd Floor Loobby

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

Photograph ID: 12

Sample ID:
AB-WINDOW WIPE-02

Sample Date:
7/10/2015

Sample Location:
Interior; 1st Floor Loobby

Sample Result:
13

Units - Analyte:
ug/100 cm2 - PCB

Client:	**Foster Pepper PLLC**	**Project:**	**Privileged and Confidential Sampling**
Site Name:	**Anacortes WTP - Admin Bldg**	**Site Location:**	**Mt. Vernon, WA**

Photograph ID: 13

Sample ID:
AB-WINDOW WIPE-03

Sample Date:
7/10/2015

Sample Location:
Interior; 2nd Floor Alum Room

Sample Result:
<10

Units - Analyte:
ug/100 cm2 - PCB

Appendix C2. Data Gap Investigation Field Documentation

1 - Field Corrective Actions - Data Gap Investigation

2 - Boring Log Reports

3 - Well Construction Diagrams rev 1

4 - Cascade Well Reports

5 - Well Development Forms

6 - Low flow sampling forms

7 - Lagoon Sample Photolog

8 - Mastic sample locations 5-20-16

9 - Administration Bldg. Wipe Samples - 5-25-16

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From:	Richard Malcolm
To:	Norman Cira; Bradly Toth
Cc:	Richard Malcolm
Subject:	Privileged and Confidential - Field Corrective Action #13
Date:	Tuesday, May 24, 2016 12:31:00 PM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: The Sampling Plan v1.10 included installation of 6 piezometers in the vicinity of the Filtration Basin and 10 piezometers in the vicinity of the Sedimentation Basin.

Deviation:

1. Utility clearance in the vicinity of the Filtration Basin did not allow installation of 6 piezometers. Piezometers were not installed in the location of FB-Soil-3 and FB-Soil-5 due to proximity of marked utilities and hand auger activities encountering below grade obstacles. Soil samples were collected in all locations using the hand auger.
2. Utility clearance in the vicinity of the Sedimentation Basin did not allow installation of 10 piezometers. A piezometers was not installed in the location of SB-Soil-5 due to proximity of marked utilities and hand auger activities encountering below grade obstacles. Soil samples were collected in all locations using the hand auger.
3. The down gradient piezometer was relocated to spot adjacent to the newly installed building northwest of the sedimentation basin in order to eliminate boring through asphalt and to provide a greater distance from the up gradient piezometers.

This deviation affects the number and location of groundwater samples that will be collected; however, the redundancy of piezometer placement on the original plan ensures collection of samples from representative locations around the site.

Richard Malcolm

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: Privileged and Confidential - Field Corrective Action #14
Date: Thursday, May 26, 2016 11:16:00 AM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: The Sampling Plan v1.10 states, "Soil samples from drilling will be continuously logged by a qualified geologist/engineer for lithologic description."

Deviation:

1. In locations where soil borings are co-located less than ten feet from one another, only one of the borings was continuously logged.

This deviation affects four borings in total. Due to the close proximity of the borings, soil lithography is not expected to differ significantly. Field observations confirmed that soil lithography was similar for all borings that were logged during boring installation.

Richard Malcolm

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From: Richard Malcolm
To: Norman Cira; Bradly Toth
Subject: Privileged and Confidential - Field Corrective Action #15
Date: Thursday, May 26, 2016 11:22:00 AM

In accordance with Section 4.1.3 of the QAPP, the following deviation from sample collection activities identified in the Sampling Plan is described below:

Sampling Plan Requirement: The Sampling Plan v1.10 included collection of two soil samples from the native stratum beneath sediment in one lagoon as stated below.

> Two hand auger soil borings will be advanced in one of the sediment settling lagoons. Location will be determined by assessing which lagoon is dry and affords geoprobe equipment access.
> • Soil samples will be collected from the "native" soil stratum beneath the sediment layer in the lagoon.
> • One soil sample will be collected from the 0"-12" interval of native soils in each of 2 hand auger borings for a total of 2 samples as indicated in Table 1A and analyzed for PCBs.
> • One QC sample will also be collected.

Deviation:

1. Two lagoons were accessible for sampling during field activities. For this reason, two additional samples were collected for a total of four samples. Two samples were collected from Lagoon #1 and two samples were collected from Lagoon #2.
2. The samples were collected from a sand layer beneath the sediment. A "native" soil layer was not reached beneath the sand layer.

This deviation affects the number and location of lagoon soil samples that were collected. Due to the accessibility of two separate lagoons, additional representative samples were collected. The lagoons appear to be designed with a sand filtration layer beneath the sediment layer. This sand filtration layer was sampled due to its proximity to sediment, rather than excavation beneath sand to an underlying layer.

Richard Malcolm

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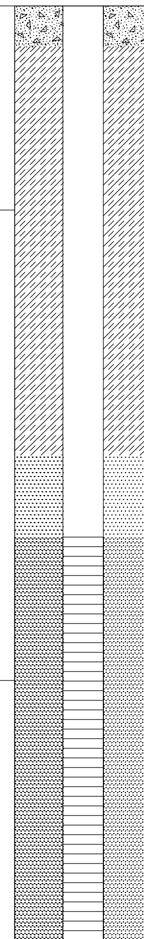
Boring ID: DG-GW

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	30.7 '
Date Started:	5/25/2016	**Total Depth (ft):**	25.0'
Date Finished:	5/25/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	14.5'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithologic Description	Remarks
0–5		0				SM	0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.	Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-11' bgs.
5–10		31				SM	5' - 16.5' Very dark grayish brown (2.5 Y 3/2) silty fine grained SAND, trace coarse grained sand, little to trace fine to coarse grained sub-round to sub-angular gravel, moist, (FILL).	3/4-inch diameter PVC riser from 0-13' bgs.
10–15		36					12.5' Color change to dark olive brown (2.5 Y 3/3), possibly native material although may have been reworked.	Filter Pack: Silica Quartz Sand (10/20 sand) from 11-13' bgs.
15–20		24				SP	16.5' - 23.75' Very dark gray (5 Y 3/1) fine grained SAND, little silt, trace coarse grained sand, trace fine grained sub-round gravel; appears native although may have been reworked.	3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 13-23' bgs.
20–25		26				SP	23.75' - 25' Very dark gray (5 Y 3/1) fine to medium grained SAND, little coarse grained sand, little fine grained gravel.	
25–30							25' Metal, nail-like shards at bottom of boring, supports observation that native material from approximately. 12.5 to 25 ft bgs. may have been reworked, likely during construction of the new WWTP. End of boring.	

Well Diagram



MWH

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Boring ID: PZ-FILT-01

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.2 '
Date Started:	5/24/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/24/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0				FB-SOIL-12-01 FB-SOIL-36-01		SM		0' - 5' LITHOLOGY DESCRIPTION FROM ADJACENT BORING FILT-02. Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5						SM		5' - 13.25' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little fine to coarse grained round to sub-round gravel, trace coarse grained sand, moist, limited recovery as large gravel grain in shoe (FILL).		3/4-inch diameter PVC riser from 0-20' bgs.
10										
						SM		13.25' - 15.25' Very dark gray (5 Y 3/1) silty fine grained SAND, trace fine grained round gravel, trace clay.		
15						SP-SM		15.25' - 27' Dark grayish brown (2.5 Y 4/2) fine grained sand, some silt, moist. 20' Color change to very dark grayish brown (2.5 Y 3/2). Little silt, less silt with depth.		Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs. 3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
20										
25										
						SP		27' - 30' Very dark gray (5 Y 3/1) fine grained sand, some medium grained sand, becomes coarser with depth.		
30								30' End of boring.		

MWH	MWH Americas, Inc. 2353 130th Avenue N.E., Suite 200 Bellevue, Washington 98005

Boring ID: PZ-FILT-02 / FB-02

Project Name: City of Anacortes Water Treatment Facility
Location: Mount Vernon, WA.
Project Number: 10507136
Date Started: 5/23/2016
Date Finished: 5/23/2016
Drilling Method: Geoprobe
Sampling Method: Macrocore
Drill Rig Operator: Tyler Day

Boring Location: Mt. Vernon, WA
Drilling Company: Cascade Drilling, L.P.
Top of Casing Elevation (ft NAVD88): 39.3 '
Total Depth (ft): 30.0'
Boring Diameter (in): 2"
Water Level During Drilling (ft bgs): 22.5'
Weather Conditions: Partly cloudy, mid-60's
Logged By: Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID
0 - 5		0		FB-SOIL-12-02 FB-SOIL-36-02
5 - 10		12		
10 - 15		22		
15 - 20		31		
20 - 25		36		
25 - 30		32		

USCS	Lithologic Description	Remarks
SM	0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.	Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
SM	5' - 13.25' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little fine to coarse grained round to sub-round gravel, trace coarse grained sand, moist, limited recovery as large gravel grain in shoe (FILL). 12' Perched water, saturated from 12 to 15 ft bgs.	3/4-inch diameter PVC riser from 0-20' bgs.
SM	13.25' - 15.25' Very dark gray (5 Y 3/1) silty fine grained SAND, trace fine grained round gravel, trace clay.	
SP-SM	15.25' - 27' Dark grayish brown (2.5 Y 4/2) fine grained sand, some silt, moist. 20' Color change to very dark grayish brown (2.5 Y 3/2). Little silt, less silt with depth.	Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs. 3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
SP	27' - 30' Very dark gray (5 Y 3/1) fine grained sand, some medium grained sand, becomes coarser with depth. 29' Wood fragments at 29 and 30 ft bgs.	
	30' End of boring.	

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Boring ID: PZ-FILT-04 / FB-04

Project Name: City of Anacortes Water Treatment Facility
Location: Mount Vernon, WA.
Project Number: 10507136
Date Started: 5/24/2016
Date Finished: 5/24/2016
Drilling Method: Geoprobe
Sampling Method: Macrocore
Drill Rig Operator: Tyler Day

Boring Location: Mt. Vernon, WA
Drilling Company: Cascade Drilling, L.P.
Top of Casing Elevation (ft NAVD88): 37.2 '
Total Depth (ft): 30.0'
Boring Diameter (in): 2"
Water Level During Drilling (ft bgs): 20.5'
Weather Conditions: Partly cloudy, mid-60's
Logged By: Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0		0		FB-SOIL-12-04 FB-SOIL-36-04		SM		0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		15				SM		5' - 11.25' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little medium grained sand, trace coarse grained sand, little fine to coarse grained round to sub-round gravel, moist, (FILL).		
10		20				SM		11.25' - 12.5' Very dark gray (5 Y 3/1) silty fine grained SAND, trace fine grained gravel, trace coarse grained sand, trace wood fragment.		3/4-inch diameter PVC riser from 0-20' bgs.
						SP-SM		12.5' - 24' Dark grayish brown (2.5 Y 4/2) silty fine grained SAND, trace coarse grained sand, trace fine grained sub-round gravel. 15' Limited recovery.		
15		7								Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20		22								3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25		35				SP		24' - 30' Very dark gray (2.5 Y 3/1) fine to medium grained sand, little coarse grained sand, little to trace fine grained sub-angular gravel. 25' Color changes to dark olive gray (5 Y 3/2), fine grained, little silt, iron staining / oxidation from 20 to 24 ft bgs. Wood fragment at 30 feet bgs.		
30								30' End of boring.		

MWH	MWH Americas, Inc. 2353 130th Avenue N.E., Suite 200 Bellevue, Washington 98005	**Boring ID: PZ-FILT-06** Page 1 of 1	
Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.2 '
Date Started:	5/24/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/24/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0				FB-SOIL-12-06 FB-SOIL-36-06		SM		0' - 5' LITHOLOGY DESCRIPTION FROM ADJACENT BORING FILT-02. Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clear		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5						SM		5' - 13.25' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little fine to coarse grained round to sub-round gravel, trace coarse grained sand, moist, limited recovery as large gravel grain in shoe (FILL).		
10										3/4-inch diameter PVC riser from 0-20' bgs.
						SM		13.25' - 15.25' Very dark gray (5 Y 3/1) silty fine grained SAND, trace fine grained round gravel, trace clay.		
15						SP-SM		15.25' - 27' Dark grayish brown (2.5 Y 4/2) fine grained sand, some silt, moist.		Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20								20' Color change to very dark grayish brown (2.5 Y 3/2). Little silt, less silt with depth.		3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25										
						SP		27' - 30' Very dark gray (5 Y 3/1) fine grained sand, some medium grained sand, becomes coarser with depth.		
30								30' End of boring.		

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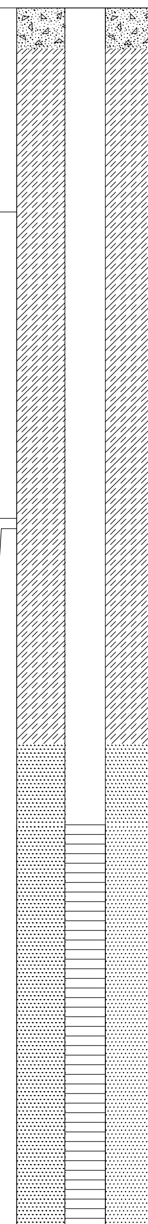
Boring ID: PZ-SED-01 / SB-01

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	38.8 '
Date Started:	5/23/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/23/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	21'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	USCS	Lithologic Description	Remarks
0		0		SB-SOIL-12-01 SB-SOIL-36-01	SM	0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, some/little fine to coarse grained round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.	Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		27			SM	5' - 12.5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little fine to coarse grained angular to round gravel, trace coarse grained sand, moist, (FILL).	
10		27			MLS SP	12.5' - 12.75' Dark grayish brown (2.5 Y 4/2) sandy SILT/silty fine grained SAND. 12.75' - 30' Dark grayish brown (2.5 Y 4/2) silty fine grained SAND, less silt with depth.	3/4-inch diameter PVC riser from 0-20' bgs.
15		35					Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20		40				20' Color change to very dark grayish brown (2.5 Y 3/2). Fine grained sand with little to some silt.	3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25		24				25' Dark olive gray (5 Y 3/2) fine grained sand, trace to little silt, some medium grained sand. 29' Wood fragment at 29 ft bgs and wood fragment in shoe at 30 ft bgs.	
30						30' End of boring.	

Well Diagram



MWH

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Bellevue, Washington 98005

Boring ID: PZ-SED-02

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.1 '
Date Started:	5/23/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/23/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0				SB-SOIL-12-02 SB-SOIL-36-02		SM		0' - 5' LITHOLOGY DESCRIPTION FROM ADJACENT BORING SED-01. Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, some/little fine to coarse grained round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5						SM		5' - 12.5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little fine to coarse grained angular to round gravel, trace coarse grained sand, moist, (FILL).		
10										3/4-inch diameter PVC riser from 0-20' bgs.
12.5						MLS SP		12.5' - 12.75' Dark grayish brown (2.5 Y 4/2) sandy SILT/silty fine grained SAND. 12.75' - 25' Dark grayish brown (2.5 Y 4/2) silty fine grained SAND, less silt with depth.		
15										Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20								20' Color change to very dark grayish brown (2.5 Y 3/2). Fine grained sand with little to some silt.		3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25						SP		25' - 30' Dark olive gray (5 Y 3/2) fine grained sand, trace to little silt, some medium grained sand.		
30								30' End of boring.		

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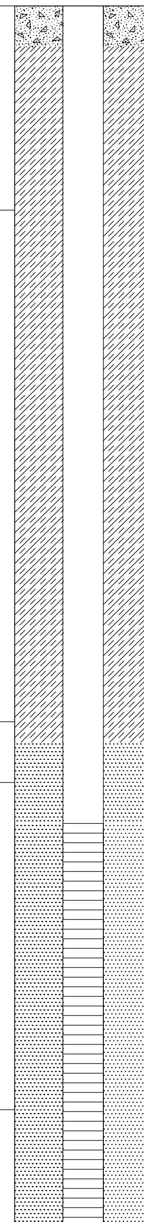
Boring ID: PZ-SED-03 / SB-03

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	40.9 '
Date Started:	5/24/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/24/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	21.75'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0		0		SB-SOIL-12-03 SB-SOIL-36-03		SM		0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, some/little fine to coarse grained round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		33				SM		5' - 17.5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace fine to coarse grained sub-angular to sub-round gravel, trace coarse grained sand, less gravel with depth, moist, (FILL).		
10		29								3/4-inch diameter PVC riser from 0-20' bgs.
15		17				SP		17.5' - 19' Dark gray (2.5 Y 4/1) fine to coarse grained SAND, little fine grained sub-round gravel, moist.		Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
						SM		19' - 27' Olive brown (2.5 Y 4/3) silty fine grained SAND, moist, less silt with depth, some iron staining / oxidation.		
20		26								3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25		21				SP		27' - 30' Very dark gray (2.5 Y 3/1) fine grained SAND, some medium grained sand, trace silt.		
30								30' End of boring.		



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Boring ID: PZ-SED-04

Project Name:	City of Anacortes Water Treatment Facility
Location:	Mount Vernon, WA.
Project Number:	10507136
Date Started:	5/25/2016
Date Finished:	5/25/2016
Drilling Method:	Geoprobe
Sampling Method:	Macrocore
Drill Rig Operator:	Tyler Day
Boring Location:	Mt. Vernon, WA
Drilling Company:	Cascade Drilling, L.P.
Top of Casing Elevation (ft NAVD88):	40.8 '
Total Depth (ft):	30.0'
Boring Diameter (in):	2"
Water Level During Drilling (ft bgs):	'
Weather Conditions:	Partly cloudy, mid-60's
Logged By:	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0				SB-SOIL-12-04 SB-SOIL-36-04		SM		0' - 5' LITHOLOGY DESCRIPTION FROM ADJACENT BORING SED-03. Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, some/little fine to coarse grained round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5						SM		5' - 17.5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace fine to coarse grained sub-angular to sub-round gravel, trace coarse grained sand, less gravel with depth, moist, (FILL).		
10										3/4-inch diameter PVC riser from 0-20' bgs.
15										
17.5						SP		17.5' - 19' Dark gray (2.5 Y 4/1) fine to coarse grained SAND, little fine grained sub-round gravel, moist.		Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
19						SM		19' - 27' Olive brown (2.5 Y 4/3) silty fine grained SAND, moist, less silt with depth, some iron staining / oxidation.		
20										3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25										
27						SP		27' - 30' Very dark gray (2.5 Y 3/1) fine grained SAND, some medium grained sand, trace silt.		
30								30' End of boring.		

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Boring ID: PZ-SED-06 / SB-06

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.4 '
Date Started:	5/24/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/24/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	22'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0		0		SB-SOIL-12-06 SB-SOIL-36-06		SM		0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		32				SM		5' - 8.5' Very dark grayish brown (2.5 Y 3/2) silty fine grained SAND, trace coarse grained sand, little fine to coarse grained sub-round to round gravel, moist, (FILL).		
						SP-SM		8.5' - 11' Very dark grayish brown (2.5 Y 3/2) fine grained SAND with silt, trace coarse grained sand, trace fine grained sub-round to round gravel, moist.		
10		42				MLS		11' - 12' Very dark gray (2.5 Y 3/1) fine grained sandy SILT, moist.		3/4-inch diameter PVC riser from 0-20' bgs.
						SP-SM		12' - 26.5' Dark grayish brown (2.5 Y 4/2) fine grained SAND, some silt, moist, less silt with depth.		
15		38								Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20		40						20' Some iron oxidation / staining from 20-25 ft bgs.		3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25		40				SP		26.5' - 30' Very dark gray (2.5 Y 3/1) fine grained SAND with medium grained sand, trace fine grained sub-angular gravel, trace coarse grained sand.		
30								30' End of boring.		

MWH	MWH Americas, Inc. 2353 130th Avenue N.E., Suite 200 Bellevue, Washington 98005	**Boring ID: PZ-SED-07 / SB-07** Page 1 of 1

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.0 '
Date Started:	5/24/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/24/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	22'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0		0		SB-SOIL-12-07 SB-SOIL-36-07		SM		0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace coarse grained sand, little fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		17				SM SP		5' - 6' Dark grayish brown (2.5 Y 4/2) silty fine grained SAND, poor recovery. Driller noted rods pushed easily to 7 ft bgs before hammering (loose material); (FILL). 6' - 11.5' Dark gray (10 YR 4/1) fine to medium grained SAND, some coarse grained sand, little to some fine to coarse grained sub-round to sub-angular gravel, (FILL).		
10		36				MLS SP-SM		11.5' - 12.25' Very dark gray (5 Y 3/1) fine grained sandy SILT. 11.75' Color change to very dark grayish brown (2.5 Y 3/2). 12.25' - 25' Dark grayish brown (2.5 Y 4/2) fine grained SAND, some to little silt.		3/4-inch diameter PVC riser from 0-20' bgs.
15		32						17' Some iron staining / oxidation from 17-22.5 ft bgs, some silt.		Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20		27								3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25						SP		25' - 30' Very dark gray (2.5 Y 3/1) fine grained SAND with some medium grained sand, little fine grained sub-round to sub-angular gravel, trace coarse grained sand.		
30								30' End of boring.		

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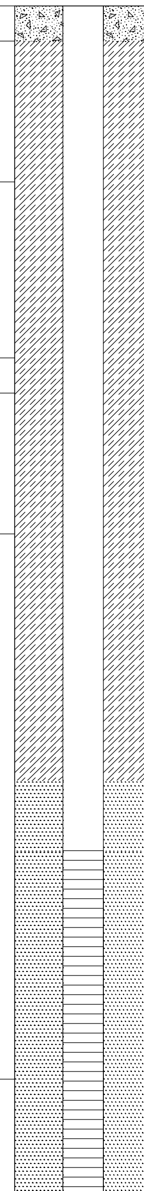
Boring ID: PZ-SED-08 / SB-08

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	42.6 '
Date Started:	5/25/2016	**Total Depth (ft):**	34.0'
Date Finished:	5/25/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	25'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	USCS	Lithologic Description	Remarks
0 - 5		0		SB-SOIL-12-08; SB-SOIL-36-08	SM	0' - 1' GRAVEL, (FILL). Hand augered to 5' bgs for utility clearance. 1' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, trace medium and coarse grained sand, trace fine to coarse grained gravel. Hand augered to 5' bgs for utility clearance.	Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-22' bgs.
5 - 10		36			SP	5' - 10' Dark olive brown (2.5 Y 3/3) fine grained SAND, little to some silt, trace medium grained sand, trace fine grained angular gravel, moist.	
10 - 15		39			SM; SP-SM	10' - 11' Dark gray (2.5 Y 4/1) silty fine grained SAND, moist. 11' - 15' Dark olive brown (2.5 Y 3/3) fine grained SAND, some to little silt, trace medium and coarse grained sand, trace coarse grained gravel.	3/4-inch diameter PVC riser from 0-24' bgs.
15 - 20		40			SP-SM	15' - 30.5' Dark olive brown (2.5 Y 3/3) fine grained SAND, some to little silt.	
20 - 25		24					Filter Pack: Silica Quartz Sand (10/20 sand) from 22-24' bgs.
25 - 30		22				25' Color change to dark olive gray (5 Y 3/2) iron staining / oxidation from 25 - 30 ft bgs.	3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 24-34' bgs.
30 - 34		22			SP	30.5' - 34' Very dark gray (5 Y 3/1) fine grained SAND, some medium grained sand, trace fine grained sub-round to sub-angular gravel, trace coarse grained sand, large wood fragment at bottom of interval.	
34 - 35						34' End of boring; refusal on large piece of wood.	

Well Diagram



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Boring ID: PZ-SED-09 / SB-09

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	38.7 '
Date Started:	5/23/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/23/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	21.5'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0		0		SB-SOIL-12-09 SB-SOIL-36-09		SM		0' - 5' Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5		19				SM		5' - 11.5' Very dark gray (2.5 Y 3/1) silty fine grained SAND, little fine to coarse sub-round to round gravel, trace to little coarse grained sand, moist, (FILL).		
10		37				MLS		11.5' - 12.25' Dark olive gray (5 Y 3/2) fine grained sandy SILT, moist.		3/4-inch diameter PVC riser from 0-20' bgs.
						SP-SM		12.25' - 25' Dark grayish brown (2.5 Y 4/2) fine grained SAND with some silt, less silt with depth.		
15		31								Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20								20' Trace silt from 20-25 ft bgs.		3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25						SP		25' - 30' Very dark grayish brown (2.5 Y 3/2) fine grained sand, some medium grained sand, trace coarse grained sand, trace fine grained sub-angular gravel.		
30								30' End of boring.		

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Boring ID: PZ-SED-10

Project Name:	City of Anacortes Water Treatment Facility	**Boring Location:**	Mt. Vernon, WA
Location:	Mount Vernon, WA.	**Drilling Company:**	Cascade Drilling, L.P.
Project Number:	10507136	**Top of Casing Elevation (ft NAVD88):**	39.2 '
Date Started:	5/23/2016	**Total Depth (ft):**	30.0'
Date Finished:	5/23/2016	**Boring Diameter (in):**	2"
Drilling Method:	Geoprobe	**Water Level During Drilling (ft bgs):**	'
Sampling Method:	Macrocore	**Weather Conditions:**	Partly cloudy, mid-60's
Drill Rig Operator:	Tyler Day	**Logged By:**	Jeff Bechtel

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0				SB-SOIL-12-10 SB-SOIL-36-10		SM		0' - 5' LITHOLOGY DESCRIPTION FROM ADJACENT BORING SED-09. Dark olive brown (2.5 Y 3/3) silty fine grained SAND, little to some fine to coarse grained round to sub-round gravel, moist (FILL). Hand augered to 5' bgs for utility clearance.		Concrete pad/flush mount well cover from 0-1' bgs. Bentonite hole plug from 1-18' bgs.
5						SM		5' - 11.5' Very dark gray (2.5 Y 3/1) silty fine grained SAND, little fine to coarse sub-round to round gravel, trace to little coarse grained sand, moist, (FILL).		
10						MLS		11.5' - 12.25' Dark olive gray (5 Y 3/2) fine grained sandy SILT, moist.		3/4-inch diameter PVC riser from 0-20' bgs.
						SP-SM		12.25' - 25' Dark grayish brown (2.5 Y 4/2) fine grained SAND with some silt, less silt with depth.		
15										Filter Pack: Silica Quartz Sand (10/20 sand) from 18-20' bgs.
20								20' Trace silt from 20-25 ft bgs.		3/4-inch ID by 1.4-inch OD PVC pre-packed screen (0.010"-slot; 10/20 sand) from 20-30' bgs.
25						SP		25' - 30' Very dark grayish brown (2.5 Y 3/2) fine grained sand, some medium grained sand, trace coarse grained sand, trace fine grained sub-angular gravel.		
30								30' End of boring.		

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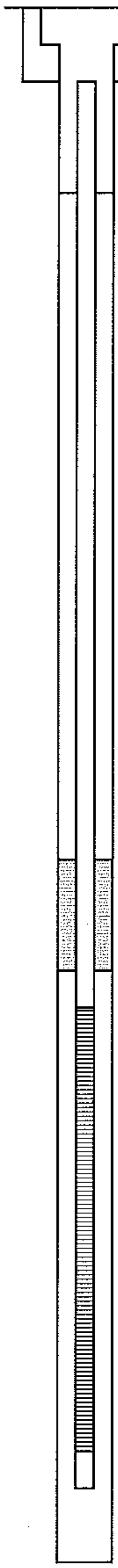
Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID DG-GW



Depth:		
____ ft	top of casing	
____ ft	top of annular seal	
1 ft	top of seal	
11 ft	top of filter pack	
13 ft	top of screen	
23 ft	bottom of screen	
23 ft	bottom of well	
25 ft	bottom of boring	

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/25/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	gravel Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	13'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica sand 10/20
Volume Placed	
Screen Type:	PVC - Pre-packed screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface.

Not to scale.

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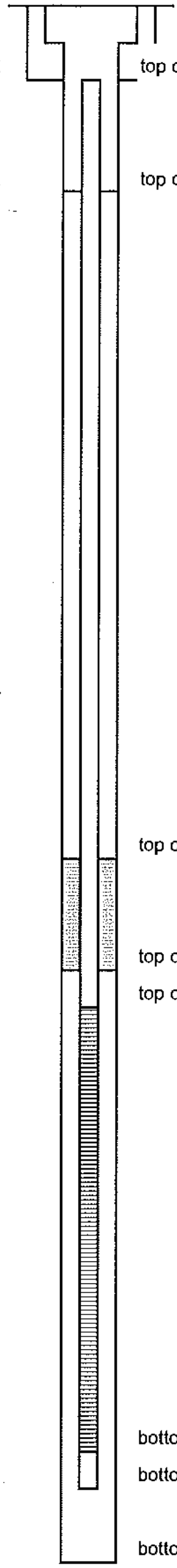
Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-FILT-01



Depth:	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/24/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	
Surface Condition:	grass
Elev:	
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (Puregold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-Packed Screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface.

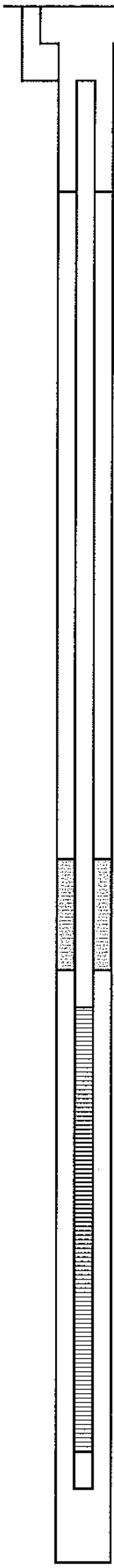
Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID: PZ-FIIT-02

Depth:



Depth	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/23/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC - Pre-packed screen 10/20 SAND
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface.

Not to scale.

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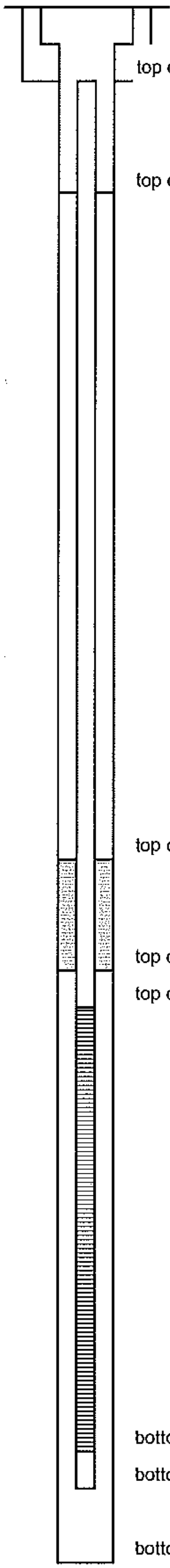
Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-FILT-04

Project:	Privileged & Confidential
Location:	Mt. Vernon, WA
Job No:	10507136
Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris
Date:	5/24/16
Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	
Surface Condition:	grass
Elev:	
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (Puregold)
Installation Method:	
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	~PVC - Pre-packed screen 10/20 Sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.5" OD
Silt Trap:	
Material Below Screen:	

Depth:



Depth	
___ ft	top of casing
___ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

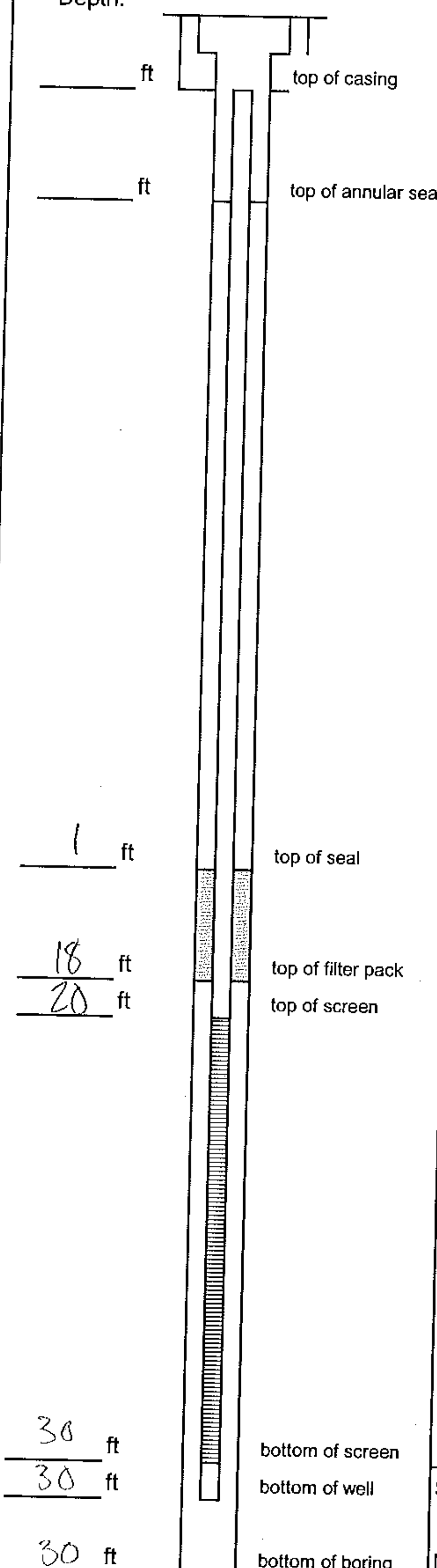
Depths are reported in feet below ground surface.

Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID: PZ-FILT-06



Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/24/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-packed screen 10/20 SAND
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface.

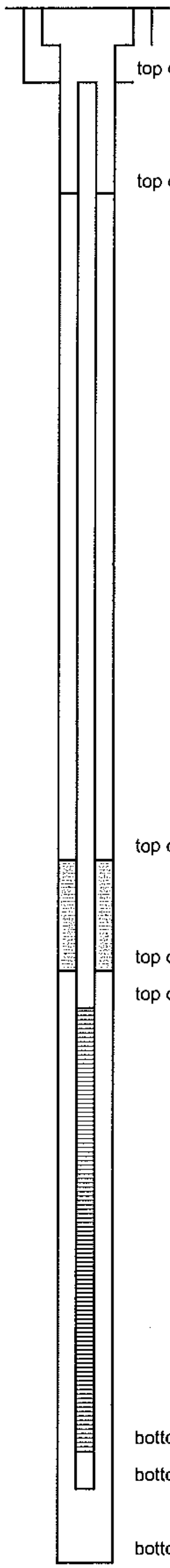
Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-SED-01

Depth:	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring



Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/23/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (Puregold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica sand. 10/20
Volume Placed	
Screen Type:	PVC - Pre-packed screen 10/20 SAND
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

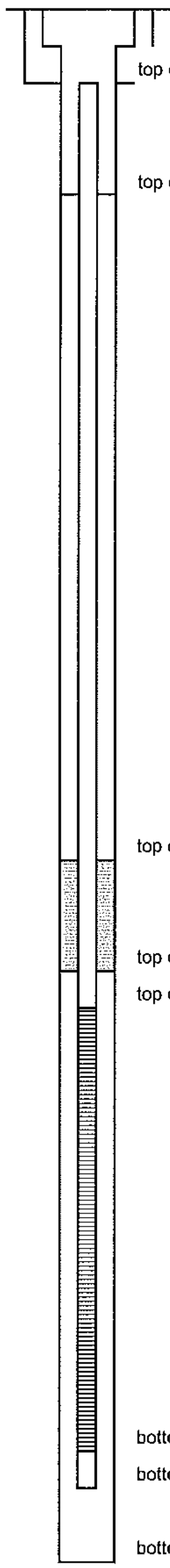
Depths are reported in feet below ground surface.

Not to scale.

Flush-Mounted Groundwater Monitoring Well Construction Diagram

MWH

Well ID PZ-SED-02



Depth:	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/23/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC - Pre-packed screen 10/20 Sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

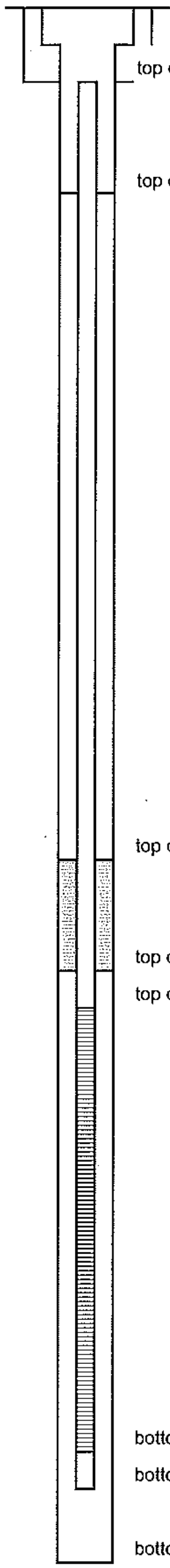
Depths are reported in feet below ground surface.

Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-SED-03



Depth:	
___ ft	top of casing
___ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/24/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	gravel Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4 Inch PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (puregold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-Packed Screen 10/20 Sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.5" OD
Silt Trap:	
Material Below Screen:	

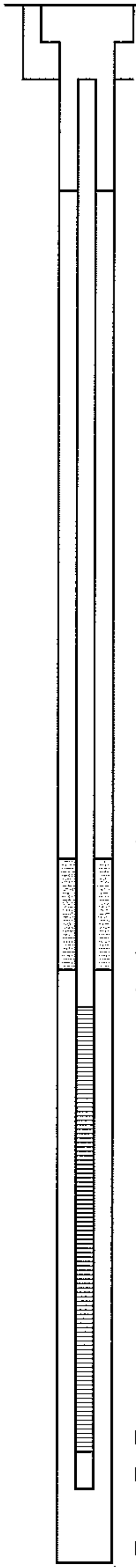
Depths are reported in feet below ground surface.

Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID: PZ-SED-04



Depth:	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/25/16

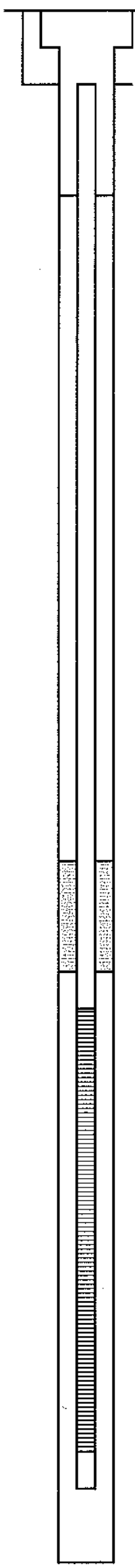
Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-packed screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface. Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-SED-06



Depth:

Depth		
ft		top of casing
ft		top of annular seal
1	ft	top of seal
18	ft	top of filter pack
20	ft	top of screen
30	ft	bottom of screen
30	ft	bottom of well
30	ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/24/16

Drilling Contractor: Cascade Drilling

Drill Rig Type: Geoprobe

Drilling Method: Direct Push

Borehole Diameter: 2"

Surface Condition: grass Elev:

Well Box Type:

Lock:

J-Plug:

Concreate Seal:

Sand Drainage:

Riser Pipe Type: 3/4" PVC

Riser Pipe Length: 20'

Annular Seal Type:

Installation Method:

Volume Placed:

Bentonite Seal Type: Chipped bentonite (Pure gold)

Installation Method: gravity

Volume Placed:

Filter Pack Material Colorado Silica Sand 10/20 SAND

Volume Placed

Screen Type: PVC- Pre-packed Screen 10/20 SAND

Screen Length: 10'

Slot Size: 0.010

Slotted Length:

Screen Diameter: 3/4" ID x 1.4" OD

Silt Trap:

Material Below Screen:

Depths are reported in feet below ground surface.

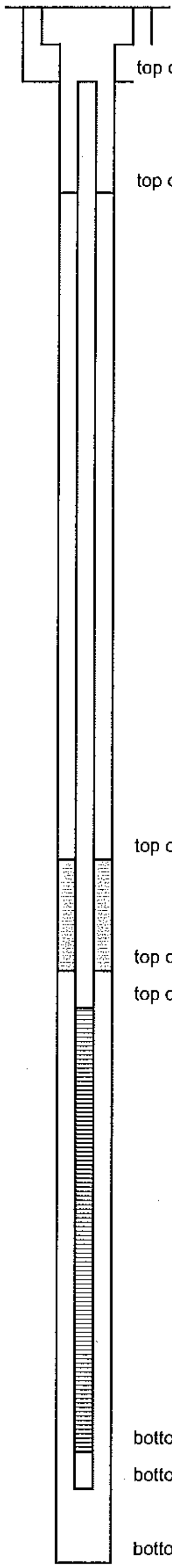
Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-SED-07

Depth:



Depth		
___ ft	top of casing	
___ ft	top of annular seal	
1 ft	top of seal	
18 ft	top of filter pack	
20 ft	top of screen	
30 ft	bottom of screen	
30 ft	bottom of well	
30 ft	bottom of boring	

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (Puregold)
Installation Method:	10/20
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-packed screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

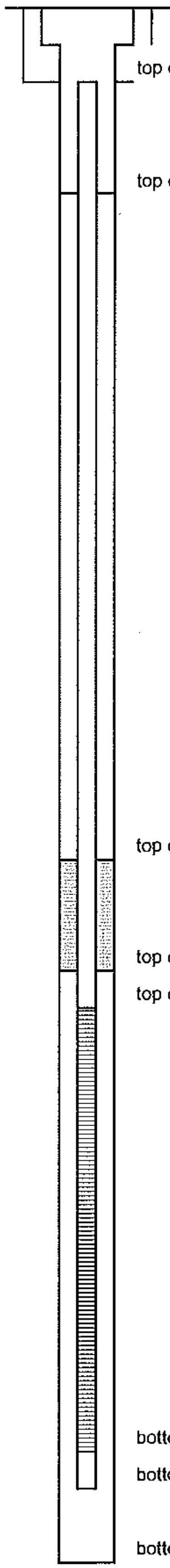
Depths are reported in feet below ground surface. Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID: PZ-SED-08

Depth:



Depth	
ft	top of casing
ft	top of annular seal
1 ft	top of seal
22 ft	top of filter pack
24 ft	top of screen
34 ft	bottom of screen
34 ft	bottom of well
34 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/25/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	gravel Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	24'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-Packed Screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.1" OD
Silt Trap:	
Material Below Screen:	

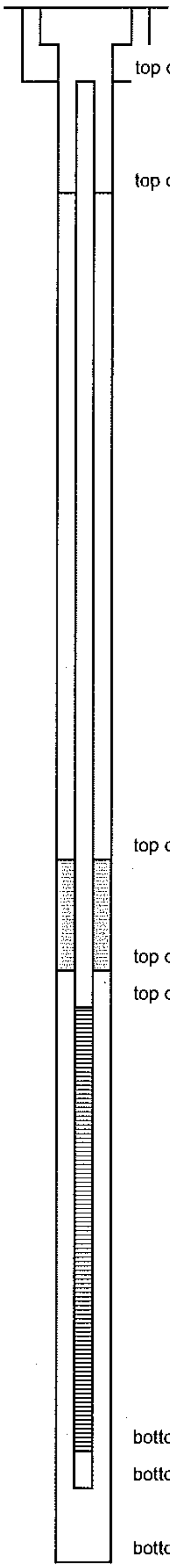
Depths are reported in feet below ground surface. Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID: P2-SED-09

Depth:	
___ ft	top of casing
___ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring



Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/23/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	grass Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	chipped bentonite (Pure gold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC - Pre-packed screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4" ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

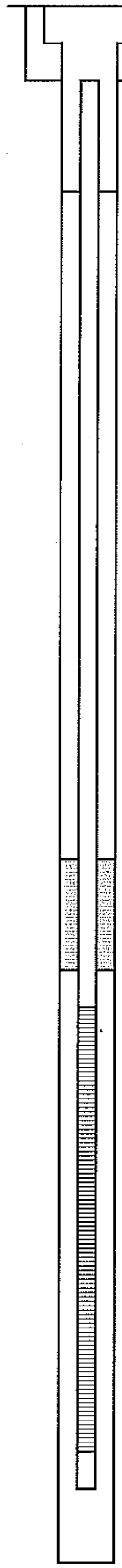
Depths are reported in feet below ground surface.

Not to scale.

MWH

Flush-Mounted Groundwater Monitoring Well Construction Diagram

Well ID PZ-SED-10



Depth:	
____ ft	top of casing
____ ft	top of annular seal
1 ft	top of seal
18 ft	top of filter pack
20 ft	top of screen
30 ft	bottom of screen
30 ft	bottom of well
30 ft	bottom of boring

Project:	Privileged & Confidential	Location:	Mt. Vernon, WA
Job No:	10507136	Logged by:	J. Bechtel
Proj Mgr:	Gregory Harris	Date:	5/23/16

Drilling Contractor:	Cascade Drilling
Drill Rig Type:	Geoprobe
Drilling Method:	Direct Push
Borehole Diameter:	2"
Surface Condition:	Elev:
Well Box Type:	
Lock:	
J-Plug:	
Concreate Seal:	
Sand Drainage:	
Riser Pipe Type:	3/4" PVC
Riser Pipe Length:	20'
Annular Seal Type:	
Installation Method:	
Volume Placed:	
Bentonite Seal Type:	Chipped bentonite (puregold)
Installation Method:	gravity
Volume Placed:	
Filter Pack Material	Colorado Silica Sand 10/20
Volume Placed	
Screen Type:	PVC Pre-packed screen 10/20 sand
Screen Length:	10'
Slot Size:	0.010
Slotted Length:	
Screen Diameter:	3/4 ID x 1.4" OD
Silt Trap:	
Material Below Screen:	

Depths are reported in feet below ground surface. Not to scale.

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ____

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BSY 031

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x Long Deg x Long Min/Sec x

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Tax Parcel No. 0

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature T~

Driller/Trainee License No. **2896**

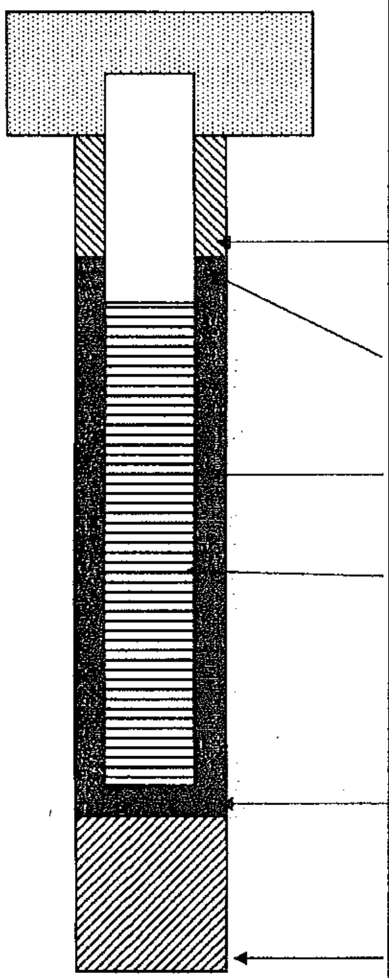
Cased or Uncased Diameter 3/4" Static Level 21'

Work/Decommision Start Date 5/23/16

If trainee, licensed driller's Signature and License No. ____

Work/Decommision End Date 5/23/16

Construction/Design | Well Data 103-16-2330 | Formation Description



PZ - SED - 10

Well Data		Formation Description
Concrete Surface Seal Depth	0 - 1 FT	0 - 10 FT SILTS
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill	FT	
Type		0 10 - 20 FT SILTY SAND
Seal	1 - 18	
Material	Bentonite	
Gravel Pack	18 - 30 FT	
Material	SAND 10/20	0 20 - 30 FT MEDIUM SAND
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30 FT	
Backfill		
Material		
Total Hole Depth	30 FT	

Scale 1" = ____ Page ____ of ____

ECY 050-12 (Rec=v 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Mount Vernon (Well Installations)**

Site Address: **14489 Riverbend Rd**

City: **Mount Vernon** County: **Skagit**

Consulting Firm: **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BJY 032

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required): Lat Deg **x** Lat Min/Sec **x**; Long Deg **x** Long Min/Sec **x**

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Tax Parcel No. **0**

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature ______

Driller/Trainee License No. **2896**

Cased or Uncased Diameter 3/4" Static Level 21

Work/Decommision Start Date 5/23/16

If trainee, licensed driller's Signature and License No. ______

Work/Decommision End Date 5/23/16

Construction/Design	Well Data 103-16-2330	Formation Description
	02-SEO-09	
	Concrete Surface Seal Depth: 0-1 FT	0 - 10 FT: silty
	Blank Casing (dia x dep): .75 x 20	
	Material: PVC	
	Backfill: ______ FT	
	Type: ______	
	Seal: 1-18'	0 10 - 20' FT: silty sand
	Material: Bentonite	
	Gravel Pack: 18-30 FT	
	Material: ~~Pea~~ sand 10/20	0 20 - 30 FT: medium sand
	Screen (dia x dep): .75 x 10'	
	Slot Size: .010	
	Material: PVC	
	Well Depth: 30 FT	
	Backfill: ______	
	Material: ______	
	Total Hole Depth: 30 FT	

Scale 1" = ______ Page ______ of ______

ECY 050-12 (Rev=v 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BJY 033

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x Long Deg x Long Min/Sec x

Tax Parcel No. 0

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature ______

Driller/Trainee License No. **2896**

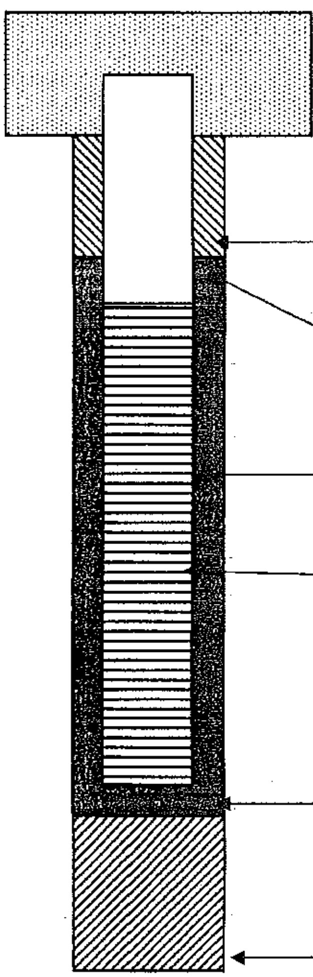
If trainee, licensed driller's Signature and License No. ______

Cased or Uncased Diameter .75" Static Level 2'

Work/Decommision Start Date 5/23/16

Work/Decommision End Date 5/23/16

Construction/Design — Well Data 103-16-2330 — Formation Description



Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	0 - 10 FT Silts
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill	FT	
Type		
Seal	1-18'	0 10 - 20' FT Silty Sand
Material	Bentonite	
Gravel Pack	18'-30' FT	
Material	~~[illegible]~~ Sand 10/20	0 20' - 30' FT Medium Sand
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30 FT	
Backfill		
Material		
Total Hole Depth	30 FT	

Scale 1" = - Page ____ of ____

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Mount Vernon (Well Installations)**

Site Address: **14489 Riverbend Rd**

City: **Mount Vernon** County: **Skagit**

Consulting Firm: **MWH Americas, Inc.**

Unique Ecology Well ID Tag No.: BSY 034

Location: 1/4 SE 1/4 NW Sec 13 TWN 34N R 3E or EWM / WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s,t,r still Required): Lat Deg x Lat Min/Sec x; Long Deg x Long Min/Sec x

Tax Parcel No.: 0

[X] Driller [ ] Trainee Name (Print): **Tyler Day**

Driller/Trainee Signature: [signature]

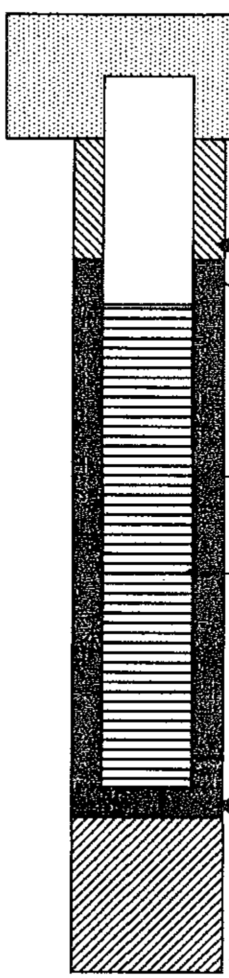
Driller/Trainee License No.: **2896**

Cased or Uncased Diameter: .75" Static Level: 21'

Work/Decommision Start Date: 5/22/16

If trainee, licensed driller's Signature and License No.: ______

Work/Decommision End Date: 5/23/16

Construction/Design	Well Data 103-16-2330		Formation Description
	Concrete Surface Seal Depth	0-1 FT	0 - 10 FT SILTS
	Blank Casing (dia x dep)	.75" x 20'	
	Material	PVC	
	Backfill	FT	
	Type		0 10 - 20' FT SILTY SAND
	Seal	1-18'	
	Material	Bentonite	
	Gravel Pack	18'-30' FT	
	Material	SAND 10/20	0 20' - 30' FT MEDIUM SAND
	Screen (dia x dep)	.75 x 10'	
	Slot Size	.010	
	Material	PVC	
	Well Depth	30 FT	
	Backfill		
	Material		
	Total Hole Depth	30 FT	

Scale 1" = ______ Page ______ of ______

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Mount Vernon (Well Installations)**

Site Address: **14489 Riverbend Rd**

City: **Mount Vernon** County: **Skagit**

Consulting Firm: **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BSY 038

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x

Long Deg x Long Min/Sec x

Tax Parcel No. **0**

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature ______

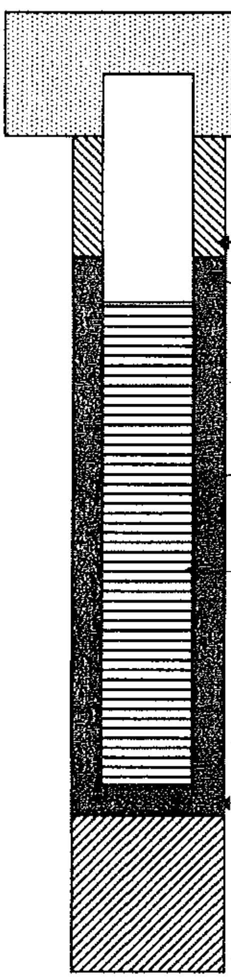
Driller/Trainee License No. **2896**

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommision Start Date 5/23/16

If trainee, licensed driller's Signature and License No. ______

Work/Decommision End Date 5/23/16

Construction/Design	Well Data 103-16-2330			Formation Description
	Concrete Surface Seal Depth	0'-1	FT	0 - 10 FT SILTS
	Blank Casing (dia x dep)	.75" x 20'		
	Material	PVC		
	Backfill		FT	
	Type			
	Seal	1-18'		0 10' - 20' FT SILTY SAND
	Material	Bentonite		
	Gravel Pack	18'-30'	FT	
	Material	SAND 10/20		
				0 20' - 30' FT MEDIUM SAND
	Screen (dia x dep)	.75" x 10'		
	Slot Size	.010		
	Material	PVC		
	Well Depth	30	FT	
	Backfill			
	Material			
	Total Hole Depth	30	FT	

Scale 1" = ______ Page ______ of ______

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. B54 036

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x

Long Deg x Long Min/Sec x

Tax Parcel No. 0

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature T

Driller/Trainee License No. **2896**

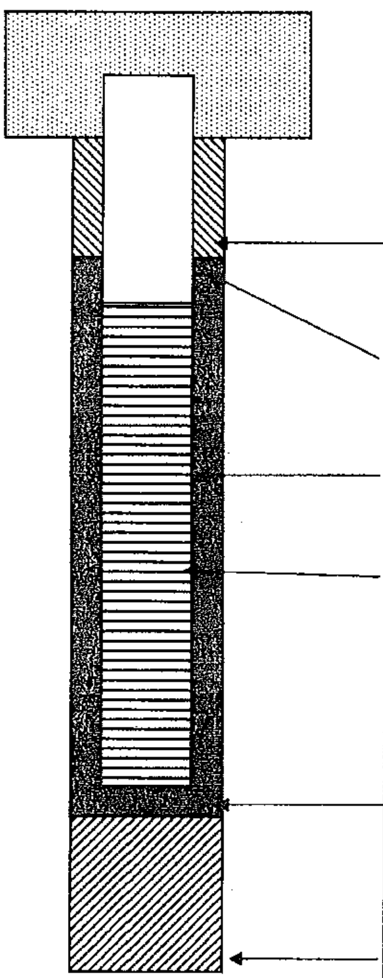
If trainee, licensed driller's Signature and License No. ______

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommission Start Date 5/23/16

Work/Decommission End Date 5/23/16

Construction/Design Well Data 103-16-2330 Formation Description



Well Data		
Concrete Surface Seal Depth	0-1	FT
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill		FT
Type		
Seal	1-18'	
Material	Bentonite	
Gravel Pack	18'-30'	FT
Material	Sand 10/20	
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30	FT
Backfill		
Material		
Total Hole Depth	30	FT

Formation Description:

0 - 10 FT
Silty

0 10 . 20' FT
Silty Sand

0 20'. 30' FT
Medium Sand

Scale 1" = ______ Page ______ of ______

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction
[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ____________

Type of Well
[X] Resource Protection
[ ] Geotechnical Soil Boring

Consulting Firm **MWH Americas, Inc.**

Property Owner **Mount Vernon (Well Installations)**
Site Address **14489 Riverbend Rd**
City **Mount Vernon** County **Skagit**

Unique Ecology Well ID Tag No. BSY 037

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x
Long Deg x Long Min/Sec x

Tax Parcel No. 0

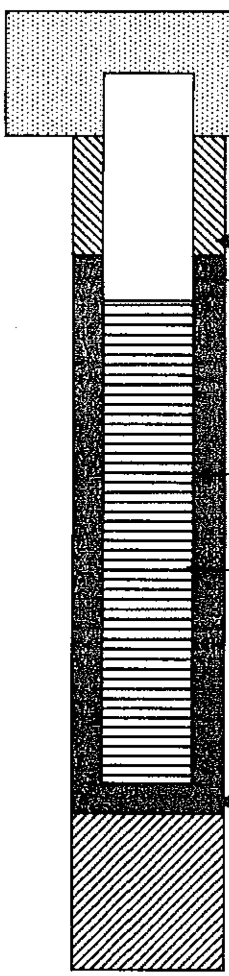
[X] Driller [ ] Trainee Name (Print) **Tyler Day**
Driller/Trainee Signature TZ
Driller/Trainee License No. **2896**

If trainee, licensed driller's Signature and License No. ____________

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommision Start Date 5/24/16

Work/Decommision End Date 5/24/16

Construction/Design	Well Data 103-16-2330		Formation Description
	Concrete Surface Seal Depth	0-1 FT	0 - 10 FT silty
	Blank Casing (dia x dep)	.75" x 20'	
	Material	PVC	
	Backfill	FT	
	Type		
	Seal	1-18'	0 10 - 20 FT silty sand
	Material	Bentonite	
	Gravel Pack	18'-30' FT	
	Material	sand 10/20	
			0 20 - 30' FT medium sands
	Screen (dia x dep)	.75" x 10'	
	Slot Size	.010	
	Material	PVC	
	Well Depth	30 FT	
	Backfill		
	Material		
	Total Hole Depth	30 FT	

Scale 1" = ________ Page ______ of ______

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Mount Vernon (Well Installations)**

Site Address: **14489 Riverbend Rd**

City: **Mount Vernon** County: **Skagit**

Consulting Firm: **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BJY 038

Location: 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** or EWM / WWM — [X] EWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required): Lat Deg x Lat Min/Sec x; Long Deg x Long Min/Sec x

Tax Parcel No. 0

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature ______

Driller/Trainee License No. **2896**

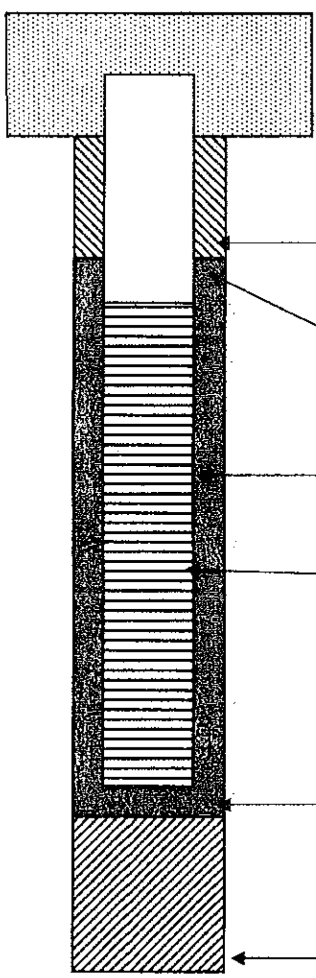
If trainee, licensed driller's Signature and License No. ______

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommission Start Date 5/24/16

Work/Decommission End Date 5/24/16

Construction/Design — Well Data 103-16-2330 — Formation Description



Well Data		
Concrete Surface Seal Depth	0-1	FT
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill		FT
Type		
Seal	1-18'	
Material	Benton.	
Gravel Pack	18'-30'	FT
Material	SAND 10/20	
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30	FT
Backfill		
Material		
Total Hole Depth	30	FT

Formation Description

0 - 10 FT	SILTS
0 10 - 20' FT	SILTY SAND
0 20' - 30' FT	MEDIUM SANDS

Scale 1" = ______ Page ____ of ____

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. B5Y 039

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [BWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x

Long Deg x Long Min/Sec x

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature ______

Driller/Trainee License No. **2896**

If trainee, licensed driller's Signature and License No. ______

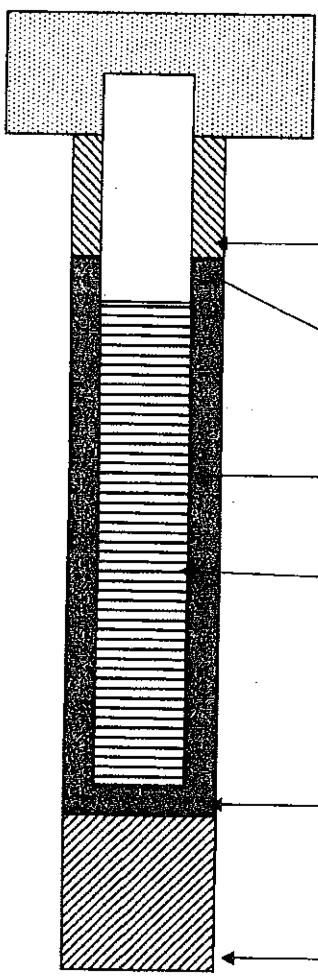
Tax Parcel No. **0**

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommission Start Date 5/24/16

Work/Decommission End Date 5/24/16

Construction/Design Well Data 103-16-2330 Formation Description



Well Data			Formation Description	
Concrete Surface Seal Depth	0 - 1	FT	0 - 10'	FT
			silts	
Blank Casing (dia x dep)	.75" x 20'			
Material	PVC			
Backfill		FT		
Type				
Seal	1-18'		0 10 - 20'	FT
Material	Bentonite		silty sand	
Gravel Pack	18'-30'	FT		
Material	Sand 10/20			
			0 20 - 30'	FT
Screen (dia x dep)	.75 x 10'		medium sand	
Slot Size	.010			
Material	PVC			
Well Depth	30	FT		
Backfill				
Material				
Total Hole Depth	30	FT		

Scale 1" = ______ Page ______ of ______

ECY 050-12 (Rec=v 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Mount Vernon (Well Installations)**

Site Address: **14489 Riverbend Rd**

City: **Mount Vernon** County: **Skagit**

Consulting Firm: **MWH Americas, Inc.**

Unique Ecology Well ID Tag No.: BJY 040

Location: 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required): Lat Deg x Lat Min/Sec x; Long Deg x Long Min/Sec x

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature: [signature]

Driller/Trainee License No. **2896**

Tax Parcel No. **0**

Cased or Uncased Diameter: .75" Static Level: 21'

Work/Decommision Start Date: 5/24/16

Work/Decommision End Date: 5/24/16

If trainee, licensed driller's Signature and License No.	

Construction/Design | Well Data 103-16-2330 | Formation Description

Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	0 - 10 FT: Silts
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill	FT	
Type		
Seal	1-18'	0 10 - 20' FT: Silty Sand
Material	Bentonite	
Gravel Pack	18'-30' FT	
Material	Sand 10/20	0 20' - 30' FT: Medium Sand
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30 FT	
Backfill		
Material		
Total Hole Depth	30 FT	

Scale 1" = ______ Page ____ of ____

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BSY 041

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg **x** Lat Min/Sec **x**

Long Deg **x** Long Min/Sec **x**

Tax Parcel No. **0**

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature Ty

Driller/Trainee License No. **2896**

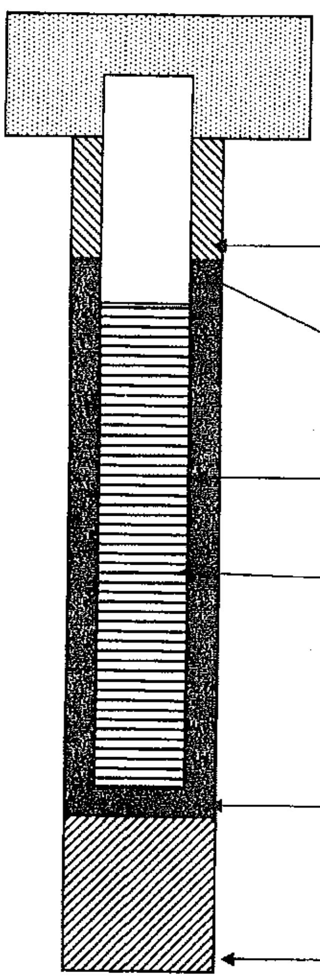
If trainee, licensed driller's Signature and License No. ______

Cased or Uncased Diameter .75" Static Level 21'

Work/Decommision Start Date 5/24/16

Work/Decommision End Date 5/24/16

Construction/Design Well Data 103-16-2330 Formation Description



Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	0 - 10 FT
Blank Casing (dia x dep)	.75" x 20'	SILTS
Material	PVC	
Backfill	FT	
Type		
Seal	1-18'	0 10 - 20 FT
Material	Bentonite	SILTY SAND
Gravel Pack	18'-30' FT	
Material	SAND 10/20	0 20' - 30' FT
Screen (dia x dep)	.75" x 10'	MEDIUM SAND
Slot Size	.010	
Material	PVC	
Well Depth	30 FT	
Backfill		
Material		
Total Hole Depth	30 FT	

Scale 1" = ______ Page ______ of ______

ECY 050-12 (Rec=v 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BJY 042

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x

Long Deg x Long Min/Sec x

Tax Parcel No. **0**

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature

Driller/Trainee License No. **2896**

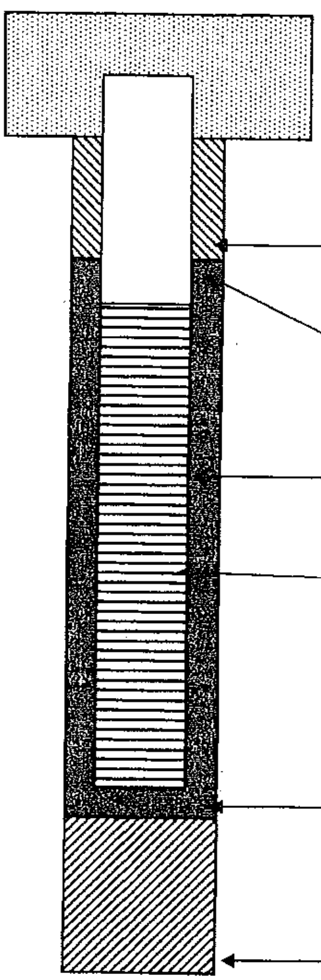
Cased or Uncased Diameter .75" Static Level 21'

Work/Decommission Start Date 5/25/16

If trainee, licensed driller's Signature and License No. ______

Work/Decommision End Date 5/25/16

Construction/Design | Well Data 103-16-2330 | Formation Description



Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	0 - 10 FT Silts
Blank Casing (dia x dep)	.75" x 20'	
Material	PVC	
Backfill	FT	
Type		
Seal	1 - 18"	0 10 - 20' FT Silty Sand
Material	Bentonite	
Gravel Pack	18'-30' FT	
Material	Sand 10/20	0 20' - 30' FT Medium Sand
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	30 FT	
Backfill		
Material		
Total Hole Depth	30 FT	

Scale 1" = ______

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BJY 044

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

Lat/Long (s,t,r still Required) Lat Deg **x** Lat Min/Sec **x** Long Deg **x** Long Min/Sec **x**

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature TD

Driller/Trainee License No. **2896**

Tax Parcel No. **0**

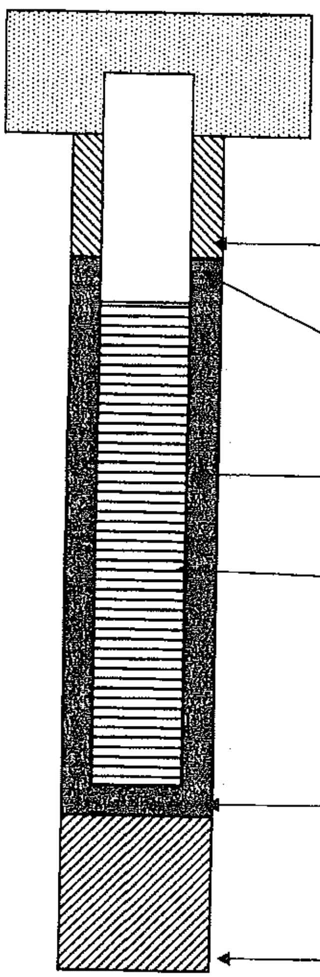
Cased or Uncased Diameter .75" Static Level 25'

Work/Decommission Start Date 5/25/16

If trainee, licensed driller's	
Signature and License No.	

Work/Decommission End Date 5/25/16

Construction/Design — Well Data 103-16-2330 — Formation Description



Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	**0** - 15' **FT** Silts
Blank Casing (dia x dep)	.75" x 35'	
Material	PVC	
Backfill	FT	
Type		
Seal	1-23'	**0** 15'-25' **FT** Silty sand
Material	Bentonite	
Gravel Pack	23'-35' FT	
Material	Sand 10/20	
		0 25'-35' **FT** Medium sand
Screen (dia x dep)	.75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	35 FT	
Backfill		
Material		
Total Hole Depth	35 FT	

Scale 1" = ______

Page ______ of ______

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT

Notice of Intent No. **RE12841**

Construction/Decommission

[X] Construction

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ____________

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner **Mount Vernon (Well Installations)**

Site Address **14489 Riverbend Rd**

City **Mount Vernon** County **Skagit**

Consulting Firm **MWH Americas, Inc.**

Unique Ecology Well ID Tag No. BSY 043

Location 1/4 **SE** 1/4 **NW** Sec **13** TWN **34N** R **3E** [EWM] or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg **x** Lat Min/Sec **x**

Long Deg **x** Long Min/Sec **x**

Tax Parcel No. **0**

[X] Driller [ ] Trainee Name (Print) **Tyler Day**

Driller/Trainee Signature [signature]

Driller/Trainee License No. **2896**

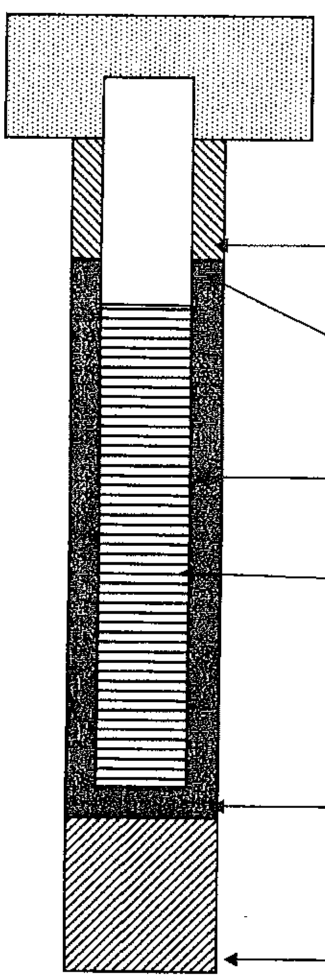
If trainee, licensed driller's Signature and License No. ____________

Cased or Uncased Diameter .75" Static Level 15'

Work/Decommission Start Date 5/25/16

Work/Decommision End Date 5/25/16

Construction/Design | Well Data 103-16-2330 | Formation Description



Well Data		Formation Description
Concrete Surface Seal Depth	0-1 FT	**0** - 15' FT Silty Sand
Blank Casing (dia x dep)	.75" x 13'	
Material	PVC	
Backfill	FT	
Type		**0** 15' - 25' FT Medium Sand
Seal	1 - 11'	
Material	Bentonite	
Gravel Pack	11' - 23' FT	
Material	Sand 10/20	**0** - FT
Screen (dia x dep)	~~FP~~' .75" x 10'	
Slot Size	.010	
Material	PVC	
Well Depth	23 FT	
Backfill	23 - 25'	
Material	Bentonite	
Total Hole Depth	25 FT	

Scale 1" = ____________ Page ______ of ______

ECY 050-12 (Rec=v 2/01)

MONITORING WELL DEVELOPMENT FORM

MWH
BUILDING A BETTER WORLD

Project Name	Priviledged and Confidential	Well No.	DG-GW
Location	Mt. Vernon, Washington	Project No.	10507136.000000
Developed By	S. Alberts	Checked By	

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ________ ☐
3. Time spent developing well ________ min.
4. Total well depth (TOC) ________ ft.
   (From well construction summary)

   Measured well depth (Before) 22.19 ft.

   Measured well depth (After) 22.19 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.78 gal.
7. Volume of water removed from well ________ gal.

   0.092 gal/ft
8. Volume of water added (if any) ________ gal.
9. Source of water added ________

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	13.69 ft.	13.79 (13.79) ft.
Date:	b.	5/26/16 (mm dd yy)	5/26/16 (mm dd yy)
Time:	c.	1050 ☒ a.m. ☐ p.m.	1149 ☒ a.m. ☐ p.m.
11 Sediment in well bottom:		________ feet	________ feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☐ Turbid ☐ (Describe)
Color		Dark Brown	Clear
Odor		None	None
Turbidity		Overrange	22.8
Other			

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$	=	0.00
Well casing Vol. (gallons) $0.16r^2 \times 1$	=	0.00
Saturated length of sand pack (ft.) (ls)		
Length of water column (ft.) (l)		0.00
R = Radius of borehole (in.) ☐	r = Well radius (in.) ☐	

Comments: Began purge 1056. Very dark + turbid. Cleared quickly somewhat.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L DTW
1105	~2.0	6.67	690	12.2	625	115.4	None	Very cloudy	1.37
1143	~8	6.68	585.7	12.3	22.8	111.8	None	Clear	1.41

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Location: Mt. Vernon, Washington
Developed By: S. Alberts
Well No.: PZ-FILT-01
Project No.: 10507136.000000
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ______ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) ______ ft.
   (From well construction summary)
   Measured well depth (Before) 29.28 ft.
   Measured well depth (After) 29.28 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.67 gal.
7. Volume of water removed from well ~7 gal.
8. Volume of water added (if any) N/A gal.
9. Source of water added ______

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	22.03 ft.	22.07 ft.
Date:	b.	5/25/16 (mm dd yy)	5/25/16 (mm dd yy)
Time:	c.	11:01 ☐ a.m. ☐ p.m.	1202 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		______ feet	______ feet
12 Water Observations:		Clear ☐ Turbid ☐ (Describe)	Clear ☐ Turbid ☐ (Describe)
Color		Dark Brown/gray	
Odor			
Turbidity			
Other			

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00
Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00
Saturated length of sand pack (ft.) (ls) ______
Length of water column (ft.) (l) 0.00
R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L DTW
1109	~1.0	6.36	442.7	15.14	273	43.7	None	Cloudy	–
~~	~~~3.5~~	~~6.20~~		~~16.0~~					
1133	~3.5	6.24	313.9	15.4	7.68	43.1	None	Clear	1.12
1151	~6	6.24	302.3	15.9	4.39	39.9	None	Clear	1.95
1202	~7	6.20	299.9	15.5	3.26		None	Clear	1.22

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential | Well No.: PZ-FILT-02
Location: Mt. Vernon, Washington | Project No.: 10507136.000000
Developed By: S. Alberts | Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) ______ ft.
   (From well construction summary)
   Measured well depth (Before) 29.30 ft.
   Measured well depth (After) 29.30 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.65 gal.
7. Volume of water removed from well ~8.5 gal.

0.092 g/ft 1.5" OD (w/filter pack)

8. Volume of water added (if any) N/A gal.
9. Source of water added ______

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	22.22 ft.	22.22 ft.
Date:	b.	5/25/16 (mm dd yy)	5/25/16 (mm dd yy)
Time:	c.	1046 ☒ a.m. ☐ p.m.	1152 ☒ a.m. ☐ p.m.
11 Sediment in well bottom:		______ feet	______ feet
12 Water Observations:		Clear ☐ Turbid ☐ (Describe)	Clear ☐ Turbid ☐ (Describe)
	Color	Dark brown/gray	Clear
	Odor	None	None
	Turbidity	Overrange	3.71
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments

Time	Gallons Purged	pH	Spec. Cond uS/cm	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L	DTW
1049	~0.5	6.25	334.8	16.6	overrange	49.6	None	Cloudy	1.36	
1115	~3.5	6.20	259.1	16.0	11.6	30.9	None	Clear	0.95	
1146	~6.5	6.18	262.1	16.3	3.71	34.4	None	Clear	1.02	

MWH

BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Well No.: PZ-FILT-04
Location: Mt. Vernon, Washington
Project No.: 10507136.000000
Developed By: S. Alberts
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ______ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) ______ ft.
   (From well construction summary)
   Measured well depth (Before) 29.33 ft.
   Measured well depth (After) 29.32 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.85 gal.
7. Volume of water removed from well 9.5 gal.

0.092 gal/FT

8. Volume of water added (if any) N/A gal.
9. Source of water added ______

	Before Development	After Development
10 Depth to Water (from top of well casing) a.	20.04 ft.	20.05 ft.
Date: b. (mm dd yy)	5/26/16	5/26/16
Time: c.	1025 ☒ a.m. ☐ p.m.	1159 ☒ a.m. ☐ p.m.
11 Sediment in well bottom:	______ feet	______ feet
12 Water Observations:	Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
Color	Brown	Clear
Odor	None	None
Turbidity	Overrange	4.53
Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times 1$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Began purge 10:33. Very dark + turbid

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L	DTW
1038	~1.0	6.24	305.8	14.6	562	114.0	None	Cloudy	1.48	
1115	~5.5	6.21	220.0	14.6	11.8	108.4	None	Clear	1.07	
1157	~9.5	6.19	196.0	14.7	4.53	104.1	None	Clear	0.74	

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Location: Mt. Vernon, Washington
Developed By: S. Alberts / J. Bechtel
Well No.: PZ-FILT-06
Project No.: 10507136.000000
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) bgs 30 ft.
   (From well construction summary)
   Measured well depth (Before) 29.34 ft.
   Measured well depth (After) 29.34 ft.
5. Inside diameter of well 3/4 in.
6. Volume of water in filter pack and well casing 0.092 0.66 gal.
7. Volume of water removed from well 7 gal.
8. Volume of water added (if any) N/A gal.
9. Source of water added N/A

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	22.11 ft.	22.11 ft.
Date:	b.	5/25/16 (mm dd yy)	5/25/16 (mm dd yy)
Time:	c.	1234 ☐ a.m. ☒ p.m.	1334 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		0 feet	0 feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☐ Turbid ☐ (Describe)
	Color	Dark Brown	
	Odor		
	Turbidity	over range	
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times 1$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: 1248 Begin Development

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO ~~DTW~~ mg/L
1255	~2	6.33	409.9	16.3	33.8	50.3	None	Cloudy	1.92
1317	~5	6.29	374.0	16.0	9.39	54.9	None	~~cloudy~~ clear	1.40
1332	7	6.25	363.7	16.1	6.08	55.6	None	Clear	1.67

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Location: Mt. Vernon, Washington
Developed By: J. Bechtel
Well No.: PZ-SED-01
Project No.: 10507136.000000
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ________ ☐
3. Time spent developing well: 64 min.
4. Total well depth (TOC) (From well construction summary): bgs 30 ft.
   Measured well depth (Before): 29.32 ft.
   Measured well depth (After): 29.32 ft.
5. Inside diameter of well: 3/4 in.
6. Volume of water in filter pack and well casing: 0.72 gal. 0.092 gal/ft. 1.5" OD (w/ filler pack)
7. Volume of water removed from well: 8 gal.
8. Volume of water added (if any): N/A gal.
9. Source of water added: N/A

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	21.56 ft.	21.54 ft.
Date:	b.	5/24/16 (mm dd yy)	5/24/16 (mm dd yy)
Time:	c.	12:59 ☐ a.m. ☒ p.m.	14:26 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		0 feet	0 feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
	Color	Dark brown	Clear
	Odor	None	None
	Turbidity	out of range	7.43
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times 1$ = 0.00

Saturated length of sand pack (ft.) (ls) = ________

Length of water column (ft.) (l) = 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Very turbid at first but clearing quickly as development proceeds. Started purge at 12:59.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	mg/L ~~DTW~~ DO
1303	~1 gal	6.25	265	15.7	617	-67.7	None	turbid	—
1325	~4 gal	6.18	186.2	15.2	17.8	-8.4	None	mostly clear	—
1345	~6 gal	6.19	179.3	15.1	11.6	-12.0	None	clear	3.28
1702	8 gal	6.18	174.9	15.1	7.43	-4.1	None	clear	2.48

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name	Priviledged and Confidential	Well No.	PZ-SED-02
Location	Mt. Vernon, Washington	Project No.	10507136.000000
Developed By	J. Bechtel	Checked By	

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ________ ☐
3. Time spent developing well ________ min.
4. Total well depth (TOC) bgs 30 ft.
   (From well construction summary)

   Measured well depth (Before) 29.30 ft.

   Measured well depth (After) 29.30 ft.
5. Inside diameter of well 3/4 in.
6. Volume of water in filter pack and well casing 0.69 gal.
   0.092 gal/ft 1.5" OD (w/filter pack)
7. Volume of water removed from well 7 gal.
8. Volume of water added (if any) N/A gal.
9. Source of water added N/A

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	21.73 ft.	21.73 ft.
Date:	b.	5/24/16 (mm dd yy)	5/24/16 (mm dd yy)
Time:	c.	1316 ☐ a.m. ☒ p.m.	1618 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		0 feet	0 feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
	Color	Dark Brown	clear
	Odor	None	NONE
	Turbidity	865	6.58
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls) ________

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Started out very dark brown but quickly cleared. Started purge at 1407.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO ~~DTW~~ mg/l
1407	~0.5	6.18	231.7	14.5	79.0	32.1	None	cloudy	3.98
1428	~3.5	6.08	183.8	14.8	13.3	0.1	NONE	clear	2.03
1440	~4.0	battery died / temporarily stopped development.							
1543	resume	development							
1552	5.5	6.03	183.1	15.8	11.4	21.2	NONE	clear	3.95
1606	6.5	6.03	182.0	16.1	8.23	41.3	NONE	clear	2.82
1614	7.0	6.10	177.0	14.9	6.58		NONE	clear	3.49

41.3
37.7

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name	Priviledged and Confidential	Well No.	PZ - SED-03
Location	Mt. Vernon, Washington	Project No.	10507136.000000
Developed By	S. Alberts	Checked By	

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ______ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) (From well construction summary) ______ ft.
   - Measured well depth (Before) 29.26 ft.
   - Measured well depth (After) 29.26 ft.
5. Inside diameter of well ______ in.
6. Volume of water in filter pack and well casing 0.56 gal.
7. Volume of water removed from well ______ gal.

   0.092 gal/ft -
8. Volume of water added (if any) ______ gal.
9. Source of water added ______

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	23.14 ft.	23.14 ft.
Date:	b.	5/26/16 (mm dd yy)	5/26/16 (mm dd yy)
Time:	c.	0841 ☒ a.m. ☐ p.m.	0950 ☒ a.m. ☐ p.m.
11 Sediment in well bottom:		______ feet	______ feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☐ Turbid ☐ (Describe)
	Color	Brown	Clear
	Odor	None	None
	Turbidity	Overrange	3.11
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times 1$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Began purging 0850. Very turbid. Cleared quickly

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L	DTW
0856	~ 1.0	6.36	732	14.2	177	125.9	None	Cloudy	1.55	
0924	~ 5	6.32	702	14.1	5.08	123.9	None	Clear	1.59	
0947	~ 8	6.28	697	~~3.11~~ SA 14.2	3.11	121.5	None	Clear	1.01	

MWH

BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Location: Mt. Vernon, Washington
Developed By: S. Alberts
Well No.: PZ-SFD-04
Project No.: 10507136.000000
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ________ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) ______ ft.
   (From well construction summary)
   Measured well depth (Before) 29.25 ft.
   Measured well depth (After) 29.25 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.58 gal.
7. Volume of water removed from well ~6.5 gal.

0.092 gal/ft

8. Volume of water added (if any) ______ gal.
9. Source of water added ______

		Before Development	After Development
10	Depth to Water (from top of well casing)	a. 22.97 ft.	22.97 ft.
	Date:	b. 5/26/16 (mm dd yy)	5/26/16 (mm dd yy)
	Time:	c. 0830 ☒ a.m. ☐ p.m.	0917 ☒ a.m. ☐ p.m.
11	Sediment in well bottom:	______ feet	______ feet
12	Water Observations:	Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
	Color	Brown	Clear
	Odor	None	None
	Turbidity	Overrange	2.71
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Began purge

Time	Gallons Purged	pH	Spec. Cond uS/cm	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L	DTW
0836	~1.0	6.24	395.2	14.2	130	120.0	None	slightly cloudy	1.42	
~~0908~~	~~~5~~			~~14.1~~	~~5.93~~		~~None~~	~~Clear~~		
0915	~6.5	6.20	408.3	14.2	2.71	121.9	None	Clear	1.49	

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential | Well No.: PZ-SED-6
Location: Mt. Vernon, Washington | Project No.: 10507136.000000
Developed By: J. Bechtel | Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ______ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) (From well construction summary) bgs 30 ft.
   Measured well depth (Before) 29.41 ft.
   Measured well depth (After) 29.43 ft.
5. Inside diameter of well 3/4 in.
6. Volume of water in filter pack and well casing 0.64 gal.
7. Volume of water removed from well 7 gal.
   0.092 gal/ft 1.5" OD w/ filter pack
8. Volume of water added (if any) N/A gal.
9. Source of water added N/A

		Before Development	After Development
10	Depth to Water (from top of well casing) a.	22.26 ft.	22.25 ft.
	Date: b. (mm dd yy)	5/25/16	5/25/16
	Time: c.	1354 ☐ a.m. ☒ p.m.	☐ a.m. ☒ p.m.
11	Sediment in well bottom:	0.02 feet	0 feet
12	Water Observations:	Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
	Color	dark brown	
	Odor	NONE	
	Turbidity	over range	
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times 1$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: 1357 begin development. Dark brown @ first but quickly begins to clear.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO ~~DTW~~ mg/L
1404	~1.5	6.56	392.4	15.2	76.9	71.7	None	cloudy	5.22
1425	~5	6.39	358.1	14.8	4.95	72.4	None	clear	2.34
1438	7	6.38	350.0	14.3	2.79		None	clear	2.79

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential | Well No.: PZ-SED-07
Location: Mt. Vernon, Washington | Project No.: 10507136.000000
Developed By: | Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☐
   - pumped slowly ☐
   - Other ________ ☐
3. Time spent developing well ________ min.
4. Total well depth (TOC) (From well construction summary) bgs 30 ft.
   Measured well depth (Before) 29.36 ft.
   Measured well depth (After) 29.36 ft.
5. Inside diameter of well 3/4 in.
6. Volume of water in filter pack and well casing 0.69 gal.
7. Volume of water removed from well 7 gal.
   0.092 gal/ft
8. Volume of water added (if any) N/A gal.
9. Source of water added N/A

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	21.86 ft.	21.88 ft.
Date:	b.	5/25/16 (mm dd yy)	5/25/16 (mm dd yy)
Time:	c.	1455 ☐ a.m. ☒ p.m.	1549 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		____ feet	____ feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☐ Turbid ☐ (Describe)
	Color	Dark brown	
	Odor	None	
	Turbidity	over range	
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls) ________

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: 1455 begin development. Very turbid @ first but clears quickly.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO ~~DTW~~ Mg/L
~~14~~ 1516	3.5	6.36	194.1	17.4	6.79	100.3	None	clear	3.76
1540	~6.5	6.22	178.7	16.7	7.37	95.3	None	Clear	0.83

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Well No.: PZ-SED-08
Location: Mt. Vernon, Washington
Project No.: 10507136.000000
Developed By: S. Alberts
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ______ ☐
3. Time spent developing well ______ min.
4. Total well depth (TOC) (From well construction summary) ______ ft.
   - Measured well depth (Before) 33.33 ft.
   - Measured well depth (After) 33.34 ft.
5. Inside diameter of well 0.75 in.
6. Volume of water in filter pack and well casing 0.75 gal.
7. Volume of water removed from well 7.5 gal.

0.092 gal/Ft

8. Volume of water added (if any) N/A gal.
9. Source of water added ______

		Before Development	After Development
10 Depth to Water (from top of well casing)	a.	25.22 ft.	25.24 ft.
Date: (mm dd yy)	b.	5/25/16	5/25/16
Time:	c.	1521 ☐ a.m. ☒ p.m.	1640 ☐ a.m. ☒ p.m.
11 Sediment in well bottom:		feet	feet
12 Water Observations:		Clear ☐ Turbid ☒ (Describe)	Clear ☒ Turbid ☐ (Describe)
	Color	Brown	
	Odor	None	
	Turbidity	Overrange	5.26
	Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls) ______

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO mg/L DTW
1527	~0.5	6.51	186.2	17.1	900	92.1	None	Light tan	1.71
1559	~4	6.36	174.6	16.8	12.0	101.5	None	Clear	-
1636	7.5	6.32	178.6	17.7	5.26	93.1	None	Clear	1.54

MONITORING WELL DEVELOPMENT FORM

MWH — BUILDING A BETTER WORLD

Project Name: Priviledged and Confidential
Location: Mt. Vernon, Washington
Developed By: J. Bechtel / S. Alberts
Well No.: PZ-SED-09
Project No.: 10507136.000000
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ☐
3. Time spent developing well: 95 min.
4. Total well depth (TOC) (From well construction summary): ft.
   Measured well depth (Before): 29.80 ft.
   Measured well depth (After): 29.80 ft.
5. Inside diameter of well: 3/4 in.
6. Volume of water in filter pack and well casing: 0.79 gal.
7. Volume of water removed from well: 8 gal.
   0.092 gal/ft 1.5" OD (w/ filter pack)
8. Volume of water added (if any): N/A gal.
9. Source of water added: N/A

	Before Development	After Development
10 Depth to Water (from top of well casing) a.	21.73 ft.	21.73 ft.
Date: b. (mm/dd/yy)	5/25/16	5/25/16
Time: c.	0849 ☒ a.m. ☐ p.m.	1024 ☒ a.m. ☐ p.m.
11 Sediment in well bottom:	feet	feet
12 Water Observations:	Clear ☐ Turbid ☒	Clear ☒ Turbid ☐
Color	Dark Brown	Clear
Odor	None	None
Turbidity	over range	1.37
Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls)

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: Note well riser not trimmed down yet. 0854 begin development.

Time	Gallons Purged	pH	Spec. Cond uS	Temp °C	Turbidity (NTU)	ORP	Odor	Color	DO ~~DTW~~ mg/L
0905	~1	6.28	309.4	14.3	203	-16	NONE	Cloudy	3.19
0926	~3	6.18	262.8	15.3	3.19	29.0	NONE	Clear	4.42
0949	~6	6.17	260.3	17.1	2.30	41.9	None	Clear	2.53
1020	~8	6.11	259.9	15.3	1.37	58.4	None	Clear	1.95

MWH
BUILDING A BETTER WORLD

MONITORING WELL DEVELOPMENT FORM

Project Name: Priviledged and Confidential
Well No.: PZ-SED-10
Location: Mt. Vernon, Washington
Project No.: 10507136.000000
Developed By: J. Bechtel / S. Alberts
Checked By:

1. Can this well be purged dry? ☐ Yes ☐ No
2. Well development method
   - surged with bailer and bailed ☐
   - surged with bailer and pumped ☐
   - surged with block and bailed ☐
   - surged with block and pumped ☐
   - surged with block, bailed and pumped ☐
   - compressed air ☐
   - bailed only ☐
   - pumped only ☒
   - pumped slowly ☐
   - Other ☐
3. Time spent developing well: ______ min.
4. Total well depth (TOC) (From well construction summary): bgs 30 ft.
   - Measured well depth (Before): 29.27 ft.
   - Measured well depth (After): 29.27 ft.
5. Inside diameter of well: 3/4 in.
6. Volume of water in filter pack and well casing: 0.69 gal.
   0.092 gal/ft 1.5" OD (w/ filter pack)
7. Volume of water removed from well: ______ gal.
8. Volume of water added (if any): N/A gal.
9. Source of water added: N/A

	Before Development	After Development
10 Depth to Water (from top of well casing) a.	21.73 ft.	21.73 ft.
Date: b.	5/25/16 (mm dd yy)	5/25/16 (mm dd yy)
Time: c.	0835 ☒ a.m. ☐ p.m.	☐ a.m. ☐ p.m.
11 Sediment in well bottom:	0 feet	0 feet
12 Water Observations:	Clear ☐ Turbid ☒	Clear ☒ Turbid ☐
(Describe) Color	Brown	clear
Odor	None	None
Turbidity	over range	4.47
Other		

Filter Pack Vol. (gallons) $(R^2-r^2)ls0.25$ = 0.00

Well casing Vol. (gallons) $0.16r^2 \times l$ = 0.00

Saturated length of sand pack (ft.) (ls)

Length of water column (ft.) (l) 0.00

R = Radius of borehole (in.) ☐ r = Well radius (in.) ☐

Comments: 0810 Begin development. Water very turbid at first. Begins to clear quickly.

Time	Gallons Purged	pH	Spec. Cond us/cm	Temp °C	Turbidity (NTU)	ORP mV	Odor	Color	D.O. mg/L DTW
0810	0.5	6.43	258.1	13.9	Out of range	-0.3	None	Brown	—
0908	~3.5	6.26	215.1	13.6	21.2	-7.4	None	slightly cloudy	2.11
0930	~6.5	6.23	210.8	14.6	2.92	27.7	None	clear	2.37
0935	7 gal	6.21	207.9	14.0	4.47	26.4	None	clear	2.20

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	Well Number	DG-GW	Sampler	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	Total Well Depth	22.20	Samples Collected:	PCB'S
Job Number	10507136	Pump Intake Depth (ft)	16.5'		

Static Water Level (ft)	13.45	Time Purge Started	13:18
Pumping Water Level (ft)	—	Sampling Date	6-1-16
Standing Water Column (ft)	—	Sample Time	13:55
Purge & Sampling Methods	Peristaltic Pump	Total Volume Purged (gal)	4

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	mS Cond. (~~µS~~/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
13:24	6.41	0.88	182	0.91	12.3	28.1	—	550	↓ FR
13:29	6.49	0.82	59.6	0.82	12.4	19.9	—	500	↓ FR
1332	6.50	0.80	28.3	0.80	12.4	16.7	—	425	
1335	6.52	0.76	14.0	0.78	12.5	13.7	—	—	
1338	6.53	0.74	18.7	0.74	12.7	8.8	—	—	
1341	6.53	0.74	13.6	0.73	13.0	6.3	—	—	NEW BATTERY
1344	6.52	0.75	9.0	0.72	12.4	3.1	—	—	
1347	6.54	0.75	11.5	0.70	12.4	-1.0	—	—	
1350	6.55	0.74	10.1	0.71	12.3	-2.6	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	Well Number	PZ-Filt-01	Sampler	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	Total Well Depth	24.25	Samples Collected:	PCB'S
Job Number	10507136	Pump Intake Depth (ft)	~25'		

Static Water Level (ft)	21.94	Time Purge Started	1050
Pumping Water Level (ft)	–	Sampling Date	6-1-15
Standing Water Column (ft)	–	Sample Time	1134
Purge & Sampling Methods	Peristaltic Pump	Total Volume Purged (gal)	~5 gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1051	6.28	575.4	+++	3.53	15.0	217.4	–	~400	
1101	6.25	443	32.0	0.42	14.9	180.4	–	"	
1106	6.25	413.5	21.0	0.34	14.9	174.6	–	"	
1109	6.24	397.7	17.3	0.32	14.8	172.2	–	"	
1112	6.24	386.6	13.1	0.30	14.9	170.8	–	"	
1115	6.24	380.1	9.77	0.29	14.9	169.8	–	"	
1118	6.24	374.0	8.77	0.28	14.9	168.5	–	"	
1121	6.23	370.2	8.20	0.26	14.9	167.6	–	"	
1124	6.23	364.2	8.59	0.27	14.9	166.9	–	"	
1127	6.23	356.2	7.63	0.26	15.0	165.4	–	"	
1130	6.23	355.5	5.65	0.26	15.1	164.6	–	"	
1133	6.23	355.4	5.82	0.26	15.0	164.0	–	"	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-FILT-02	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.3	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	24.5'		

Static Water Level (ft) 22.1'
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1049
Sampling Date 6-1-16
Sample Time 1131
Total Volume Purged (gal) 5

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (mS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1053	6.06	0.330	417	1.26	15.6	-31.2	—	450	
1100	6.11	0.286	101	0.76	15.6	-67.6	—	—	
1103	6.13	0.283	48.0	0.74	15.4	-80.9	—	450	
1106	6.13	0.282	20.5	0.73	15.4	-81.4	—	—	
1109	6.13	0.281	14.2	0.69	15.4	-83.8	—	—	
1112	6.12	0.281	9.59	0.66	15.4	-88.0	—	—	
1115	6.12	0.281	7.15	0.64	15.5	-93.3	—	425	
1118	6.12	0.281	7.20	0.62	15.5	-100.2	—	—	
1121	6.12	0.281	5.41	0.62	15.6	-106.2	—	—	
1124	6.13	0.281	5.35	0.60	15.5	-115.1	—	—	
1127	6.11	0.281	5.87	0.59	15.4	-120.6	—	—	
1130	6.10	0.281	6.02	0.58	15.5	119.8	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	Well Number	PZ-FILT-04	Sampler	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	Total Well Depth	29.35'	Samples Collected:	PCB'S
Job Number	10507136	Pump Intake Depth (ft)	23'		

Static Water Level (ft) 19.94'
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1205
Sampling Date 6-1-16
Sample Time 12:46
Total Volume Purged (gal) ~5

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	mS Cond. (μS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1211	6.06	0.241	217	0.82	15.1	-1.9	—	450	
1216	6.08	0.227	142	0.72	14.9	-13.6	—	—	
1219	6.07	0.219	97.3	0.70	15.0	-18.3	—	400	
1222	6.06	0.220	64.9	0.70	15.0	-18.2	—	—	NEW BATTERY
1225	6.07	0.217	53.8	0.72	14.8	-21.4	—	—	
1228	6.08	0.212	40.2	0.66	14.9	-23.8	—	450	
1231	6.09	0.207	30.8	0.62	15.1	-25.1	—	—	
1234	6.09	0.207	25.5	0.60	15.1	-26.8	—	—	
1237	6.09	0.204	22.3	0.57	15.3	-28.7	—	—	
1240	6.09	0.202	23.5	0.55	15.4	-31.8	—	—	
1243	6.09	0.200	15.0	0.53	15.1	-33.7	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-Fill-06	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.34	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~25'		

Static Water Level (ft) 21.95

Pumping Water Level (ft) –

Standing Water Column (ft) –

Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1301

Sampling Date 6-1-16

Sample Time 1335

Total Volume Purged (gal) ~4.5 gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1305	6.36	554.7	632	11.18	15.4	222.4	–	~500	Sheen observed in outer casing
1315	6.33	457.6	14.2	0.56	15.6	206.3	–	~400	reduced flow rate manually
1320	6.29	443.9	8.37	0.44	15.5	205.9	–	~400	
1323	6.30	435.7	9.20	0.37	15.5	204.6	–	"	
1326	6.29	431.8	8.40	0.33	15.5	205.1	–	"	
1329	6.28	430.9	4.85	0.32	15.4	205.4	–	"	
1332	6.28	424.7	5.59	0.31	15.5	205.6	–	"	
									Duplicate-02 Sample taken

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-SED-01	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.25'	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	24.5'		

Static Water Level (ft) 21.3'
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 16:11
Sampling Date 5.31.16
Sample Time 1646
Total Volume Purged (gal) 4.0

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1613	6.28	0.192	OVER RANGE	1.41	14.1	-25.8	—	500	↓ FR
1618	6.25	0.174	176	1.12	14.1	-39.4	—	450	↓ FR
1621	6.27	0.173	43.8	1.02	14.1	-53.4	—	400	
1624	6.25	0.170	22.9	0.96	14.0	-59.1	—	—	
1627	6.22	0.168	18.6	0.94	14.0	-66.1	—	—	
1630	6.23	0.169	10.9	0.91	14.0	-73.3	—	—	
1633	6.23	0.167	8.48	0.90	14.0	-77.5	—	—	
1636	6.27	0.165	7.46	0.87	14.0	-90.4	—	—	
1639	6.26	0.166	5.89	0.86	14.0	-89.3	—	—	
1642	6.25	0.165	8.68	0.86	14.0	-89.2	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	P2-Sed-C2	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.3	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~25'		

Static Water Level (ft) 21.55
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1612
Sampling Date 5-31-16
Sample Time 1650
Total Volume Purged (gal) ~5gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH	Cond. (µS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)	Depth to Water (ft)	Flow Rate (mL/min)	Comments
	±0.1	±3%	±10%	±10 %	±3%	±10mV	<0.3'	rate<500ml	
1615	6.07	176.2	67.1	0.54	13.8	57.7	–	~500	
1625	6.07	165.0	26.8	0.53	13.7	50.3	–	~400	Lowered flow rate at 1616 ~400
1628	6.06	165.1	15.6	0.43	13.7	49.5	–	"	
1631	6.06	164.8	9.00	0.36	13.8	49.5	–	"	
1634	6.06	163.8	7.26	0.33	13.8	49.9	–	"	
1637	6.05	163.9	5.63	0.30	13.8	50.1	–	"	
1640	6.04	163.1	5.90	0.26	13.7	51.1	–	"	
1643	6.05	163.8	5.84	0.27	13.7	51.3	–	"	
1646	6.05	163.9	5.47	0.26	13.7	51.2	–	"	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	P2-Sed-03	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.26	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~26		

Static Water Level (ft)	22.91	**Time Purge Started**	0938
Pumping Water Level (ft)	—	**Sampling Date**	6-1-16
Standing Water Column (ft)	—	**Sample Time**	1013
Purge & Sampling Methods	Peristaltic Pump	**Total Volume Purged (gal)**	~4gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3′	Flow Rate (mL/min) rate<500ml	Comments
0940	6.26	734	[illegible]	0.78	14.5	189.9	22.91	~400	
0950	6.27	700	42.5	0.47	14.4	184.8	—	"	
0955	6.27	697	28.0	0.47	14.4	183.2	—	"	
0958	6.27	693	14.8	0.47	14.3	182.3	—	"	
1001	6.27	690	5.54	0.46	14.4	181.6	—	"	5.54 - turbidity
1004	6.27	689	5.53	0.45	14.3	180.9	—	"	
1007	6.27	688	4.97	0.43	14.3	180.4	—	"	
1010	6.27	686	3.43	0.43	14.4	180.0	—	"	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	P2-Sed-04	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.28	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~25'		

Static Water Level (ft) 22.74
Pumping Water Level (ft) -
Standing Water Column (ft) -
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 0934
Sampling Date 6-1-16
Sample Time 1014
Total Volume Purged (gal) 4.75

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
0940	6.09	0.402	119	0.93	14.6	-9.6	—	475	↓ FR
0945	6.10	0.406	32.8	0.87	14.6	-24.3	—	450	↓ FR
0948	6.10	0.405	21.4	0.86	14.6	-28.9	—	400	
0951	6.10	0.404	10.9	0.82	14.6	-28.7	—	—	
0955	6.10	0.406	6.89	0.78	14.6	-40.0	—	"	
0958	6.10	0.406	4.99	0.73	14.6	-49.0	—	"	
1003	6.10	0.406	5.14	0.69	14.6	-70.7	—	—	
1006	6.09	0.406	4.04	0.69	14.5	-74.7	—	—	
1009	6.09	0.405	4.69	0.68	14.5	-70.6	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-Sed-06	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.42	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~25'		

Static Water Level (ft)	22.05	**Time Purge Started**	1423
Pumping Water Level (ft)	~~29.42~~	**Sampling Date**	6-1-16
Standing Water Column (ft)		**Sample Time**	1500
Purge & Sampling Methods	Peristaltic Pump	**Total Volume Purged (gal)**	~4.5 gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1425	6.35	409.9	[illegible]	1.01	14.1	236.7	—	Same	
1435	6.39	394.0	145	0.79	14.1	230.2	—	~400	Reduced flow rate manually
1440	6.38	390.1	42.9	0.83	14.2	229.6			
1443	6.38	388.7	28.4	0.84	14.2	229.2			
1446	6.38	387.6	16.5	0.84	14.1	229.4			
1449	6.37	387.0	12.8	0.84	14.1	229.0			
1452	6.37	385.0	7.70	0.841	14.1	229.3			
1455	6.37	380.1	7.46	0.841	14.1	229.3			
1458	6.37	382.3	6.04	0.841	14.1	228.9			
									MS/MSD Sample Collected

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	P2-Sed-07	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29.38	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~24'		

Static Water Level (ft) 21.59
Pumping Water Level (ft) –
Standing Water Column (ft) –
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 0755
Sampling Date 5-1-16
Sample Time 0832
Total Volume Purged (gal) ~5gal

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
0757	6.16	204.0	++++	1.35	15.0	157.3	–	~500	Sheen observed in outer casing
0807	6.17	183.2	103	0.52	15.1	164.6	–	~400	Lowered flow rate manually ~400
0812	6.17	180.6	35.2	0.54	15.2	166.5	–	~400	
0815	6.17	179.0	22.1	0.51	15.1	166.7	–	~400	
0818	6.17	178.6	14.9	0.47	15.1	167.1	–	"	
0821	6.16	177.3	12.2	0.43	15.2	167.4	–	"	
0824	6.16	177.9	9.38	0.37	15.2	167.4	–	"	
0827	6.17	177.8	6.39	0.38	15.2	167.6	–	"	
0830	6.16	177.8	5.83	0.36	15.2	167.6	–	"	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-SED-08	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	33.3'	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	28'		

Static Water Level (ft) 25'
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 0757
Sampling Date 6/1/16
Sample Time 0834
Total Volume Purged (gal) 4

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
0802	6.24	0.151	656	1.19	15.5	6.4	—	350	
0807	6.28	0.146	146	0.91	15.6	-10.2	—	375	
0812	6.28	0.146	64.3	0.86	15.6	-15	—	—	
0815	6.28	0.146	30.9	0.83	15.6	-18	—	—	
0818	6.28	0.146	20.5	0.79	15.6	-22.4	—	—	
0821	6.28	0.146	15.0	0.78	15.6	-25.6	—	400	
0824	6.28	0.146	10.9	0.77	15.6	-29.6	—	—	
0827	6.28	0.147	8.97	0.76	15.6	-32.3	—	—	
0830	6.29	0.147	7.23	0.77	15.6	-36.4	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	PZ-SED-09	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29' 3"	**Samples Collected:**	PCB'S DUP 1
Job Number	10507136	**Pump Intake Depth (ft)**			

Static Water Level (ft) 20' 9.8"
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1500
Sampling Date 5/31/15
Sample Time 15:33
Total Volume Purged (gal) 4 GAL

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
15:02	5.99	0.269	—	2.49	14.1	-14.1	—	500	↓ TURB OUT OF RANGE
15:07	5.96	0.260	590	1.93	14.0	-46.4	—	400	
15:12	6.03	0.255	31.2	1.61	14.0	-79.6	—	—	
15:15	6.06	0.255	17.9	1.53	14.0	-86.2	—	400	
15:18	6.08	0.256	9.49	1.45	14.0	-95.7	—	—	
15:21	6.08	0.252	6.27	1.39	14.0	-95.6	—	—	
1524	6.09	0.253	5.08	1.37	14.0	100.5	—	—	
15:27	6.09	0.253	6.13	1.34	14.0	103.0	—	400	
15:30	6.09	0.252	2.89	1.31	13.9	101.2	—	—	

Notes:

GROUNDWATER SAMPLING LOG

Client	City of Anacortes	**Well Number**	P2-Sed-10	**Sampler**	C. Dunning / D. Sheldon
Site	Mt. Vernon, WA	**Total Well Depth**	29' 3"	**Samples Collected:**	PCB'S
Job Number	10507136	**Pump Intake Depth (ft)**	~24'		

Static Water Level (ft) 21' 6"
Pumping Water Level (ft)
Standing Water Column (ft)
Purge & Sampling Methods Peristaltic Pump

Time Purge Started 1500
Sampling Date 5-31-16
Sample Time 1533
Total Volume Purged (gal) ~5 gal.

All measurements taken from: Top of Casing ☒ Protective Casing ☐ Ground Level ☐

Time	pH ±0.1	Cond. (µS/cm) ±3%	Turbidity (NTU) ±10%	DO (mg/L) ±10 %	Temp (°C) ±3%	ORP (mV) ±10mV	Depth to Water (ft) <0.3'	Flow Rate (mL/min) rate<500ml	Comments
1505	6.17	222.6	99.1	1.46	13.6	23.7	21'6"	~400	
1515	6.14	222.3	11.9	0.52	13.6	28.2	"	~400	
1520	6.13	222.4	6.99	0.44	13.6	29.3	"	~400	
1523	6.12	222.1	6.38	0.40	13.6	30.4	"	~400	
1526	6.12	223.0	3.99	0.38	13.7	30.8	"	~400	
1529	6.12	222.3	3.64	0.37	13.6	30.4	"	~400	

Notes:

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 1

Photo Location:
Settling Lagoon #2

Survey Date:
5/25/2016

Comments:
SL-Soil-01: East side of Lagoon #2. Sediment chunks removed to expose sand filtration layer.

Photograph ID: 2

Photo Location:
Settling Lagoon #2

Survey Date:
5/25/2016

Comments:
SL-SOIL-01: East side of Lagoon #2. Sand filtration layer hand excavated to ~12" depth for composite soil sample.

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 3

Photo Location:
Settling Lagoon #2

Survey Date:
5/25/2016

Comments:
SL-SOIL-02 and SL-SOIL-DUP: West side of Lagoon #2.

Photograph ID: 4

Photo Location:
Settling Lagoon #2

Survey Date:
5/25/2016

Comments:
SL-SOIL-02 and SL-SOIL-DUP: West side of Lagoon #2.

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 5

Photo Location:
Settling Lagoon #1

Survey Date:
5/25/2016

Comments:
SL-SOIL-03: East side of Lagoon #1. Sediment previously removed from lagoon (last year). Thin sediment layer scraped away to reveal sand filtration layer.

Photograph ID: 6

Photo Location:
Settling Lagoon #1

Survey Date:
5/25/2016

Comments:
SL-SOIL-04: West side of Lagoon #1.

MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 1

Photo Location:
Sedimentation Basin

Survey Date:
5/23/2016

Comments:
SB-Mastic-01 collected on west side of Sedimentation Basin.

Photograph ID: 2

Photo Location:
Sedimentation Basin

Survey Date:
5/23/2016

Comments:
SB-Mastic-01 collected on west side of Sedimentation Basin.

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 3

Photo Location:
Sedimentation Basin

Survey Date:
5/23/2016

Comments:
SB-Mastic-02 collected on east side of Sedimentation Basin.

Photograph ID: 4

Photo Location:
Sedimentation Basin

Survey Date:
5/23/2016

Comments:
SB-Mastic-02 collected on east side of Sedimentation Basin.

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 5

Photo Location:
Filtration Basin

Survey Date:
5/23/2016

Comments:
FB-Mastic-01 collected on south side of Filtration Basin.

Photograph ID: 6

Photo Location:
Filtration Basin

Survey Date:
5/23/2016

Comments:
FB-Mastic-01 collected on south side of Filtration Basin.

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 7

Photo Location:
Clearwell

Survey Date:
5/23/2016

Comments:
No mastic found on north side of Clearwell at concrete cap.

Photograph ID: 8

Photo Location:
Clearwell

Survey Date:
5/23/2016

Comments:
No mastic found on north side of Clearwell at concrete cap.

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 9 **Photo Location:** Clearwell **Survey Date:** 5/23/2016 **Comments:** CW-Mastic-01 collected on west side of Clearwell.	
Photograph ID: 10 **Photo Location:** Clearwell **Survey Date:** 5/23/2016 **Comments:** CW-Mastic-01 collected on west side of Clearwell.	

MWH

Photographic Log

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 1

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-01 - Alum Room Hopper #1

Result:
<10 ug/100 cm2

Photograph ID: 2

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-02 - Alum Room Polymer Feed Control

Result:
<10 ug/100 cm2

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 3

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-03 - 2nd Floor Control Console

Result:
<10 ug/100 cm2

Photograph ID: 4

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-04 - 1st Floor Alum Feed Control Cabinet

Result:
<10 ug/100 cm2

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 5

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-05 - Lime Dust Collector - Torit

Result:
10 ug/100 cm2 (Aroclor 1254)

Photograph ID: 6

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-06 - Dry Transformer

Result:
<10 ug/100 cm2

Client:	Foster Pepper PLLC	Project:	Data Gap Investigation
Site Name:	Anacortes WTP	Site Location:	Mount Vernon, WA

Photograph ID: 7

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-07 - Generator transfer switch

Result:
<10 ug/100 cm2

Photograph ID: 8

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-08 - Pump #9 Electrical Connection Box

Result:
<10 ug/100 cm2

MWH

Photographic Log

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 9

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-09 - Pump #1 Housing Internal

Result:
17 ug/100 cm2 (Aroclor 1254)

Photograph ID: 10

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-10 - Pump #7 Electrical Connection Box

Result:
<10 ug/100 cm2

Client:	**Foster Pepper PLLC**	**Project:**	**Data Gap Investigation**
Site Name:	**Anacortes WTP**	**Site Location:**	**Mount Vernon, WA**

Photograph ID: 11

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-11 - Pump #1 MCC

Result:
<10 ug/100 cm2

Photograph ID: 12

Photo Location:
Administration Building

Survey Date:
5/25/2016

Comments:
AB-WIPE-12 - PLC Rack #4

Result:
43 ug/100 cm2 (Aroclor 1254)

Appendix D1. Initial Investigation Laboratory Analytical Data

1 –Anacortes WTP 507113

2 –Anacortes WTP 507132

3 –Anacortes WTP 507133

4 –Anacortes WTP 507154

5 –Anacortes WTP 507195

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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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August 5, 2015

Ken Lederman
Foster Pepper PLLC
1111 3rd Ave, Suite 3400
Seattle, WA 98101

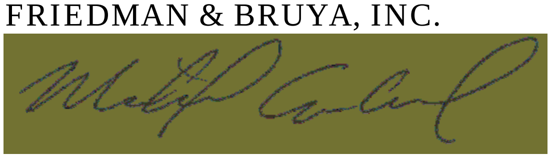
Dear Mr. Lederman:

Included are the results from the testing of material submitted on July 8, 2015 from the Anacortes WTP, F&BI 507113 project. There are 100 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
NAA0805R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 8, 2015 by Friedman & Bruya, Inc. from the Foster Pepper PLLC Anacortes WTP, F&BI 507113 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper PLLC
507113 -01	SB-EXPC-08
507113 -02	AB-SEAL-04
507113 -03	AB-SEAL-02
507113 -04	SB-EXPC-08 MSD
507113 -05	SB-EXCP-08 MS
507113 -06	AB-SEAL-05
507113 -07	AB-SEAL-01
507113 -08	AB-SEAL-DUP
507113 -09	AB-SEAL-MSD
507113 -10	AB-SEAL-03
507113 -11	AB-SEAL-06
507113 -12	SB-EXPC-DUP
507113 -13	SB-EXPC-05
507113 -14	AB-SEAL-MS
507113 -15	SB-EXPC-03
507113 -16	SB-EXPC-01
507113 -17	SB-EXPC-06
507113 -18	SB-EXPC-02
507113 -19	SB-EXPC-07
507113 -20	AB-SEAL-08
507113 -21	PC-01
507113 -22	PC-02
507113 -23	PC-03
507113 -24	PC-04
507113 -25	PC-05
507113 -26	PC-06
507113 -27	FB-EXPC-01
507113 -28	FB-EXPC-02
507113 -29	FB-EXPC-02-MSD
507113 -30	FB-EXPC-02-MS
507113 -31	FB-EXPC-03
507113 -32	FB-EXPC-DUP
507113 -33	FB-EXPC-04
507113 -34	SB-EXPC-04
507113 -35	RINS-01
507113 -36	FB-BED-01

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper PLLC
507113 -37	FB-ANTH-01
507113 -38	FB-SAND-01
507113 -39	FB-FIBWIPE-01
507113 -40	FB-CONC-01
507113 -41	FB-INPC-01

Acetone and methylene chloride were detected in the 8260C TCLP analysis of samples SB-EXPC-05 and SB-EXPC-01. Both compounds were detected in the method blank and were flagged accordingly. In addition, the methylene chloride laboratory control sample and laboratory control sample duplicate failed below the acceptance criteria. The results were flagged accordingly.

The 8260C water sample RINS-01 was transferred from VOA vials without septum lids. The results were flagged accordingly.

Benzoic acid was detected in the 8270D TCLP analysis of samples SB-EXPC-05 and SB-EXPC-01. Both compounds were detected in the method blank and were flagged accordingly. In addition, several compounds exceeded the laboratory control sample and laboratory control sample duplicate relative percent difference and acceptance criteria. The affected results were flagged accordingly.

Several compounds in the 8270D soil and water laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

An 8270D internal standard failed the acceptance criteria for samples FB-CONC-01 and FB-INCP-01 due to matrix interferences. The data were flagged accordingly. The samples were diluted and reanalyzed.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-EXPC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-13 x10
Date Analyzed:	07/16/15	Data File:	507113-13 x10.026
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	35.7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-16 x10
Date Analyzed:	07/16/15	Data File:	507113-16 x10.027
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	44.7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-21 x10
Date Analyzed:	07/16/15	Data File:	507113-21 x10.029
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	91	60	125
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	2,060
Cadmium	<10
Chromium	1,300
Lead	23,300
Mercury	<10
Selenium	<10
Silver	<10

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-02	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-22 x10
Date Analyzed:	07/16/15	Data File:	507113-22 x10.030
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	89	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	17.1
Cadmium	<10
Chromium	13.9
Lead	112
Mercury	<10
Selenium	<10
Silver	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-03	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-23 x10
Date Analyzed:	07/16/15	Data File:	507113-23 x10.031
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	87	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	973
Cadmium	<10
Chromium	400
Lead	87.8
Mercury	<10
Selenium	<10
Silver	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-04	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-24 x10
Date Analyzed:	07/16/15	Data File:	507113-24 x10.032
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	88	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	17.1
Cadmium	<10
Chromium	<10
Lead	26.7
Mercury	<10
Selenium	<10
Silver	<10

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-25 x10
Date Analyzed:	07/16/15	Data File:	507113-25 x10.033
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	89	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	41.1
Cadmium	<10
Chromium	20.0
Lead	261
Mercury	<10
Selenium	<10
Silver	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-06	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-26 x10
Date Analyzed:	07/16/15	Data File:	507113-26 x10.034
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	88	60	125
Indium	86	60	125
Holmium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	3,300
Cadmium	<10
Chromium	13.2
Lead	421
Mercury	<10
Selenium	<10
Silver	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-27 x10
Date Analyzed:	07/16/15	Data File:	507113-27 x10.035
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	89	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	161
Cadmium	<10
Chromium	<10
Lead	30.2
Mercury	52.8
Selenium	<10
Silver	<10

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-BED-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-36
Date Analyzed:	07/16/15	Data File:	507113-36.022
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	88	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.00
Barium	19.3
Cadmium	<1
Chromium	4.74
Lead	1.90
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-ANTH-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-37
Date Analyzed:	07/16/15	Data File:	507113-37.023
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	84	60	125
Holmium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.37
Barium	41.6
Cadmium	<1
Chromium	2.90
Lead	5.18
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-SAND-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-38
Date Analyzed:	07/16/15	Data File:	507113-38.024
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	86	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.98
Barium	20.0
Cadmium	<1
Chromium	4.35
Lead	2.09
Mercury	<1
Selenium	<1
Silver	<1

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-40
Date Analyzed:	07/16/15	Data File:	507113-40.025
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125
Indium	87	60	125
Holmium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	10.9
Barium	94.4
Cadmium	<1
Chromium	16.3
Lead	6.18
Mercury	<1
Selenium	<1
Silver	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-41 x10
Date Analyzed:	07/16/15	Data File:	507113-41 x10.036
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	88	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<10
Barium	21.8
Cadmium	<10
Chromium	<10
Lead	<10
Mercury	<10
Selenium	<10
Silver	<10

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	I5-396 mb
Date Analyzed:	07/16/15	Data File:	I5-396 mb.021
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	90	60	125
Holmium	92	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	RINS-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-35
Date Analyzed:	07/15/15	Data File:	507113-35.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	90	60	125
Holmium	97	60	125

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	I5-395 mb
Date Analyzed:	07/15/15	Data File:	I5-395 mb.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	89	60	125
Holmium	95	60	125

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

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-EXPC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-13
Date Analyzed:	07/20/15	Data File:	507113-13.009
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	97	60	125
Holmium	99	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-16
Date Analyzed:	07/20/15	Data File:	507113-16.012
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	99	60	125
Holmium	101	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	I5-398 mb
Date Analyzed:	07/20/15	Data File:	I5-398 mb.007
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	98	60	125
Holmium	100	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-EXPC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-13
Date Analyzed:	07/15/15	Data File:	071508.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	85	117
Toluene-d8	96	91	108
4-Bromofluorobenzene	103	76	126

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	70 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	31 fb, jl	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	0.51	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-16
Date Analyzed:	07/15/15	Data File:	071509.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	85	117
Toluene-d8	97	91	108
4-Bromofluorobenzene	107	76	126

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	60 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	26 fb, jl	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	2.5	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	05-1429 mb
Date Analyzed:	07/15/15	Data File:	071507.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	107	76	126

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	54 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	26 fb, jl	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	RINS-01 pc	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-35
Date Analyzed:	07/10/15	Data File:	071014.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	98	76	126

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	17	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:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	05-1402 mb
Date Analyzed:	07/10/15	Data File:	071010.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	97	91	108
4-Bromofluorobenzene	101	76	126

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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	FB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-27
Date Analyzed:	07/10/15	Data File:	071016.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	89	113
Toluene-d8	97	64	137
4-Bromofluorobenzene	100	81	119

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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	FB-BED-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-36
Date Analyzed:	07/10/15	Data File:	071017.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	89	113
Toluene-d8	97	64	137
4-Bromofluorobenzene	98	81	119

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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	FB-ANTH-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-37
Date Analyzed:	07/10/15	Data File:	071018.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	89	113
Toluene-d8	97	64	137
4-Bromofluorobenzene	98	81	119

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:	FB-SAND-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-38
Date Analyzed:	07/10/15	Data File:	071019.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	89	113
Toluene-d8	98	64	137
4-Bromofluorobenzene	99	81	119

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:	FB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-40
Date Analyzed:	07/10/15	Data File:	071020.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	89	113
Toluene-d8	98	64	137
4-Bromofluorobenzene	98	81	119

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	0.16
Hexane	<0.25	o-Xylene	0.055
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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	507113-41
Date Analyzed:	07/10/15	Data File:	071021.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	89	113
Toluene-d8	99	64	137
4-Bromofluorobenzene	99	81	119

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	1.9
Acetone	0.72	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	8.6
Hexane	<0.25	o-Xylene	4.1
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	0.053
Chloroform	0.46	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	0.090	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	0.87	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/10/15	Lab ID:	05-1403 mb
Date Analyzed:	07/10/15	Data File:	071011.D
Matrix:	Soil/Solid	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	89	113
Toluene-d8	97	64	137
4-Bromofluorobenzene	98	81	119

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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-EXPC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/22/15	Lab ID:	507113-13 1/2
Date Analyzed:	07/23/15	Data File:	072306.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	90	32	162
Phenol-d6	74	10	170
Nitrobenzene-d5	104	50	150
2-Fluorobiphenyl	106	43	158
2,4,6-Tribromophenol	117	43	146
Terphenyl-d14	119	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	22 lc jl	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/22/15	Lab ID:	507113-16 1/2
Date Analyzed:	07/23/15	Data File:	072307.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	84	32	162
Phenol-d6	70	10	170
Nitrobenzene-d5	104	50	150
2-Fluorobiphenyl	102	43	158
2,4,6-Tribromophenol	126	43	146
Terphenyl-d14	117	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	28 lc jl	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/22/15	Lab ID:	05-1443 mb
Date Analyzed:	07/23/15	Data File:	072305.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	77	32	162
Phenol-d6	58	10	170
Nitrobenzene-d5	117	50	150
2-Fluorobiphenyl	126	43	158
2,4,6-Tribromophenol	110	43	146
Terphenyl-d14	128	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RINS-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	507113-35
Date Analyzed:	07/17/15	Data File:	071706A.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	53	32	162
Phenol-d6	32	10	170
Nitrobenzene-d5	112	50	150
2-Fluorobiphenyl	120	43	158
2,4,6-Tribromophenol	107	43	146
Terphenyl-d14	114	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/15/15	Lab ID:	05-1436 mb
Date Analyzed:	07/17/15	Data File:	071705.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	72	32	162
Phenol-d6	48	10	170
Nitrobenzene-d5	116	50	150
2-Fluorobiphenyl	125	43	158
2,4,6-Tribromophenol	102	43	146
Terphenyl-d14	116	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-27 1/250
Date Analyzed:	07/17/15	Data File:	071716.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	30 d	56	115
Phenol-d6	37 d	54	113
Nitrobenzene-d5	35 d	31	164
2-Fluorobiphenyl	55 d	47	133
2,4,6-Tribromophenol	230 d	35	141
Terphenyl-d14	70 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<25	2,6-Dinitrotoluene	<12
Bis(2-chloroethyl) ether	<2.5	3-Nitroaniline	<250
2-Chlorophenol	<25	Acenaphthene	<2.5
1,3-Dichlorobenzene	<2.5	2,4-Dinitrophenol	<75
1,4-Dichlorobenzene	<2.5	Dibenzofuran	<2.5
1,2-Dichlorobenzene	<2.5	2,4-Dinitrotoluene	<12
Benzyl alcohol	<25	4-Nitrophenol	<75
Bis(2-chloroisopropyl) ether	<2.5	Diethyl phthalate	<25
2-Methylphenol	<25	Fluorene	<2.5
Hexachloroethane	<2.5	4-Chlorophenyl phenyl ether	<2.5
N-Nitroso-di-n-propylamine	<2.5	N-Nitrosodiphenylamine	<2.5
3-Methylphenol + 4-Methylphenol	<50	4-Nitroaniline	<250
Nitrobenzene	<2.5	4,6-Dinitro-2-methylphenol	<75
Isophorone	<2.5	4-Bromophenyl phenyl ether	<2.5
2-Nitrophenol	<25	Hexachlorobenzene	<2.5
2,4-Dimethylphenol	<25	Pentachlorophenol	<25
Benzoic acid	<120	Phenanthrene	<2.5
Bis(2-chloroethoxy)methane	<2.5	Anthracene	<2.5
2,4-Dichlorophenol	<25	Carbazole	<25
1,2,4-Trichlorobenzene	<2.5	Di-n-butyl phthalate	<25
Naphthalene	<2.5	Fluoranthene	<2.5
Hexachlorobutadiene	<2.5	Pyrene	<2.5
4-Chloroaniline	<250	Benzyl butyl phthalate	<25
4-Chloro-3-methylphenol	<25	Benz(a)anthracene	<2.5
2-Methylnaphthalene	<2.5	Chrysene	<2.5
1-Methylnaphthalene	<2.5	Bis(2-ethylhexyl) phthalate	<40
Hexachlorocyclopentadiene	<7.5	Di-n-octyl phthalate	<25
2,4,6-Trichlorophenol	<25	Benzo(a)pyrene	<2.5
2,4,5-Trichlorophenol	<25	Benzo(b)fluoranthene	<2.5
2-Chloronaphthalene	<2.5	Benzo(k)fluoranthene	<2.5
2-Nitroaniline	<12	Indeno(1,2,3-cd)pyrene	<2.5
Dimethyl phthalate	<25	Dibenz(a,h)anthracene	<2.5
Acenaphthylene	<2.5	Benzo(g,h,i)perylene	<2.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-BED-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-36
Date Analyzed:	07/17/15	Data File:	071711.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	91	56	115
Phenol-d6	92	54	113
Nitrobenzene-d5	97	31	164
2-Fluorobiphenyl	107	47	133
2,4,6-Tribromophenol	101	35	141
Terphenyl-d14	111	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	2,6-Dinitrotoluene	<0.05
Bis(2-chloroethyl) ether	<0.01	3-Nitroaniline	<1
2-Chlorophenol	<0.1	Acenaphthene	<0.01
1,3-Dichlorobenzene	<0.01	2,4-Dinitrophenol	<0.3
1,4-Dichlorobenzene	<0.01	Dibenzofuran	<0.01
1,2-Dichlorobenzene	<0.01	2,4-Dinitrotoluene	<0.05
Benzyl alcohol	<0.1	4-Nitrophenol	<0.3
Bis(2-chloroisopropyl) ether	<0.01	Diethyl phthalate	<0.1
2-Methylphenol	<0.1	Fluorene	<0.01
Hexachloroethane	<0.01	4-Chlorophenyl phenyl ether	<0.01
N-Nitroso-di-n-propylamine	<0.01	N-Nitrosodiphenylamine	<0.01
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitroaniline	<1
Nitrobenzene	<0.01	4,6-Dinitro-2-methylphenol	<0.3
Isophorone	<0.01	4-Bromophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	Hexachlorobenzene	<0.01
2,4-Dimethylphenol	<0.1	Pentachlorophenol	<0.1
Benzoic acid	<0.5	Phenanthrene	<0.01
Bis(2-chloroethoxy)methane	<0.01	Anthracene	<0.01
2,4-Dichlorophenol	<0.1	Carbazole	<0.1
1,2,4-Trichlorobenzene	<0.01	Di-n-butyl phthalate	<0.1
Naphthalene	<0.01	Fluoranthene	<0.01
Hexachlorobutadiene	<0.01	Pyrene	<0.01
4-Chloroaniline	<1	Benzyl butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benz(a)anthracene	<0.01
2-Methylnaphthalene	<0.01	Chrysene	<0.01
1-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
Hexachlorocyclopentadiene	<0.03	Di-n-octyl phthalate	<0.1
2,4,6-Trichlorophenol	<0.1	Benzo(a)pyrene	<0.01
2,4,5-Trichlorophenol	<0.1	Benzo(b)fluoranthene	<0.01
2-Chloronaphthalene	<0.01	Benzo(k)fluoranthene	<0.01
2-Nitroaniline	<0.05	Indeno(1,2,3-cd)pyrene	<0.01
Dimethyl phthalate	<0.1	Dibenz(a,h)anthracene	<0.01
Acenaphthylene	<0.01	Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-ANTH-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-37
Date Analyzed:	07/17/15	Data File:	071712.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	89	56	115
Phenol-d6	90	54	113
Nitrobenzene-d5	95	31	164
2-Fluorobiphenyl	103	47	133
2,4,6-Tribromophenol	104	35	141
Terphenyl-d14	105	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	2,6-Dinitrotoluene	<0.05
Bis(2-chloroethyl) ether	<0.01	3-Nitroaniline	<1
2-Chlorophenol	<0.1	Acenaphthene	<0.01
1,3-Dichlorobenzene	<0.01	2,4-Dinitrophenol	<0.3
1,4-Dichlorobenzene	<0.01	Dibenzofuran	<0.01
1,2-Dichlorobenzene	<0.01	2,4-Dinitrotoluene	<0.05
Benzyl alcohol	<0.1	4-Nitrophenol	<0.3
Bis(2-chloroisopropyl) ether	<0.01	Diethyl phthalate	<0.1
2-Methylphenol	<0.1	Fluorene	<0.01
Hexachloroethane	<0.01	4-Chlorophenyl phenyl ether	<0.01
N-Nitroso-di-n-propylamine	<0.01	N-Nitrosodiphenylamine	<0.01
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitroaniline	<1
Nitrobenzene	<0.01	4,6-Dinitro-2-methylphenol	<0.3
Isophorone	<0.01	4-Bromophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	Hexachlorobenzene	<0.01
2,4-Dimethylphenol	<0.1	Pentachlorophenol	<0.1
Benzoic acid	<0.5	Phenanthrene	<0.01
Bis(2-chloroethoxy)methane	<0.01	Anthracene	<0.01
2,4-Dichlorophenol	<0.1	Carbazole	<0.1
1,2,4-Trichlorobenzene	<0.01	Di-n-butyl phthalate	<0.1
Naphthalene	<0.01	Fluoranthene	<0.01
Hexachlorobutadiene	<0.01	Pyrene	<0.01
4-Chloroaniline	<1	Benzyl butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benz(a)anthracene	<0.01
2-Methylnaphthalene	<0.01	Chrysene	<0.01
1-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
Hexachlorocyclopentadiene	<0.03	Di-n-octyl phthalate	<0.1
2,4,6-Trichlorophenol	<0.1	Benzo(a)pyrene	<0.01
2,4,5-Trichlorophenol	<0.1	Benzo(b)fluoranthene	<0.01
2-Chloronaphthalene	<0.01	Benzo(k)fluoranthene	<0.01
2-Nitroaniline	<0.05	Indeno(1,2,3-cd)pyrene	<0.01
Dimethyl phthalate	<0.1	Dibenz(a,h)anthracene	<0.01
Acenaphthylene	<0.01	Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-SAND-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-38
Date Analyzed:	07/17/15	Data File:	071713.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	86	56	115
Phenol-d6	89	54	113
Nitrobenzene-d5	88	31	164
2-Fluorobiphenyl	97	47	133
2,4,6-Tribromophenol	105	35	141
Terphenyl-d14	106	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	2,6-Dinitrotoluene	<0.05
Bis(2-chloroethyl) ether	<0.01	3-Nitroaniline	<1
2-Chlorophenol	<0.1	Acenaphthene	<0.01
1,3-Dichlorobenzene	<0.01	2,4-Dinitrophenol	<0.3
1,4-Dichlorobenzene	<0.01	Dibenzofuran	<0.01
1,2-Dichlorobenzene	<0.01	2,4-Dinitrotoluene	<0.05
Benzyl alcohol	<0.1	4-Nitrophenol	<0.3
Bis(2-chloroisopropyl) ether	<0.01	Diethyl phthalate	<0.1
2-Methylphenol	<0.1	Fluorene	<0.01
Hexachloroethane	<0.01	4-Chlorophenyl phenyl ether	<0.01
N-Nitroso-di-n-propylamine	<0.01	N-Nitrosodiphenylamine	<0.01
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitroaniline	<1
Nitrobenzene	<0.01	4,6-Dinitro-2-methylphenol	<0.3
Isophorone	<0.01	4-Bromophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	Hexachlorobenzene	<0.01
2,4-Dimethylphenol	<0.1	Pentachlorophenol	<0.1
Benzoic acid	<0.5	Phenanthrene	<0.01
Bis(2-chloroethoxy)methane	<0.01	Anthracene	<0.01
2,4-Dichlorophenol	<0.1	Carbazole	<0.1
1,2,4-Trichlorobenzene	<0.01	Di-n-butyl phthalate	<0.1
Naphthalene	<0.01	Fluoranthene	<0.01
Hexachlorobutadiene	<0.01	Pyrene	<0.01
4-Chloroaniline	<1	Benzyl butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benz(a)anthracene	<0.01
2-Methylnaphthalene	<0.01	Chrysene	<0.01
1-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
Hexachlorocyclopentadiene	<0.03	Di-n-octyl phthalate	<0.1
2,4,6-Trichlorophenol	<0.1	Benzo(a)pyrene	<0.01
2,4,5-Trichlorophenol	<0.1	Benzo(b)fluoranthene	<0.01
2-Chloronaphthalene	<0.01	Benzo(k)fluoranthene	<0.01
2-Nitroaniline	<0.05	Indeno(1,2,3-cd)pyrene	<0.01
Dimethyl phthalate	<0.1	Dibenz(a,h)anthracene	<0.01
Acenaphthylene	<0.01	Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-40
Date Analyzed:	07/17/15	Data File:	071715.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 ip	56	115
Phenol-d6	2 ip	54	113
Nitrobenzene-d5	95	31	164
2-Fluorobiphenyl	103	47	133
2,4,6-Tribromophenol	0 ip	35	141
Terphenyl-d14	97	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	2,6-Dinitrotoluene	<0.05
Bis(2-chloroethyl) ether	<0.01	3-Nitroaniline	<1
2-Chlorophenol	<0.1	Acenaphthene	<0.01
1,3-Dichlorobenzene	<0.01	2,4-Dinitrophenol	<0.3
1,4-Dichlorobenzene	<0.01	Dibenzofuran	<0.01
1,2-Dichlorobenzene	<0.01	2,4-Dinitrotoluene	<0.05
Benzyl alcohol	6.2 ve	4-Nitrophenol	<0.3
Bis(2-chloroisopropyl) ether	<0.01	Diethyl phthalate	<0.1
2-Methylphenol	<0.1	Fluorene	<0.01
Hexachloroethane	<0.01	4-Chlorophenyl phenyl ether	<0.01
N-Nitroso-di-n-propylamine	<0.01	N-Nitrosodiphenylamine	<0.01
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitroaniline	<1
Nitrobenzene	<0.01	4,6-Dinitro-2-methylphenol	<0.3
Isophorone	<0.01	4-Bromophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	Hexachlorobenzene	<0.01
2,4-Dimethylphenol	<0.1	Pentachlorophenol	<0.1
Benzoic acid	<0.5	Phenanthrene	<0.01
Bis(2-chloroethoxy)methane	<0.01	Anthracene	<0.01
2,4-Dichlorophenol	<0.1	Carbazole	<0.1
1,2,4-Trichlorobenzene	<0.01	Di-n-butyl phthalate	<0.1
Naphthalene	<0.01	Fluoranthene	<0.01
Hexachlorobutadiene	<0.01	Pyrene	<0.01
4-Chloroaniline	<1	Benzyl butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benz(a)anthracene	<0.01
2-Methylnaphthalene	<0.01	Chrysene	<0.01
1-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
Hexachlorocyclopentadiene	<0.03	Di-n-octyl phthalate	<0.1 J
2,4,6-Trichlorophenol	<0.1	Benzo(a)pyrene	<0.01 J
2,4,5-Trichlorophenol	<0.1	Benzo(b)fluoranthene	<0.01 J
2-Chloronaphthalene	<0.01	Benzo(k)fluoranthene	<0.01 J
2-Nitroaniline	<0.05	Indeno(1,2,3-cd)pyrene	<0.01 J
Dimethyl phthalate	<0.1	Dibenz(a,h)anthracene	<0.01 J
Acenaphthylene	<0.01	Benzo(g,h,i)perylene	<0.01 J

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-40 1/20
Date Analyzed:	07/20/15	Data File:	072007.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 d	56	115
Phenol-d6	0 d	54	113
Nitrobenzene-d5	75	31	164
2-Fluorobiphenyl	95	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	102	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	6.2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-41 1/5
Date Analyzed:	07/17/15	Data File:	071717.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 ip	56	115
Phenol-d6	0 ip	54	113
Nitrobenzene-d5	0 ip	31	164
2-Fluorobiphenyl	99	47	133
2,4,6-Tribromophenol	19 ip	35	141
Terphenyl-d14	220 J, vo	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	2,6-Dinitrotoluene	<0.25
Bis(2-chloroethyl) ether	<0.05	3-Nitroaniline	<5
2-Chlorophenol	<0.5	Acenaphthene	<0.05
1,3-Dichlorobenzene	<0.05	2,4-Dinitrophenol	<1.5
1,4-Dichlorobenzene	<0.05	Dibenzofuran	<0.05
1,2-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
Benzyl alcohol	1,600 ve	4-Nitrophenol	<1.5
Bis(2-chloroisopropyl) ether	<0.05	Diethyl phthalate	<0.5
2-Methylphenol	<0.5	Fluorene	<0.05
Hexachloroethane	<0.05	4-Chlorophenyl phenyl ether	<0.05
N-Nitroso-di-n-propylamine	<0.05	N-Nitrosodiphenylamine	<0.05 J
3-Methylphenol + 4-Methylphenol	<1	4-Nitroaniline	<5 J
Nitrobenzene	<0.05	4,6-Dinitro-2-methylphenol	<1.5 J
Isophorone	<0.05	4-Bromophenyl phenyl ether	<0.05 J
2-Nitrophenol	<0.5	Hexachlorobenzene	<0.05 J
2,4-Dimethylphenol	<0.5	Pentachlorophenol	<0.5 J
Benzoic acid	<2.5	Phenanthrene	0.26 J
Bis(2-chloroethoxy)methane	<0.05	Anthracene	<0.05 J
2,4-Dichlorophenol	<0.5	Carbazole	<0.5 J
1,2,4-Trichlorobenzene	0.30	Di-n-butyl phthalate	<0.5 J
Naphthalene	4.6	Fluoranthene	<0.05 J
Hexachlorobutadiene	<0.05	Pyrene	<0.05 J
4-Chloroaniline	<5	Benzyl butyl phthalate	<0.5 J
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.05 J
2-Methylnaphthalene	<0.05	Chrysene	<0.05 J
1-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	0.82 fc
Hexachlorocyclopentadiene	<0.15	Di-n-octyl phthalate	<0.5 J
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.05 J
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.05 J
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.05 J
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.05 J
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.05 J
Acenaphthylene	<0.05	Benzo(g,h,i)perylene	<0.05 J

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-41 1/2500
Date Analyzed:	07/20/15	Data File:	072008.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 d	56	115
Phenol-d6	0 d	54	113
Nitrobenzene-d5	0 d	31	164
2-Fluorobiphenyl	0 d	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	0 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<250	2,6-Dinitrotoluene	<120
Bis(2-chloroethyl) ether	<25	3-Nitroaniline	<2,500
2-Chlorophenol	<250	Acenaphthene	<25
1,3-Dichlorobenzene	<25	2,4-Dinitrophenol	<750
1,4-Dichlorobenzene	<25	Dibenzofuran	<25
1,2-Dichlorobenzene	<25	2,4-Dinitrotoluene	<120
Benzyl alcohol	20,000 ve	4-Nitrophenol	<750
Bis(2-chloroisopropyl) ether	<25	Diethyl phthalate	<250
2-Methylphenol	<250	Fluorene	<25
Hexachloroethane	<25	4-Chlorophenyl phenyl ether	<25
N-Nitroso-di-n-propylamine	<25	N-Nitrosodiphenylamine	<25
3-Methylphenol + 4-Methylphenol	<500	4-Nitroaniline	<2,500
Nitrobenzene	<25	4,6-Dinitro-2-methylphenol	<750
Isophorone	<25	4-Bromophenyl phenyl ether	<25
2-Nitrophenol	<250	Hexachlorobenzene	<25
2,4-Dimethylphenol	<250	Pentachlorophenol	<250
Benzoic acid	<1,200	Phenanthrene	<25
Bis(2-chloroethoxy)methane	<25	Anthracene	<25
2,4-Dichlorophenol	<250	Carbazole	<250
1,2,4-Trichlorobenzene	<25	Di-n-butyl phthalate	<250
Naphthalene	<25	Fluoranthene	<25
Hexachlorobutadiene	<25	Pyrene	<25
4-Chloroaniline	<2,500	Benzyl butyl phthalate	<250
4-Chloro-3-methylphenol	<250	Benz(a)anthracene	<25
2-Methylnaphthalene	<25	Chrysene	<25
1-Methylnaphthalene	<25	Bis(2-ethylhexyl) phthalate	<400
Hexachlorocyclopentadiene	<75	Di-n-octyl phthalate	<250
2,4,6-Trichlorophenol	<250	Benzo(a)pyrene	<25
2,4,5-Trichlorophenol	<250	Benzo(b)fluoranthene	<25
2-Chloronaphthalene	<25	Benzo(k)fluoranthene	<25
2-Nitroaniline	<120	Indeno(1,2,3-cd)pyrene	<25
Dimethyl phthalate	<250	Dibenz(a,h)anthracene	<25
Acenaphthylene	<25	Benzo(g,h,i)perylene	<25

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	507113-41 1/50000
Date Analyzed:	07/20/15	Data File:	072010.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	0 d	56	115
Phenol-d6	0 d	54	113
Nitrobenzene-d5	0 d	31	164
2-Fluorobiphenyl	0 d	47	133
2,4,6-Tribromophenol	0 d	35	141
Terphenyl-d14	0 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<5,000	2,6-Dinitrotoluene	<2,500
Bis(2-chloroethyl) ether	<500	3-Nitroaniline	<50,000
2-Chlorophenol	<5,000	Acenaphthene	<500
1,3-Dichlorobenzene	<500	2,4-Dinitrophenol	<15,000
1,4-Dichlorobenzene	<500	Dibenzofuran	<500
1,2-Dichlorobenzene	<500	2,4-Dinitrotoluene	<2,500
Benzyl alcohol	21,000	4-Nitrophenol	<15,000
Bis(2-chloroisopropyl) ether	<500	Diethyl phthalate	<5,000
2-Methylphenol	<5,000	Fluorene	<500
Hexachloroethane	<500	4-Chlorophenyl phenyl ether	<500
N-Nitroso-di-n-propylamine	<500	N-Nitrosodiphenylamine	<500
3-Methylphenol + 4-Methylphenol	<10,000	4-Nitroaniline	<50,000
Nitrobenzene	<500	4,6-Dinitro-2-methylphenol	<15,000
Isophorone	<500	4-Bromophenyl phenyl ether	<500
2-Nitrophenol	<5,000	Hexachlorobenzene	<500
2,4-Dimethylphenol	<5,000	Pentachlorophenol	<5,000
Benzoic acid	<25,000	Phenanthrene	<500
Bis(2-chloroethoxy)methane	<500	Anthracene	<500
2,4-Dichlorophenol	<5,000	Carbazole	<5,000
1,2,4-Trichlorobenzene	<500	Di-n-butyl phthalate	<5,000
Naphthalene	<500	Fluoranthene	<500
Hexachlorobutadiene	<500	Pyrene	<500
4-Chloroaniline	<50,000	Benzyl butyl phthalate	<5,000
4-Chloro-3-methylphenol	<5,000	Benz(a)anthracene	<500
2-Methylnaphthalene	<500	Chrysene	<500
1-Methylnaphthalene	<500	Bis(2-ethylhexyl) phthalate	<8,000
Hexachlorocyclopentadiene	<1,500	Di-n-octyl phthalate	<5,000 J
2,4,6-Trichlorophenol	<5,000	Benzo(a)pyrene	<500 J
2,4,5-Trichlorophenol	<5,000	Benzo(b)fluoranthene	<500 J
2-Chloronaphthalene	<500	Benzo(k)fluoranthene	<500 J
2-Nitroaniline	<2,500	Indeno(1,2,3-cd)pyrene	<500 J
Dimethyl phthalate	<5,000	Dibenz(a,h)anthracene	<500 J
Acenaphthylene	<500	Benzo(g,h,i)perylene	<500 J

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/16/15	Lab ID:	05-1446 mb
Date Analyzed:	07/17/15	Data File:	071710.D
Matrix:	Soil/Solid	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	99	56	115
Phenol-d6	102	54	113
Nitrobenzene-d5	108	31	164
2-Fluorobiphenyl	118	47	133
2,4,6-Tribromophenol	106	35	141
Terphenyl-d14	116	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	2,6-Dinitrotoluene	<0.05
Bis(2-chloroethyl) ether	<0.01	3-Nitroaniline	<1
2-Chlorophenol	<0.1	Acenaphthene	<0.01
1,3-Dichlorobenzene	<0.01	2,4-Dinitrophenol	<0.3
1,4-Dichlorobenzene	<0.01	Dibenzofuran	<0.01
1,2-Dichlorobenzene	<0.01	2,4-Dinitrotoluene	<0.05
Benzyl alcohol	<0.1	4-Nitrophenol	<0.3
Bis(2-chloroisopropyl) ether	<0.01	Diethyl phthalate	<0.1
2-Methylphenol	<0.1	Fluorene	<0.01
Hexachloroethane	<0.01	4-Chlorophenyl phenyl ether	<0.01
N-Nitroso-di-n-propylamine	<0.01	N-Nitrosodiphenylamine	<0.01
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitroaniline	<1
Nitrobenzene	<0.01	4,6-Dinitro-2-methylphenol	<0.3
Isophorone	<0.01	4-Bromophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	Hexachlorobenzene	<0.01
2,4-Dimethylphenol	<0.1	Pentachlorophenol	<0.1
Benzoic acid	<0.5	Phenanthrene	<0.01
Bis(2-chloroethoxy)methane	<0.01	Anthracene	<0.01
2,4-Dichlorophenol	<0.1	Carbazole	<0.1
1,2,4-Trichlorobenzene	<0.01	Di-n-butyl phthalate	<0.1
Naphthalene	<0.01	Fluoranthene	<0.01
Hexachlorobutadiene	<0.01	Pyrene	<0.01
4-Chloroaniline	<1	Benzyl butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benz(a)anthracene	<0.01
2-Methylnaphthalene	<0.01	Chrysene	<0.01
1-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
Hexachlorocyclopentadiene	<0.03	Di-n-octyl phthalate	<0.1
2,4,6-Trichlorophenol	<0.1	Benzo(a)pyrene	<0.01
2,4,5-Trichlorophenol	<0.1	Benzo(b)fluoranthene	<0.01
2-Chloronaphthalene	<0.01	Benzo(k)fluoranthene	<0.01
2-Nitroaniline	<0.05	Indeno(1,2,3-cd)pyrene	<0.01
Dimethyl phthalate	<0.1	Dibenz(a,h)anthracene	<0.01
Acenaphthylene	<0.01	Benzo(g,h,i)perylene	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-08	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-01 1/25,000
Date Analyzed:	07/13/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	6,900
Aroclor 1260	4,600

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-04	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-02 1/250
Date Analyzed:	07/13/15	Data File:	09.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	6.6
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-02	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-03 1/250
Date Analyzed:	07/13/15	Data File:	10.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	47
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-06 1/2,500
Date Analyzed:	07/16/15	Data File:	20.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	160
Aroclor 1260	250

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-07 1/5,000
Date Analyzed:	07/13/15	Data File:	18.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	500
Aroclor 1260	<20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-DUP	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-08 1/250
Date Analyzed:	07/13/15	Data File:	19.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	160
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-03	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-10 1/250
Date Analyzed:	07/14/15	Data File:	22.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	91
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-06	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-11 1/5,000
Date Analyzed:	07/14/15	Data File:	23.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	420
Aroclor 1260	220

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-12 1/25,000
Date Analyzed:	07/14/15	Data File:	28.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	7,800
Aroclor 1260	9,100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-05	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-13 1/25,000
Date Analyzed:	07/14/15	Data File:	29.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	12,000
Aroclor 1260	9,300

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-03	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-15 1/125,000
Date Analyzed:	07/16/15	Data File:	21.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<500
Aroclor 1232	<500
Aroclor 1016	<500
Aroclor 1242	<500
Aroclor 1248	<500
Aroclor 1254	18,000
Aroclor 1260	16,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-16 1/125,000
Date Analyzed:	07/16/15	Data File:	25.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<500
Aroclor 1232	<500
Aroclor 1016	<500
Aroclor 1242	<500
Aroclor 1248	<500
Aroclor 1254	11,000
Aroclor 1260	10,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-06	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-17 1/125,000
Date Analyzed:	07/16/15	Data File:	26.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<500
Aroclor 1232	<500
Aroclor 1016	<500
Aroclor 1242	<500
Aroclor 1248	<500
Aroclor 1254	6,400
Aroclor 1260	4,700

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-02	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-18 1/25,000
Date Analyzed:	07/14/15	Data File:	14.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	14,000
Aroclor 1260	13,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-07	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-19 1/25,000
Date Analyzed:	07/14/15	Data File:	15.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	16,000
Aroclor 1260	12,000

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-08	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-20 1/500
Date Analyzed:	07/16/15	Data File:	04.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<2
Aroclor 1232	<2
Aroclor 1016	2.8
Aroclor 1242	<2
Aroclor 1248	<2
Aroclor 1254	15
Aroclor 1260	<2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-EXPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-27 1/25,000
Date Analyzed:	07/14/15	Data File:	17.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	14,000
Aroclor 1260	11,000

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-EXPC-02	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-28 1/250,000
Date Analyzed:	07/16/15	Data File:	05.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1,000
Aroclor 1232	<1,000
Aroclor 1016	<1,000
Aroclor 1242	<1,000
Aroclor 1248	<1,000
Aroclor 1254	20,000
Aroclor 1260	15,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-EXPC-03	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-31 1/25,000
Date Analyzed:	07/14/15	Data File:	25.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	14,000
Aroclor 1260	11,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-EXPC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-32 1/25,000
Date Analyzed:	07/14/15	Data File:	26.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	14,000
Aroclor 1260	10,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-EXPC-04	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-33 1/25,000
Date Analyzed:	07/15/15	Data File:	27.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	15,000
Aroclor 1260	11,000

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-EXPC-04	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-34 1/25,000
Date Analyzed:	07/15/15	Data File:	28.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	6,000
Aroclor 1260	4,400

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-36 1/50
Date Analyzed:	07/20/15	Data File:	072020.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	0.22
Aroclor 1260	<0.2

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-37 1/50
Date Analyzed:	07/20/15	Data File:	072021.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-38 1/50
Date Analyzed:	07/22/15	Data File:	072211.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-40 1/5,000
Date Analyzed:	07/15/15	Data File:	37.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	43
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	190
Aroclor 1260	<20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	507113-41 1/25,000
Date Analyzed:	07/15/15	Data File:	38.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	200
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	870
Aroclor 1260	<100

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	05-1416 mb 1/5
Date Analyzed:	07/14/15	Data File:	07.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	66	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/09/15	Lab ID:	05-1417 mb 1/5
Date Analyzed:	07/14/15	Data File:	11.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	74	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

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/20/15	Lab ID:	507113-39
Date Analyzed:	07/23/15	Data File:	08.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	79	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/20/15	Lab ID:	05-1433 mb
Date Analyzed:	07/23/15	Data File:	07.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	RINS-01	Client:	Foster Pepper PLLC
Date Received:	07/08/15	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/20/15	Lab ID:	507113-35
Date Analyzed:	07/23/15	Data File:	072238.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507113
Date Extracted:	07/20/15	Lab ID:	05-1434 mb
Date Analyzed:	07/23/15	Data File:	072237.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75	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

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507190-01 (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	2.42	101	98	67-121	3
Barium	mg/kg (ppm)	50	48.8	107	119	74-135	11
Cadmium	mg/kg (ppm)	10	1.65	111	104	88-121	7
Chromium	mg/kg (ppm)	50	14.5	88	81	57-128	8
Lead	mg/kg (ppm)	50	5.64	97	98	59-148	1
Mercury	mg/kg (ppm	10	<1	98	98	50-150	0
Selenium	mg/kg (ppm)	5	<1	98	92	55-130	6
Silver	mg/kg (ppm)	10	<1	109	106	73-122	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	107	83-113
Barium	mg/kg (ppm)	50	110	85-116
Cadmium	mg/kg (ppm)	10	110	85-114
Chromium	mg/kg (ppm)	50	97	78-121
Lead	mg/kg (ppm)	50	105	80-120
Mercury	mg/kg (ppm)	10	103	70-130
Selenium	mg/kg (ppm)	5	106	87-117
Silver	mg/kg (ppm)	10	112	78-117

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507113-35 (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	106	107	60-150	1
Barium	ug/L (ppb)	50	<1	104	104	79-126	0
Cadmium	ug/L (ppb)	5	<1	107	106	80-124	1
Chromium	ug/L (ppb)	20	<1	109	110	64-132	1
Lead	ug/L (ppb)	10	<1	106	107	79-121	1
Mercury	ug/L (ppb)	10	<1	103	103	50-150	0
Selenium	ug/L (ppb)	5	<1	106	109	68-142	3
Silver	ug/L (ppb)	5	<1	106	112	60-121	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	103	80-111
Barium	ug/L (ppb)	50	100	83-117
Cadmium	ug/L (ppb)	5	102	83-113
Chromium	ug/L (ppb)	20	107	80-119
Lead	ug/L (ppb)	10	103	83-115
Mercury	ug/L (ppb)	10	101	70-130
Selenium	ug/L (ppb)	5	102	81-119
Silver	ug/L (ppb)	5	103	75-120

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL/SOLID SAMPLES
FOR TCLP METALS USING
EPA METHOD 200.8 AND 40 CFR PART 261**

Laboratory Code: 507113-13 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	102	101	50-150	1
Barium	mg/L (ppm)	5.0	<1	100	99	50-150	1
Cadmium	mg/L (ppm)	0.5	<1	99	97	50-150	2
Chromium	mg/L (ppm)	2.0	<1	103	101	50-150	2
Lead	mg/L (ppm)	1.0	<1	96	97	50-150	1
Mercury	mg/L (ppm)	1.0	<0.1	102	100	50-150	2
Selenium	mg/L (ppm)	0.5	<1	100	100	50-150	0
Silver	mg/L (ppm)	0.5	<1	102	100	50-150	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	101	70-130
Barium	mg/L (ppm)	5.0	100	70-130
Cadmium	mg/L (ppm)	0.5	99	70-130
Chromium	mg/L (ppm)	2.0	104	70-130
Lead	mg/L (ppm)	1.0	98	70-130
Mercury	mg/L (ppm)	1.0	97	70-130
Selenium	mg/L (ppm)	0.5	99	70-130
Silver	mg/L (ppm)	0.5	100	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP 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	100	98	54-149	2
Chloromethane	ug/L (ppb)	50	94	93	67-133	1
Vinyl chloride	ug/L (ppb)	50	94	93	70-119	1
Bromomethane	ug/L (ppb)	50	117	115	62-188	2
Chloroethane	ug/L (ppb)	50	102	101	66-149	1
Trichlorofluoromethane	ug/L (ppb)	50	98	97	70-132	1
Acetone	ug/L (ppb)	250	82	77	44-145	6
1,1-Dichloroethene	ug/L (ppb)	50	94	92	75-119	2
Hexane	ug/L (ppb)	50	91	90	51-153	1
Methylene chloride	ug/L (ppb)	50	47 vo	45 vo	63-132	4
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	104	102	70-122	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	96	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	95	93	80-116	2
2,2-Dichloropropane	ug/L (ppb)	50	108	109	62-141	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	98	95	80-112	3
Chloroform	ug/L (ppb)	50	93	91	81-109	2
2-Butanone (MEK)	ug/L (ppb)	250	103	98	53-140	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	90	87	79-109	3
1,1,1-Trichloroethane	ug/L (ppb)	50	100	98	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	97	97	78-112	0
Carbon tetrachloride	ug/L (ppb)	50	101	99	72-128	2
Benzene	ug/L (ppb)	50	93	91	81-108	2
Trichloroethene	ug/L (ppb)	50	95	93	77-108	2
1,2-Dichloropropane	ug/L (ppb)	50	95	93	82-109	2
Bromodichloromethane	ug/L (ppb)	50	97	93	76-120	4
Dibromomethane	ug/L (ppb)	50	98	94	80-110	4
4-Methyl-2-pentanone	ug/L (ppb)	250	119	115	59-142	3
cis-1,3-Dichloropropene	ug/L (ppb)	50	104	102	76-128	2
Toluene	ug/L (ppb)	50	94	93	83-108	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	103	101	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	95	92	82-110	3
2-Hexanone	ug/L (ppb)	250	102	98	53-145	4
1,3-Dichloropropane	ug/L (ppb)	50	96	94	83-110	2
Tetrachloroethene	ug/L (ppb)	50	92	90	78-109	2
Dibromochloromethane	ug/L (ppb)	50	101	99	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	99	96	82-118	3
Chlorobenzene	ug/L (ppb)	50	92	90	84-108	2
Ethylbenzene	ug/L (ppb)	50	97	95	83-111	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	96	95	76-125	1
m,p-Xylene	ug/L (ppb)	100	99	97	84-112	2
o-Xylene	ug/L (ppb)	50	101	100	81-117	1
Styrene	ug/L (ppb)	50	106	105	83-121	1
Isopropylbenzene	ug/L (ppb)	50	106	106	81-122	0
Bromoform	ug/L (ppb)	50	99	98	40-161	1
n-Propylbenzene	ug/L (ppb)	50	94	93	81-115	1
Bromobenzene	ug/L (ppb)	50	92	90	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	99	83-117	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	91	89	79-118	2
1,2,3-Trichloropropane	ug/L (ppb)	50	90	88	74-116	2
2-Chlorotoluene	ug/L (ppb)	50	93	93	79-112	0
4-Chlorotoluene	ug/L (ppb)	50	96	95	81-113	1
tert-Butylbenzene	ug/L (ppb)	50	107	106	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	102	101	81-121	1
sec-Butylbenzene	ug/L (ppb)	50	102	101	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	101	101	81-122	0
1,3-Dichlorobenzene	ug/L (ppb)	50	92	91	82-110	1
1,4-Dichlorobenzene	ug/L (ppb)	50	91	90	81-105	1
1,2-Dichlorobenzene	ug/L (ppb)	50	89	90	83-111	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	100	100	62-133	0
1,2,4-Trichlorobenzene	ug/L (ppb)	50	94	95	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	89	90	70-116	1
Naphthalene	ug/L (ppb)	50	109	109	72-131	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	93	94	80-114	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507113-35 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	<1	<1	nm
Chloromethane	ug/L (ppb)	<10	<10	nm
Vinyl chloride	ug/L (ppb)	<0.2	<0.2	nm
Bromomethane	ug/L (ppb)	<1	<1	nm
Chloroethane	ug/L (ppb)	<1	<1	nm
Trichlorofluoromethane	ug/L (ppb)	<1	<1	nm
Acetone	ug/L (ppb)	<10	<10	nm
1,1-Dichloroethene	ug/L (ppb)	<1	<1	nm
Hexane	ug/L (ppb)	17 a	8.9 a	63 a
Methylene chloride	ug/L (ppb)	<5	<5	nm
Methyl t-butyl ether (MTBE)	ug/L (ppb)	<1	<1	nm
trans-1,2-Dichloroethene	ug/L (ppb)	<1	<1	nm
1,1-Dichloroethane	ug/L (ppb)	<1	<1	nm
2,2-Dichloropropane	ug/L (ppb)	<1	<1	nm
cis-1,2-Dichloroethene	ug/L (ppb)	<1	<1	nm
Chloroform	ug/L (ppb)	<1	<1	nm
2-Butanone (MEK)	ug/L (ppb)	<10	<10	nm
1,2-Dichloroethane (EDC)	ug/L (ppb)	<1	<1	nm
1,1,1-Trichloroethane	ug/L (ppb)	<1	<1	nm
1,1-Dichloropropene	ug/L (ppb)	<1	<1	nm
Carbon tetrachloride	ug/L (ppb)	<1	<1	nm
Benzene	ug/L (ppb)	<0.35	<0.35	nm
Trichloroethene	ug/L (ppb)	<1	<1	nm
1,2-Dichloropropane	ug/L (ppb)	<1	<1	nm
Bromodichloromethane	ug/L (ppb)	<1	<1	nm
Dibromomethane	ug/L (ppb)	<1	<1	nm
4-Methyl-2-pentanone	ug/L (ppb)	<10	<10	nm
cis-1,3-Dichloropropene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
trans-1,3-Dichloropropene	ug/L (ppb)	<1	<1	nm
1,1,2-Trichloroethane	ug/L (ppb)	<1	<1	nm
2-Hexanone	ug/L (ppb)	<10	<10	nm
1,3-Dichloropropane	ug/L (ppb)	<1	<1	nm
Tetrachloroethene	ug/L (ppb)	<1	<1	nm
Dibromochloromethane	ug/L (ppb)	<1	<1	nm
1,2-Dibromoethane (EDB)	ug/L (ppb)	<1	<1	nm
Chlorobenzene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
1,1,1,2-Tetrachloroethane	ug/L (ppb)	<1	<1	nm
m,p-Xylene	ug/L (ppb)	<2	<2	nm
o-Xylene	ug/L (ppb)	<1	<1	nm
Styrene	ug/L (ppb)	<1	<1	nm
Isopropylbenzene	ug/L (ppb)	<1	<1	nm
Bromoform	ug/L (ppb)	<1	<1	nm
n-Propylbenzene	ug/L (ppb)	<1	<1	nm
Bromobenzene	ug/L (ppb)	<1	<1	nm
1,3,5-Trimethylbenzene	ug/L (ppb)	<1	<1	nm
1,1,2,2-Tetrachloroethane	ug/L (ppb)	<1	<1	nm
1,2,3-Trichloropropane	ug/L (ppb)	<1	<1	nm
2-Chlorotoluene	ug/L (ppb)	<1	<1	nm
4-Chlorotoluene	ug/L (ppb)	<1	<1	nm
tert-Butylbenzene	ug/L (ppb)	<1	<1	nm
1,2,4-Trimethylbenzene	ug/L (ppb)	<1	<1	nm
sec-Butylbenzene	ug/L (ppb)	<1	<1	nm
p-Isopropyltoluene	ug/L (ppb)	<1	<1	nm
1,3-Dichlorobenzene	ug/L (ppb)	<1	<1	nm
1,4-Dichlorobenzene	ug/L (ppb)	<1	<1	nm
1,2-Dichlorobenzene	ug/L (ppb)	<1	<1	nm
1,2-Dibromo-3-chloropropane	ug/L (ppb)	<10	<10	nm
1,2,4-Trichlorobenzene	ug/L (ppb)	<1	<1	nm
Hexachlorobutadiene	ug/L (ppb)	<1	<1	nm
Naphthalene	ug/L (ppb)	<1	<1	nm
1,2,3-Trichlorobenzene	ug/L (ppb)	<1	<1	nm

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

Laboratory Code: 507151-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	89	55-137
Chloromethane	ug/L (ppb)	50	<10	90	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	91	61-139
Bromomethane	ug/L (ppb)	50	<1	111	20-265
Chloroethane	ug/L (ppb)	50	<1	99	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	97	71-128
Acetone	ug/L (ppb)	250	<10	100	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	93	71-123
Hexane	ug/L (ppb)	50	<1	92	61-127
Methylene chloride	ug/L (ppb)	50	<5	101	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	104	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	96	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	110	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	63-126
Chloroform	ug/L (ppb)	50	<1	93	79-113
2-Butanone (MEK)	ug/L (ppb)	250	<10	101	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	90	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	98	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	101	70-132
Benzene	ug/L (ppb)	50	<0.35	93	78-108
Trichloroethene	ug/L (ppb)	50	<1	94	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	97	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	96	78-117
Dibromomethane	ug/L (ppb)	50	<1	97	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	119	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	100	76-120
Toluene	ug/L (ppb)	50	<1	95	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	103	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	95	81-116
2-Hexanone	ug/L (ppb)	250	<10	103	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	95	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	93	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	100	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	98	79-120
Chlorobenzene	ug/L (ppb)	50	<1	92	75-115
Ethylbenzene	ug/L (ppb)	50	<1	97	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	97	76-130
m,p-Xylene	ug/L (ppb)	100	<2	99	63-128
o-Xylene	ug/L (ppb)	50	<1	102	64-129
Styrene	ug/L (ppb)	50	<1	106	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	107	77-122
Bromoform	ug/L (ppb)	50	<1	97	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	92	74-117
Bromobenzene	ug/L (ppb)	50	<1	90	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	98	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	89	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	89	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	93	70-123
4-Chlorotoluene	ug/L (ppb)	50	<1	94	79-113
tert-Butylbenzene	ug/L (ppb)	50	<1	105	78-124
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	102	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	101	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	99	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	91	79-109
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	90	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	89	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	102	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	94	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	87	67-120
Naphthalene	ug/L (ppb)	50	<1	110	62-140
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	93	59-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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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	96	99	54-149	3
Chloromethane	ug/L (ppb)	50	92	93	67-133	1
Vinyl chloride	ug/L (ppb)	50	92	92	70-119	0
Bromomethane	ug/L (ppb)	50	111	116	62-188	4
Chloroethane	ug/L (ppb)	50	101	103	66-149	2
Trichlorofluoromethane	ug/L (ppb)	50	97	99	70-132	2
Acetone	ug/L (ppb)	250	101	102	44-145	1
1,1-Dichloroethene	ug/L (ppb)	50	93	94	75-119	1
Hexane	ug/L (ppb)	50	90	90	51-153	0
Methylene chloride	ug/L (ppb)	50	98	100	63-132	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	102	104	70-122	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	100	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	94	95	80-116	1
2,2-Dichloropropane	ug/L (ppb)	50	110	113	62-141	3
cis-1,2-Dichloroethene	ug/L (ppb)	50	97	99	80-112	2
Chloroform	ug/L (ppb)	50	92	94	81-109	2
2-Butanone (MEK)	ug/L (ppb)	250	99	96	53-140	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	88	88	79-109	0
1,1,1-Trichloroethane	ug/L (ppb)	50	99	101	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	95	96	78-112	1
Carbon tetrachloride	ug/L (ppb)	50	102	103	72-128	1
Benzene	ug/L (ppb)	50	91	91	81-108	0
Trichloroethene	ug/L (ppb)	50	92	93	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	94	94	82-109	0
Bromodichloromethane	ug/L (ppb)	50	95	96	76-120	1
Dibromomethane	ug/L (ppb)	50	95	94	80-110	1
4-Methyl-2-pentanone	ug/L (ppb)	250	117	115	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	102	101	76-128	1
Toluene	ug/L (ppb)	50	94	94	83-108	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	101	100	76-128	1
1,1,2-Trichloroethane	ug/L (ppb)	50	93	94	82-110	1
2-Hexanone	ug/L (ppb)	250	102	98	53-145	4
1,3-Dichloropropane	ug/L (ppb)	50	93	92	83-110	1
Tetrachloroethene	ug/L (ppb)	50	91	91	78-109	0
Dibromochloromethane	ug/L (ppb)	50	101	101	63-140	0
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	98	95	82-118	3
Chlorobenzene	ug/L (ppb)	50	92	91	84-108	1
Ethylbenzene	ug/L (ppb)	50	96	97	83-111	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	97	100	76-125	3
m,p-Xylene	ug/L (ppb)	100	99	99	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	81-117	2
Styrene	ug/L (ppb)	50	106	105	83-121	1
Isopropylbenzene	ug/L (ppb)	50	108	109	81-122	1
Bromoform	ug/L (ppb)	50	100	101	40-161	1
n-Propylbenzene	ug/L (ppb)	50	93	94	81-115	1
Bromobenzene	ug/L (ppb)	50	91	89	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	100	100	83-117	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	90	91	79-118	1
1,2,3-Trichloropropane	ug/L (ppb)	50	90	89	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	93	94	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	96	95	81-113	1
tert-Butylbenzene	ug/L (ppb)	50	108	109	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	103	104	81-121	1
sec-Butylbenzene	ug/L (ppb)	50	103	104	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	102	103	81-122	1
1,3-Dichlorobenzene	ug/L (ppb)	50	92	93	82-110	1
1,4-Dichlorobenzene	ug/L (ppb)	50	91	92	81-105	1
1,2-Dichlorobenzene	ug/L (ppb)	50	90	93	83-111	3
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	108	107	62-133	1
1,2,4-Trichlorobenzene	ug/L (ppb)	50	96	98	77-117	2
Hexachlorobutadiene	ug/L (ppb)	50	94	96	70-116	2
Naphthalene	ug/L (ppb)	50	112	114	72-131	2
1,2,3-Trichlorobenzene	ug/L (ppb)	50	95	99	80-114	4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 507113-40 (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	33	32	10-56	3
Chloromethane	mg/kg (ppm)	2.5	<0.5	58	59	10-90	2
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	61	60	10-91	2
Bromomethane	mg/kg (ppm)	2.5	<0.5	71	70	10-110	1
Chloroethane	mg/kg (ppm)	2.5	<0.5	72	72	10-101	0
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	73	74	10-95	1
Acetone	mg/kg (ppm)	12.5	<0.5	97	99	11-141	2
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	80	81	11-103	1
Hexane	mg/kg (ppm)	2.5	<0.25	72	71	10-95	1
Methylene chloride	mg/kg (ppm)	2.5	<0.5	89	91	14-128	2
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	96	96	17-134	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	86	89	13-112	3
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	88	87	23-115	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	97	100	18-117	3
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	89	90	25-120	1
Chloroform	mg/kg (ppm)	2.5	<0.05	88	88	29-117	0
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	99	94	20-133	5
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	84	84	22-124	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	91	91	27-112	0
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	87	88	26-107	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	92	92	22-115	0
Benzene	mg/kg (ppm)	2.5	<0.03	85	85	26-114	0
Trichloroethene	mg/kg (ppm)	2.5	<0.02	156 ip	156 ip	30-112	0
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	90	89	31-119	1
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	90	88	31-131	2
Dibromomethane	mg/kg (ppm)	2.5	<0.05	92	88	27-124	4
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	115	110	16-147	4
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	94	91	28-137	3
Toluene	mg/kg (ppm)	2.5	<0.05	89	89	34-112	0
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	97	90	30-136	7
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	90	86	32-126	5
2-Hexanone	mg/kg (ppm)	12.5	<0.5	100	94	17-147	6
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	92	88	29-125	4
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	87	86	25-114	1
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	95	92	32-143	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	94	89	32-126	5
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	88	86	37-113	2
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	90	90	34-115	0
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	92	90	35-126	2
m,p-Xylene	mg/kg (ppm)	5	0.16	95	94	25-125	1
o-Xylene	mg/kg (ppm)	2.5	0.053	97	96	27-126	1
Styrene	mg/kg (ppm)	2.5	<0.05	100	98	39-121	2
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	102	102	34-123	0
Bromoform	mg/kg (ppm)	2.5	<0.05	94	91	18-155	3
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	89	88	31-120	1
Bromobenzene	mg/kg (ppm)	2.5	<0.05	88	86	40-115	2
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	95	95	24-130	0
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	1 ip	1 ip	27-148	0
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	88	86	33-123	2
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	90	88	39-110	2
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	91	91	39-111	0
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	102	102	36-116	0
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	98	97	35-116	1
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	99	99	33-118	0
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	97	97	32-119	0
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	89	89	38-111	0
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	89	89	39-109	0
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	86	87	40-111	1
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	87	88	37-122	1
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	90	92	31-121	2
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	92	95	24-128	3
Naphthalene	mg/kg (ppm)	2.5	<0.05	102	104	24-139	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	91	93	35-117	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	10-76
Chloromethane	mg/kg (ppm)	2.5	74	34-98
Vinyl chloride	mg/kg (ppm)	2.5	78	42-107
Bromomethane	mg/kg (ppm)	2.5	87	46-113
Chloroethane	mg/kg (ppm)	2.5	90	47-115
Trichlorofluoromethane	mg/kg (ppm)	2.5	92	53-112
Acetone	mg/kg (ppm)	12.5	111	39-147
1,1-Dichloroethene	mg/kg (ppm)	2.5	93	65-110
Hexane	mg/kg (ppm)	2.5	90	55-107
Methylene chloride	mg/kg (ppm)	2.5	108	50-127
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	110	72-122
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	104	71-113
1,1-Dichloroethane	mg/kg (ppm)	2.5	103	74-109
2,2-Dichloropropane	mg/kg (ppm)	2.5	116	64-151
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	105	73-110
Chloroform	mg/kg (ppm)	2.5	102	76-110
2-Butanone (MEK)	mg/kg (ppm)	12.5	109	60-121
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	97	73-111
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	106	72-116
1,1-Dichloropropene	mg/kg (ppm)	2.5	103	72-112
Carbon tetrachloride	mg/kg (ppm)	2.5	110	67-123
Benzene	mg/kg (ppm)	2.5	99	72-106
Trichloroethene	mg/kg (ppm)	2.5	102	72-107
1,2-Dichloropropane	mg/kg (ppm)	2.5	103	74-115
Bromodichloromethane	mg/kg (ppm)	2.5	105	75-126
Dibromomethane	mg/kg (ppm)	2.5	106	76-116
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	127	80-128
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	109	71-138
Toluene	mg/kg (ppm)	2.5	104	74-111
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	111	77-135
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	105	77-116
2-Hexanone	mg/kg (ppm)	12.5	110	70-129
1,3-Dichloropropane	mg/kg (ppm)	2.5	103	75-115
Tetrachloroethene	mg/kg (ppm)	2.5	100	73-111
Dibromochloromethane	mg/kg (ppm)	2.5	110	64-152
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	107	77-117
Chlorobenzene	mg/kg (ppm)	2.5	101	76-109
Ethylbenzene	mg/kg (ppm)	2.5	106	75-112
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	107	76-125
m,p-Xylene	mg/kg (ppm)	5	109	77-115
o-Xylene	mg/kg (ppm)	2.5	113	76-115
Styrene	mg/kg (ppm)	2.5	116	76-119
Isopropylbenzene	mg/kg (ppm)	2.5	118	76-120
Bromoform	mg/kg (ppm)	2.5	109	50-174
n-Propylbenzene	mg/kg (ppm)	2.5	103	77-115
Bromobenzene	mg/kg (ppm)	2.5	101	76-112
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	110	77-121
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	101	74-121
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	99	74-116
2-Chlorotoluene	mg/kg (ppm)	2.5	102	75-113
4-Chlorotoluene	mg/kg (ppm)	2.5	106	77-115
tert-Butylbenzene	mg/kg (ppm)	2.5	117	77-123
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	113	77-119
sec-Butylbenzene	mg/kg (ppm)	2.5	112	78-120
p-Isopropyltoluene	mg/kg (ppm)	2.5	111	77-120
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	103	76-112
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	101	74-109
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	101	75-114
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	115	68-122
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	106	75-122
Hexachlorobutadiene	mg/kg (ppm)	2.5	103	74-130
Naphthalene	mg/kg (ppm)	2.5	119	73-122
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	107	75-117

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
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Project: Anacortes WTP, F&BI 507113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP 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	44	50	10-84	13
Bis(2-chloroethyl) ether	ug/L (ppb)	10	93	96	52-113	3
2-Chlorophenol	ug/L (ppb)	10	85	96	50-110	12
1,3-Dichlorobenzene	ug/L (ppb)	10	86	87	45-109	1
1,4-Dichlorobenzene	ug/L (ppb)	10	85	87	44-118	2
1,2-Dichlorobenzene	ug/L (ppb)	10	85	87	46-116	2
Benzyl alcohol	ug/L (ppb)	10	80	91	42-100	13
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	86	90	51-124	5
2-Methylphenol	ug/L (ppb)	10	78	91	38-100	15
Hexachloroethane	ug/L (ppb)	10	89	90	42-117	1
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	89	92	48-124	3
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	71	84	40-105	17
Nitrobenzene	ug/L (ppb)	10	95	100	50-118	5
Isophorone	ug/L (ppb)	10	91	95	55-116	4
2-Nitrophenol	ug/L (ppb)	10	88	90	42-127	2
2,4-Dimethylphenol	ug/L (ppb)	10	77	89	11-135	14
Benzoic acid	ug/L (ppb)	65	24	19	10-110	23 vo
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	92	97	55-115	5
2,4-Dichlorophenol	ug/L (ppb)	10	90	97	55-113	7
1,2,4-Trichlorobenzene	ug/L (ppb)	10	86	88	50-109	2
Naphthalene	ug/L (ppb)	10	87	91	53-112	4
Hexachlorobutadiene	ug/L (ppb)	10	86	85	50-109	1
4-Chloroaniline	ug/L (ppb)	20	63	97	30-109	42 vo
4-Chloro-3-methylphenol	ug/L (ppb)	10	84	94	54-114	11
2-Methylnaphthalene	ug/L (ppb)	10	86	90	53-113	5
1-Methylnaphthalene	ug/L (ppb)	10	86	90	70-130	5
Hexachlorocyclopentadiene	ug/L (ppb)	10	90	91	10-121	1
2,4,6-Trichlorophenol	ug/L (ppb)	10	112	114	46-114	2
2,4,5-Trichlorophenol	ug/L (ppb)	10	103	110	57-122	7
2-Chloronaphthalene	ug/L (ppb)	10	101	104	52-112	3
2-Nitroaniline	ug/L (ppb)	10	102	109	47-128	7
Dimethyl phthalate	ug/L (ppb)	10	98	106	55-116	8
Acenaphthylene	ug/L (ppb)	10	103	108	52-112	5
2,6-Dinitrotoluene	ug/L (ppb)	10	108	116	49-126	7
3-Nitroaniline	ug/L (ppb)	20	82	103	21-125	23 vo
Acenaphthene	ug/L (ppb)	10	100	106	52-114	6
2,4-Dinitrophenol	ug/L (ppb)	10	98	95	29-130	3
Dibenzofuran	ug/L (ppb)	10	99	106	53-113	7
2,4-Dinitrotoluene	ug/L (ppb)	10	101	108	48-129	7
4-Nitrophenol	ug/L (ppb)	10	49	51	10-80	4
Diethyl phthalate	ug/L (ppb)	10	107	116	55-116	8
Fluorene	ug/L (ppb)	10	101	108	54-115	7
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	98	104	52-115	6
N-Nitrosodiphenylamine	ug/L (ppb)	10	94	101	51-112	7
4-Nitroaniline	ug/L (ppb)	20	83	92	42-115	10
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	100	101	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	10	96	101	53-114	5
Hexachlorobenzene	ug/L (ppb)	10	96	102	54-115	6
Pentachlorophenol	ug/L (ppb)	10	100	98	49-114	2
Phenanthrene	ug/L (ppb)	10	92	97	53-113	5
Anthracene	ug/L (ppb)	10	95	100	56-119	5
Carbazole	ug/L (ppb)	10	91	93	54-115	2
Di-n-butyl phthalate	ug/L (ppb)	10	102	106	54-115	4
Fluoranthene	ug/L (ppb)	10	96	100	55-116	4
Pyrene	ug/L (ppb)	10	105	109	54-121	4
Benzyl butyl phthalate	ug/L (ppb)	10	110	114	53-122	4
Benz(a)anthracene	ug/L (ppb)	10	91	95	52-114	4
Chrysene	ug/L (ppb)	10	89	94	54-119	5
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	111	117	54-122	5
Di-n-octyl phthalate	ug/L (ppb)	10	125	131	50-131	5
Benzo(a)pyrene	ug/L (ppb)	10	117	125 vo	54-120	7
Benzo(b)fluoranthene	ug/L (ppb)	10	123 vo	130 vo	46-118	6
Benzo(k)fluoranthene	ug/L (ppb)	10	124	130 vo	56-125	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	118	126 vo	52-120	7
Dibenz(a,h)anthracene	ug/L (ppb)	10	112	121	54-122	8
Benzo(g,h,i)perylene	ug/L (ppb)	10	123 vo	133 vo	54-118	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Project: Anacortes WTP, F&BI 507113

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	44	44	10-84	0
Bis(2-chloroethyl) ether	ug/L (ppb)	10	99	102	52-113	3
2-Chlorophenol	ug/L (ppb)	10	96	98	50-110	2
1,3-Dichlorobenzene	ug/L (ppb)	10	93	95	45-109	2
1,4-Dichlorobenzene	ug/L (ppb)	10	92	95	44-118	3
1,2-Dichlorobenzene	ug/L (ppb)	10	92	95	46-116	3
Benzyl alcohol	ug/L (ppb)	10	88	89	42-100	1
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	98	100	51-124	2
2-Methylphenol	ug/L (ppb)	10	91	90	38-100	1
Hexachloroethane	ug/L (ppb)	10	96	100	42-117	4
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	97	99	48-124	2
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	81	83	40-105	2
Nitrobenzene	ug/L (ppb)	10	101	103	50-118	2
Isophorone	ug/L (ppb)	10	95	98	55-116	3
2-Nitrophenol	ug/L (ppb)	10	92	95	42-127	3
2,4-Dimethylphenol	ug/L (ppb)	10	90	77	11-135	16
Benzoic acid	ug/L (ppb)	65	32	37	10-110	14
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	99	102	55-115	3
2,4-Dichlorophenol	ug/L (ppb)	10	97	99	55-113	2
1,2,4-Trichlorobenzene	ug/L (ppb)	10	93	95	50-109	2
Naphthalene	ug/L (ppb)	10	95	97	53-112	2
Hexachlorobutadiene	ug/L (ppb)	10	94	95	50-109	1
4-Chloroaniline	ug/L (ppb)	20	97	97	30-109	0
4-Chloro-3-methylphenol	ug/L (ppb)	10	98	99	54-114	1
2-Methylnaphthalene	ug/L (ppb)	10	96	98	53-113	2
1-Methylnaphthalene	ug/L (ppb)	10	100	102	70-130	2
Hexachlorocyclopentadiene	ug/L (ppb)	10	102	92	10-121	10
2,4,6-Trichlorophenol	ug/L (ppb)	10	118 vo	118 vo	46-114	0
2,4,5-Trichlorophenol	ug/L (ppb)	10	112	113	57-122	1
2-Chloronaphthalene	ug/L (ppb)	10	108	111	52-112	3
2-Nitroaniline	ug/L (ppb)	10	116	121	47-128	4
Dimethyl phthalate	ug/L (ppb)	10	106	111	55-116	5
Acenaphthylene	ug/L (ppb)	10	109	113 vo	52-112	4
2,6-Dinitrotoluene	ug/L (ppb)	10	119	127 vo	49-126	7
3-Nitroaniline	ug/L (ppb)	20	115	119	21-125	3
Acenaphthene	ug/L (ppb)	10	108	111	52-114	3
2,4-Dinitrophenol	ug/L (ppb)	10	127	125	29-130	2
Dibenzofuran	ug/L (ppb)	10	109	112	53-113	3
2,4-Dinitrotoluene	ug/L (ppb)	10	121	126	48-129	4
4-Nitrophenol	ug/L (ppb)	10	55	54	10-80	2
Diethyl phthalate	ug/L (ppb)	10	118 vo	124 vo	55-116	5
Fluorene	ug/L (ppb)	10	113	116 vo	54-115	3
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	108	113	52-115	5
N-Nitrosodiphenylamine	ug/L (ppb)	10	100	101	51-112	1
4-Nitroaniline	ug/L (ppb)	20	105	105	42-115	0
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	117	116	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	10	98	100	53-114	2
Hexachlorobenzene	ug/L (ppb)	10	97	99	54-115	2
Pentachlorophenol	ug/L (ppb)	10	113	113	49-114	0
Phenanthrene	ug/L (ppb)	10	98	100	53-113	2
Anthracene	ug/L (ppb)	10	102	104	56-119	2
Carbazole	ug/L (ppb)	10	107	107	54-115	0
Di-n-butyl phthalate	ug/L (ppb)	10	110	112	54-115	2
Fluoranthene	ug/L (ppb)	10	103	104	55-116	1
Pyrene	ug/L (ppb)	10	97	103	54-121	6
Benzyl butyl phthalate	ug/L (ppb)	10	107	108	53-122	1
Benz(a)anthracene	ug/L (ppb)	10	97	99	52-114	2
Chrysene	ug/L (ppb)	10	94	95	54-119	1
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	110	109	54-122	1
Di-n-octyl phthalate	ug/L (ppb)	10	131	129	50-131	2
Benzo(a)pyrene	ug/L (ppb)	10	129 vo	132 vo	54-120	2
Benzo(b)fluoranthene	ug/L (ppb)	10	131 vo	133 vo	46-118	2
Benzo(k)fluoranthene	ug/L (ppb)	10	134 vo	135 vo	56-125	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	116	123 vo	52-120	6
Dibenz(a,h)anthracene	ug/L (ppb)	10	114	121	54-122	6
Benzo(g,h,i)perylene	ug/L (ppb)	10	111	118	54-118	6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507113-38 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.33	<0.1	102	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	<0.01	91	50-150
2-Chlorophenol	mg/kg (ppm)	0.33	<0.1	95	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	<0.01	84	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	<0.01	83	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	<0.01	85	50-150
Benzyl alcohol	mg/kg (ppm)	0.33	<0.1	95	50-150
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.33	<0.01	91	50-150
2-Methylphenol	mg/kg (ppm)	0.33	<0.1	97	42-143
Hexachloroethane	mg/kg (ppm)	0.33	<0.01	88	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	<0.01	93	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	<0.2	96	10-250
Nitrobenzene	mg/kg (ppm)	0.33	<0.01	93	50-150
Isophorone	mg/kg (ppm)	0.33	<0.01	93	50-150
2-Nitrophenol	mg/kg (ppm)	0.33	<0.1	90	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.33	<0.1	86	16-163
Benzoic acid	mg/kg (ppm)	0.5	<0.5	80	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	<0.01	93	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.33	<0.1	94	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	<0.01	86	50-150
Naphthalene	mg/kg (ppm)	0.33	<0.01	89	10-188
Hexachlorobutadiene	mg/kg (ppm)	0.33	<0.01	83	50-150
4-Chloroaniline	mg/kg (ppm)	0.66	<1	88	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	<0.1	100	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.33	<0.01	93	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.33	<0.01	97	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	<0.03	89	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	<0.1	109	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	<0.1	112	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.33	<0.01	102	50-150
2-Nitroaniline	mg/kg (ppm)	0.33	<0.05	113	50-150
Dimethyl phthalate	mg/kg (ppm)	0.33	<0.1	106	50-150
Acenaphthylene	mg/kg (ppm)	0.33	<0.01	105	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	<0.05	119	50-150
3-Nitroaniline	mg/kg (ppm)	0.66	<1	108	23-119
Acenaphthene	mg/kg (ppm)	0.33	<0.01	104	30-165
2,4-Dinitrophenol	mg/kg (ppm)	0.33	<0.3	119	10-162
Dibenzofuran	mg/kg (ppm)	0.33	<0.01	106	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	<0.05	122	50-150
4-Nitrophenol	mg/kg (ppm)	0.33	<0.3	107	10-179
Diethyl phthalate	mg/kg (ppm)	0.33	<0.1	122	50-150
Fluorene	mg/kg (ppm)	0.33	<0.01	113	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	<0.01	108	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	<0.01	94	50-150
4-Nitroaniline	mg/kg (ppm)	0.66	<1	93	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	<0.3	112	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	<0.01	94	50-150
Hexachlorobenzene	mg/kg (ppm)	0.33	<0.01	93	50-150
Pentachlorophenol	mg/kg (ppm)	0.33	<0.1	108	12-160
Phenanthrene	mg/kg (ppm)	0.33	<0.01	94	18-166
Anthracene	mg/kg (ppm)	0.33	<0.01	94	50-150
Carbazole	mg/kg (ppm)	0.33	<0.1	101	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.33	<0.1	111	50-150
Fluoranthene	mg/kg (ppm)	0.33	<0.01	102	10-192
Pyrene	mg/kg (ppm)	0.33	<0.01	98	10-250
Benzyl butyl phthalate	mg/kg (ppm)	0.33	<0.1	111	50-150
Benz(a)anthracene	mg/kg (ppm)	0.33	<0.01	94	50-150
Chrysene	mg/kg (ppm)	0.33	<0.01	92	39-152
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	<0.16	112	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.33	<0.1	130	54-161
Benzo(a)pyrene	mg/kg (ppm)	0.33	<0.01	121	35-147
Benzo(b)fluoranthene	mg/kg (ppm)	0.33	<0.01	124	45-144
Benzo(k)fluoranthene	mg/kg (ppm)	0.33	<0.01	126	50-150
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.33	<0.01	122	32-149
Dibenz(a,h)anthracene	mg/kg (ppm)	0.33	<0.01	118	50-150
Benzo(g,h,i)perylene	mg/kg (ppm)	0.33	<0.01	114	33-147

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/05/15
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Project: Anacortes WTP, F&BI 507113

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	100	105	51-119	5
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	96	102	60-112	6
2-Chlorophenol	mg/kg (ppm)	0.33	97	102	59-114	5
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	93	96	62-113	3
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	92	95	61-114	3
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	93	95	61-113	2
Benzyl alcohol	mg/kg (ppm)	0.33	98	105	50-119	7
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.33	95	100	59-113	5
2-Methylphenol	mg/kg (ppm)	0.33	97	104	58-115	7
Hexachloroethane	mg/kg (ppm)	0.33	97	102	63-114	5
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	94	101	62-114	7
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	95	103	54-120	8
Nitrobenzene	mg/kg (ppm)	0.33	99	103	59-114	4
Isophorone	mg/kg (ppm)	0.33	95	97	61-113	2
2-Nitrophenol	mg/kg (ppm)	0.33	90	98	59-114	9
2,4-Dimethylphenol	mg/kg (ppm)	0.33	85	94	54-107	10
Benzoic acid	mg/kg (ppm)	0.5	112	115	43-150	3
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	97	101	60-114	4
2,4-Dichlorophenol	mg/kg (ppm)	0.33	95	101	57-118	6
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	93	95	56-112	2
Naphthalene	mg/kg (ppm)	0.33	94	97	61-113	3
Hexachlorobutadiene	mg/kg (ppm)	0.33	93	95	60-116	2
4-Chloroaniline	mg/kg (ppm)	0.66	74	79	10-126	7
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	97	104	59-115	7
2-Methylnaphthalene	mg/kg (ppm)	0.33	96	101	60-115	5
1-Methylnaphthalene	mg/kg (ppm)	0.33	101	105	70-130	4
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	106	108 vo	41-107	2
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	112	122 vo	47-119	9
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	109	114	61-121	4
2-Chloronaphthalene	mg/kg (ppm)	0.33	107	111	58-114	4
2-Nitroaniline	mg/kg (ppm)	0.33	113	118	55-119	4
Dimethyl phthalate	mg/kg (ppm)	0.33	107	109	58-116	2
Acenaphthylene	mg/kg (ppm)	0.33	108	112	56-114	4
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	121 vo	124 vo	57-119	2
3-Nitroaniline	mg/kg (ppm)	0.66	100	106	10-143	6
Acenaphthene	mg/kg (ppm)	0.33	107	110	57-114	3
2,4-Dinitrophenol	mg/kg (ppm)	0.33	121	138 vo	40-122	13
Dibenzofuran	mg/kg (ppm)	0.33	109	113	56-115	4
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	122	125	53-126	2
4-Nitrophenol	mg/kg (ppm)	0.33	107	119	40-124	11
Diethyl phthalate	mg/kg (ppm)	0.33	122 vo	123 vo	57-116	1
Fluorene	mg/kg (ppm)	0.33	113	118	57-118	4
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	110	113	54-119	3
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	94	98	54-113	4
4-Nitroaniline	mg/kg (ppm)	0.66	89	99	47-109	11
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	111	123	55-147	10
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	95	98	56-116	3
Hexachlorobenzene	mg/kg (ppm)	0.33	96	98	57-115	2
Pentachlorophenol	mg/kg (ppm)	0.33	110	120	45-123	9
Phenanthrene	mg/kg (ppm)	0.33	96	100	57-113	4
Anthracene	mg/kg (ppm)	0.33	99	102	60-118	3
Carbazole	mg/kg (ppm)	0.33	103	108	57-116	5
Di-n-butyl phthalate	mg/kg (ppm)	0.33	111	117	56-118	5
Fluoranthene	mg/kg (ppm)	0.33	102	108	58-117	6
Pyrene	mg/kg (ppm)	0.33	99	98	58-120	1
Benzyl butyl phthalate	mg/kg (ppm)	0.33	110	116	56-122	5
Benz(a)anthracene	mg/kg (ppm)	0.33	96	99	54-114	3
Chrysene	mg/kg (ppm)	0.33	93	95	57-119	2
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	110	116	56-155	5
Di-n-octyl phthalate	mg/kg (ppm)	0.33	127 vo	139 vo	58-120	9
Benzo(a)pyrene	mg/kg (ppm)	0.33	123 vo	128 vo	56-119	4
Benzo(b)fluoranthene	mg/kg (ppm)	0.33	126 vo	132 vo	47-121	5
Benzo(k)fluoranthene	mg/kg (ppm)	0.33	127 vo	134 vo	59-126	5
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.33	135	126	52-137	7
Dibenz(a,h)anthracene	mg/kg (ppm)	0.33	130	121	51-138	7
Benzo(g,h,i)perylene	mg/kg (ppm)	0.33	129	118	48-138	9

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507113-38 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	64	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	79	50-150

Laboratory Code: 507113-30 1/250,000 and 507113-29 1/250,000 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	4.2	<1,000	0 ip	0 ip	50-150	0
Aroclor 1260	mg/kg (ppm)	4.2	15,000	0 ip	0 ip	50-150	0

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	76	90	55-130	17
Aroclor 1260	mg/kg (ppm)	0.8	81	93	58-133	14

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

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

Laboratory Code: 507113-05 1/25,000 and 507113-04 1/25,000 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<100	0 ip	0 ip	50-150	0
Aroclor 1260	mg/kg (ppm)	0.8	4,600	0 ip	0 ip	50-150	0

Laboratory Code: 507113-14 1/5,000 and 507113-09 1/5,000 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	4.2	<0.02	0 ip	0 ip	50-150	0
Aroclor 1260	mg/kg (ppm)	4.2	<0.02	0 ip	0 ip	50-150	0

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	77	89	55-130	14
Aroclor 1260	mg/kg (ppm)	0.8	81	89	58-133	9

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WIPE 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/wipe	100	81	79	70-130	2
Aroclor 1260	ug/wipe	100	79	80	70-130	1

Date of Report: 08/05/15
Date Received: 07/08/15
Project: Anacortes WTP, F&BI 507113

**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	74	82	37-136	10
Aroclor 1260	ug/L (ppb)	2.5	79	81	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.

507113

SAMPLE CHAIN OF CUSTODY

ME 07/08/15

4-A2

Page # 1 of 5

Send Report To KEN LEDERMAN

Company FOSTER PEPPER PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. ANACORTES WTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [x] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBS						Notes
SB-EXPC-08	01	7/7/15	1445	GRAB	1							✓						
AB-SEAL-04	02	7/7/15	1545	GRAB	1							✓						
AB-SEAL-02	03	7/7/15	1520	GRAB	1							✓						
SB-EXPC-08MSD	04	7/7/15	1445	GRAB	1							✓						
SB-EXPC-08MS	05	7/7/15	1445	GRAB	1							✓						
AB-SEAL-05	06	7/7/15	1400	GRAB	1							✓						
AB-SEAL-01	07	7/7/15	1300	GRAB	1							✓						
AB-SEAL-DUP	08	7/7/15	—	GRAB	1							✓						
AB-SEAL-MSD	09	7/7/15	1430	GRAB	1							✓						Samples received at 4 °C
AB-SEAL-03	10	7/7/15	1530	GRAB	1							✓						

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:	RICHARD MALCOM	MWH	7/8/15	1435
Received by:	VINH	FBI	7/8/15	1435
Relinquished by:	VINH	FBI	7/8/15	1635
Received by:	Michael Erdahl	F&Binc	7/8/15	1635

507113

SAMPLE CHAIN OF CUSTODY

ME 07/08/15

LT-A2

Send Report To: KEN LEDERMAN

Company: FOSTER PEPPER PLLC

Address:

City, State, ZIP:

Phone #: Fax #:

SAMPLERS (signature):

PROJECT NAME/NO.: ANACORTES WTP

PO#:

REMARKS: PRIVILEGED & CONFIDENTIAL

Page # 2 of 5

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TOTAL LEAD	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA METALS		Notes
AB-SEAL-06	11	7/7/15	1430	GRAB	1							✓						
~~DUP~~ SB-EXPC-DUP	12	7/7/15	—	GRAB	1							✓						
SB-EXPC-05	13 A-B	7/7/15	1405	GRAB	2							✓	✓	✓	✓	✓		
AB-SEAL-MS	14	7/7/15	1430	GRAB	1							✓						
SB-EXPC-03	15	7/7/15	1345	GRAB	1							✓						
SB-EXPC-01	16 A-B	7/7/15	1315	GRAB	2							✓	✓	✓	✓	✓		
SB-EXPC-06	17	7/7/15	1415	GRAB	1							✓						
SB-EXPC-02	18	7/7/15	1315	GRAB	1							✓						
SB-EXPC-07	19	7/7/15	14:20	GRAB	1							✓						...ples received at 4 °C
AB-SEAL-08	20	7/7/15	1500	GRAB	1							✓						

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Seattle, WA 98119-2029
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Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	RICHARD MALCOLM	MWH	7/8/15	1435
Received by: [signature]	VINH	FBI	7/8/15	1435
Relinquished by: [signature]	VINH	FBI	7/8/15	1635
Received by: [signature]	Michael Erdahl	F&Bine	7/8/15	1635

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SAMPLE CHAIN OF CUSTODY

ME 07/08/15

LT-A2

[redacted]

Send Report To Ken Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

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[redacted] 3 of 5

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	Total Lead	Total RCRA VOC	Total RCRA SVOC	Total RCRA Metals		Notes
PC-01	21	7/7/15	15:15	GRAB	1								✓			✓		
PC-02	22	7/7/15	1328	GRAB	1								✓			✓		
PC-03	23	7/7/15	1130	GRAB	1								✓			✓		
PC-04	24	7/7/15	1255	GRAB	1								✓			✓		
PC-05	25	7/7/15	1315	GRAB	1								✓			✓		
PC-06	26	7/7/15	1430	GRAB	1								✓			✓		
FB-EXPC-01	27 A-B	7/7/15	1530	GRAB	2							✓	✓	✓	✓	✓		
FB-EXPC-02	28	7/7/15	1600	GRAB	1							✓						
FB-EXPC-02-MSD	29	7/7/15	1600	GRAB	1							✓						Samples received at 4 °C
FB-EXPC-02-MS	30	7/7/15	1600	GRAB	1							✓						

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Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Richard Malcolm	MWH	7/8/15	1435
Received by:	VINH	FBI	7/8/15	1435
Relinquished by:	VINH	FBI	7/8/15	1635
Received by:	Michael Erdahl	FEBinc	↓	1635

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507113

SAMPLE CHAIN OF CUSTODY

ME 07/08/15

LT-A2

Send Report To Ken Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TOTAL LEAD	TOTAL RCRA VOC	TOTAL RCRA SVOC	TOTAL RCRA METALS		Notes
FB-EXPC-03	31	7/7/15	15:55	GRAB	1							✓						
FB-EXPC-DUP	32	7/7/15	—	GRAB	1							✓						
FB-EXPC-04	33	7/7/15	1610	GRAB	1							✓						
SB-EXPC-04	34	7/7/15	1340	GRAB	1							✓						
RINS-01	35A-F	7/8/15	1045	LIQUID	3 Ambers 3 VOAS							✓	✓	✓	✓	✓		All containers are unpreserved
FB-BED-01	36A-B	7/8/15	8:50	Grab	2							✓	✓	✓	✓	✓		
FB-ANTH-01	37A-B	7/8/15	8:30	Grab	2							✓	✓	✓	✓	✓		
FB-SAND-01	38A-B	7/8/15	8:40	Grab	2							✓	✓	✓	✓	✓		
FB-FIBWIPE-01	39	7/8/15	9:00	Wipe	1							✓						
FB-CONC-01	40A-B	7/8/15	9:15	Grab	2							✓	✓	✓	✓	✓		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Samples received at 4 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Richard Malcolm	MWH	7/8/15	1435
Received by:		VINH	FBI	7/8/15	1435
Relinquished by:		VINH	FBI	7/8/15	1635
Received by:		Michael Erdahl	F&Bme	7/8/15	1635

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507113

SAMPLE CHAIN OF CUSTODY

ME 07/08/15

LT-A2

Send Report To: KEW LEDERMAN
Company: FOSTER PEPPER PLLC
Address:
City, State, ZIP:
Phone #: Fax #:

SAMPLERS (*signature*):

PROJECT NAME/NO.: ANACORTES WTP

PO#:

REMARKS: PRIVILEGED AND CONFIDENTIAL

Page # 5 of 5

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	Total Lead	Total RCRA VOC	Total RCRA SVOC	Total RCRA Metals		Notes
FB-INPC-01	41 A-B	7/8/15	10:00	Grab	2							✓	✓	✓	✓	✓		

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:	RICHARD MALCOLM	MWH	7/8/15	1435
Received by:	VINH	FBI	7/8/15	1435
Relinquished by:	VINH	FBI	7/8/15	1635
Received by:	Michael Erdahl	FeBinc	7/8/15	1635

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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

August 6, 2015

Ken Lederman
Foster Pepper PLLC
1111 3rd Avenue, Suite 3400
Seattle, WA 98101

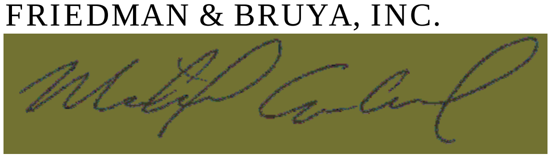
Dear Mr. Lederman:

Included are the results from the testing of material submitted on July 9, 2015 from the Anacortes WTP, F&BI 507132 project. There are 41 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
NAA0806R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 9, 2015 by Friedman & Bruya, Inc. from the Foster Pepper PLLC Anacortes WTP, F&BI 507132 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper PLLC
507132 -01	FB-ANTH-02
507132 -02	FB-ANTH-02 MS
507132 -03	FB-ANTH-02 MSD
507132 -04	FB-ANTH-DUP
507132 -05	FB-SAND-02
507132 -06	FB-BED-02
507132 -07	FB-CONC-02
507132 -08	FB-CONC-DUP
507132 -09	FB-INPC-02
507132 -10	FB-FIBWIPE-02
507132 -11	FB-ANTH-03
507132 -12	FB-SAND-03
507132 -13	FB-BED-03
507132 -14	FB-CONC-03
507132 -15	FB-INPC-03
507132 -16	FB-FIBWIPE-03
507132 -17	FB-ANTH-04
507132 -18	FB-SAND-04
507132 -19	FB-SAND-04 MS
507132 -20	FB-SAND-04 MSD
507132 -21	FB-SAND-DUP
507132 -22	FB-BED-04
507132 -23	FB-CONC-04
507132 -24	FB-CONC-04 MS
507132 -25	FB-CONC-04 MSD
507132 -26	FB-INPC-04
507132 -27	FB-FIBWIPE-04
507132 -28	FB-ANTH-05
507132 -29	FB-SAND-05
507132 -30	FB-BED-05
507132 -31	FB-BED-05 MS
507132 -32	FB-BED-05 MSD
507132 -33	FB-BED-DUP
507132 -34	FB-CONC-05
507132 -35	FB-INPC-05
507132 -36	FB-FIBWIPE-05

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper PLLC
507132 -37	FB-ANTH-06
507132 -38	FB-SAND-06
507132 -39	FB-BED-06
507132 -40	FB-CONC-06

The samples that were selected as the matrix spikes and matrix spike duplicates were reported as part of the quality assurance.

All quality control requirements were acceptable.

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-01 1/50
Date Analyzed:	07/15/15	Data File:	45.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-DUP	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-04 1/50
Date Analyzed:	07/15/15	Data File:	46.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-05 1/50
Date Analyzed:	07/16/15	Data File:	27.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-06 1/50
Date Analyzed:	07/16/15	Data File:	28.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-07 1/5,000
Date Analyzed:	07/17/15	Data File:	04.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	160
Aroclor 1260	<20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-08 1/500
Date Analyzed:	07/22/15	Data File:	072219.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<2
Aroclor 1232	<2
Aroclor 1016	3.1
Aroclor 1242	<2
Aroclor 1248	<2
Aroclor 1254	21
Aroclor 1260	<2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-09 1/250
Date Analyzed:	07/22/15	Data File:	072220.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	2.1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	6.3
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-11 1/50
Date Analyzed:	07/20/15	Data File:	22.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-12 1/50
Date Analyzed:	07/20/15	Data File:	23.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-13 1/50
Date Analyzed:	07/20/15	Data File:	24.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-14 1/5,000
Date Analyzed:	07/17/15	Data File:	05.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	180
Aroclor 1260	<20

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-15 1/25,000
Date Analyzed:	07/16/15	Data File:	48.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	330
Aroclor 1260	<100

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-17 1/50
Date Analyzed:	07/16/15	Data File:	46.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-18 1/50
Date Analyzed:	07/21/15	Data File:	072025.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-DUP	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-21 1/50
Date Analyzed:	07/16/15	Data File:	47.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-22 1/50
Date Analyzed:	07/17/15	Data File:	11.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-23 1/1,000
Date Analyzed:	07/23/15	Data File:	072227.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<4
Aroclor 1232	<4
Aroclor 1016	25
Aroclor 1242	<4
Aroclor 1248	<4
Aroclor 1254	110
Aroclor 1260	<4

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-26 1/25,000
Date Analyzed:	07/23/15	Data File:	072226.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	770
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	3,300
Aroclor 1260	<100

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-28 1/50
Date Analyzed:	07/22/15	Data File:	072206.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-29 1/50
Date Analyzed:	07/22/15	Data File:	072207.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-30 1/50
Date Analyzed:	07/17/15	Data File:	21.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-DUP	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-33 1/50
Date Analyzed:	07/17/15	Data File:	22.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-34 1/1,000
Date Analyzed:	07/23/15	Data File:	072228.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<4
Aroclor 1232	<4
Aroclor 1016	11
Aroclor 1242	<4
Aroclor 1248	<4
Aroclor 1254	59
Aroclor 1260	<4

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-35 1/50
Date Analyzed:	08/04/15	Data File:	53.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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	0.26
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-ANTH-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-37 1/50
Date Analyzed:	07/22/15	Data File:	072208.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SAND-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-38 1/50
Date Analyzed:	07/22/15	Data File:	072210.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-BED-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-39 1/50
Date Analyzed:	07/22/15	Data File:	072209.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-CONC-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	507132-40 1/1,000
Date Analyzed:	07/23/15	Data File:	072229.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<4
Aroclor 1232	<4
Aroclor 1016	10
Aroclor 1242	<4
Aroclor 1248	<4
Aroclor 1254	54
Aroclor 1260	<4

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	05-1425 mb 1/5
Date Analyzed:	07/15/15	Data File:	44.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	92	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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/13/15	Lab ID:	05-1426 mb 1/5
Date Analyzed:	07/17/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/20/15	Lab ID:	507132-10
Date Analyzed:	07/23/15	Data File:	09.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	94	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/20/15	Lab ID:	507132-16
Date Analyzed:	07/23/15	Data File:	10.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	84	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-04	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/20/15	Lab ID:	507132-27
Date Analyzed:	07/23/15	Data File:	11.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	94	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-05	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/20/15	Lab ID:	507132-36
Date Analyzed:	07/23/15	Data File:	14.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	91	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507132
Date Extracted:	07/20/15	Lab ID:	05-1433 mb
Date Analyzed:	07/23/15	Data File:	07.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Date of Report: 08/06/15
Date Received: 07/09/15
Project: Anacortes WTP, F&BI 507132

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

Laboratory Code: 507132-02/03 1/150 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	86	84	50-150	2
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	103	92	50-150	11

Laboratory Code: 507132-18 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	83	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	90	50-150

Laboratory Code: 507132-19/20 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	86	78	50-150	10
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	103	86	50-150	18

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	87	87	55-130	0
Aroclor 1260	mg/kg (ppm)	0.8	91	88	58-133	3

Date of Report: 08/06/15
Date Received: 07/09/15
Project: Anacortes WTP, F&BI 507132

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

Laboratory Code: 507132-29 (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	89	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	96	50-150

Laboratory Code: 507132-24/25 (Matrix Spike) 1/1,000

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	0 ip	0 ip	50-150	0
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	0 ip	0 ip	50-150	0

Laboratory Code: 507132-31/32 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	76	64	50-150	17
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	82	74	50-150	10

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	85	55-130	1
Aroclor 1260	mg/kg (ppm)	0.8	87	88	58-133	1

Date of Report: 08/06/15
Date Received: 07/09/15
Project: Anacortes WTP, F&BI 507132

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WIPE 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/wipe	100	81	79	70-130	2
Aroclor 1260	ug/wipe	100	79	80	70-130	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 pr esence 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.

507132

SAMPLE CHAIN OF CUSTODY

ME 07/09/15

SS-1

Page # 1 of 4

Send Report To: KEN LEDERMAN

Company: FOSTER PEPPER PLLC

Address: ____

City, State, ZIP ____

Phone # ____ Fax # ____

SAMPLERS (signature):

PROJECT NAME/NO.: ANACORTES WTP

PO#:

REMARKS: PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	Total Lead	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA Metals		Notes
FB-ANTH-02	01	7/8/15	9:45	Grab	1							X						
FB-ANTH-02MS	02	7/8/15	9:45	Grab	1							X						
FB-ANTH-02MSD	03	7/8/15	9:45	Grab	1							X						
FB-ANTH-DUP	04	7/8/15		Grab	1							X						
FB-SAND-02	05	7/8/15	10:00	Grab	1							X						
FB-BED-02	06	7/8/15	10:10	Grab	1							X						
FB-CONC-02	07	7/8/15	10:25	Grab	1							X						
FB-CONC-DUP	08	7/8/15		Grab	1							X						
FB-INDC-02	09	7/8/15	8:15	Grab	1							X						
FB-FIBWIPE-02	10	7/8/15	10:30	WIPE	1							X						

Samples received at 11 °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:	RICHARD MACA	MUTT	7/9/15	1446
Received by:	VINH	FBI	7/9/15	1446
Relinquished by:	VINH	FBI	7/9/15	1635
Received by:	Michael Erdahl	FG Binc	7/9/15	1635

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507132

SAMPLE CHAIN OF CUSTODY ME 07/09/15

SS-1

Page # 2 of 4

Send Report To Ken Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	Total Lead	TCLP RCRA VOCs	TCLP RCRA SVOCs	TCLP RCRA Metals		Notes
FB-ANTH-03	11	7/8/15	11:00	Grab	1							X						
FB-SAND-03	12	7/8/15	11:05	Grab	1							X						
FB-BED-03	13	7/8/15	11:10	Grab	1							X						
FB-CONC-03	14	7/8/15	11:30	Grab	1							X						
FB-INPC-03	15	7/8/15	11:20	Grab	1							X						
FB-FIBWIPE-03	16	7/8/15	11:15	Wipe	1							X						
FB-ANTH-04	17	7/8/15	13:30	Grab	1							X						
FB-SAND-04	18	7/8/15	13:35	Grab	1							X						
FB-SAND-04 MS	19	7/8/15	13:35	Grab	1							X						
FB-SAND-04MSD	20	7/8/15	13:35	Grab	1							X						Samples received at 11 °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:	Richard Malcom	MCH	7/9/15	1446
Received by:	VINH	FBI	7/9/15	1446
Relinquished by:	VINH	FBI	7/9/15	1635
Received by:	Michael Erdahl	FEBinc	7/9/15	1635

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507132

SAMPLE CHAIN OF CUSTODY

ME 07/09/15

55-1

Page # 3 of 4

Send Report To Ken Ledgman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs						Notes
FB-SAND-DUP	21	7/8/15		Grab	1							X						
FB-BED-04	22	7/8/15	13:40	Grab	1							X						
FB-CONC-04	23	7/8/15	14:10	Grab	1							X						
FB-CONC-04MS	24	7/8/15	14:10	Grab	1							X						
FB-CONC-04MSD	25	7/8/15	14:10	Grab	1							X						
FB-INPC-04	26	7/8/15	13:55	Grab	1							X						
FB-FIBWIPE-04	27	7/8/15	13:45	WIPE	1							X						
FB-ANTH-05	28	7/8/15	14:45	Grab	1							X						
FB-SAND-05	29	7/8/15	14:50	Grab	1							X						
FB-BED-05	30	7/8/15	14:55	Grab	1							X						Samples received at 11 °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:	Richard Malcom	Matt	7/9/15	1446
Received by:	VINH	FBI	7/9/15	1446
Relinquished by:	VINH	FBI	7/9/15	1635
Received by:	Michael Erdahl	FGBm	7/9/15	1635

FORMS\COC\COC.DOC

507132

SAMPLE CHAIN OF CUSTODY

ME 07/09/15 SS-1

Send Report To Ken Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs						Notes
FB-BED-05MS	31	7/8/15	1455	Grab	1							X						
FB-BED-05MSD	32	7/8/15	1455	Grab	1							X						
FB-BED-DUP	33	7/8/15		Grab	1							X						
FB-CONC-05	34	7/8/15	15:10	Grab	1							X						
FB-INPC-05	35	7/8/15	14:40	Grab	1							X						
FB-FIBWIPE-05	36	7/8/15	15:00	Grab	1							X						
FB-ANTH-06	37	7/8/15	15:30	Grab	1							X						
FB-SAND-06	38	7/8/15	15:35	Grab	1							X						
FB-BED-06	39	7/8/15	15:40	Grab	1							X						
FB-CONC-06	40	7/8/15	15:45	Grab	1							X						Samples received at 11 °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:		Richard [illegible]	MWH	7/9/15	1446
Received by:		VINH	FBI	7/9/15	1446
Relinquished by:		VINH	FBI	7/9/15	1635
Received by:		Michael Erdahl	F&Bru	7/9/15	1635

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

August 6, 2015

Ken Lederman
Foster Pepper PLLC
1111 3rd Avenue, Suite 3400
Seattle, WA 98101

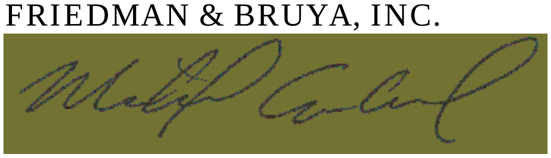
Dear Mr. Lederman:

Included are the results from the testing of material submitted on July 9, 2015 from the Anacortes WTP, F&BI 507133 project. There are 11 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
NAA0806R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 9, 2015 by Friedman & Bruya, Inc. from the Foster Pepper PLLC Anacortes WTP, F&BI 507133 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper PLLC
507133 -01	FB-INPC-06
507133 -02	FB-FIBWIPE-06
507133 -03	AB-WINDOW WIPE-01
507133 -04	AB-WINDOW WIPE-02
507133 -05	AB-WINDOW WIPE-03

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-INPC-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/13/15	Lab ID:	507133-01 1/5,000
Date Analyzed:	07/23/15	Data File:	072230.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	130
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	680
Aroclor 1260	<20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/13/15	Lab ID:	05-1426 mb 1/5
Date Analyzed:	07/17/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-FIBWIPE-06	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/20/15	Lab ID:	507133-02
Date Analyzed:	07/23/15	Data File:	15.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-WINDOW WIPE-01	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/20/15	Lab ID:	507133-03
Date Analyzed:	07/23/15	Data File:	072316.D\ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	93	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-WINDOW WIPE-02	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/20/15	Lab ID:	507133-04
Date Analyzed:	07/23/15	Data File:	072317.D\ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	87	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	13.0
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-WINDOW WIPE-03	Client:	Foster Pepper PLLC
Date Received:	07/09/15	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/20/15	Lab ID:	507133-05
Date Analyzed:	07/23/15	Data File:	18.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	92	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507133
Date Extracted:	07/20/15	Lab ID:	05-1433 mb
Date Analyzed:	07/23/15	Data File:	07.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Date of Report: 08/06/15
Date Received: 07/09/15
Project: Anacortes WTP, F&BI 507133

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

Laboratory Code: 507132-29 (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	89	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	96	50-150

Laboratory Code: 507132-24/25 (Matrix Spike) 1/1,000

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	0 ip	0 ip	50-150	0
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	0 ip	0 ip	50-150	0

Laboratory Code: 507132-31/32 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	76	64	50-150	17
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	82	74	50-150	10

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	85	55-130	1
Aroclor 1260	mg/kg (ppm)	0.8	87	88	58-133	1

Date of Report: 08/06/15
Date Received: 07/09/15
Project: Anacortes WTP, F&BI 507133

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WIPE 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/wipe	100	81	79	70-130	2
Aroclor 1260	ug/wipe	100	79	80	70-130	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.

507133

SAMPLE CHAIN OF CUSTODY ME 07/09/15

B-552

Send Report To KEN LEDERMAN

Company FOSTER PEPPER PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. AWACORTES WTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

Page # A of A

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB'S						Notes
FB-INPC-06	01	7/8/15	1550	GRAB	1							X						
FB-FIBWIPE-06	02	7/8/15	1545	WIPE	1							X						
AB-WINDOW WIPE-01	03	7/9/15	0730	WIPE	1							X						
AB-WINDOW WIPE-02	04	7/9/15	07:40	WIPE	1							X						
AB-WINDOW WIPE-03	05	7/9/15	07:50	WIPE	1							X						

Samples received at 11 °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:	RICHARD MALCO	MCH		
Received by:	VINH	FBI	7/9/15	1446
Relinquished by:	VINH	FBI	7/9/15	1635
Received by:	James Bruya	F&B	7/9/15	1635

FORMS\COC\COC.DOC

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

August 6, 2015

Ken Lederman
Foster Pepper PLLC
1111 3rd Avenue, Suite 3400
Seattle, WA 98101

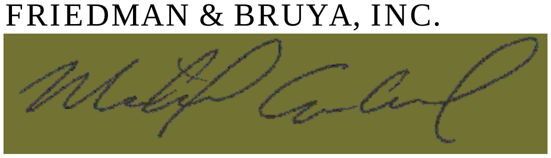
Dear Mr. Lederman:

Included are the results from the testing of material submitted on July 10, 2015 from the Anacortes WTP, F&BI 507154 project. There are 111 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
NAA0806R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2015 by Friedman & Bruya, Inc. from the Foster Pepper PLLC Anacortes WTP, F&BI 507154 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper PLLC
507154-01	CW-CONC-06
507154-02	CW-CONC-07
507154-03	CW-CONC-08
507154-04	CW-CONC-09
507154-05	CW-CONC-10
507154-06	CW-CONC-DUP
507154-07	CW-SED-01
507154-08	CW-SED-02
507154-09	CW-SED-03
507154-10	CW-SED-04
507154-11	CW-SED-05
507154-12	CW-SED-06
507154-13	CW-SED-DUP
507154-14	CW-SED-MS
507154-15	CW-SED-MSD
507154-16	CW-BAF-01
507154-17	CW-BAF-02
507154-18	CW-BAF-03
507154-19	CW-BAF-MS
507154-20	CW-BAF-MSD
507154-21	CW-BAF-DUP
507154-22	WF-CONC-01
507154-23	WF-CONC-02
507154-24	WF-CONC-03
507154-25	WF-CONC-04
507154-26	WF-CONC-05
507154-27	WF-CONC-06
507154-28	WF-CONC-MS
507154-29	WF-CONC-MSD
507154-30	WF-CONC-DUP
507154-31	WF-SED-01
507154-32	WF-SED-02
507154-33	WF-SED-03
507154-34	WF-SED-04
507154-35	WF-SED-DUP
507154-36	CW-CONC-01

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper PLLC
507154-37	CW-CONC-02
507154-38	CW-CONC-03
507154-39	CW-CONC-04
507154-40	CW-CONC-05
507154-41	SB-STEELWIPE-01
507154-42	SB-SED-01
507154-43	SB-SED-DUP
507154-44	SB-CONC-01
507154-45	SB-CONC-02
507154-46	SB-CONC-DUP
507154-47	SB-CONC-04
507154-48	SB-SED-02
507154-49	SB-SED-MS
507154-50	SB-SED-MSD
507154-51	SB-STEELWIPE-02
507154-52	RINS-02
507154-53	SB-CONC-03

Acetone and methylene chloride were detected in the samples submitted for 8260C TCLP analysis. Both compounds were detected in the method blank and were flagged accordingly. In addition, the methylene chloride laboratory control sample and laboratory control sample duplicate failed below the acceptance criteria. The results were flagged accordingly.

The 8260C water sample RINS-02 was transferred from VOA vials without septum lids. The results were flagged accordingly.

Benzoic acid was detected in the 8270D TCLP analysis of sample CW-CONC-01 and was flagged as laboratory contamination. In addition, several compounds exceeded the laboratory control sample and laboratory control sample duplicate relative percent difference and acceptance criteria. The affected results were flagged accordingly.

Several compounds in the 8270D soil and water laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	CW-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-07
Date Analyzed:	07/21/15	Data File:	507154-07.014
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	20.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	CW-BAF-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-16
Date Analyzed:	07/21/15	Data File:	507154-16.015
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	WF-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-22
Date Analyzed:	07/21/15	Data File:	507154-22.016
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	16.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	WF-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-31
Date Analyzed:	07/21/15	Data File:	507154-31.018
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	9.41

Analysis For Total Metals By EPA Method 200.8

Client ID:	CW-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-36
Date Analyzed:	07/21/15	Data File:	507154-36.019
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	12.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-42
Date Analyzed:	07/21/15	Data File:	507154-42.020
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	4.83

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-44
Date Analyzed:	07/21/15	Data File:	507154-44.021
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	13.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	I5-404 mb
Date Analyzed:	07/21/15	Data File:	I5-404 mb.007
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	RINS-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	507154-52
Date Analyzed:	07/15/15	Data File:	507154-52.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	ICPMS1

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	89	60	125
Holmium	97	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	I5-395 mb
Date Analyzed:	07/15/15	Data File:	I5-395 mb.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	ICPMS1

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	89	60	125
Holmium	95	60	125

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

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	CW-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-07
Date Analyzed:	07/20/15	Data File:	507154-07.013
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	99	60	125
Holmium	100	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	CW-BAF-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-16
Date Analyzed:	07/20/15	Data File:	507154-16.014
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	97	60	125
Holmium	98	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	WF-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-22
Date Analyzed:	07/20/15	Data File:	507154-22.020
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	98	60	125
Holmium	99	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	WF-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-31
Date Analyzed:	07/20/15	Data File:	507154-31.015
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	96	60	125
Holmium	98	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	CW-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-36
Date Analyzed:	07/20/15	Data File:	507154-36.023
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	85	60	125
Indium	91	60	125
Holmium	94	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-42
Date Analyzed:	07/20/15	Data File:	507154-42.016
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	98	60	125
Holmium	99	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	507154-44
Date Analyzed:	07/20/15	Data File:	507154-44.024
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	86	60	125
Indium	93	60	125
Holmium	96	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	I5-398 mb
Date Analyzed:	07/20/15	Data File:	I5-398 mb.007
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	98	60	125
Holmium	100	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/16/15	Lab ID:	I5-403 mb
Date Analyzed:	07/20/15	Data File:	I5-403 mb.018
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	99	60	125
Holmium	100	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Chromium	<1	5.0
Arsenic	<1	5.0
Selenium	<1	1.0
Silver	<1	5.0
Cadmium	<1	1.0
Barium	<1	100
Lead	<1	5.0
Mercury	<0.1	0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	CW-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	507154-07
Date Analyzed:	07/15/15	Data File:	071510.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	110	76	126

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	71 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	28 fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	CW-BAF-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	507154-16
Date Analyzed:	07/15/15	Data File:	071513.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	97	91	108
4-Bromofluorobenzene	105	76	126

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	250 ve fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	31 fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	WF-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	507154-22
Date Analyzed:	07/15/15	Data File:	071514.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	105	76	126

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	77 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	30 fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	WF-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	507154-31
Date Analyzed:	07/15/15	Data File:	071515.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	85	117
Toluene-d8	97	91	108
4-Bromofluorobenzene	104	76	126

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	120 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	30 fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	CW-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/19/15	Lab ID:	507154-36
Date Analyzed:	07/21/15	Data File:	072106.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	108	76	126

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	29 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	150 jl fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/19/15	Lab ID:	507154-42
Date Analyzed:	07/21/15	Data File:	072107.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	105	76	126

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	27 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	150 jl fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/19/15	Lab ID:	507154-44
Date Analyzed:	07/21/15	Data File:	072108.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	107	76	126

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	37 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	180 ve jl fb	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	1.6	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 TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	05-1429 mb
Date Analyzed:	07/15/15	Data File:	071507.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	107	76	126

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	54 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	26 fb	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 TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	05-1429 mb2
Date Analyzed:	07/15/15	Data File:	071512.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	107	76	126

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	72 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	27 fb	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 TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/19/15	Lab ID:	05-1475 mb
Date Analyzed:	07/21/15	Data File:	072105.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	107	76	126

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	17 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	120 jl fb	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	RINS-02 pc	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	507154-52
Date Analyzed:	07/13/15	Data File:	071315.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	104	76	126

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	1.3	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:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/13/15	Lab ID:	05-1405 mb
Date Analyzed:	07/13/15	Data File:	071314.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	101	76	126

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 TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	CW-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-07 1/2
Date Analyzed:	07/23/15	Data File:	072308.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	94	32	162
Phenol-d6	79	10	170
Nitrobenzene-d5	111	50	150
2-Fluorobiphenyl	108	43	158
2,4,6-Tribromophenol	121	43	146
Terphenyl-d14	126	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	CW-BAF-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-16 1/2
Date Analyzed:	07/23/15	Data File:	072319.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	75	32	162
Phenol-d6	89	10	170
Nitrobenzene-d5	102	50	150
2-Fluorobiphenyl	103	43	158
2,4,6-Tribromophenol	121	43	146
Terphenyl-d14	119	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	20 jl lc	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	WF-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-22 1/2
Date Analyzed:	07/23/15	Data File:	072309.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	98	32	162
Phenol-d6	82	10	170
Nitrobenzene-d5	110	50	150
2-Fluorobiphenyl	111	43	158
2,4,6-Tribromophenol	117	43	146
Terphenyl-d14	130	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	43 jl lc	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	WF-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-31 1/2
Date Analyzed:	07/23/15	Data File:	072310.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	70	32	162
Phenol-d6	79	10	170
Nitrobenzene-d5	104	50	150
2-Fluorobiphenyl	99	43	158
2,4,6-Tribromophenol	121	43	146
Terphenyl-d14	125	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	5.2
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	CW-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-36 1/2
Date Analyzed:	07/23/15	Data File:	072311.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	93	32	162
Phenol-d6	75	10	170
Nitrobenzene-d5	111	50	150
2-Fluorobiphenyl	113	43	158
2,4,6-Tribromophenol	115	43	146
Terphenyl-d14	130	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	23 jl lc	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-42 1/2
Date Analyzed:	07/23/15	Data File:	072312.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	94	32	162
Phenol-d6	74	10	170
Nitrobenzene-d5	113	50	150
2-Fluorobiphenyl	118	43	158
2,4,6-Tribromophenol	116	43	146
Terphenyl-d14	126	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	507154-44 1/2
Date Analyzed:	07/23/15	Data File:	072313.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	94	32	162
Phenol-d6	78	10	170
Nitrobenzene-d5	108	50	150
2-Fluorobiphenyl	111	43	158
2,4,6-Tribromophenol	117	43	146
Terphenyl-d14	125	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	38	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/22/15	Lab ID:	05-1443 mb
Date Analyzed:	07/23/15	Data File:	072305.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	77	32	162
Phenol-d6	58	10	170
Nitrobenzene-d5	117	50	150
2-Fluorobiphenyl	126	43	158
2,4,6-Tribromophenol	110	43	146
Terphenyl-d14	128	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RINS-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	507154-52
Date Analyzed:	07/17/15	Data File:	071707.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	62	32	162
Phenol-d6	39	10	170
Nitrobenzene-d5	105	50	150
2-Fluorobiphenyl	113	43	158
2,4,6-Tribromophenol	99	43	146
Terphenyl-d14	114	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	05-1436 mb
Date Analyzed:	07/17/15	Data File:	071705.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	72	32	162
Phenol-d6	48	10	170
Nitrobenzene-d5	116	50	150
2-Fluorobiphenyl	125	43	158
2,4,6-Tribromophenol	102	43	146
Terphenyl-d14	116	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-06	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-01 1/50
Date Analyzed:	07/18/15	Data File:	35.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-07	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-02 1/50
Date Analyzed:	07/18/15	Data File:	36.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	110 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-08	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-03 1/50
Date Analyzed:	07/18/15	Data File:	37.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-09	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-04 1/50
Date Analyzed:	07/18/15	Data File:	38.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-10	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-05 1/50
Date Analyzed:	07/18/15	Data File:	39.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	110 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-06 1/50
Date Analyzed:	07/18/15	Data File:	40.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	115 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-07 1/50
Date Analyzed:	07/18/15	Data File:	41.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	2.3
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	4.1
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-08 1/50
Date Analyzed:	07/23/15	Data File:	072224.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	2.0
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	5.6
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-09 1/50
Date Analyzed:	07/18/15	Data File:	43.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	7.3
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	3.7
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-04	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-10 1/50
Date Analyzed:	07/18/15	Data File:	44.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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	1.1
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	4.0
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-05	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-11 1/50
Date Analyzed:	07/18/15	Data File:	45.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	1.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	5.0
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-06	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-12 1/50
Date Analyzed:	07/18/15	Data File:	46.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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	0.38
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2

FRIEDMAN & BRUYA, INC.

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-13 1/50
Date Analyzed:	07/18/15	Data File:	47.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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	1.8
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	5.2
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-BAF-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-16 1/250
Date Analyzed:	07/18/15	Data File:	071754.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-BAF-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-17 1/250
Date Analyzed:	07/18/15	Data File:	071755.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-BAF-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-18 1/250
Date Analyzed:	07/18/15	Data File:	071756.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-BAF-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-21 1/250
Date Analyzed:	07/18/15	Data File:	59.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-22 1/50
Date Analyzed:	07/18/15	Data File:	60.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-23 1/50
Date Analyzed:	07/18/15	Data File:	61.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-24 1/50
Date Analyzed:	07/18/15	Data File:	62.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-04	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-25 1/50
Date Analyzed:	07/18/15	Data File:	63.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-05	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	507154-26 1/50
Date Analyzed:	07/30/15	Data File:	05.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-06	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-27 1/50
Date Analyzed:	07/18/15	Data File:	65.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-CONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-30 1/50
Date Analyzed:	07/19/15	Data File:	72.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	507154-31 1/50
Date Analyzed:	07/30/15	Data File:	06.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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	0.26
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-SED-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	507154-32 1/50
Date Analyzed:	07/30/15	Data File:	07.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-SED-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	507154-33 1/50
Date Analyzed:	07/30/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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	3.4
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-SED-04	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	507154-34 1/50
Date Analyzed:	07/30/15	Data File:	09.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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	0.49
Aroclor 1260	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	WF-SED-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-35 1/50
Date Analyzed:	07/19/15	Data File:	071777.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-36 1/50
Date Analyzed:	07/19/15	Data File:	071778.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-37 1/50
Date Analyzed:	07/19/15	Data File:	071779.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-38 1/50
Date Analyzed:	07/19/15	Data File:	87.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-04	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-39 1/50
Date Analyzed:	07/19/15	Data File:	88.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-CONC-05	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-40 1/50
Date Analyzed:	07/19/15	Data File:	89.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-42 1/50
Date Analyzed:	07/19/15	Data File:	90.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-43 1/50
Date Analyzed:	07/19/15	Data File:	91.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	0.51
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-44 1/50
Date Analyzed:	07/19/15	Data File:	92.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	135 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-45 1/50
Date Analyzed:	07/19/15	Data File:	93.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	120 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-46 1/50
Date Analyzed:	07/19/15	Data File:	94.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	130 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-04	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-47 1/50
Date Analyzed:	07/19/15	Data File:	95.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	135 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-48 1/50
Date Analyzed:	07/19/15	Data File:	96.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-03	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	507154-53 1/50
Date Analyzed:	07/19/15	Data File:	99.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/15/15	Lab ID:	05-1430 mb 1/5
Date Analyzed:	07/16/15	Data File:	45.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	77	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	05-1431 mb 1/5
Date Analyzed:	07/18/15	Data File:	34.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	65	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	0.029 lc
Aroclor 1260	0.024 lc

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/14/15	Lab ID:	05-1432 mb 1/5
Date Analyzed:	07/19/15	Data File:	86.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mwdl

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/29/15	Lab ID:	05-1530 mb2 1/5
Date Analyzed:	07/30/15	Data File:	04.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	82	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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-STEELWIPE-01	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-41
Date Analyzed:	07/23/15	Data File:	19.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	93	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-STEELWIPE-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-51
Date Analyzed:	07/23/15	Data File:	20.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	94	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	05-1433 mb
Date Analyzed:	07/23/15	Data File:	07.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	RINS-02	Client:	Foster Pepper PLLC
Date Received:	07/10/15	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	507154-52
Date Analyzed:	07/23/15	Data File:	072239.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	64	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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507154
Date Extracted:	07/20/15	Lab ID:	05-1434 mb
Date Analyzed:	07/23/15	Data File:	072237.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75	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

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507274-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	56.6	112	105	59-148	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	105	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507113-35 (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	106	107	60-150	1
Barium	ug/L (ppb)	50	<1	104	104	79-126	0
Cadmium	ug/L (ppb)	5	<1	107	106	80-124	1
Chromium	ug/L (ppb)	20	<1	109	110	64-132	1
Lead	ug/L (ppb)	10	<1	106	107	79-121	1
Mercury	ug/L (ppb)	10	<1	103	103	50-150	0
Selenium	ug/L (ppb)	5	<1	106	109	68-142	3
Silver	ug/L (ppb)	5	<1	106	112	60-121	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	103	80-111
Barium	ug/L (ppb)	50	100	83-117
Cadmium	ug/L (ppb)	5	102	83-113
Chromium	ug/L (ppb)	20	107	80-119
Lead	ug/L (ppb)	10	103	83-115
Mercury	ug/L (ppb)	10	101	70-130
Selenium	ug/L (ppb)	5	102	81-119
Silver	ug/L (ppb)	5	103	75-120

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL/SOLID/SOLID SAMPLES
FOR TCLP METALS USING
EPA METHOD 200.8 AND 40 CFR PART 261

Laboratory Code: 507113-13 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	102	101	50-150	1
Barium	mg/L (ppm)	5.0	<1	100	99	50-150	1
Cadmium	mg/L (ppm)	0.5	<1	99	97	50-150	2
Chromium	mg/L (ppm)	2.0	<1	103	101	50-150	2
Lead	mg/L (ppm)	1.0	<1	96	97	50-150	1
Mercury	mg/L (ppm)	1.0	<0.1	102	100	50-150	2
Selenium	mg/L (ppm)	0.5	<1	100	100	50-150	0
Silver	mg/L (ppm)	0.5	<1	102	100	50-150	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	101	70-130
Barium	mg/L (ppm)	5.0	100	70-130
Cadmium	mg/L (ppm)	0.5	99	70-130
Chromium	mg/L (ppm)	2.0	104	70-130
Lead	mg/L (ppm)	1.0	98	70-130
Mercury	mg/L (ppm)	1.0	97	70-130
Selenium	mg/L (ppm)	0.5	99	70-130
Silver	mg/L (ppm)	0.5	100	70-130

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**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL/SOLID/SOLID SAMPLES
FOR TCLP METALS USING
EPA METHOD 200.8 AND 40 CFR PART 261**

Laboratory Code: 507154-22 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	96	100	50-150	4
Barium	mg/L (ppm)	5.0	<1	100	104	50-150	4
Cadmium	mg/L (ppm)	0.5	<1	97	100	50-150	3
Chromium	mg/L (ppm)	2.0	<1	103	106	50-150	3
Lead	mg/L (ppm)	1.0	<1	98	97	50-150	1
Mercury	mg/L (ppm)	1.0	<0.1	99	99	50-150	0
Selenium	mg/L (ppm)	0.5	<1	93	97	50-150	4
Silver	mg/L (ppm)	0.5	<1	99	103	50-150	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	97	70-130
Barium	mg/L (ppm)	5.0	99	70-130
Cadmium	mg/L (ppm)	0.5	98	70-130
Chromium	mg/L (ppm)	2.0	101	70-130
Lead	mg/L (ppm)	1.0	98	70-130
Mercury	mg/L (ppm)	1.0	97	70-130
Selenium	mg/L (ppm)	0.5	97	70-130
Silver	mg/L (ppm)	0.5	100	70-130

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID/SOLID SAMPLES FOR TCLP 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	100	98	54-149	2
Chloromethane	ug/L (ppb)	50	94	93	67-133	1
Vinyl chloride	ug/L (ppb)	50	94	93	70-119	1
Bromomethane	ug/L (ppb)	50	117	115	62-188	2
Chloroethane	ug/L (ppb)	50	102	101	66-149	1
Trichlorofluoromethane	ug/L (ppb)	50	98	97	70-132	1
Acetone	ug/L (ppb)	250	82	77	44-145	6
1,1-Dichloroethene	ug/L (ppb)	50	94	92	75-119	2
Hexane	ug/L (ppb)	50	91	90	51-153	1
Methylene chloride	ug/L (ppb)	50	47 vo	45 vo	63-132	4
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	104	102	70-122	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	96	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	95	93	80-116	2
2,2-Dichloropropane	ug/L (ppb)	50	108	109	62-141	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	98	95	80-112	3
Chloroform	ug/L (ppb)	50	93	91	81-109	2
2-Butanone (MEK)	ug/L (ppb)	250	103	98	53-140	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	90	87	79-109	3
1,1,1-Trichloroethane	ug/L (ppb)	50	100	98	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	97	97	78-112	0
Carbon tetrachloride	ug/L (ppb)	50	101	99	72-128	2
Benzene	ug/L (ppb)	50	93	91	81-108	2
Trichloroethene	ug/L (ppb)	50	95	93	77-108	2
1,2-Dichloropropane	ug/L (ppb)	50	95	93	82-109	2
Bromodichloromethane	ug/L (ppb)	50	97	93	76-120	4
Dibromomethane	ug/L (ppb)	50	98	94	80-110	4
4-Methyl-2-pentanone	ug/L (ppb)	250	119	115	59-142	3
cis-1,3-Dichloropropene	ug/L (ppb)	50	104	102	76-128	2
Toluene	ug/L (ppb)	50	94	93	83-108	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	103	101	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	95	92	82-110	3
2-Hexanone	ug/L (ppb)	250	102	98	53-145	4
1,3-Dichloropropane	ug/L (ppb)	50	96	94	83-110	2
Tetrachloroethene	ug/L (ppb)	50	92	90	78-109	2
Dibromochloromethane	ug/L (ppb)	50	101	99	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	99	96	82-118	3
Chlorobenzene	ug/L (ppb)	50	92	90	84-108	2
Ethylbenzene	ug/L (ppb)	50	97	95	83-111	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	96	95	76-125	1
m,p-Xylene	ug/L (ppb)	100	99	97	84-112	2
o-Xylene	ug/L (ppb)	50	101	100	81-117	1
Styrene	ug/L (ppb)	50	106	105	83-121	1
Isopropylbenzene	ug/L (ppb)	50	106	106	81-122	0
Bromoform	ug/L (ppb)	50	99	98	40-161	1
n-Propylbenzene	ug/L (ppb)	50	94	93	81-115	1
Bromobenzene	ug/L (ppb)	50	92	90	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	99	83-117	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	91	89	79-118	2
1,2,3-Trichloropropane	ug/L (ppb)	50	90	88	74-116	2
2-Chlorotoluene	ug/L (ppb)	50	93	93	79-112	0
4-Chlorotoluene	ug/L (ppb)	50	96	95	81-113	1
tert-Butylbenzene	ug/L (ppb)	50	107	106	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	102	101	81-121	1
sec-Butylbenzene	ug/L (ppb)	50	102	101	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	101	101	81-122	0
1,3-Dichlorobenzene	ug/L (ppb)	50	92	91	82-110	1
1,4-Dichlorobenzene	ug/L (ppb)	50	91	90	81-105	1
1,2-Dichlorobenzene	ug/L (ppb)	50	89	90	83-111	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	100	100	62-133	0
1,2,4-Trichlorobenzene	ug/L (ppb)	50	94	95	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	89	90	70-116	1
Naphthalene	ug/L (ppb)	50	109	109	72-131	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	93	94	80-114	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID/SOLID SAMPLES FOR TCLP 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	115	117	54-149	2
Chloromethane	ug/L (ppb)	50	86	88	67-133	2
Vinyl chloride	ug/L (ppb)	50	87	90	70-119	3
Bromomethane	ug/L (ppb)	50	119	124	62-188	4
Chloroethane	ug/L (ppb)	50	97	99	66-149	2
Trichlorofluoromethane	ug/L (ppb)	50	121	121	70-132	0
Acetone	ug/L (ppb)	250	96	93	44-145	3
1,1-Dichloroethene	ug/L (ppb)	50	96	98	75-119	2
Hexane	ug/L (ppb)	50	92	92	51-153	0
Methylene chloride	ug/L (ppb)	50	28 vo	28 vo	63-132	0
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	118	119	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	104	104	76-118	0
1,1-Dichloroethane	ug/L (ppb)	50	100	101	80-116	1
2,2-Dichloropropane	ug/L (ppb)	50	134	136	62-141	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	102	80-112	1
Chloroform	ug/L (ppb)	50	104	105	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	98	99	53-140	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	103	105	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	122 vo	123 vo	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	107	105	78-112	2
Carbon tetrachloride	ug/L (ppb)	50	124	126	72-128	2
Benzene	ug/L (ppb)	50	94	93	81-108	1
Trichloroethene	ug/L (ppb)	50	103	104	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	96	97	82-109	1
Bromodichloromethane	ug/L (ppb)	50	107	108	76-120	1
Dibromomethane	ug/L (ppb)	50	104	106	80-110	2
4-Methyl-2-pentanone	ug/L (ppb)	250	126	123	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	109	110	76-128	1
Toluene	ug/L (ppb)	50	90	90	83-108	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	104	104	76-128	0
1,1,2-Trichloroethane	ug/L (ppb)	50	88	89	82-110	1
2-Hexanone	ug/L (ppb)	250	92	91	53-145	1
1,3-Dichloropropane	ug/L (ppb)	50	92	91	83-110	1
Tetrachloroethene	ug/L (ppb)	50	94	93	78-109	1
Dibromochloromethane	ug/L (ppb)	50	102	104	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	99	99	82-118	0
Chlorobenzene	ug/L (ppb)	50	90	89	84-108	1
Ethylbenzene	ug/L (ppb)	50	95	95	83-111	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	100	102	76-125	2
m,p-Xylene	ug/L (ppb)	100	95	96	84-112	1
o-Xylene	ug/L (ppb)	50	99	100	81-117	1
Styrene	ug/L (ppb)	50	104	104	83-121	0
Isopropylbenzene	ug/L (ppb)	50	107	109	81-122	2
Bromoform	ug/L (ppb)	50	97	98	40-161	1
n-Propylbenzene	ug/L (ppb)	50	89	88	81-115	1
Bromobenzene	ug/L (ppb)	50	92	89	80-113	3
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	97	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	81	81	79-118	0
1,2,3-Trichloropropane	ug/L (ppb)	50	85	84	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	91	90	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	94	93	81-113	1
tert-Butylbenzene	ug/L (ppb)	50	107	106	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	101	101	81-121	0
sec-Butylbenzene	ug/L (ppb)	50	99	98	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	100	100	81-122	0
1,3-Dichlorobenzene	ug/L (ppb)	50	91	89	82-110	2
1,4-Dichlorobenzene	ug/L (ppb)	50	90	88	81-105	2
1,2-Dichlorobenzene	ug/L (ppb)	50	88	88	83-111	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	103	97	62-133	6
1,2,4-Trichlorobenzene	ug/L (ppb)	50	99	97	77-117	2
Hexachlorobutadiene	ug/L (ppb)	50	100	99	70-116	1
Naphthalene	ug/L (ppb)	50	106	105	72-131	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	94	94	80-114	0

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

Laboratory Code: 507173-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	92	55-137
Chloromethane	ug/L (ppb)	50	<10	93	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	88	61-139
Bromomethane	ug/L (ppb)	50	<1	113	20-265
Chloroethane	ug/L (ppb)	50	<1	99	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	96	71-128
Acetone	ug/L (ppb)	250	<10	100	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	92	71-123
Hexane	ug/L (ppb)	50	<1	94	61-127
Methylene chloride	ug/L (ppb)	50	<5	100	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	105	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	95	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	109	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	97	63-126
Chloroform	ug/L (ppb)	50	<1	92	79-113
2-Butanone (MEK)	ug/L (ppb)	250	<10	103	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	91	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	99	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	100	70-132
Benzene	ug/L (ppb)	50	1.0	92	78-108
Trichloroethene	ug/L (ppb)	50	<1	96	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	96	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	97	78-117
Dibromomethane	ug/L (ppb)	50	<1	97	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	117	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	105	76-120
Toluene	ug/L (ppb)	50	<1	94	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	106	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	95	81-116
2-Hexanone	ug/L (ppb)	250	<10	102	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	96	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	92	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	100	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	98	79-120
Chlorobenzene	ug/L (ppb)	50	<1	91	75-115
Ethylbenzene	ug/L (ppb)	50	<1	96	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	96	76-130
m,p-Xylene	ug/L (ppb)	100	<2	98	63-128
o-Xylene	ug/L (ppb)	50	<1	102	64-129
Styrene	ug/L (ppb)	50	<1	106	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	106	77-122
Bromoform	ug/L (ppb)	50	<1	97	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	93	74-117
Bromobenzene	ug/L (ppb)	50	<1	90	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	99	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	90	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	88	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	94	70-123
4-Chlorotoluene	ug/L (ppb)	50	<1	96	79-113
tert-Butylbenzene	ug/L (ppb)	50	<1	107	78-124
1,2,4-Trimethylbenzene	ug/L (ppb)	50	1.0	102	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	102	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	102	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	92	79-109
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	91	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	90	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	104	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	97	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	89	67-120
Naphthalene	ug/L (ppb)	50	<1	114	62-140
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	95	59-130

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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	92	89	54-149	3
Chloromethane	ug/L (ppb)	50	90	87	67-133	3
Vinyl chloride	ug/L (ppb)	50	91	88	70-119	3
Bromomethane	ug/L (ppb)	50	112	109	62-188	3
Chloroethane	ug/L (ppb)	50	100	98	66-149	2
Trichlorofluoromethane	ug/L (ppb)	50	95	94	70-132	1
Acetone	ug/L (ppb)	250	109	102	44-145	7
1,1-Dichloroethene	ug/L (ppb)	50	93	91	75-119	2
Hexane	ug/L (ppb)	50	92	89	51-153	3
Methylene chloride	ug/L (ppb)	50	99	97	63-132	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	102	103	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	99	96	76-118	3
1,1-Dichloroethane	ug/L (ppb)	50	94	94	80-116	0
2,2-Dichloropropane	ug/L (ppb)	50	109	109	62-141	0
cis-1,2-Dichloroethene	ug/L (ppb)	50	96	96	80-112	0
Chloroform	ug/L (ppb)	50	91	91	81-109	0
2-Butanone (MEK)	ug/L (ppb)	250	101	102	53-140	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	88	87	79-109	1
1,1,1-Trichloroethane	ug/L (ppb)	50	100	99	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	97	96	78-112	1
Carbon tetrachloride	ug/L (ppb)	50	102	99	72-128	3
Benzene	ug/L (ppb)	50	92	91	81-108	1
Trichloroethene	ug/L (ppb)	50	94	93	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	95	94	82-109	1
Bromodichloromethane	ug/L (ppb)	50	95	94	76-120	1
Dibromomethane	ug/L (ppb)	50	96	95	80-110	1
4-Methyl-2-pentanone	ug/L (ppb)	250	119	117	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	105	102	76-128	3
Toluene	ug/L (ppb)	50	93	92	83-108	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	104	102	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	93	91	82-110	2
2-Hexanone	ug/L (ppb)	250	100	97	53-145	3
1,3-Dichloropropane	ug/L (ppb)	50	94	92	83-110	2
Tetrachloroethene	ug/L (ppb)	50	90	90	78-109	0
Dibromochloromethane	ug/L (ppb)	50	98	98	63-140	0
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	96	94	82-118	2
Chlorobenzene	ug/L (ppb)	50	90	89	84-108	1
Ethylbenzene	ug/L (ppb)	50	96	94	83-111	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	95	94	76-125	1
m,p-Xylene	ug/L (ppb)	100	97	96	84-112	1
o-Xylene	ug/L (ppb)	50	101	100	81-117	1
Styrene	ug/L (ppb)	50	105	103	83-121	2
Isopropylbenzene	ug/L (ppb)	50	106	104	81-122	2
Bromoform	ug/L (ppb)	50	97	96	40-161	1
n-Propylbenzene	ug/L (ppb)	50	95	92	81-115	3
Bromobenzene	ug/L (ppb)	50	91	89	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	100	98	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	91	89	79-118	2
1,2,3-Trichloropropane	ug/L (ppb)	50	90	89	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	94	92	79-112	2
4-Chlorotoluene	ug/L (ppb)	50	96	94	81-113	2
tert-Butylbenzene	ug/L (ppb)	50	108	107	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	103	101	81-121	2
sec-Butylbenzene	ug/L (ppb)	50	104	101	83-123	3
p-Isopropyltoluene	ug/L (ppb)	50	102	100	81-122	2
1,3-Dichlorobenzene	ug/L (ppb)	50	92	91	82-110	1
1,4-Dichlorobenzene	ug/L (ppb)	50	90	89	81-105	1
1,2-Dichlorobenzene	ug/L (ppb)	50	90	89	83-111	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	106	104	62-133	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	99	99	77-117	0
Hexachlorobutadiene	ug/L (ppb)	50	95	92	70-116	3
Naphthalene	ug/L (ppb)	50	115	115	72-131	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	96	96	80-114	0

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID/SOLID SAMPLES FOR TCLP 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	44	50	10-84	13
Bis(2-chloroethyl) ether	ug/L (ppb)	10	93	96	52-113	3
2-Chlorophenol	ug/L (ppb)	10	85	96	50-110	12
1,3-Dichlorobenzene	ug/L (ppb)	10	86	87	45-109	1
1,4-Dichlorobenzene	ug/L (ppb)	10	85	87	44-118	2
1,2-Dichlorobenzene	ug/L (ppb)	10	85	87	46-116	2
Benzyl alcohol	ug/L (ppb)	10	80	91	42-100	13
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	86	90	51-124	5
2-Methylphenol	ug/L (ppb)	10	78	91	38-100	15
Hexachloroethane	ug/L (ppb)	10	89	90	42-117	1
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	89	92	48-124	3
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	71	84	40-105	17
Nitrobenzene	ug/L (ppb)	10	95	100	50-118	5
Isophorone	ug/L (ppb)	10	91	95	55-116	4
2-Nitrophenol	ug/L (ppb)	10	88	90	42-127	2
2,4-Dimethylphenol	ug/L (ppb)	10	77	89	11-135	14
Benzoic acid	ug/L (ppb)	65	24	19	10-110	23 vo
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	92	97	55-115	5
2,4-Dichlorophenol	ug/L (ppb)	10	90	97	55-113	7
1,2,4-Trichlorobenzene	ug/L (ppb)	10	86	88	50-109	2
Naphthalene	ug/L (ppb)	10	87	91	53-112	4
Hexachlorobutadiene	ug/L (ppb)	10	86	85	50-109	1
4-Chloroaniline	ug/L (ppb)	20	63	97	30-109	42 vo
4-Chloro-3-methylphenol	ug/L (ppb)	10	84	94	54-114	11
2-Methylnaphthalene	ug/L (ppb)	10	86	90	53-113	5
1-Methylnaphthalene	ug/L (ppb)	10	86	90	70-130	5
Hexachlorocyclopentadiene	ug/L (ppb)	10	90	91	10-121	1
2,4,6-Trichlorophenol	ug/L (ppb)	10	112	114	46-114	2
2,4,5-Trichlorophenol	ug/L (ppb)	10	103	110	57-122	7
2-Chloronap hthalene	ug/L (ppb)	10	101	104	52-112	3
2-Nitroaniline	ug/L (ppb)	10	102	109	47-128	7
Dimethyl phthalate	ug/L (ppb)	10	98	106	55-116	8
Acenaphthylene	ug/L (ppb)	10	103	108	52-112	5
2,6-Dinitrotoluene	ug/L (ppb)	10	108	116	49-126	7
3-Nitroaniline	ug/L (ppb)	20	82	103	21-125	23 vo
Acenaphthene	ug/L (ppb)	10	100	106	52-114	6
2,4-Dinitrophenol	ug/L (ppb)	10	98	95	29-130	3
Dibenzofuran	ug/L (ppb)	10	99	106	53-113	7
2,4-Dinitrotoluene	ug/L (ppb)	10	101	108	48-129	7
4-Nitrophenol	ug/L (ppb)	10	49	51	10-80	4
Diethyl phthalate	ug/L (ppb)	10	107	116	55-116	8
Fluorene	ug/L (ppb)	10	101	108	54-115	7
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	98	104	52-115	6
N-Nitrosodiphenylamine	ug/L (ppb)	10	94	101	51-112	7
4-Nitroaniline	ug/L (ppb)	20	83	92	42-115	10
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	100	101	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	10	96	101	53-114	5
Hexachlorobenzene	ug/L (ppb)	10	96	102	54-115	6
Pentachlorophenol	ug/L (ppb)	10	100	98	49-114	2
Phenanthrene	ug/L (ppb)	10	92	97	53-113	5
Anthracene	ug/L (ppb)	10	95	100	56-119	5
Carbazole	ug/L (ppb)	10	91	93	54-115	2
Di-n-butyl phthalate	ug/L (ppb)	10	102	106	54-115	4
Fluoranthene	ug/L (ppb)	10	96	100	55-116	4
Pyrene	ug/L (ppb)	10	105	109	54-121	4
Benzyl butyl phthalate	ug/L (ppb)	10	110	114	53-122	4
Benz(a)anthracene	ug/L (ppb)	10	91	95	52-114	4
Chrysene	ug/L (ppb)	10	89	94	54-119	5
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	111	117	54-122	5
Di-n-octyl phthalate	ug/L (ppb)	10	125	131	50-131	5
Benzo(a)pyrene	ug/L (ppb)	10	117	125 vo	54-120	7
Benzo(b)fluoranthene	ug/L (ppb)	10	123 vo	130 vo	46-118	6
Benzo(k)fluoranthene	ug/L (ppb)	10	124	130 vo	56-125	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	118	126 vo	52-120	7
Dibenz(a,h)anthracene	ug/L (ppb)	10	112	121	54-122	8
Benzo(g,h,i)perylene	ug/L (ppb)	10	123 vo	133 vo	54-118	8

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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	44	44	10-84	0
Bis(2-chloroethyl) ether	ug/L (ppb)	10	99	102	52-113	3
2-Chlorophenol	ug/L (ppb)	10	96	98	50-110	2
1,3-Dichlorobenzene	ug/L (ppb)	10	93	95	45-109	2
1,4-Dichlorobenzene	ug/L (ppb)	10	92	95	44-118	3
1,2-Dichlorobenzene	ug/L (ppb)	10	92	95	46-116	3
Benzyl alcohol	ug/L (ppb)	10	88	89	42-100	1
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	98	100	51-124	2
2-Methylphenol	ug/L (ppb)	10	91	90	38-100	1
Hexachloroethane	ug/L (ppb)	10	96	100	42-117	4
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	97	99	48-124	2
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	81	83	40-105	2
Nitrobenzene	ug/L (ppb)	10	101	103	50-118	2
Isophorone	ug/L (ppb)	10	95	98	55-116	3
2-Nitrophenol	ug/L (ppb)	10	92	95	42-127	3
2,4-Dimethylphenol	ug/L (ppb)	10	90	77	11-135	16
Benzoic acid	ug/L (ppb)	65	32	37	10-110	14
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	99	102	55-115	3
2,4-Dichlorophenol	ug/L (ppb)	10	97	99	55-113	2
1,2,4-Trichlorobenzene	ug/L (ppb)	10	93	95	50-109	2
Naphthalene	ug/L (ppb)	10	95	97	53-112	2
Hexachlorobutadiene	ug/L (ppb)	10	94	95	50-109	1
4-Chloroaniline	ug/L (ppb)	20	97	97	30-109	0
4-Chloro-3-methylphenol	ug/L (ppb)	10	98	99	54-114	1
2-Methylnaphthalene	ug/L (ppb)	10	96	98	53-113	2
1-Methylnaphthalene	ug/L (ppb)	10	100	102	70-130	2
Hexachlorocyclopentadiene	ug/L (ppb)	10	102	92	10-121	10
2,4,6-Trichlorophenol	ug/L (ppb)	10	118 vo	118 vo	46-114	0
2,4,5-Trichlorophenol	ug/L (ppb)	10	112	113	57-122	1
2-Chloronaphthalene	ug/L (ppb)	10	108	111	52-112	3
2-Nitroaniline	ug/L (ppb)	10	116	121	47-128	4
Dimethyl phthalate	ug/L (ppb)	10	106	111	55-116	5
Acenaphthylene	ug/L (ppb)	10	109	113 vo	52-112	4
2,6-Dinitrotoluene	ug/L (ppb)	10	119	127 vo	49-126	7
3-Nitroaniline	ug/L (ppb)	20	115	119	21-125	3
Acenaphthene	ug/L (ppb)	10	108	111	52-114	3
2,4-Dinitrophenol	ug/L (ppb)	10	127	125	29-130	2
Dibenzofuran	ug/L (ppb)	10	109	112	53-113	3
2,4-Dinitrotoluene	ug/L (ppb)	10	121	126	48-129	4
4-Nitrophenol	ug/L (ppb)	10	55	54	10-80	2
Diethyl phthalate	ug/L (ppb)	10	118 vo	124 vo	55-116	5
Fluorene	ug/L (ppb)	10	113	116 vo	54-115	3
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	108	113	52-115	5
N-Nitrosodiphenylamine	ug/L (ppb)	10	100	101	51-112	1
4-Nitroaniline	ug/L (ppb)	20	105	105	42-115	0
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	117	116	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	10	98	100	53-114	2
Hexachlorobenzene	ug/L (ppb)	10	97	99	54-115	2
Pentachlorophenol	ug/L (ppb)	10	113	113	49-114	0
Phenanthrene	ug/L (ppb)	10	98	100	53-113	2
Anthracene	ug/L (ppb)	10	102	104	56-119	2
Carbazole	ug/L (ppb)	10	107	107	54-115	0
Di-n-butyl phthalate	ug/L (ppb)	10	110	112	54-115	2
Fluoranthene	ug/L (ppb)	10	103	104	55-116	1
Pyrene	ug/L (ppb)	10	97	103	54-121	6
Benzyl butyl phthalate	ug/L (ppb)	10	107	108	53-122	1
Benz(a)anthracene	ug/L (ppb)	10	97	99	52-114	2
Chrysene	ug/L (ppb)	10	94	95	54-119	1
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	110	109	54-122	1
Di-n-octyl phthalate	ug/L (ppb)	10	131	129	50-131	2
Benzo(a)pyrene	ug/L (ppb)	10	129 vo	132 vo	54-120	2
Benzo(b)fluoranthene	ug/L (ppb)	10	131 vo	133 vo	46-118	2
Benzo(k)fluoranthene	ug/L (ppb)	10	134 vo	135 vo	56-125	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	116	123 vo	52-120	6
Dibenz(a,h)anthracene	ug/L (ppb)	10	114	121	54-122	6
Benzo(g,h,i)perylene	ug/L (ppb)	10	111	118	54-118	6

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507154-14/15 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	40 ip	60	50-150	40 ip
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	41 ip	43 ip	50-150	5

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	94	93	55-130	1
Aroclor 1260	mg/kg (ppm)	0.8	92	92	58-133	0

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507154-19/20 (Matrix Spike) 1/250

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	71	78	50-150	9
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	76	79	50-150	4

Laboratory Code: 507154-28/29 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	84	83	50-150	1
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	82	81	50-150	1

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	96	102	55-130	6
Aroclor 1260	mg/kg (ppm)	0.8	97	103	58-133	6

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507154-49/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	87	84	50-150	4
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	86	85	50-150	1

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	99	79	55-130	22 vo
Aroclor 1260	mg/kg (ppm)	0.8	100	82	58-133	20

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

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

Laboratory Code: 507399-01 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	219 ip	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	89	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	70	75	55-130	7
Aroclor 1260	mg/kg (ppm)	0.8	79	84	58-133	6

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WIPE 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/wipe (ppm)	100	81	79	70-130	2
Aroclor 1260	ug/wipe (ppm)	100	79	80	70-130	1

Date of Report: 08/06/15
Date Received: 07/10/15
Project: Anacortes WTP, F&BI 507154

**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	74	82	37-136	10
Aroclor 1260	ug/L (ppb)	2.5	79	81	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.

NP ~~507153~~ 507154
7-10-15

SAMPLE CHAIN OF CUSTODY

ME 07-10-15

Page # 1 of ~~5~~ 55-2

Send Report To Kew Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	TOTAL LEAD	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA METALS		Notes
CW-CONC-06	01	7/9/15	0950	GRAB	1							X						
CW-CONC-07	02	7/9/15	1000	GRAB	1							X						
CW-CONC-08	03	7/9/15	1010	GRAB	1							X						
CW-CONC-09	04	7/9/15	1020	GRAB	1							X						
CW-CONC-10	05	7/9/15	1030	GRAB	1							X						
CW-CONC-DUP	06	7/9/15	—	GRAB	1							X						
CW-SED-01	07 A-B	7/9/15	1035	GRAB	2							X	X	X	X	X		
CW-SED-02	08	7/9/15	1040	GRAB	1							X						
CW-SED-03	09	7/9/15	1045	GRAB	1							X						
CW-SED-04	10	7/9/15	1050	GRAB	1							X						

Samples received at 5 °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:	Richard Malcom	MWH	7/10/15	1310
Received by:	VINH	FBI	7/10/15	1310
Relinquished by:	VINH	FBI	7/10/15	1445
Received by:	Nhan Phan	FeBI	7/10/15	1445

FORMS\COC\COC.DOC

507154

SAMPLE CHAIN OF CUSTODY

ME 07-10-15

SS-2

Page # 2 of 6

Send Report To KEN LEDERMAN

Company FOSTER PEPPER PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. AWACORTES WTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	TOTAL LEAD	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA METALS		Notes
CW-SED-05	11	7/9/15	1055	GRAB	1							X						
CW-SED-06	12	7/9/15	1100	GRAB	1							X						
CW-SED-DUP	13	7/9/15	—	GRAB	1							X						
CW-SED-MS	14	7/9/15	1045	GRAB	1							X						
CW-SED-MSD	15	7/9/15	1045	GRAB	1							X						
CW-BAF-01	16 AB	7/9/15	1110	GRAB	2							X	X	X	X	X		
CW-BAF-02	17	7/9/15	1115	GRAB	1							X						
CW-BAF-03	18	7/9/15	1125	GRAB	1							X						
CW-BAF-MS	19	7/9/15	1125	GRAB	1							X						
CW-BAF-MSD	20	7/9/15	1125	GRAB	1							X						

Samples received at 5 °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:	RICHARD MALCOL	MWH	7/10/15	1310
Received by:	VINH	FBI	7/10/15	1310
Relinquished by:	VINH	FBI	7/10/15	~~1645~~ 1445
Received by:	Nhan Phan	FEB I	7/10/15	1445

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507154

SAMPLE CHAIN OF CUSTODY

ME 07-10-15

SS-2

Send Report To Few Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [x] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TOTAL LEAD	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA METALS		Notes
CW-BAF-DUP	21	7/9/15	—	GRAB	1							X						
WF-CONC-01	22 A-B	7/9/15	1330	~~13:30~~ GRAB	2							X	X	X	X	X		
WF-CONC-02	23	7/9/15	1340	~~1340~~ GRAB	1							X						
WF-CONC-03	24	7/9/15	1350	~~1350~~ GRAB	1							X						
WF-CONC-04	25	7/9/15	1400	~~1400~~ GRAB	1							X						
WF-CONC-05	26	7/9/15	1410	GRAB	1							X						
WF-CONC-06	27	7/9/15	1425	GRAB	1							X						
WF-CONC-MS	28	7/9/15	1340	GRAB	1							X						
WF-CONC-MSD	29	7/9/15	1340	GRAB	1							X						
WF-CONC-DUP	30	7/9/15	—	GRAB	1							X						

Samples received at 5 °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:	Richard Malcolm	MWH	7/10/15	1310
Received by:	VINH	FBI	7/10/15	1310
Relinquished by:	VINH	FBI	7/10/15	~~1645~~ 1445 VV
Received by:	Nhan Phan	FeB	7/10/15	1445

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507154

SAMPLE CHAIN OF CUSTODY

ME 07-10-15

SS-2

Page # 4 of 6

Send Report To: KEN LEDERMAN

Company: FOSTER PEPPER PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO.: ANACORTES WTP

PO#

REMARKS: PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	TOTAL LEAD	TCLP RCRA VOC	TCLP RCRA SVOC	TCLP RCRA METALS		Notes
WF-SED-01	31 A-B	7/9/15	1450	GRAB	2							X	X	X	X	X		
WF-SED-02	32	7/9/15	1505	GRAB	1							X						
WF-SED-03	33	7/9/15	1520	GRAB	1							X						
WF-SED-04	34	7/9/15	1535	GRAB	1							X						
WF-SED-DUP	35	7/9/15	—	GRAB	1							X						
CW-CONC-01	36	7/9/15	0900	GRAB	1							X	X	X	X	X		IF NOT ENOUGH VOLUME, CALL FOR INSTRUCTIONS
CW-CONC-02	37	7/9/15	0910	GRAB	1							X						
CW-CONC-03	38	7/9/15	0920	GRAB	1							X						
CW-CONC-04	39	7/9/15	0930	GRAB	1							X						
CW-CONC-05	40	7/9/15	0940	GRAB	1							X						

Samples received at 5 °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:	[signature]	RICHARD MALCOM	MWH	7/10/15	1310
Received by:	[signature]	VINH	FBI	7/10/15	1310
Relinquished by:	[signature]	VINH	FBI	7/10/15	1445
Received by:	[signature]	Nhan Phan	FBI	7/10/15	1445

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507154

SAMPLE CHAIN OF CUSTODY

ME 07-10-15

Page # 5 of 6 SS-2

Send Report To KEN LEDERMAN

Company FOSTER PEPPER PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. ANACORTES WTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TOTAL Pb	TCLP VOC	TCLP SVOC	TCLP RCRA METALS		Notes
SB-STEELWIPE-01	41	7/10/15	0845	WIPE	1							X						
SB-SED-01	42 A-B	7/10/15	0900	GRAB	2							X	X	X	X	X		
SB-SED-DUP	43	7/10/15	—	GRAB	1							X						
SB-CONC-01	44 A-B	7/10/15	0930	GRAB	2							X	X	X	X	X		
SB-CONC-02	45	7/10/15	0945	GRAB	1							X						
SB-CONC-DUP	46	7/10/15	—	GRAB	1							X						
SB-CONC-04	47	7/10/15	1100	GRAB	1							X						
SB-SED-02	48	7/10/15	1115	GRAB	1							X						
SB-SED-MS	49	7/10/15	1115	GRAB	1							X						
SB-SED-MSD	50	7/10/15	1115	GRAB	1							X						Samples received at 5 °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:	RICHARD MALOW	MWH	7/10/15	1310
Received by:	VINH	FBI	7/10/15	1310
Relinquished by:	VINH	FBI	7/10/15	1645
Received by:	Nhan Phan	FeBI	7/10/15	1445

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507154

SAMPLE CHAIN OF CUSTODY ME 07-10-15

Page # 6 of 6 55-2

Send Report To Ken Lederman

Company Foster Pepper PLLC

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Anacortes WTP

PO#

REMARKS Privileged & Confidential

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	METALS					Notes
SB-STEELWIPE-02	51	7/10/15	1045	WIPE	1							X						
RINS-02	52 AG	7/10/15	1000	GRAB	7				X	X		X	X					ALL CONTAINERS UNPRESERVED
SB-CONC-03	53	7/10/15	1110	GRAB	1							X						

Samples received at 5 °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: [signature]	RICHARD MALCOM	MWH	7/10/15	1310
Received by: [signature]	VINH	FBI	7/10/15	1310
Relinquished by: [signature]	VINH	FBI	7/10/15	~~1445~~ 1445
Received by: [signature]	Nhan Phan	FeBI	7/10/15	1445

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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

August 7, 2015

Ken Lederman
Foster Pepper PLLC
1111 3rd Avenue, Suite 3400
Seattle, WA 98101

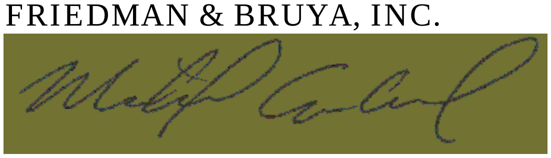
Dear Mr. Lederman:

Included are the results from the testing of material submitted on July 14, 2015 from the Anacortes WTP, F&BI 507195 project. There are 128 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
NAA0807R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 14, 2015 by Friedman & Bruya, Inc. from the Foster Pepper PLLC Anacortes WTP, F&BI 507195 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pep00 per PLLC
507195-01	SB-CONC-13
507195-02	SB-SED-08
507195-03	SB-CONC-27
507195-04	SB-SED-09
507195-05	SB-SED-06
507195-06	SB-CONC-28
507195-07	SB-CONC-24
507195-08	SB-CONC-26
507195-09	SB-CONC-23
507195-10	SB-CONC-30
507195-11	SB-SED-05
507195-12	SB-SED-03
507195-13	SB-SED-04
507195-14	SB-SEAL-MSD
507195-15	SB-SEAL-02 (RESIN)
507195-16	SB-FIBWIPE-02
507195-17	SB-SEAL-MS
507195-18	SB-CONC-18
507195-19	SB-CONC-32
507195-20	SB-CONC-33
507195-21	SB-CONC-34
507195-22	SB-CONC-35
507195-23	SB-CONC-36
507195-24	SB-CORK-03
507195-25	SB-SEALB-03
507195-26	SB-SEAL-04
507195-27	SB-SEALC-03
507195-28	SB-CAULK-01
507195-29	SB-CORK-04
507195-30	SB-CONC-37
507195-31	SB-CONC-31
507195-32	SB-CONC-25
507195-33	SB-CONC-29
507195-34	SB-SED-07
507195-35	SB-CONC-DUP3
507195-36	SB-CONC-MSD2

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper PLLC
507195-37	SB-CONC-MS2
507195-38	SB-CONC-16
507195-39	SB-CONC-07
507195-40	SB-CONC-21
507195-41	SB-INTPC-01
507195-42	SB-CORK-MSD
507195-43	SB-CONC-22
507195-44	SB-CORK-MS
507195-45	SB-CONC-05
507195-46	SB-CONC-06
507195-47	SB-CONC-MS
507195-48	SB-CONC-MSD
507195-49	SB-CONC-10
507195-50	SB-SEALC-02
507195-51	SB-CORK-02
507195-52	SB-CONC-11
507195-53	SB-CONC-12
507195-54	SB-CONC-14
507195-55	SB-CONC-DUP
507195-56	SB-CONC-15
507195-57	SB-SEALA-01
507195-58	SB-CORK-DUP
507195-59	SB-FIBWIPE-01
507195-60	SB-CORK-01
507195-61	SB-SEAL-01
507195-62	SB-SEAL-MS
507195-63	SB-SEAL-DUP
507195-64	SB-SEALB-01
507195-65	SB-SEALC-01
507195-66	SB-CONC-09
507195-67	SB-CONC-17
507195-68	SB-CONC-19
507195-69	SB-CONC-08
507195-70	SB-CONC-20
507195-71	SB-CONC-38
507195-72	SB-CONC-39
507195-73	SB-CONC-40
507195-74	SB-CAULK-03
507195-75	SB-SED-10

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper PLLC
507195-76	SB-CAULK-02
507195-77	SB-SEALA-03
507195-78	SB-INTPC-02
507195-79	FB-PGCONC-01
507195-80	FB-PGCONC-02
507195-81	FB-PGCONC-DUP
507195-82	AB-SEAL-07
507195-83	AB-SEAL-09
507195-84	AB-SEAL-10
507195-85	PC-07

Acetone and methylene chloride were detected in the samples submitted for 8260C TCLP analysis. Both compounds were detected in the method blank and were flagged accordingly. In addition, the methylene chloride laboratory control sample and laboratory control sample duplicate failed below the acceptance criteria. The results were flagged accordingly.

Benzoic acid was detected in several samples for 8270D TCLP analysis and was flagged as laboratory contamination. In addition, several compounds exceeded the laboratory control sample and laboratory control sample duplicate relative percent difference and acceptance criteria. The affected results were flagged accordingly.

The 8082A aroclor matrix spike and matrix spike duplicate laboratory control sample and laboratory control sample duplicate failed the relative percent difference in one of the analytical batches. The relative percent difference of the laboratory control sample and laboratory control sample duplicate passed the acceptance criteria, therefore the results were likely due to matrix effect.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-40
Date Analyzed:	07/21/15	Data File:	507195-40.022
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	13.1

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-CORK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-60 x2
Date Analyzed:	07/21/15	Data File:	507195-60 x2.023
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	<2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-61
Date Analyzed:	07/21/15	Data File:	507195-61.024
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	9.57

Analysis For Total Metals By EPA Method 200.8

Client ID:	SB-SED-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-75 x2
Date Analyzed:	07/21/15	Data File:	507195-75 x2.025
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	40.8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	FB-PGCONC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-79
Date Analyzed:	07/21/15	Data File:	507195-79.026
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	PC-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-85 x10
Date Analyzed:	07/21/15	Data File:	507195-85 x10.029
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	163

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	I5-404 mb
Date Analyzed:	07/21/15	Data File:	I5-404 mb.007
Matrix:	Soil/Solid	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-40
Date Analyzed:	07/29/15	Data File:	507195-40.020
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	90	60	125
Holmium	92	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-CORK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-60
Date Analyzed:	07/29/15	Data File:	507195-60.025
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	86	60	125
Holmium	88	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-61
Date Analyzed:	07/29/15	Data File:	507195-61.030
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	86	60	125
Holmium	90	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	SB-SED-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-75
Date Analyzed:	07/29/15	Data File:	507195-75.031
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	86	60	125
Holmium	90	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	FB-PGCONC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-79
Date Analyzed:	07/29/15	Data File:	507195-79.029
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	87	60	125
Holmium	89	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	PC-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-85
Date Analyzed:	07/29/15	Data File:	507195-85.032
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	85	60	125
Holmium	89	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	3.29	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	I5-410 mb
Date Analyzed:	07/29/15	Data File:	I5-410 mb.023
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	86	60	125
Holmium	89	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	I5-412 mb
Date Analyzed:	07/29/15	Data File:	I5-412 mb.018
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	103	60	125
Indium	92	60	125
Holmium	93	60	125

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/19/15	Lab ID:	507195-40
Date Analyzed:	07/22/15	Data File:	072208A.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	108	76	126

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	16 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	40 jl lc	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 TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-CORK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/19/15	Lab ID:	507195-60
Date Analyzed:	07/22/15	Data File:	072209.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	103	91	108
4-Bromofluorobenzene	104	76	126

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	59 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	310 ve jl lc	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/19/15	Lab ID:	507195-61
Date Analyzed:	07/22/15	Data File:	072210.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	85	117
Toluene-d8	104	91	108
4-Bromofluorobenzene	106	76	126

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	12 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	130 jl lc	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-SED-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-75
Date Analyzed:	07/27/15	Data File:	072714.D
Matrix:	TCLP Extract	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	99	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	96 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	85 lc	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	FB-PGCONC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-79
Date Analyzed:	07/27/15	Data File:	072715.D
Matrix:	TCLP Extract	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	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	tert-Butylbenzene	<1
Carbon tetrachloride	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	34 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	72 lc	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	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 TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/19/15	Lab ID:	05-1475 mb2
Date Analyzed:	07/22/15	Data File:	072207.D
Matrix:	TCLP Extract	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	85	117
Toluene-d8	103	91	108
4-Bromofluorobenzene	109	76	126

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	13 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	37 lc	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		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	05-1505 mb
Date Analyzed:	07/27/15	Data File:	072713.D
Matrix:	TCLP	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	94	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	103	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	41 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	32 jl lc	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 TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-40 1/2
Date Analyzed:	07/23/15	Data File:	072314.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	100	32	162
Phenol-d6	84	10	170
Nitrobenzene-d5	110	50	150
2-Fluorobiphenyl	114	43	158
2,4,6-Tribromophenol	123	43	146
Terphenyl-d14	128	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	260 ve	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	100 lc jl	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-40 1/20
Date Analyzed:	07/24/15	Data File:	072404.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	92 d	32	162
Phenol-d6	82 d	10	170
Nitrobenzene-d5	97 d	50	150
2-Fluorobiphenyl	110 d	43	158
2,4,6-Tribromophenol	131 d	43	146
Terphenyl-d14	111 d	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	270	2,6-Dinitrotoluene	<20
Bis(2-chloroethyl) ether	<4	3-Nitroaniline	<400
2-Chlorophenol	<40	Acenaphthene	<4
1,3-Dichlorobenzene	<4	2,4-Dinitrophenol	<120
1,4-Dichlorobenzene	<4	Dibenzofuran	<4
1,2-Dichlorobenzene	<4	2,4-Dinitrotoluene	<20
Benzyl alcohol	<40	4-Nitrophenol	<120
Bis(2-chloroisopropyl) ether	<4	Diethyl phthalate	<40
2-Methylphenol	<40	Fluorene	<4
Hexachloroethane	<4	4-Chlorophenyl phenyl ether	<4
N-Nitroso-di-n-propylamine	<4	N-Nitrosodiphenylamine	<4
3-Methylphenol + 4-Methylphenol	<80	4-Nitroaniline	<400
Nitrobenzene	<4	4,6-Dinitro-2-methylphenol	<120
Isophorone	<4	4-Bromophenyl phenyl ether	<4
2-Nitrophenol	<40	Hexachlorobenzene	<4
2,4-Dimethylphenol	<40	Pentachlorophenol	<40
Benzoic acid	<200	Phenanthrene	<4
Bis(2-chloroethoxy)methane	<4	Anthracene	<4
2,4-Dichlorophenol	<40	Carbazole	<40
1,2,4-Trichlorobenzene	<4	Di-n-butyl phthalate	<40
Naphthalene	<4	Fluoranthene	<4
Hexachlorobutadiene	<4	Pyrene	<4
4-Chloroaniline	<400	Benzyl butyl phthalate	<40
4-Chloro-3-methylphenol	<40	Benz(a)anthracene	<4
2-Methylnaphthalene	<4	Chrysene	<4
1-Methylnaphthalene	<4	Bis(2-ethylhexyl) phthalate	<64
Hexachlorocyclopentadiene	<12	Di-n-octyl phthalate	<40
2,4,6-Trichlorophenol	<40	Benzo(a)pyrene	<4
2,4,5-Trichlorophenol	<40	Benzo(b)fluoranthene	<4
2-Chloronaphthalene	<4	Benzo(k)fluoranthene	<4
2-Nitroaniline	<20	Indeno(1,2,3-cd)pyrene	<4
Dimethyl phthalate	<40	Dibenz(a,h)anthracene	<4
Acenaphthylene	<4	Benzo(g,h,i)perylene	<4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-CORK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-60 1/2
Date Analyzed:	07/23/15	Data File:	072315.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	91	32	162
Phenol-d6	76	10	170
Nitrobenzene-d5	108	50	150
2-Fluorobiphenyl	109	43	158
2,4,6-Tribromophenol	134	43	146
Terphenyl-d14	127	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	6.2	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	22 lc jl	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

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Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-61 1/2
Date Analyzed:	07/23/15	Data File:	072316.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	75	32	162
Phenol-d6	83	10	170
Nitrobenzene-d5	112	50	150
2-Fluorobiphenyl	84	43	158
2,4,6-Tribromophenol	131	43	146
Terphenyl-d14	133	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	140 ve
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-61 1/20
Date Analyzed:	07/27/15	Data File:	072706.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	97 d	32	162
Phenol-d6	79 d	10	170
Nitrobenzene-d5	103 d	50	150
2-Fluorobiphenyl	119 d	43	158
2,4,6-Tribromophenol	143 d	43	146
Terphenyl-d14	119 d	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<40	2,6-Dinitrotoluene	<20
Bis(2-chloroethyl) ether	<4	3-Nitroaniline	<400
2-Chlorophenol	<40	Acenaphthene	<4
1,3-Dichlorobenzene	<4	2,4-Dinitrophenol	<120
1,4-Dichlorobenzene	<4	Dibenzofuran	<4
1,2-Dichlorobenzene	<4	2,4-Dinitrotoluene	<20
Benzyl alcohol	<40	4-Nitrophenol	<120
Bis(2-chloroisopropyl) ether	<4	Diethyl phthalate	<40
2-Methylphenol	<40	Fluorene	<4
Hexachloroethane	<4	4-Chlorophenyl phenyl ether	<4
N-Nitroso-di-n-propylamine	<4	N-Nitrosodiphenylamine	<4
3-Methylphenol + 4-Methylphenol	<80	4-Nitroaniline	<400
Nitrobenzene	<4	4,6-Dinitro-2-methylphenol	<120
Isophorone	<4	4-Bromophenyl phenyl ether	<4
2-Nitrophenol	<40	Hexachlorobenzene	<4
2,4-Dimethylphenol	<40	Pentachlorophenol	<40
Benzoic acid	<200 ca	Phenanthrene	<4
Bis(2-chloroethoxy)methane	<4	Anthracene	<4
2,4-Dichlorophenol	<40	Carbazole	<40
1,2,4-Trichlorobenzene	<4	Di-n-butyl phthalate	160
Naphthalene	<4	Fluoranthene	<4
Hexachlorobutadiene	<4	Pyrene	<4
4-Chloroaniline	<400	Benzyl butyl phthalate	<40
4-Chloro-3-methylphenol	<40	Benz(a)anthracene	<4
2-Methylnaphthalene	<4	Chrysene	<4
1-Methylnaphthalene	<4	Bis(2-ethylhexyl) phthalate	<64
Hexachlorocyclopentadiene	<12	Di-n-octyl phthalate	<40
2,4,6-Trichlorophenol	<40	Benzo(a)pyrene	<4
2,4,5-Trichlorophenol	<40	Benzo(b)fluoranthene	<4
2-Chloronaphthalene	<4	Benzo(k)fluoranthene	<4
2-Nitroaniline	<20	Indeno(1,2,3-cd)pyrene	<4
Dimethyl phthalate	<40	Dibenz(a,h)anthracene	<4
Acenaphthylene	<4	Benzo(g,h,i)perylene	<4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	SB-SED-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-75 1/2
Date Analyzed:	07/23/15	Data File:	072317.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	74	32	162
Phenol-d6	88	10	170
Nitrobenzene-d5	111	50	150
2-Fluorobiphenyl	110	43	158
2,4,6-Tribromophenol	126	43	146
Terphenyl-d14	129	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	7.7	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	<20	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	9.0
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	FB-PGCONC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	507195-79 1/2
Date Analyzed:	07/23/15	Data File:	072318.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	92	32	162
Phenol-d6	84	10	170
Nitrobenzene-d5	113	50	150
2-Fluorobiphenyl	111	43	158
2,4,6-Tribromophenol	130	43	146
Terphenyl-d14	128	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<4	2,6-Dinitrotoluene	<2
Bis(2-chloroethyl) ether	<0.4	3-Nitroaniline	<40
2-Chlorophenol	<4	Acenaphthene	<0.4
1,3-Dichlorobenzene	<0.4	2,4-Dinitrophenol	<12
1,4-Dichlorobenzene	<0.4	Dibenzofuran	<0.4
1,2-Dichlorobenzene	<0.4	2,4-Dinitrotoluene	<2
Benzyl alcohol	<4	4-Nitrophenol	<12
Bis(2-chloroisopropyl) ether	<0.4	Diethyl phthalate	<4
2-Methylphenol	<4	Fluorene	<0.4
Hexachloroethane	<0.4	4-Chlorophenyl phenyl ether	<0.4
N-Nitroso-di-n-propylamine	<0.4	N-Nitrosodiphenylamine	<0.4
3-Methylphenol + 4-Methylphenol	<8	4-Nitroaniline	<40
Nitrobenzene	<0.4	4,6-Dinitro-2-methylphenol	<12
Isophorone	<0.4	4-Bromophenyl phenyl ether	<0.4
2-Nitrophenol	<4	Hexachlorobenzene	<0.4
2,4-Dimethylphenol	<4	Pentachlorophenol	<4
Benzoic acid	71 lc jl	Phenanthrene	<0.4
Bis(2-chloroethoxy)methane	<0.4	Anthracene	<0.4
2,4-Dichlorophenol	<4	Carbazole	<4
1,2,4-Trichlorobenzene	<0.4	Di-n-butyl phthalate	<4
Naphthalene	<0.4	Fluoranthene	<0.4
Hexachlorobutadiene	<0.4	Pyrene	<0.4
4-Chloroaniline	<40	Benzyl butyl phthalate	<4
4-Chloro-3-methylphenol	<4	Benz(a)anthracene	<0.4
2-Methylnaphthalene	<0.4	Chrysene	<0.4
1-Methylnaphthalene	<0.4	Bis(2-ethylhexyl) phthalate	<6.4
Hexachlorocyclopentadiene	<1.2	Di-n-octyl phthalate	<4
2,4,6-Trichlorophenol	<4	Benzo(a)pyrene	<0.4
2,4,5-Trichlorophenol	<4	Benzo(b)fluoranthene	<0.4
2-Chloronaphthalene	<0.4	Benzo(k)fluoranthene	<0.4
2-Nitroaniline	<2	Indeno(1,2,3-cd)pyrene	<0.4
Dimethyl phthalate	<4	Dibenz(a,h)anthracene	<0.4
Acenaphthylene	<0.4	Benzo(g,h,i)perylene	<0.4

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/22/15	Lab ID:	05-1443 mb
Date Analyzed:	07/23/15	Data File:	072305.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	77	32	162
Phenol-d6	58	10	170
Nitrobenzene-d5	117	50	150
2-Fluorobiphenyl	126	43	158
2,4,6-Tribromophenol	110	43	146
Terphenyl-d14	128	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-13	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-01 1/50
Date Analyzed:	07/24/15	Data File:	072408.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-08	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-02 1/50
Date Analyzed:	07/24/15	Data File:	072409.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	0.31
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-27	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-03 1/50
Date Analyzed:	07/24/15	Data File:	072410.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-09	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-04 1/50,000
Date Analyzed:	08/04/15	Data File:	70.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<200
Aroclor 1232	<200
Aroclor 1016	<200
Aroclor 1242	<200
Aroclor 1248	<200
Aroclor 1254	1,900
Aroclor 1260	<200

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-06	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-05 1/50
Date Analyzed:	08/04/15	Data File:	71.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	6.1
Aroclor 1260	<0.2

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-28	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-06 1/50
Date Analyzed:	08/04/15	Data File:	72.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-24	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-07 1/50
Date Analyzed:	08/05/15	Data File:	73.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	140 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

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-26	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-08 1/50
Date Analyzed:	07/24/15	Data File:	072417.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	160 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

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-23	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-09 1/50
Date Analyzed:	07/24/15	Data File:	072418.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-30	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-10 1/50
Date Analyzed:	07/24/15	Data File:	072419.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	145 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-05	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-11 1/50
Date Analyzed:	07/24/15	Data File:	072420.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	5.5
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-12 1/50
Date Analyzed:	07/25/15	Data File:	072423.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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	0.25
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-04	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-13 1/50
Date Analyzed:	07/25/15	Data File:	072424.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEAL-02 (RESIN)	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-15 1/5,000
Date Analyzed:	08/05/15	Data File:	74.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	850
Aroclor 1260	<20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-18	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-18 1/50
Date Analyzed:	07/25/15	Data File:	072428.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-32	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-19 1/50
Date Analyzed:	07/25/15	Data File:	072429.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	115 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-33	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-20 1/50
Date Analyzed:	07/25/15	Data File:	072430.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-34	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-21 1/50
Date Analyzed:	07/25/15	Data File:	072433.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-35	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-22 1/50
Date Analyzed:	07/25/15	Data File:	072434.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	130 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-36	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-23 1/50
Date Analyzed:	07/25/15	Data File:	072435.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	115 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CORK-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-24 1/250
Date Analyzed:	07/25/15	Data File:	072436.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALB-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-25 1/250,000
Date Analyzed:	07/25/15	Data File:	072437.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1,000
Aroclor 1232	<1,000
Aroclor 1016	<1,000
Aroclor 1242	38,000
Aroclor 1248	<1,000
Aroclor 1254	<1,000
Aroclor 1260	<1,000

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEAL-04	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-26 1/250
Date Analyzed:	08/05/15	Data File:	13.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	8.7
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALC-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-27 1/25,000
Date Analyzed:	07/25/15	Data File:	072439.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	<100
Aroclor 1242	1,700
Aroclor 1248	<100
Aroclor 1254	<100
Aroclor 1260	<100

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CAULK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-28 1/25,000
Date Analyzed:	07/25/15	Data File:	072440.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	430
Aroclor 1242	<100
Aroclor 1248	<100
Aroclor 1254	3,000
Aroclor 1260	1,800

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CORK-04	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-29 1/250
Date Analyzed:	08/05/15	Data File:	14.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	15 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	1.0
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-37	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-30 1/5,000
Date Analyzed:	08/05/15	Data File:	76.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	<20
Aroclor 1254	260
Aroclor 1260	<20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-31	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-31 1/50
Date Analyzed:	08/05/15	Data File:	80.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-25	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-32 1/50
Date Analyzed:	08/05/15	Data File:	81.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-29	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-33 1/50
Date Analyzed:	07/31/15	Data File:	23.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-34 1/50
Date Analyzed:	07/31/15	Data File:	24.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-DUP3	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-35 1/50
Date Analyzed:	07/31/15	Data File:	25.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-16	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-38 1/100
Date Analyzed:	07/31/15	Data File:	26.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.4
Aroclor 1232	<0.4
Aroclor 1016	<0.4
Aroclor 1242	<0.4
Aroclor 1248	<0.4
Aroclor 1254	<0.4
Aroclor 1260	<0.4

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-39 1/50
Date Analyzed:	07/31/15	Data File:	27.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-21	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-40 1/2,500
Date Analyzed:	07/31/15	Data File:	28.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	260
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-INTPC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-41 1/2,500
Date Analyzed:	07/31/15	Data File:	29.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	1,600
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-22	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-43 1/500
Date Analyzed:	07/31/15	Data File:	30.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<2
Aroclor 1232	<2
Aroclor 1016	<2
Aroclor 1242	<2
Aroclor 1248	<2
Aroclor 1254	61
Aroclor 1260	<2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-05	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-45 1/50
Date Analyzed:	07/31/15	Data File:	31.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-06	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-46 1/50
Date Analyzed:	07/31/15	Data File:	32.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-49 1/50
Date Analyzed:	07/31/15	Data File:	33.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALC-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-50 1/25,000
Date Analyzed:	07/31/15	Data File:	34.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	2,700
Aroclor 1016	<100
Aroclor 1242	1,400
Aroclor 1248	1,500
Aroclor 1254	<100
Aroclor 1260	<100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CORK-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-51 1/250
Date Analyzed:	08/05/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-11	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-52 1/50
Date Analyzed:	08/05/15	Data File:	09.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	155 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-12	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-53 1/50
Date Analyzed:	08/03/15	Data File:	08.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-14	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-54 1/50
Date Analyzed:	08/04/15	Data File:	29.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-55 1/50
Date Analyzed:	08/04/15	Data File:	30.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-15	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-56 1/50
Date Analyzed:	08/04/15	Data File:	31.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALA-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-57 1/2,500
Date Analyzed:	08/04/15	Data File:	39.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<20
Aroclor 1232	<20
Aroclor 1016	<20
Aroclor 1242	<20
Aroclor 1248	470
Aroclor 1254	<20
Aroclor 1260	<20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CORK-DUP	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-58 1/250
Date Analyzed:	08/05/15	Data File:	10.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	19
Aroclor 1254	<1
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CORK-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-60 1/125,000
Date Analyzed:	08/04/15	Data File:	41.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<500
Aroclor 1232	<500
Aroclor 1016	<500
Aroclor 1242	<500
Aroclor 1248	1,100
Aroclor 1254	<500
Aroclor 1260	<500

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEAL-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-61 1/25,000
Date Analyzed:	08/04/15	Data File:	42.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	9,700
Aroclor 1242	<100
Aroclor 1248	13,000
Aroclor 1254	<100
Aroclor 1260	<100

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEAL-DUP	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-63 1/25,000
Date Analyzed:	08/04/15	Data File:	58.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<100
Aroclor 1232	<100
Aroclor 1016	7,700
Aroclor 1242	<100
Aroclor 1248	10,000
Aroclor 1254	<100
Aroclor 1260	<100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALB-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-64 1/2,500
Date Analyzed:	08/04/15	Data File:	59.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	1,100
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-65 1/2,500
Date Analyzed:	08/04/15	Data File:	60.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	1,500
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-09	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-66 1/50
Date Analyzed:	08/04/15	Data File:	32.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-17	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-67 1/50
Date Analyzed:	08/04/15	Data File:	33.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-19	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-68 1/250
Date Analyzed:	08/04/15	Data File:	61.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	83
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-08	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-69 1/50
Date Analyzed:	08/04/15	Data File:	37.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	110 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-20	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-70 1/250
Date Analyzed:	08/04/15	Data File:	62.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	71
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-38	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-71 1/50
Date Analyzed:	08/04/15	Data File:	38.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 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	22
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-39	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-72 1/250
Date Analyzed:	08/04/15	Data File:	63.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	125 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	48
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CONC-40	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-73 1/250
Date Analyzed:	07/31/15	Data File:	41.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	65
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CAULK-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-74 1/2,500
Date Analyzed:	07/31/15	Data File:	42.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	480
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SED-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-75 1/2,500
Date Analyzed:	07/31/15	Data File:	43.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	1,800
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-CAULK-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-76 1/250
Date Analyzed:	07/31/15	Data File:	55C.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	3.6
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SEALA-03	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-77 1/250
Date Analyzed:	07/31/15	Data File:	45C.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	120
Aroclor 1254	<1
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-INTPC-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-78 1/50,000
Date Analyzed:	07/31/15	Data File:	46.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	0 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<200
Aroclor 1232	<200
Aroclor 1016	<200
Aroclor 1242	<200
Aroclor 1248	<200
Aroclor 1254	20,000
Aroclor 1260	<200

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-PGCONC-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-79 1/50
Date Analyzed:	07/31/15	Data File:	47.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90 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	0.52
Aroclor 1260	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-PGCONC-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-80 1/500
Date Analyzed:	07/31/15	Data File:	48.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	150 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<2
Aroclor 1232	<2
Aroclor 1016	<2
Aroclor 1242	<2
Aroclor 1248	<2
Aroclor 1254	180
Aroclor 1260	<2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-PGCONC-DUP	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-81 1/500
Date Analyzed:	07/31/15	Data File:	49.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	150 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<2
Aroclor 1232	<2
Aroclor 1016	<2
Aroclor 1242	<2
Aroclor 1248	<2
Aroclor 1254	160
Aroclor 1260	<2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-82 1/1,250
Date Analyzed:	07/31/15	Data File:	50.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<5
Aroclor 1232	<5
Aroclor 1016	<5
Aroclor 1242	<5
Aroclor 1248	<5
Aroclor 1254	260
Aroclor 1260	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-09	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	507195-83 1/1,250
Date Analyzed:	07/31/15	Data File:	51.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	100 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<5
Aroclor 1232	<5
Aroclor 1016	<5
Aroclor 1242	<5
Aroclor 1248	<5
Aroclor 1254	53
Aroclor 1260	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-SEAL-10	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-84 1/250
Date Analyzed:	08/05/15	Data File:	11.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	63 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	<1
Aroclor 1260	9.6

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PC-07	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-85 1/250
Date Analyzed:	08/05/15	Data File:	12.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

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

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<1
Aroclor 1232	<1
Aroclor 1016	<1
Aroclor 1242	<1
Aroclor 1248	<1
Aroclor 1254	1.7
Aroclor 1260	<1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	05-1473 mb 1/5
Date Analyzed:	07/20/15	Data File:	11.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	05-1479 mb 1/5
Date Analyzed:	07/24/15	Data File:	072407.D\ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	81	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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	05-1480 mb 1/5
Date Analyzed:	07/30/15	Data File:	22.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	78	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	05-1481 mb 1/5
Date Analyzed:	08/01/15	Data File:	69.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	76	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/23/15	Lab ID:	05-1482 mb 1/5
Date Analyzed:	08/03/15	Data File:	06.D\ ECD1A.CH
Matrix:	Soil/Solid	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	73	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-FIBWIPE-02	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-16
Date Analyzed:	07/23/15	Data File:	21.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-FIBWIPE-01	Client:	Foster Pepper PLLC
Date Received:	07/14/15	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	507195-59
Date Analyzed:	07/23/15	Data File:	22.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	97	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper PLLC
Date Received:	Not Applicable	Project:	Anacortes WTP, F&BI 507195
Date Extracted:	07/20/15	Lab ID:	05-1433 mb
Date Analyzed:	07/23/15	Data File:	07.D\ ECD1A.CH
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	29	154

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/07/15
Date Received: 07/14/15
Project: Anacortes WTP, F&BI 507195

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

Laboratory Code: 507274-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	mg/kg (ppm)	50	56.6	112	105	59-148	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	105	80-120

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP METALS USING EPA METHOD 200.8 AND 40 CFR PART 261

Laboratory Code: 507195-60 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	99	101	50-150	2
Barium	mg/L (ppm)	5.0	<1	100	100	50-150	0
Cadmium	mg/L (ppm)	0.5	<1	101	100	50-150	1
Chromium	mg/L (ppm)	2.0	<1	97	97	50-150	0
Lead	mg/L (ppm)	1.0	<1	102	101	50-150	1
Mercury	mg/L (ppm)	1.0	<0.1	104	102	50-150	2
Selenium	mg/L (ppm)	0.5	<1	102	104	50-150	2
Silver	mg/L (ppm)	0.5	<1	99	99	50-150	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	100	70-130
Barium	mg/L (ppm)	5.0	100	70-130
Cadmium	mg/L (ppm)	0.5	101	70-130
Chromium	mg/L (ppm)	2.0	94	70-130
Lead	mg/L (ppm)	1.0	102	70-130
Mercury	mg/L (ppm)	1.0	81	70-130
Selenium	mg/L (ppm)	0.5	102	70-130
Silver	mg/L (ppm)	0.5	99	70-130

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QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TCLP METALS USING
EPA METHOD 200.8 AND 40 CFR PART 261

Laboratory Code: 507195-40 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	99	98	50-150	1
Barium	mg/L (ppm)	5.0	<1	100	98	50-150	2
Cadmium	mg/L (ppm)	0.5	<1	101	100	50-150	1
Chromium	mg/L (ppm)	2.0	<1	99	99	50-150	0
Lead	mg/L (ppm)	1.0	<1	102	103	50-150	1
Mercury	mg/L (ppm)	1.0	<0.1	102	100	50-150	2
Selenium	mg/L (ppm)	0.5	<1	102	102	50-150	0
Silver	mg/L (ppm)	0.5	<1	96	98	50-150	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	97	70-130
Barium	mg/L (ppm)	5.0	100	70-130
Cadmium	mg/L (ppm)	0.5	100	70-130
Chromium	mg/L (ppm)	2.0	96	70-130
Lead	mg/L (ppm)	1.0	103	70-130
Mercury	mg/L (ppm)	1.0	97	70-130
Selenium	mg/L (ppm)	0.5	100	70-130
Silver	mg/L (ppm)	0.5	99	70-130

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP 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	115	117	54-149	2
Chloromethane	ug/L (ppb)	50	86	88	67-133	2
Vinyl chloride	ug/L (ppb)	50	87	90	70-119	3
Bromomethane	ug/L (ppb)	50	119	124	62-188	4
Chloroethane	ug/L (ppb)	50	97	99	66-149	2
Trichlorofluoromethane	ug/L (ppb)	50	121	121	70-132	0
Acetone	ug/L (ppb)	250	96	93	44-145	3
1,1-Dichloroethene	ug/L (ppb)	50	96	98	75-119	2
Hexane	ug/L (ppb)	50	92	92	51-153	0
Methylene chloride	ug/L (ppb)	50	28 vo	28 vo	63-132	0
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	118	119	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	104	104	76-118	0
1,1-Dichloroethane	ug/L (ppb)	50	100	101	80-116	1
2,2-Dichloropropane	ug/L (ppb)	50	134	136	62-141	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	102	80-112	1
Chloroform	ug/L (ppb)	50	104	105	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	98	99	53-140	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	103	105	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	122 vo	123 vo	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	107	105	78-112	2
Carbon tetrachloride	ug/L (ppb)	50	124	126	72-128	2
Benzene	ug/L (ppb)	50	94	93	81-108	1
Trichloroethene	ug/L (ppb)	50	103	104	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	96	97	82-109	1
Bromodichloromethane	ug/L (ppb)	50	107	108	76-120	1
Dibromomethane	ug/L (ppb)	50	104	106	80-110	2
4-Methyl-2-pentanone	ug/L (ppb)	250	126	123	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	109	110	76-128	1
Toluene	ug/L (ppb)	50	90	90	83-108	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	104	104	76-128	0
1,1,2-Trichloroethane	ug/L (ppb)	50	88	89	82-110	1
2-Hexanone	ug/L (ppb)	250	92	91	53-145	1
1,3-Dichloropropane	ug/L (ppb)	50	92	91	83-110	1
Tetrachloroethene	ug/L (ppb)	50	94	93	78-109	1
Dibromochloromethane	ug/L (ppb)	50	102	104	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	99	99	82-118	0
Chlorobenzene	ug/L (ppb)	50	90	89	84-108	1
Ethylbenzene	ug/L (ppb)	50	95	95	83-111	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	100	102	76-125	2
m,p-Xylene	ug/L (ppb)	100	95	96	84-112	1
o-Xylene	ug/L (ppb)	50	99	100	81-117	1
Styrene	ug/L (ppb)	50	104	104	83-121	0
Isopropylbenzene	ug/L (ppb)	50	107	109	81-122	2
Bromoform	ug/L (ppb)	50	97	98	40-161	1
n-Propylbenzene	ug/L (ppb)	50	89	88	81-115	1
Bromobenzene	ug/L (ppb)	50	92	89	80-113	3
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	97	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	81	81	79-118	0
1,2,3-Trichloropropane	ug/L (ppb)	50	85	84	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	91	90	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	94	93	81-113	1
tert-Butylbenzene	ug/L (ppb)	50	107	106	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	101	101	81-121	0
sec-Butylbenzene	ug/L (ppb)	50	99	98	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	100	100	81-122	0
1,3-Dichlorobenzene	ug/L (ppb)	50	91	89	82-110	2
1,4-Dichlorobenzene	ug/L (ppb)	50	90	88	81-105	2
1,2-Dichlorobenzene	ug/L (ppb)	50	88	88	83-111	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	103	97	62-133	6
1,2,4-Trichlorobenzene	ug/L (ppb)	50	99	97	77-117	2
Hexachlorobutadiene	ug/L (ppb)	50	100	99	70-116	1
Naphthalene	ug/L (ppb)	50	106	105	72-131	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	94	94	80-114	0

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ENVIRONMENTAL CHEMISTS

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP 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	108	110	25-158	2
Chloromethane	ug/L (ppb)	50	104	108	45-156	4
Vinyl chloride	ug/L (ppb)	50	106	104	50-154	2
Bromomethane	ug/L (ppb)	50	132	134	55-143	2
Chloroethane	ug/L (ppb)	50	120	122	58-146	2
Trichlorofluoromethane	ug/L (ppb)	250	123	120	50-150	2
Acetone	ug/L (ppb)	250	79	77	53-131	3
1,1-Dichloroethene	ug/L (ppb)	50	112	107	67-136	5
Hexane	ug/L (ppb)	50	103	100	57-137	3
Methylene chloride	ug/L (ppb)	50	44	40	39-148	10
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	105	103	64-147	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	114	111	68-128	3
1,1-Dichloroethane	ug/L (ppb)	50	109	108	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	116	120	55-143	3
cis-1,2-Dichloroethene	ug/L (ppb)	50	106	103	80-123	3
Chloroform	ug/L (ppb)	50	110	107	80-121	3
2-Butanone (MEK)	ug/L (ppb)	250	105	100	57-149	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	103	101	73-132	2
1,1,1-Trichloroethane	ug/L (ppb)	50	117	114	83-130	3
1,1-Dichloropropene	ug/L (ppb)	50	107	105	77-129	2
Carbon tetrachloride	ug/L (ppb)	50	129	125	75-158	3
Benzene	ug/L (ppb)	50	100	97	69-134	3
Trichloroethene	ug/L (ppb)	50	113	106	80-120	6
1,2-Dichloropropane	ug/L (ppb)	50	106	102	77-123	4
Bromodichloromethane	ug/L (ppb)	50	119	116	81-133	3
Dibromomethane	ug/L (ppb)	50	107	105	82-125	2
4-Methyl-2-pentanone	ug/L (ppb)	250	109	104	65-138	5
cis-1,3-Dichloropropene	ug/L (ppb)	50	115	112	82-132	3
Toluene	ug/L (ppb)	50	101	100	72-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	112	110	80-136	2
1,1,2-Trichloroethane	ug/L (ppb)	50	106	103	75-124	3
2-Hexanone	ug/L (ppb)	250	104	102	60-136	2
1,3-Dichloropropane	ug/L (ppb)	50	105	102	76-126	3
Tetrachloroethene	ug/L (ppb)	50	102	100	76-121	2
Dibromochloromethane	ug/L (ppb)	50	120	118	84-133	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	113	112	82-125	1
Chlorobenzene	ug/L (ppb)	50	98	97	83-114	1
Ethylbenzene	ug/L (ppb)	50	100	98	77-124	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	112	112	84-127	0
m,p-Xylene	ug/L (ppb)	100	102	100	83-125	2
o-Xylene	ug/L (ppb)	50	101	99	81-121	2
Styrene	ug/L (ppb)	50	106	105	84-119	1
Isopropylbenzene	ug/L (ppb)	50	103	102	85-117	1
Bromoform	ug/L (ppb)	50	123	122	74-136	1
n-Propylbenzene	ug/L (ppb)	50	104	101	74-126	3
Bromobenzene	ug/L (ppb)	50	105	102	80-121	3
1,3,5-Trimethylbenzene	ug/L (ppb)	50	106	105	78-123	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	107	108	66-126	1
1,2,3-Trichloropropane	ug/L (ppb)	50	101	99	67-124	2
2-Chlorotoluene	ug/L (ppb)	50	101	99	77-127	2
4-Chlorotoluene	ug/L (ppb)	50	103	100	78-128	3
tert-Butylbenzene	ug/L (ppb)	50	107	104	80-123	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	104	102	79-122	2
sec-Butylbenzene	ug/L (ppb)	50	106	104	80-125	2
p-Isopropyltoluene	ug/L (ppb)	50	106	104	81-123	2
1,3-Dichlorobenzene	ug/L (ppb)	50	101	100	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	99	97	84-121	2
1,2-Dichlorobenzene	ug/L (ppb)	50	99	98	85-116	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	114	114	57-141	0
1,2,4-Trichlorobenzene	ug/L (ppb)	50	105	104	72-130	1
Hexachlorobutadiene	ug/L (ppb)	50	112	110	53-141	2
Naphthalene	ug/L (ppb)	50	107	107	64-133	0
1,2,3-Trichlorobenzene	ug/L (ppb)	50	105	105	65-136	0

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP 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	44	50	10-84	13
Bis(2-chloroethyl) ether	ug/L (ppb)	10	93	96	52-113	3
2-Chlorophenol	ug/L (ppb)	10	85	96	50-110	12
1,3-Dichlorobenzene	ug/L (ppb)	10	86	87	45-109	1
1,4-Dichlorobenzene	ug/L (ppb)	10	85	87	44-118	2
1,2-Dichlorobenzene	ug/L (ppb)	10	85	87	46-116	2
Benzyl alcohol	ug/L (ppb)	10	80	91	42-100	13
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	86	90	51-124	5
2-Methylphenol	ug/L (ppb)	10	78	91	38-100	15
Hexachloroethane	ug/L (ppb)	10	89	90	42-117	1
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	89	92	48-124	3
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	71	84	40-105	17
Nitrobenzene	ug/L (ppb)	10	95	100	50-118	5
Isophorone	ug/L (ppb)	10	91	95	55-116	4
2-Nitrophenol	ug/L (ppb)	10	88	90	42-127	2
2,4-Dimethylphenol	ug/L (ppb)	10	77	89	11-135	14
Benzoic acid	ug/L (ppb)	65	24	19	10-110	23 vo
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	92	97	55-115	5
2,4-Dichlorophenol	ug/L (ppb)	10	90	97	55-113	7
1,2,4-Trichlorobenzene	ug/L (ppb)	10	86	88	50-109	2
Naphthalene	ug/L (ppb)	10	87	91	53-112	4
Hexachlorobutadiene	ug/L (ppb)	10	86	85	50-109	1
4-Chloroaniline	ug/L (ppb)	20	63	97	30-109	42 vo
4-Chloro-3-methylphenol	ug/L (ppb)	10	84	94	54-114	11
2-Methylnaphthalene	ug/L (ppb)	10	86	90	53-113	5
1-Methylnaphthalene	ug/L (ppb)	10	86	90	70-130	5
Hexachlorocyclopentadiene	ug/L (ppb)	10	90	91	10-121	1
2,4,6-Trichlorophenol	ug/L (ppb)	10	112	114	46-114	2
2,4,5-Trichlorophenol	ug/L (ppb)	10	103	110	57-122	7
2-Chloronaphthalene	ug/L (ppb)	10	101	104	52-112	3
2-Nitroaniline	ug/L (ppb)	10	102	109	47-128	7
Dimethyl phthalate	ug/L (ppb)	10	98	106	55-116	8
Acenaphthylene	ug/L (ppb)	10	103	108	52-112	5
2,6-Dinitrotoluene	ug/L (ppb)	10	108	116	49-126	7
3-Nitroaniline	ug/L (ppb)	20	82	103	21-125	23 vo
Acenaphthene	ug/L (ppb)	10	100	106	52-114	6
2,4-Dinitrophenol	ug/L (ppb)	10	98	95	29-130	3
Dibenzofuran	ug/L (ppb)	10	99	106	53-113	7
2,4-Dinitrotoluene	ug/L (ppb)	10	101	108	48-129	7
4-Nitrophenol	ug/L (ppb)	10	49	51	10-80	4
Diethyl phthalate	ug/L (ppb)	10	107	116	55-116	8
Fluorene	ug/L (ppb)	10	101	108	54-115	7
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	98	104	52-115	6
N-Nitrosodiphenylamine	ug/L (ppb)	10	94	101	51-112	7
4-Nitroaniline	ug/L (ppb)	20	83	92	42-115	10
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	100	101	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	10	96	101	53-114	5
Hexachlorobenzene	ug/L (ppb)	10	96	102	54-115	6
Pentachlorophenol	ug/L (ppb)	10	100	98	49-114	2
Phenanthrene	ug/L (ppb)	10	92	97	53-113	5
Anthracene	ug/L (ppb)	10	95	100	56-119	5
Carbazole	ug/L (ppb)	10	91	93	54-115	2
Di-n-butyl phthalate	ug/L (ppb)	10	102	106	54-115	4
Fluoranthene	ug/L (ppb)	10	96	100	55-116	4
Pyrene	ug/L (ppb)	10	105	109	54-121	4
Benzyl butyl phthalate	ug/L (ppb)	10	110	114	53-122	4
Benz(a)anthracene	ug/L (ppb)	10	91	95	52-114	4
Chrysene	ug/L (ppb)	10	89	94	54-119	5
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	111	117	54-122	5
Di-n-octyl phthalate	ug/L (ppb)	10	125	131	50-131	5
Benzo(a)pyrene	ug/L (ppb)	10	117	125 vo	54-120	7
Benzo(b)fluoranthene	ug/L (ppb)	10	123 vo	130 vo	46-118	6
Benzo(k)fluoranthene	ug/L (ppb)	10	124	130 vo	56-125	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	118	126 vo	52-120	7
Dibenz(a,h)anthracene	ug/L (ppb)	10	112	121	54-122	8
Benzo(g,h,i)perylene	ug/L (ppb)	10	123 vo	133 vo	54-118	8

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

Laboratory Code: 507195-36/37 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	60	71	50-150	17
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	64	77	50-150	18

Laboratory Code: 507195-42/44 (Matrix Spike) 1/25,000

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<100	20 ip	40 ip	50-150	67 ip
Aroclor 1260	mg/kg (ppm)	0.8	<100	140	140	50-150	0

Laboratory Code: 507195-47/48 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	100	66	50-150	41 vo
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	110	71	50-150	43 vo

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	75	77	55-130	3
Aroclor 1260	mg/kg (ppm)	0.8	82	84	58-133	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

Laboratory Code: 507195-17/14 (Matrix Spike) 1/250 and 1/25,000

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<10	200 ip	0 d ip	50-150	nm
Aroclor 1260	mg/kg (ppm)	0.8	<10	100	0 d ip	50-150	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	78	70	55-130	11
Aroclor 1260	mg/kg (ppm)	0.8	76	73	58-133	4

Date of Report: 08/07/15
Date Received: 07/14/15
Project: Anacortes WTP, F&BI 507195

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

Laboratory Code: 507267-04 (Matrix Spike) 1/5

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.02	77	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.02	87	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	86	84	55-130	2
Aroclor 1260	mg/kg (ppm)	0.8	85	82	58-133	4

Date of Report: 08/07/15
Date Received: 07/14/15
Project: Anacortes WTP, F&BI 507195

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

Laboratory Code: 507195-73 (Matrix Spike) 1/250

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<1	0 d	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<1	0 d	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	85	80	55-130	6
Aroclor 1260	mg/kg (ppm)	0.8	95	89	58-133	7

Date of Report: 08/07/15
Date Received: 07/14/15
Project: Anacortes WTP, F&BI 507195

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

Laboratory Code: 507195-62 (Matrix Spike) 1/2,500

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<10	300 ip d	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<10	830 ip d	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	67	66	55-130	2
Aroclor 1260	mg/kg (ppm)	0.8	78	76	58-133	3

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ENVIRONMENTAL CHEMISTS

Date of Report: 08/07/15
Date Received: 07/14/15
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**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WIPE 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/wipe	100	81	79	70-130	2
Aroclor 1260	ug/wipe	100	79	80	70-130	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.

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SAMPLE CHAIN OF CUSTODY

ME 07-14-15

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PROJECT NAME/NO. ANACORTES WTP

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REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TCLP VOC	TCLP SVOC	TCLP RCRA METALS			Notes
SB-CONC-13	01	7/13	0920	GRAB-DUST	1							X						
SB-SED-08	02	7/13	1350	GRAB	1							X						
SB-CONC-27	03	7/13	1440	GRAB-DUST	1							X						
SB-SED-09	04	7/14	0750	GRAB	1							X						
SB-SED-06	05	7/13	1330	GRAB	1							X						
SB-CONC-28	06	7/13	1450	GRAB-DUST	1							X						
SB-CONC-24	07	7/13	1410	GRAB-DUST	1							X						
SB-CONC-26	08	7/13	1430	GRAB-DUST	1							X						
SB-CONC-23	09	7/13	1400	GRAB-DUST	1							X						
SB-CONC-30	10	7/13	1510	GRAB-DUST	1							X						

Samples received at 8 °C

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Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	RICHARD MALCOL	MWH	7/14/15	1330
Received by:	VINH	FBI	7/14/15	1330
Relinquished by:	VINH	FBI	7/14/15	1510
Received by:	Nhan Phan	FeBI	7/14/15	1510

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SAMPLE CHAIN OF CUSTODY

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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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	Notes
SB-SED-08	11	7/10	1420	GRAB	1							X	
SB-SED-03	12	7/10	1410	GRAB	1							X	
SB-SED-04	13	7/10	1415	GRAB	1							X	
SB-SEAL-MSD	14	7/13		GRAB	1							X	QC MSD
SB-SEAL-02(RESIN)	15	7/13	1030	GRAB	1							X	
SB-FIBWIPE-02	16	7/13	1348	WIPE	1							X	
SB-SEAL-MS	17	7/13		GRAB	1							X	QC MS
SB-CONC-18	18	7/13	1010	GRAB-DUST	1							X	
SB-CONC-32	19	7/14	~~0809~~ 0800	GRAB-DUST	1							X	
SB-CONC-33	20	7/14	0810	GRAB-DUST	1							X	Samples received at 8 °C

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Relinquished by:		Richard Malcolm	MWH	7/14/15	1330
Received by:		VINH	FBI	7/14/15	1330
Relinquished by:		VINH	FBI	7/14/15	1510
Received by:		Nhan Phan	FeBI	7/14/15	1510

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TURNAROUND TIME
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- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☑ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs						Notes
SB-CONC-34	21	7/14	0820	GRAB-DUST	1							X						
SB-CONC-35	22	7/14	0830	GRAB-DUST	1							X						
SB-CONC-36	23	7/14	0840	GRAB-DUST	1							X						
SB-CORK-03	24	7/14	0900	GRAB	1							X						
SB-SEALB-03	25	7/14	0930	GRAB	1							X						
SB-SEAL-04	26	7/14	0940	GRAB	1							X						
SB-SEALC-03	27	7/14	0950	GRAB	1							X						
SB-CAULK-01	28	7/14	1000	GRAB	1							X						
SB-CORK-04	29	7/14	1010	GRAB	1							X						
SB-CONC-37	30	7/14	1020	GRAB-DUST	1							X						Samples received at 8 °C

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Relinquished by:	Richard Malcolm	MWH	7/14/15	1330
Received by:	VINH	FBI	7/14/15	1331
Relinquished by:	VINH	FBI	7/14/15	1510
Received by:	Nhan Phan	FBI	7/14/15	1510

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SAMPLE CHAIN OF CUSTODY

ME 07-14-15

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TURNAROUND TIME
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☐ RUSH
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SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☑ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TCLP VOC	TCLP SVOC	TCLP RCRA METALS	TOTAL LEAD		Notes
SB-CONC-31	31	7/13	1520	GRAB-DUST	1							X						
SB-CONC-25	32	7/13	1420	GRAB-DUST	1							X						
SB-CONC-29	33	7/13	1500	GRAB-DUST	1							X						
SB-SED-07	34	7/13	1340	GRAB	1							X						
SB-CONC-DUP3	35	7/13	1400	GRAB-DUST	1							X						QC DUPLICATE
SB-CONC-MSD2	36	7/13	1400	GRAB-DUST	1							X						QC MSD
SB-CONC-MS2	37	7/13	1400	GRAB-DUST	1							X						QC-MS
SB-CONC-16	38	7/13	0950	GRAB-DUST	1							X						
SB-CONC-07	39	7/13	0820	GRAB-DUST	1							X						Samples received at 8 °C
SB-CONC-21	40 A-B	7/13	1040	GRAB-DUST	2							X	X	X	X	X		

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TURNAROUND TIME
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☐ RUSH
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SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs						Notes
SB-INTPC-01	41	7/13	1400	GRAB/CHIP	1							X						
SB-CORK-MSD	42	7/13		GRAB	1							X						QC-MSD
SB-CONC-22	43	7/13	1050	GRAB-DUST	1							X						
SB-CORK-MS	44	7/13		GRAB	1							X						QC-MS
SB-CONC-05	45	7/13	0800	GRAB-DUST	1							X						
SB-CONC-06	46	7/13	0810	GRAB-DUST	1							X						
SB-CONC-MS	47	7/13		GRAB DUST	1							X						QC-MS
SB-CONC-MSD	48	7/13		GRAB-DUST	1							X						QC-MSD
SB-CONC-10	49	7/13	0850	GRAB-DUST	1							X						
SB-SEALC-02	50	7/13	1030	GRAB	1							X						

Samples received at 8 °C

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	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		RICHARD MALCOLM	MWH	7/14/15	1330
Received by:		VINH	FBI	7/14/15	1330
Relinquished by:		VINH	FBI	7/14/15	1510
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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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TCLP VOC	TCLP SVOC	TCLP RCRA METALS	TOTAL LEAD		Notes
SB-CORK-02	51	7/13	1025	GRAB	1							X						
SB-CONC-11	52	7/13	0900	GRAB-DUST	1							X						
SB-CONC-12	53	7/13	0910	GRAB-DUST	1							X						
SB-CONC-14	54	7/13	0930	GRAB-DUST	1							X						
SB-CONC-DUP	55	7/13		GRAB-DUST	1							X						QC DUPLICATE
SB-CONC-15	56	7/13	0940	GRAB-DUST	1							X						
SB-SEALA-01	57	7/13	0930	GRAB	1							X						
SB-CORK-DUP	58	7/13		GRAB	1							X						QC DUPLICATE
SB-PIBWIPE-01	59	7/13	0805	WIPE	1							X						Samples received at 8 °C
SB-CORK-01	60 A-B	7/13	0925	GRAB	2							X	X	X	X	X		

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Received by:	[signature]	VINH	FBI	7/14/15	1330
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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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TCLP VOC	TCLP SVOC	TCLP RCRA METALS	TOTAL LEAD		Notes
SB-SEAL-01	61 A-B	7/13	0930	GRAB	2							X	X	X	X	X		
SB-SEAL-MS	62	7/13		GRAB	1							X						QC MS
SB-SEAL-DUP	63	7/13		GRAB	1							X						QC DUPLICATE
SB-SEALB-01	64	7/13	0930	GRAB	1							X						
SB-SEALC-01	65	7/13	0930	GRAB	1							X						
SB-CONC-09	66	7/13	0840	GRAB-DUST	1							X						
SB-CONC-17	67	7/13	1000	GRAB-DUST	1							X						
SB-CONC-19	68	7/13	1020	GRAB-DUST	1							X						
SB-CONC-08	69	7/13	0830	GRAB-DUST	1							X						
SB-CONC-20	70	7/13	1030	GRAB-DUST	1							X						

Samples received at 8 °C

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Received by:	VINH	FBI	7/14/15	1330
Relinquished by:	VINH	FBI	7/14/15	1510
Received by:	Nhan Phan	FeBI	7/14/15	1510

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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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	TCLP VOC	TCLP SVOC	TCLP RCRA METALS	TOTAL LEAD		Notes
SB-CONC-38	71	7/14	1030	GRAB-DUST	1							X						
SB-CONC-39	72	7/14	1040	GRAB-DUST	1							X						
SB-CONC-40	73	7/14	1050	GRAB-DUST	1							X						
SB-CAULK-03	74	7/14	1000	GRAB	1							X						
SB-SED-~~0~~1	75	7/14	1030	GRAB	1							X	X	X	X	X		IF NOT ENOUGH VOL. CALL FOR ASSISTANCE
SB-CAULK-02	76	7/14	1010	GRAB	1							X						
SB-SEALA-03	77	7/14	0950	GRAB	1							X						
SB-~~INTGP~~ INTPC-02	78	7/14	1100	GRAB	1							X						
FB-PGCONC-01	79A B	7/14	1050	GRAB-DUST	2							X	X	X	X	X		
FB-~~PG~~CONC-02	80	7/14	1100	GRAB-DUST	1							X						

per CH estate 7/31/15 ME

Samples received at 8 °C

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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
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Received by: [signature]	VINH	FBI	7/14/15	1330
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☒ 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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs	Total Pb	RCRA TCLP Metals				Notes
FB-YGLANL-DUP	81	7/14	1110	GRAB-DUST	1							X						
AB-SEAL-07	82	7/14	1120	GRAB	1							X						
AB-SEAL-09	83	7/14	1120	GRAB	1							X						
AB-SEAL-10	84	7/14	1120	GRAB	1							X						
PC-07	85 A/B	7/14	12:30	GRAP	2							X	X	X				
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Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]	Richard Malcom	MWH	7/14/15	1330
Received by:	[signature]	VINH	FBI	7/14/15	1330
Relinquished by:	[signature]	VINH	FBI	7/14/15	1510
Received by:	[signature]	Nhan Phan	FeBI	7/14/15	1510

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Appendix D2. Initial Investigation Third Party Data Validation Summary

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INITIAL INVESTIGATION DATA VALIDATION REPORT – SEPTEMBER 17, 2015

Five samples delivery groups (SDGs – 507113, 507132, 507133, 507154 and 507195) resulting from the Initial Investigation were reviewed by a third party validator (Laboratory Data Consultants, Inc.) for precision, accuracy, representativeness, completeness, and comparability.

The following is a summary of the data quality evaluation and qualification of the sample results. The Data Validation Report from Laboratory Data Consultants, Inc. is included after this summary. Based on professional judgment, the data associated with these SDGs are usable for their intended purpose with the recommended flag.

Precision is assessed through the calculation of relative percent difference (RPD) and relative standard deviations (RSD) measured through field duplicate samples, split samples, and laboratory duplicate samples. The following is a summary of the quality control sample results that did not meet the criteria established in the Project QAPP.

Qualifiers Based on Duplicate Analyses

SDG	Sample	Compound	LDC Flag	Recommended Flag
507113	AB-SEAL-01 and AB-SEAL-01-DUP	Aroclor 1254	J (all detects)	J
507113	SB-EXPC-02 and SB-EXPC-DUP	Aroclor-1254 Aroclor-1260	J (all detects)	J
507132	FB-CONC-02 and FB-CONC-DUP	Aroclor-1016	J (all detects) R (non-detects)	None
507132	FB-CONC-02 and FB-CONC-DUP	Aroclor-1265	J (all detects)	J
507132	WF-SED-03 and WF-SED-DUP	Aroclor-1254	J (all detects) R (non-detects)	None
507132	SB-SED-01 and SB-SED-DUP	Aroclor-1254	J (all detects) R (non-detects)	None
507195	SB-CORK-DUP and SB-CORK-01	Aroclor-1248	J (all detects)	J
507195	SB-SEAL-DUP and SB-SEALC-01	Aroclor-1016	J (all detects) R (non-detects)	None
507195	SB-SEAL-DUP and SB-SEALC-01	Aroclor-1248	J (all detects)	J

Based on professional judgment, RPDs between results in which a one result is non-detect and the other is a detection should not be calculated and results not qualified due to the fact that non-detect results are reported at the reporting limit which in many instances can be greater than the actual concentration reported in the duplicate sample.

Qualifiers Based on RPD between primary and secondary columns

SDG	Sample	Compound	LDC Flag	Recommended Flag
507113	AB-SEAL-06	Aroclor 1254	J (all detects)	J

Accuracy in the laboratory is assessed through the analysis percent recoveries (%R) and percent differences (%D) of matrix spike (MS) and Matrix Spike Duplicates (MSD), surrogate recoveries, laboratory control samples (LCS) and calibration criteria.

INITIAL INVESTIGATION DATA VALIDATION REPORT – SEPTEMBER 17, 2015

Qualifiers Based on Continuing Calibration

SDG	Sample	Compound	LDC Flag	Recommended Flag
507113	SB-EXPC-08 AB-SEAL-04 AB-SEAL-02 FB-EXPC-03 FB-EXPC-DUP FB-EXPC-04 AB-SEAL-08 FBEXPC-02	Aroclor-1016 Aroclor-1221 Aroclor-1232	R (non-detects)	J (non-detects)
507113	SB-EXPC-01 SB-EXPC-06	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248	R (non-detects)	J (non-detects)
507113	SB-EXPC-01 SB-EXPC-06	Aroclor-1254 Aroclor-1260	J (all detects)	J
507132	FB-ANTH-02 FB-ANTH-DU	Aroclor-1016 Aroclor-1221 Aroclor-1232	R (non-detects)	J (non-detects)
507132	FB-SAND-002 FB-BED-02	All TCL compounds	R (non-detects) J (all detects)	J
507132	FB-INPC-03 FB-ANTH-04 FB-SAND-DUP FB-CONC-02 FB-CONC-03	Aroclor-1016 Aroclor-1221 Aroclor-1232	R (non-detects)	J (non-detects)
507154	CW-CONC-06 CW-CONC-07 CW-CONC-08 CW-CONC-09 CW-CONC-10 CW-CONC-DUP CW-SED-01 CW-SED-03 CW-SED-04 CW-SED-05 CW-SED-06 CW-SED-DUP	All TCL compounds	J (all detects) R (non-detects)	J
507154	WF-CONC-DUP WF-SED-DUP CW-CONC-01 CW-CONC-02 CW-CONC-03 CW-CONC-04 CW-CONC-05 SB-STEELWIPE-01 SB-SED-01 SB-CONC-01	All TCL compounds	R (non-detects)	J (non-detects)

	SB-CONC-02 SB-CONC-DUP SB-CNC-04 SB-SED-02 SB-CONC-03			
507154	WF-SED-01 WF-SED-02 WF-SED-03 WF-SED-04	Aroclor-1016 Aroclor-1221 Aroclor-1232	R (non-detects)	J (non-detects)
507195	SB-CONC-29 SB-SED-07 SB-CONC-DUP3 SB-CONC-16 SB-CONC-07 SB-CONC-21 SB-INTPC-01 SB-CONC-22 B-CONC-06 SB-CONC-10 SB-SEALC-02 SB-CORK-02 SB-CONC-005	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) R (non-detects)	J
507195	SB-CONC-11 SB-CONC-12 SB-CONC-14 SB-CONC-DUP SB-CONC-15 SB-CONC-09 SB-CONC-17 SB-CONC-31 SB-CONC-25 SB-SEAL-04 SB-CORK-04 SB-CORK-02 SB-CONC-11 SB-CORK-DUP AB-SEAL-10 PC-07	Aroclor-1016 Aroclor-1221 Aroclor-1232	R (non-detects)	J (non-detects)
507195	SB-SEALA-01 SB-CORK-DUP SB-CORK-01 SB-SEAL-01 SB-CONC-08 SB-CONC-38 SB-SEAL-DUP SB-SEALB-01 SB-SEALC-01 SB-CONC-19 SB-CONC-20 SB-CONC-39	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) R (non-detects)	J

INITIAL INVESTIGATION DATA VALIDATION REPORT – SEPTEMBER 17, 2015

Based on professional judgment, final data qualifier is "J" as estimated. The failures of the CCV were on the rear column and the method reports results from the primary columns. In addition, results were non-detect on both columns and high biased non-detects are not qualified. The CCV before and after the CCV that had %Ds outside of acceptance criteria were acceptable and appeared to be run within the 12 hour window.

Representativeness is determined by adherence to holding times, sample preservation, and blank analysis.

Completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. Based on the recommended flags, data would not be rejected and therefore data would be considered 100% complete with no quality control issues encountered.

Comparability was achieved by analyzing the samples according to the specified standard methods. The laboratory used USEPA methods for the analysis of the samples.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Foster Pepper
1111 3rd Avenue, #3400
Seattle, Washington
98101-3299
ATTN: Mr. Ken Lederman

September 17, 2015

SUBJECT: Anacortes WTP, Data Validation

Dear Mr. Lederman,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on August 24, 2015. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #34880:

SDG #	Fraction
507113, 507132, 507133, 507154, 507195	Polychlorinated Biphenyls

The data verification was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington, June 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng

Pei Geng
Project Manager/Senior Chemist

Attachment 1

Level IV

LDC #34880 (Foster Pepper - Seattle, WA / Anacortes WTP)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PCBs (8082A)																																
Matrix: Water/Soil/Wipe				W	S	WP	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	507113	08/24/15	09/15/15	1	27	1																														
B	507132	08/24/15	09/15/15	0	28	4																														
C	507133	08/24/15	09/15/15	0	1	4																														
D	507154	08/24/15	09/15/15	1	42	2																														
E	507195	08/24/15	09/15/15	0	74	2																														
Total	A/PG			2	172	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	187

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: September 3, 2015

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedmand & Bruya, Inc.

Sample Delivery Group (SDG): 507113

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-EXPC-08	507113-01	Soil	07/07/15
AB-SEAL-04	507113-02	Soil	07/07/15
AB-SEAL-02	507113-03	Soil	07/07/15
AB-SEAL-05	507113-06	Soil	07/07/15
AB-SEAL-01	507113-07	Soil	07/07/15
AB-SEAL-DUP	507113-08	Soil	07/07/15
AB-SEAL-03	507113-10	Soil	07/07/15
AB-SEAL-06	507113-11	Soil	07/07/15
SB-EXPC-DUP	507113-12	Soil	07/07/15
SB-EXPC-05	507113-13	Soil	07/07/15
SB-EXPC-03	507113-15	Soil	07/07/15
SB-EXPC-01	507113-16	Soil	07/07/15
SB-EXPC-06	507113-17	Soil	07/07/15
SB-EXPC-02	507113-18	Soil	07/07/15
SB-EXPC-07	507113-19	Soil	07/07/15
AB-SEAL-08	507113-20	Soil	07/07/15
FB-EXPC-01	507113-27	Soil	07/07/15
FB-EXPC-02	507113-28	Soil	07/07/15
FB-EXPC-03	507113-31	Soil	07/07/15
FB-EXPC-DUP	507113-32	Soil	07/07/15
FB-EXPC-04	507113-33	Soil	07/07/15
SB-EXPC-04	507113-34	Soil	07/07/15
RINS-01	507113-35	Water	07/08/15
FB-BED-01	507113-36	Soil	07/08/15
FB-ANTH-01	507113-37	Soil	07/08/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
FB-SAND-01	507113-38	Soil	07/08/15
FB-FIBWIPE-01	507113-39	Wipe	07/08/15
FB-CONC-01	507113-40	Soil	07/08/15
FB-INCP-01	507113-41	Soil	07/08/15
AB-SEAL-MS	507113-14	Soil	07/07/15
AB-SEAL-MSD	507113-09	Soil	07/07/15
SB-EXPC-08 MS	507113-05	Soil	07/07/15
SB-EXPC-08 MSD	507113-04	Soil	07/07/15
FB-EXPC-02-MS	507113-30	Soil	07/07/15
FB-EXPC-02-MSD	507113-29	Soil	07/07/15
FB-SAND-01MS	507113-38MS	Soil	07/08/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/13/15	071306	Rear	Aroclor-1016	29.9	SB-EXPC-08 AB-SEAL-04 AB-SEAL-02	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
07/14/15	071422	Rear	Aroclor-1016	38.2	FB-EXPC-03 FB-EXPC-DUP FB-EXPC-04 SB-EXPC-04	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
07/16/15	071523	Rear	Aroclor-1016 Aroclor-1260	40.4 20.5	SB-EXPC-01 SB-EXPC-06	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
07/16/15	071523	Rear	Aroclor-1016 Aroclor-1260	40.4 20.5	SB-EXPC-01 SB-EXPC-06	Aroclor-1254 Aroclor-1260	J (all detects) J (all detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/16/15	071603	Rear	Aroclor-1016	38.8	AB-SEAL-08 FB-EXPC-02	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample RINS-01 was identified as a rinsate. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for sample AB-SEAL-MS/MSD, SB-EXPC-08 MS/MSD, and FB-EXPC-02-MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples AB-SEAL-01 and AB-SEAL-DUP, samples SB-EXPC-DUP and SB-EXPC-02, and samples FB-EXPC-DUP and FB-EXPC-04 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	AB-SEAL-01	AB-SEAL-DUP			
Aroclor-1254	500	160	103 (≤20)	J (all detects)	A

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	SB-EXPC-DUP	SB-EXPC-02			
Aroclor-1254	7800	1400	139 (≤20)	J (all detects)	A
Aroclor-1260	9100	1300	150 (≤20)	J (all detects)	A

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	FB-EXPC-DUP	FB-EXPC-04			
Aroclor-1254	14000	15000	7 (≤20)	-	-
Aroclor-1260	10000	11000	10 (≤20)	-	-

X. Compound Quantitation

All compound quantitations met validation criteria.

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
AB-SEAL-06	Aroclor-1254	47	J (all detects)	A

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 507113	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, field duplicates RPD, RPD between two columns, and compounds reported below the RL, data were qualified as estimated in twenty-nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 507113

Sample	Compound	Flag	A or P	Reason
SB-EXPC-08 AB-SEAL-04 AB-SEAL-02 FB-EXPC-03 FB-EXPC-DUP FB-EXPC-04 SB-EXPC-04 AB-SEAL-08 FB-EXPC-02	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)
SB-EXPC-01 SB-EXPC-06	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)
SB-EXPC-01 SB-EXPC-06	Aroclor-1254 Aroclor-1260	J (all detects) J (all detects)	A	Continuing calibration (%D)
AB-SEAL-01 AB-SEAL-DUP	Aroclor-1254	J (all detects)	A	Field duplicates (RPD)
SB-EXPC-DUP SB-EXPC-02	Aroclor-1254 Aroclor-1260	J (all detects) J (all detects)	A	Field duplicates (RPD)
AB-SEAL-06	Aroclor-1254	J (all detects)	A	Compound quantitation (RPD between two columns)

Sample	Compound	Flag	A or P	Reason
SB-EXPC-08 AB-SEAL-04 AB-SEAL-02 AB-SEAL-05 AB-SEAL-01 AB-SEAL-DUP AB-SEAL-03 AB-SEAL-06 SB-EXPC-DUP SB-EXPC-05 SB-EXPC-03 SB-EXPC-01 SB-EXPC-06 SB-EXPC-02 SB-EXPC-07 AB-SEAL-08 FB-EXPC-01 FB-EXPC-02 FB-EXPC-03 FB-EXPC-DUP FB-EXPC-04 SB-EXPC-04 RINS-01 FB-BED-01 FB-ANTH-01 FB-SAND-01 FB-FIBWIPE-01 FB-CONC-01 FB-INCP-01	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 507113

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 507113

No Sample Data Qualified in this SDG

LDC #: 34880A3b

SDG #: 507113

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/26/15

Page: 1 of 2

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r² ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	R = 23
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS /D
IX.	Field duplicates	SW	D = 5/6 ; 9/14 ; 20/21
X.	Compound quantitation/RL/LOQ/LODs	SW	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB-EXPC-08	507113-01	Soil	07/07/15
2	~~WB-SEAG-04~~ AB-SEAL-04	507113-02	Soil	07/07/15
3	AB-SEAL-02	507113-03	Soil	07/07/15
4	AB-SEAL-05	507113-06	Soil	07/07/15
5	AB-SEAL-01 D1	507113-07	Soil	07/07/15
6	AB-SEAL-DUP D1	507113-08	Soil	07/07/15
7	AB-SEAL-03	507113-10	Soil	07/07/15
8	AB-SEAL-06	507113-11	Soil	07/07/15
9	SB-EXPC-DUP D2	507113-12	Soil	07/07/15
10	SB-EXPC-05	507113-13	Soil	07/07/15
11	SB-EXPC-03	507113-15	Soil	07/07/15
12	SB-EXPC-01	507113-16	Soil	07/07/15
13	SB-EXPC-06	507113-17	Soil	07/07/15
14	SB-EXPC-02 D2	507113-18	Soil	07/07/15
15	SB-EXPC-07	507113-19	Soil	07/07/15
16	AB-SEAL-08	507113-20	Soil	07/07/15
17	FB-~~W~~EXPC-01	507113-27	Soil	07/07/15

LDC #: 34880A3b

SDG #: 507113

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 08/26/15

Page: 2 of 2

Reviewer: JVG

2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID	Lab ID	Matrix	Date
18	FB-~~W~~EXPC-02	507113-28	Soil	07/07/15
19	FB-WXPC-03	507113-31	Soil	07/07/15
20	FB-WXPC-DUP D3	507113-32	Soil	07/07/15
21	FB-WXPC-04 D3	507113-33	Soil	07/07/15
22	SB-EXPC-04	507113-34	Soil	07/07/15
23 4	RINS-01	507113-35	Water	07/08/15
24	FB-BED-01	507113-36	Soil	07/08/15
25	FB-ANTH-01	507113-37	Soil	07/08/15
26	FB-SAND-01	507113-38	Soil	07/08/15
27 3	FB-FIBWIPE-01	507113-39	Wipe	07/08/15
28	FB-CONC-01	507113-40	Soil	07/08/15
29	FB-INCP-01	507113-41	Soil	07/08/15
30 1	AB-SEAL-MS	507113-14	Soil	07/07/15
31 1	AB-SEAL-MSD	507113-09	Soil	07/07/15
32 1	SB-EXPC-08 MS	507113-05	Soil	07/07/15
33 1	SB-EXPC-08 MSD	507113-04	Soil	07/07/15
34 2	FB-~~W~~EXPC-02-MS	507113-30	Soil	07/07/15
35 2	FB-~~W~~EXPC-02-MSD	507113-29	Soil	07/07/15
36 3	~~FB~~ - 26MS	-38MS		07/08/15
37				
38				
39				
40				

Notes:

1	05-1416 MB							
2	05-1417							
3	05-1433							
4	05-1434							

Note: Print outs showed results ~~after~~ after JVG manual integration.

LDC #: 34880A3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: Q

Method: ✓ GC ______ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?		✓		
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 34880A1b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	/			
Were target compounds detected in the field duplicates?	/			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	/			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			

LDC #: 34880A36

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only

Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	07/13/15	071306	~~Sig~~ Rear	V (+)	29.9	( )	1-3 (ND)	J/UJR/A
						( )		
						( )		
	07/14/15	071403		V (+)	37.3	( )	05-1416 MB, 05-1417 MB	
						( )		
						( )		
	07/14/15	071422		V (+)	38.2	( )	19-22, 34 (ND)	
						( )		
						( )		
	07/16/15	071523		V (+)	40.4	( )	12, 13 (ND)	
				BB (+)	20.5	( )	(ND - Y, Z)	
						( )	(Det - AA, BB)	
						( )		
	07/16/15	071603		V (+)	38.8	( )	16, 18, 35 (ND)	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

V = ~~also~~ qual V, W, X

BB = ~~also~~ qual Y, Z, AA, BB

LDC #: 34880A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JVG
2nd Reviewer: 9

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?

Y N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	1, 9-15, 17-22	NS	A	0 (30-150)	No qual (dil)
				( )	
				( )	
	(100 - 10,000x)			( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 34880A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: CL

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	30/31	V	0 (29-135)	0 (29-135)	( )	8	No qual (dil)
	(5000X)	BB	( )	( )	( )		
			( )	( )	( )		
	32/33	V	( )	( )	( )	1	
	(25000X)	B	( )	( )	( )		
			( )	( )	( )		
	34/35	V	( )	( )	( )	18	
	(250000X)	B	( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 34880A3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: ~~ ~~

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	5	6		
Aroclor 1254	500	160	103	Jdets/A

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	9	14		
Aroclor 1254	7800	1400	139	Jdets/A
Aroclor 1260	9100	1300	150	Jdets/A

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	20	21		
Aroclor 1254	14000	15000	7	
Aroclor 1260	10000	11000	10	

LDC #: 39880 A3b

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Aroclor 1254	8	47	J dets /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: _34880A3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page:_1_of_1_
Reviewer:__JVG__
2nd Reviewer:__Q__

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0429	4/29/2015	1260-2 (Signal 1)	NR	4.33E+07	4.96E+07	4.96E+07	18.5	18.3
			1260-2 (Signal 2)	NR	2.10E+08	2.01E+08	2.01E+08	12.3	12.3
2	ICAL pcb0721	7/21/2015	1260-1 (Signal 1)	NR	4.31E+07	4.94E+07	4.94E+07	16.3	16.3
			1260-1 (Signal 2)	NR	1.60E+08	1.99E+08	1.99E+08	18.4	18.4

LDC # _34880A3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:_Q_

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	071306	7/13/2015	1260 Total (Chan A)	1.000	0.885	0.885	NR	11.5
	(pcb0429)		1260 Total (Chan B)	1.000	1.061	1.061	NR	6.1
2	071316	7/13/2015	1260 Total (Chan A)	5.000	4.830	4.829	NR	3.4
			1260 Total (Chan B)	5.000	5.317	5.319	NR	6.4
3	071326	7/14/2015	1260 Total (Chan A)	1.000	0.971	0.971	NR	2.9
			1260 Total (Chan B)	1.000	1.011	1.011	NR	1.1
4	071403	7/14/2015	1260 Total (Chan A)	1.000	1.064	1.064	NR	6.4
			1260 Total (Chan B)	1.000	1.175	1.174	NR	17.4
5	071412	7/14/2015	1260 Total (Chan A)	5.000	4.799	4.798	NR	4.0
			1260 Total (Chan B)	5.000	5.369	5.370	NR	7.4
6	071422	7/14/2015	1260 Total (Chan A)	1.000	0.986	0.986	NR	1.4
			1260 Total (Chan B)	1.000	1.192	1.192	NR	19.2
7	071513	7/15/2015	1260 Total (Chan A)	5.000	4.760	4.759	NR	4.8
			1260 Total (Chan B)	5.000	5.572	5.574	NR	11.5
8	071523	7/15/2015	1260 Total (Chan A)	1.000	0.970	0.970	NR	3.0
			1260 Total (Chan B)	1.000	1.205	1.206	NR	20.6

LDC # _34880A3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:_Q_

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
9	071603	7/16/2015	1260 Total (Chan A)	1.000	0.981	0.981	NR	1.9
			1260 Total (Chan B)	1.000	1.167	1.167	NR	16.7
10	072015	7/20/2015	1260 Total (Chan A)	5.000	5.219	5.218	NR	4.4
			1260 Total (Chan B)	5.000	5.248	5.250	NR	5.0
11	072203 (pcb0721)	7/22/2015	1260 Total (Chan A)	1.000	0.894	0.894	NR	10.6
			1260 Total (Chan B)	1.000	0.925	0.925	NR	7.5
12	072232	7/22/2015	1260 Total (Chan A)	5.000	4.462	4.462	NR	10.8
			1260 Total (Chan B)	5.000	4.144	4.144	NR	17.1
13	072303	7/22/2015	1260 Total (Chan A)	1.000	0.908	0.908	NR	9.2
			1260 Total (Chan B)	1.000	0.869	0.869	NR	13.1

LDC #: 34880 A7b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: 9

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Y	Sig 1	0.02	0.01	50	50	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 34880A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

RPD =((({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

MS/MSD samples: 34 /3C (250000X)

Compound	Spike Added (ug/Kg)		Sample Conc. (ug/Kg)	Spike Sample Concentration (ug/Kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	4.2	4.2	15000	0	0	0	0	0	0	0	0

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLCNew.wpd

LDC #: 34880A3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =((({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 05- 1416 LCS/D

Compound		Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
		LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline	(8015)										
Diesel	(8015)										
Benzene	(8021B)										
Methane	(RSK-175)										
2,4-D	(8151)										
Dinoseb	(8151)										
Naphthalene	(8310)										
Anthracene	(8310)										
HMX	(8330)										
2,4,6-Trinitrotoluene	(8330)										
Phorate	(8141A)										
Malathion	(8141A)										
Formaldehyde	(8315A)										
1260	(8082A)	0.833	0.833	0.672	0.743	81	81	89	89	9	10

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34880 A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd Reviewer: q

METHOD: ~~GC~~ __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y ~~N~~ N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name 1260

1260-2

Concentration = $\frac{(206.5e6)}{(4.96e7)}$ = 4.163

1260 total = $\frac{10.319 + 4.168 + 4.224 + 5.209 + 3.420}{5}$ = 5.467

final conc. = $\frac{(5.467)(5)(5000)}{(30g)(0.99)}$ = 4601.9 mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
			4600		

Comments:

SAMPCALCnew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: September 3, 2015

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedmand & Bruya, Inc.

Sample Delivery Group (SDG): 507132

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
FB-ANTH-02	507132-01	Soil	07/08/15
FB-ANTH-DUP	507132-04	Soil	07/08/15
FB-SAND-02	507132-05	Soil	07/08/15
FB-BED-02	507132-06	Soil	07/08/15
FB-CONC-02	507132-07	Soil	07/08/15
FB-CONC-DUP	507132-08	Soil	07/08/15
FB-INPC-02	507132-09	Soil	07/08/15
FB-FIBWIPE-02	507132-10	Wipe	07/08/15
FB-ANTH-03	507132-11	Soil	07/08/15
FB-SAND-03	507132-12	Soil	07/08/15
FB-BED-03	507132-13	Soil	07/08/15
FB-CONC-03	507132-14	Soil	07/08/15
FB-INPC-03	507132-15	Soil	07/08/15
FB-FIBWIPE-03	507132-16	Wipe	07/08/15
FB-ANTH-04	507132-17	Soil	07/08/15
FB-SAND-04	507132-18	Soil	07/08/15
FB-SAND-DUP	507132-21	Soil	07/08/15
FB-BED-04	507132-22	Soil	07/08/15
FB-CONC-04	507132-23	Soil	07/08/15
FB-INPC-04	507132-26	Soil	07/08/15
FB-FIBWIPE-04	507132-27	Wipe	07/08/15
FB-ANTH-05	507132-28	Soil	07/08/15
FB-SAND-05	507132-29	Soil	07/08/15
FB-BED-05	507132-30	Soil	07/08/15
FB-BED-DUP	507132-33	Soil	07/08/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
FB-CONC-05	507132-34	Soil	07/08/15
FB-INPC-05	507132-35	Soil	07/08/15
FB-FIBWIPE-05	507132-36	Wipe	07/08/15
FB-ANTH-06	507132-37	Soil	07/08/15
FB-SAND-06	507132-38	Soil	07/08/15
FB-BED-06	507132-39	Soil	07/08/15
FB-CONC-06	507132-40	Soil	07/08/15
FB-ANTH-02MS	507132-02MS	Soil	07/08/15
FB-ANTH-02MSD	507132-03MSD	Soil	07/08/15
FB-SAND-04MS	507132-19MS	Soil	07/08/15
FB-SAND-04MSD	507132-20MSD	Soil	07/08/15
FB-CONC-04MS	507132-24MS	Soil	07/08/15
FB-CONC-04MSD	507132-25MSD	Soil	07/08/15
FB-BED-05MS	507132-31MS	Soil	07/08/15
FB-BED-05MSD	507132-32MSD	Soil	07/08/15
FB-BED-04MS	507132-22MS	Soil	07/08/15
FB-ANTH-06MS	507132-37MS	Soil	07/08/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/14/15	071441	Rear	Aroclor-1016	37.4	FB-ANTH-02 FB-ANTH-DUP	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
07/15/15	071523	Rear	Aroclor-1016 Aroclor-1260	40.4 20.5	FB-SAND-02 FB-BED-02	All TCL compounds	UJ (all non-detects)	A
07/15/15	071543	Rear	Aroclor-1016	38.7	FB-INPC-03 FB-ANTH-04 FB-SAND-DUP	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A
07/17/15	071703	Rear	Aroclor-1016	38.8	FB-CONC-02 FB-CONC-03	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for sample FB-CONC-04MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples FB-ANTH-02 and FB-ANTH-DUP, samples FB-CONC-02 and FB-CONC-DUP, samples FB-SAND-04 and FB-SAND-DUP, and samples FB-BED-05 and FB-BED-DUP were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (mg/Kg)				
Compound	FB-CONC-02	FB-CONC-DUP	RPD (Limits)	Flag	A or P
Aroclor-1016	20U	3.1	146 (≤20)	NQ	-
Aroclor-1254	160	21	154 (≤20)	J (all detects)	A

NQ = Both results were less than the reporting limit (RL), therefore no data were qualified.

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 507132	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, field duplicates RPD, and compounds reported below the RL, data were qualified as estimated in thirty-two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 507132

Sample	Compound	Flag	A or P	Reason
FB-ANTH-02 FB-ANTH-DUP	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)
FB-SAND-02 FB-BED-02	All TCL compounds	UJ (all non-detects)	A	Continuing calibration (%D)
FB-INPC-03 FB-ANTH-04 FB-SAND-DUP FB-CONC-02 FB-CONC-03	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
FB-CONC-02 FB-CONC-DUP	Aroclor-1254	J (all detects)	A	Field duplicates (RPD)
FB-ANTH-02 FB-ANTH-DUP FB-SAND-02 FB-BED-02 FB-CONC-02 FB-CONC-DUP FB-INPC-02 FB-FIBWIPE-02 FB-ANTH-03 FB-SAND-03 FB-BED-03 FB-CONC-03 FB-INPC-03 FB-FIBWIPE-03 FB-ANTH-04 FB-SAND-04 FB-SAND-DUP FB-BED-04 FB-CONC-04 FB-INPC-04 FB-FIBWIPE-04 FB-ANTH-05 FB-SAND-05 FB-BED-05 FB-BED-DUP FB-CONC-05 FB-INPC-05 FB-FIBWIPE-05 FB-ANTH-06 FB-SAND-06 FB-BED-06 FB-CONC-06	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 507132

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 507132

No Sample Data Qualified in this SDG

LDC #: 34880B3b

SDG #: 507132

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 08/27/15

Reviewer: JVG

2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r^2 ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS /D
IX.	Field duplicates	SW	D = *1/2 ; 5/6 ; *16/17 ; *24/25
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	FB-ANTH-02 D1	507132-01	Soil	07/08/15
2	FB-ANTH-DUP D1	507132-04	Soil	07/08/15
3	FB-SAND-02	507132-05	Soil	07/08/15
4	FB-BED -02	507132-06	Soil	07/08/15
5	FB-CONC-02 D2	507132-07	Soil	07/08/15
6	FB-CONC-DUP D2	507132-08	Soil	07/08/15
7	FB-INPC-02	507132-09	Soil	07/08/15
8	FB-FIBWIPE-02	507132-10	Wipe	07/08/15
9	FB-ANTH-03	507132-11	Soil	07/08/15
10	FB-SAND-03	507132-12	Soil	07/08/15
11	FB-BED-03	507132-13	Soil	07/08/15
12	FB-CONC-03	507132-14	Soil	07/08/15
13	FB-INPC-03	507132-15	Soil	07/08/15
14	FB-FIBWIPE-03	507132-16	Wipe	07/08/15
15	FB-ANTH-04	507132-17	Soil	07/08/15
16	FB-SAND-04 D3	507132-18	Soil	07/08/15
17	FB-SAND-DUP D3	507132-21	Soil	07/08/15

LDC #: 34880B3b
SDG #: 507132
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/27/15
Page: 2 of 2
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID	Lab ID	Matrix	Date
18	FB-BED-04	507132-22	Soil	07/08/15
19	FB-CONC-04	507132-23	Soil	07/08/15
20	FB-INPC-04	507132-26	Soil	07/08/15
21	FB-FIBWIPE-04	507132-27	Wipe	07/08/15
22	FB-ANTH-05	507132-28	Soil	07/08/15
23	FB-SAND-05	507132-29	Soil	07/08/15
24	FB-BED-05 D4	507132-30	Soil	07/08/15
25	FB-BED-DUP D4	507132-33	Soil	07/08/15
26	FB-CONC-05	507132-34	Soil	07/08/15
27	FB-INPC-05	507132-35	Soil	07/08/15
28	FB-FIBWIPE-05	507132-36	Wipe	07/08/15
29	FB-ANTH-06	507132-37	Soil	07/08/15
30	FB-SAND-06	507132-38	Soil	07/08/15
31	FB-BED-06	507132-39	Soil	07/08/15
32	FB-CONC-06	507132-40	Soil	07/08/15
33	FB-ANTH-02 MS	507132-02MS	Soil	07/08/15
34	FB-ANTH-02 MSD	507132-03MSD	Soil	07/08/15
35	FB-SAND-04 MS	507132-19MS	Soil	07/08/15
36	FB-SAND-04 MSD	507132-20MSD	Soil	07/08/15
37	FB-CONC-04 MS	507132-24MS	Soil	07/08/15
38	FB-CONC-04 MSD	507132-25MSD	Soil	07/08/15
39	FB-BED-05 MS	507132-31MS	Soil	07/08/15
40	FB-BED-05 MSD	507132-32MSD	Soil	07/08/15
41	18 MS	-18 MS		
42	29 MS	-29 MS		
43				
44				
45				

Notes:

-	05-1425 MB						
-	05-1426						
-	05-1433						

Note: ~~Print-outs showed results after manual integration.~~ Q

LDC #: 34880 B3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

Method: ✓ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?		✓		
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 34880B3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 34880 B3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?
Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?
Level IV/D Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	07/14/15	071441	Rear	V (+)	37.4	( )	1, 2, 05-1425 MB (ND)	J/UJ R/A
						( )		
						( )		
	07/15/15	071503		V (+)	39.2	( )	33-36	(QC)
				BB (+)	21.1	( )		
						( )		
						( )		
	07/15/15	071523		V (+)	40.4	( )	3, 4 (ND)	
				BB (+)	20.5	( )		
						( )		
						( )		
	07/15/15	071543		V (+)	38.7	( )	13, 15, 17 (ND + Det)	
						( )		
						( )		
	07/17/15	071703		V (+)	38.8	( )	5, 12, 42, 05-1426 MB	
						( )	(ND + Det)	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

V = qual V - X
BB = qual Y - BB

CONCAL.wpd

LDC #: 34880 B36

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?
Y N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	5	NS	A	0 (30-150)	No qual (dil)
	12			( )	
	13			( )	
	19			( )	
	20			( )	
	26			( )	
	32			( )	
				( )	
	(200 - 5000 X)			( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 34880 B3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	37/38	V	0 (29-135)	0 (29-135)	( )	19	No qual (dil)
	(10x)	BB	↓ (↓)	↓ ( )	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC#: 34880B3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082A)
Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	5	6		
Aroclor 1016	20U	3.1	146	~~J/R/A~~ —
Aroclor 1254	160	21	154	Jdets/A

NQ - Both results < RL. No data were qualified

V:\Josephine\FIELD DUPLICATES\34880B3b mwh anacortes.wpd

LDC #: _34880B3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:__JVG__
2nd Reviewer:_Q_

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0429	4/29/2015	1260-2 (Signal 1)	NR	4.33E+07	4.96E+07	4.96E+07	18.5	18.3
			1260-2 (Signal 2)	NR	2.10E+08	2.01E+08	2.01E+08	12.3	12.3
2	ICAL pcb0721	7/21/2015	1260-1 (Signal 1)	NR	4.31E+07	4.94E+07	4.94E+07	16.3	16.3
			1260-1 (Signal 2)	NR	1.60E+08	1.99E+08	1.99E+08	18.4	18.4

LDC # _34880B3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:__Q__

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	071441 (pcb0429)	7/14/2015	1260 Total (Sig 1)	1.000	0.957	0.957	NR	4.3
			1260 Total (Sig 2)	1.000	1.172	1.172	NR	17.2
2	071503	7/15/2015	1260 Total (Sig 1)	1.000	1.022	1.022	NR	2.2
			1260 Total (Sig 2)	1.000	1.211	1.211	NR	21.1
3	071523	7/15/2015	1260 Total (Sig 1)	1.000	0.970	0.970	NR	3.0
			1260 Total (Sig 2)	1.000	1.205	1.206	NR	20.6
4	071543	7/15/2015	1260 Total (Sig 1)	1.000	0.991	0.990	NR	1.0
			1260 Total (Sig 2)	1.000	1.183	1.183	NR	18.3
5	071703	7/17/2015	1260 Total (Sig 1)	1.000	0.963	0.963	NR	3.7
			1260 Total (Sig 2)	1.000	1.180	1.181	NR	18.1
6	071719	7/17/2015	1260 Total (Sig 1)	5.000	4.799	4.798	NR	4.0
			1260 Total (Sig 2)	5.000	5.499	5.501	NR	10.0
7	072015	7/20/2015	1260 Total (Sig 1)	5.000	5.219	5.218	NR	4.4
			1260 Total (Sig 2)	5.000	5.248	5.250	NR	5.0
8	072203 (pcb0721)	7/22/2015	1260 Total (Sig 1)	1.000	0.894	0.894	NR	10.6
			1260 Total (Sig 2)	1.000	0.925	0.925	NR	7.5
9	072213	7/22/2015	1260 Total (Sig 1)	5.000	4.378	4.378	NR	12.4
			1260 Total (Sig 2)	5.000	4.215	4.215	NR	15.7

LDC # _34880B3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:__Q__

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
9	072222 (pcb0721)	7/22/2015	1260 Total (Sig 1)	1.000	0.884	0.884	NR	11.6
			1260 Total (Sig 2)	1.000	0.906	0.906	NR	9.4
10	072303	7/23/2015	1260 Total (Sig 1)	1.000	0.908	0.908	NR	9.2
			1260 Total (Sig 2)	1.000	0.869	0.869	NR	13.1
11	072313	7/23/2015	1260 Total (Sig 1)	5.000	4.696	4.696	NR	6.1
			1260 Total (Sig 2)	5.000	4.375	4.375	NR	12.5

LDC #: 34880B3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer: Q

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Y	sig 1	0.200	0.16	80	80	0

(0.016 X 10 = 0.16)

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 34880 B3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG

2nd Reviewer: d

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added

MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 33/34

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.833	0.833	0	0.862	0.765	103	103	92	92	11	12

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

$MS = \frac{(0.517)(5)(10)}{(30g)} =$

LDC #: 34880 B3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 05-1433 LCS/D

Compound	Spike Added (ug/wipe)		Spike Sample Concentration (ug/wipe)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
1260 (8082A)	100	100	79.26	80.36	79	79	80	80	1	1

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34860 B7b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: CT

METHOD: ✓ GC __ HPLC

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 5 Compound Name 1254

Single pt ICAL

Concentration = $\frac{(262120 35)}{(306 28974)} = 0.856$

1254 Total = $\frac{\cancel{0.856 + 0.866} + 1.00 + 0.971 + 0.946}{5} = 0.928$

final Conc. = $\frac{(0.928)(5ml)(100)}{(30g)(0.97)} = 159.45 \approx 160$ mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
			160		

Comments:

SAMPCALCnew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: September 3, 2015

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedmand & Bruya, Inc.

Sample Delivery Group (SDG): 507133

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
FB-INPC-06	507133-01	Soil	07/08/15
FB-FIBWIPE-06	507133-02	Wipe	07/08/15
AB-WINDOW WIPE-01	507133-03	Wipe	07/09/15
AB-WINDOW WIPE-02	507133-04	Wipe	07/09/15
AB-WINDOW WIPE-03	507133-05	Wipe	07/09/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for sample FB-INPC-06. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within QC limits. No data were qualified since there were no associated samples in this SDG. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 507133	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compounds reported below the RL, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 507133

Sample	Compound	Flag	A or P	Reason
FB-INPC-06 FB-FIBWIPE-06 AB-WINDOW WIPE-01 AB-WINDOW WIPE-02 AB-WINDOW WIPE-03	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 507133

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 507133

No Sample Data Qualified in this SDG

LDC #: 34880C3b

SDG #: 507133

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/27/15

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r² ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	507132-29 ; 507132-29/25 ; 507132-31/32 (No assctd sample, NQ)
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	FB-INPC-06	507133-01	Soil	07/08/15
2	FB-FIBWIPE-06	507133-02	Wipe	07/08/15
3	AB-WINDOW WIPE-01	507133-03	Wipe	07/09/15
4	AB-WINDOW WIPE-02	507133-04	Wipe	07/09/15
5	AB-WINDOW WIPE-03	507133-05	Wipe	07/09/15
6				
7				
8				
9				
10				

Notes:

1	05-1426 MB						
2	05-1433						

Note: Print-outs showed results after manual integration.

VALIDATION FINDINGS CHECKLIST

Method: ✓ GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			Cooler temp = 11°C
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?		✓		
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 34880C2b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 34880c3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only

Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	07/17/15	071703	Rear	V (+)	38.8	( )	05-1426 MB	R A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

LDC #: 34880C 3b

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A — Were surrogates spiked into all samples, standards and blanks?

Y N N/A — Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	1	NS	A	0 (30-150)	No qual (dil)
	(200X)			( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

LDC #: _34880C3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0429	4/29/2015	1260-2 (Signal 1)	NR	4.33E+07	4.96E+07	4.96E+07	18.5	18.3
			1260-2 (Signal 2)	NR	2.10E+08	2.01E+08	2.01E+08	12.3	12.3
2	ICAL pcb0721	7/21/2015	1260-1 (Signal 1)	NR	4.31E+07	4.94E+07	4.94E+07	16.3	16.3
			1260-1 (Signal 2)	NR	1.60E+08	1.99E+08	1.99E+08	18.4	18.4

LDC # _34880C3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page:_1_of_1_
Reviewer:__JVG__
2nd Reviewer:____

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	071703	7/17/2015	1260 Total (Chan A)	1.000	0.963	0.963	NR	3.7
	(pcb0429)		1260 Total (Chan B)	1.000	1.180	1.181	NR	18.1
2	072222	7/22/2015	1260 Total (Chan A)	1.000	0.884	0.884	NR	11.6
	(pcb0721)		1260 Total (Chan B)	1.000	0.906	0.906	NR	9.4
3	072303	7/22/2015	1260 Total (Chan A)	1.000	0.908	0.908	NR	9.2
	(pcb0721)		1260 Total (Chan B)	1.000	0.869	0.869	NR	13.1
4	072313	7/2/2015	1260 Total (Chan A)	5.000	4.696	4.696	NR	6.1
	(pcb0721)		1260 Total (Chan B)	5.000	4.375	4.375	NR	12.5

LDC #: 34880 C3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: Q

METHOD: ✓ **GC** __ **HPLC**

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #4

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Y	Sig 1	0.200	0.173	87	87	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 34880C3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =((({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where
SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 50 7132 - 31/32 MS/MSD

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	--	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.833	0.833	0	0.683	0.617	82	82	74	74	10	10

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLCNew.wpd

LDC #: 34860 C3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 05-1438 LCS/D

Compound		Spike Added (ug/wiped)		Spike Sample Concentration (ug/wiped)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
		LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline	(8015)										
Diesel	(8015)										
Benzene	(8021B)										
Methane	(RSK-175)										
2,4-D	(8151)										
Dinoseb	(8151)										
Naphthalene	(8310)										
Anthracene	(8310)										
HMX	(8330)										
2,4,6-Trinitrotoluene	(8330)										
Phorate	(8141A)										
Malathion	(8141A)										
Formaldehyde	(8315A)										
1260	(8082A)	100	100	79.26	80.36	79	79	80	80	1	1

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34880C3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 1 (Single pt. cal) Compound Name 1254

Concentration = $\frac{(131.4e6)}{(33983853)}$ = 3.866

1254 Total = $\frac{3.866 + 4.004 + 3.835 + 3.770 + 3.819}{5}$ = 3.859

final conc. = $\frac{(3.859)(5ml)(200)}{(6g)(0.95)}$ = 677 ≈ 680 mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
			680		

Comments:

SAMPCALCnew.wpd

LDC Report# 34880D3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: September 3, 2015

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedmand & Bruya, Inc.

Sample Delivery Group (SDG): 507154

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
CW-CONC-06	507154-01	Soil	07/09/15
CW-CONC-07	507154-02	Soil	07/09/15
CW-CONC-08	507154-03	Soil	07/09/15
CW-CONC-09	507154-04	Soil	07/09/15
CW-CONC-10	507154-05	Soil	07/09/15
CW-CONC-DUP	507154-06	Soil	07/09/15
CW-SED-01	507154-07	Soil	07/09/15
CW-SED-02	507154-08	Soil	07/09/15
CW-SED-03	507154-09	Soil	07/09/15
CW-SED-04	507154-10	Soil	07/09/15
CW-SED-05	507154-11	Soil	07/09/15
CW-SED-06	507154-12	Soil	07/09/15
CW-SED-DUP	507154-13	Soil	07/09/15
CW-BAF-01	507154-16	Soil	07/09/15
CW-BAF-02	507154-17	Soil	07/09/15
CW-BAF-03	507154-18	Soil	07/09/15
CW-BAF-DUP	507154-21	Soil	07/09/15
WF-CONC-01	507154-22	Soil	07/09/15
WF-CONC-02	507154-23	Soil	07/09/15
WF-CONC-03	507154-24	Soil	07/09/15
WF-CONC-04	507154-25	Soil	07/09/15
WF-CONC-05	507154-26	Soil	07/09/15
WF-CONC-06	507154-27	Soil	07/09/15
WF-CONC-DUP	507154-30	Soil	07/09/15
WF-SED-01	507154-31	Soil	07/09/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
WF-SED-02	507154-32	Soil	07/09/15
WF-SED-03	507154-33	Soil	07/09/15
WF-SED-04	507154-34	Soil	07/09/15
WF-SED-DUP	507154-35	Soil	07/09/15
CW-CONC-01	507154-36	Soil	07/09/15
CW-CONC-02	507154-37	Soil	07/09/15
CW-CONC-03	507154-38	Soil	07/09/15
CW-CONC-04	507154-39	Soil	07/09/15
CW-CONC-05	507154-40	Soil	07/09/15
SB-STEELWIPE-01	507154-41	Wipe	07/10/15
SB-SED-01	507154-42	Soil	07/10/15
SB-SED-DUP	507154-43	Soil	07/10/15
SB-CONC-01	507154-44	Soil	07/10/15
SB-CONC-02	507154-45	Soil	07/10/15
SB-CONC-DUP	507154-46	Soil	07/10/15
SB-CONC-04	507154-47	Soil	07/10/15
SB-SED-02	507154-48	Soil	07/10/15
SB-STEELWIPE-02	507154-51	Wipe	07/10/15
RINS-02	507154-52	Water	07/10/15
SB-CONC-03	507154-53	Soil	07/10/15
CW-SED-MS	507154-14MS	Soil	07/09/15
CW-SED-MSD	507154-15MSD	Soil	07/09/15
CW-BAF-MS	507154-19MS	Soil	07/09/15
CW-BAF-MSD	507154-20MSD	Soil	07/09/15
WF-CONC-MS	507154-28MS	Soil	07/09/15
WF-CONC-MSD	507154-29MSD	Soil	07/09/15
SB-SED-MS	507154-49MS	Soil	07/10/15
SB-SED-MSD	507154-50MSD	Soil	07/10/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/18/15	071731	Rear	Aroclor-1016 Aroclor-1260	37.8 21.5	CW-CONC-06 CW-CONC-07 CW-CONC-08 CW-CONC-09 CW-CONC-10 CW-CONC-DUP CW-SED-01 CW-SED-03 CW-SED-04 CW-SED-05 CW-SED-06 CW-SED-DUP	All TCL compounds	J (all detects) UJ (all non-detects)	A
07/19/15	071770	Rear	Aroclor-1016 Aroclor-1260	27.3 21.9	WF-CONC-DUP WF-SED-DUP CW-CONC-01 CW-CONC-02	All TCL compounds	UJ (all non-detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/19/15	071782	Rear	Aroclor-1016 Aroclor-1260	52.0 34.4	CW-CONC-03 CW-CONC-04 CW-CONC-05 SB-STEELWIPE-01 SB-SED-01 SB-CONC-01 SB-CONC-02 SB-CONC-DUP SB-CONC-04 SB-SED-02 SB-CONC-03	All TCL compounds	UJ (all non-detects)	A
07/30/15	073003	Rear	Aroclor-1016	25.6	WF-SED-01 WF-SED-02 WF-SED-03 WF-SED-04	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
05-1431MB	07/19/15	Aroclor-1254 Aroclor-1260	0.029 mg/Kg 0.024 mg/Kg	CW-BAF-DUP WF-CONC-01 WF-CONC-02 WF-CONC-03 WF-CONC-04 WF-CONC-06 WF-CONC-DUP WF-SED-DUP CW-CONC-01 CW-CONC-02

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

Sample RINS-02 was identified as a rinsate. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for sample CW-SED-MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Affected Compounds	Flag	A or P
05-1432LCS/D (CW-CONC-03 CW-CONC-04 CW-CONC-05 SB-SED-01 SB-SED-DUP SB-CONC-01 SB-CONC-02 SB-CONC-DUP SB-CONC-04 SB-SED-02 SB-CONC-03)	Aroclor-1016	22 (≤20)	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects)	P

IX. Field Duplicates

Samples CW-CONC-07 and CW-CONC-DUP, samples CW-SED-02 and CW-SED-DUP, samples CW-BAF-01 and CW-BAF-DUP, samples WF-CONC-01 and WF-CONC-DUP, samples WF-SED-03 and WF-SED-DUP, samples SB-SED-01 and SB-SED-DUP, samples SB-CONC-02 and SB-CONC-DUP were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	CW-SED-02	CW-SED-DUP			
Aroclor-1016	2.0	1.8	11 (≤20)	-	-
Aroclor-1254	5.6	5.2	7 (≤20)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	WF-SED-03	WF-SED-DUP			
Aroclor-1254	3.4	0.2U	178 (≤20)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (mg/Kg)		RPD (Limits)	Flag	A or P
	SB-SED-01	SB-SED-DUP			
Aroclor-1254	0.2U	0.51	87 (≤20)	J (all detects) UJ (all non-detects)	A

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 507154	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, field duplicates RPD, and compounds reported below the RL, data were qualified as estimated in forty-five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 507154

Sample	Compound	Flag	A or P	Reason
CW-CONC-06 CW-CONC-07 CW-CONC-08 CW-CONC-09 CW-CONC-10 CW-CONC-DUP CW-SED-01 CW-SED-03 CW-SED-04 CW-SED-05 CW-SED-06 CW-SED-DUP	All TCL compounds	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
WF-CONC-DUP WF-SED-DUP CW-CONC-01 CW-CONC-02 CW-CONC-03 CW-CONC-04 CW-CONC-05 SB-STEELWIPE-01 SB-SED-01 SB-CONC-01 SB-CONC-02 SB-CONC-DUP SB-CONC-04 SB-SED-02 SB-CONC-03	All TCL compounds	UJ (all non-detects)	A	Continuing calibration (%D)
WF-SED-01 WF-SED-02 WF-SED-03 WF-SED-04	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)
WF-SED-03 WF-SED-DUP SB-SED-01 SB-SED-DUP	Aroclor-1254	J (all detects) UJ (all non-detects)	A	Field duplicates (RPD)

Sample	Compound	Flag	A or P	Reason
CW-CONC-06 CW-CONC-07 CW-CONC-08 CW-CONC-09 CW-CONC-10 CW-CONC-DUP CW-SED-01 CW-SED-02 CW-SED-03 CW-SED-04 CW-SED-05 CW-SED-06 CW-SED-DUP CW-BAF-01 CW-BAF-02 CW-BAF-03 CW-BAF-DUP WF-CONC-01 WF-CONC-02 WF-CONC-03 WF-CONC-04 WF-CONC-05 WF-CONC-06 WF-CONC-DUP WF-SED-01 WF-SED-02 WF-SED-03 WF-SED-04 WF-SED-DUP CW-CONC-01 CW-CONC-02 CW-CONC-03 CW-CONC-04 CW-CONC-05 SB-STEELWIPE-01 SB-SED-01 SB-SED-DUP SB-CONC-01 SB-CONC-02 SB-CONC-DUP SB-CONC-04 SB-SED-02 SB-STEELWIPE-02 RINS-02 SB-CONC-03	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 507154

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 507154

No Sample Data Qualified in this SDG

LDC #: 34880D3b

SDG #: 507154

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 08/27/15

Reviewer: JVG

2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r² ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	SW	
V.	Field blanks	ND	R = 44
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS /D
IX.	Field duplicates	SW	D = 2/6*; 8/13; 14/17*; 18/24*; 27/29; 36/37; 39/40*
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	CW-CONC-06	507154-01	Soil	07/09/15
2	CW-CONC-07 D1	507154-02	Soil	07/09/15
3	CW-CONC-08	507154-03	Soil	07/09/15
4	CW-CONC-09	507154-04	Soil	07/09/15
5	CW-CONC-10	507154-05	Soil	07/09/15
6	CW-CONC-DUP D1	507154-06	Soil	07/09/15
7	CW-SED-01	507154-07	Soil	07/09/15
8	CW-SED-02 D2	507154-08	Soil	07/09/15
9	CW-SED-03	507154-09	Soil	07/09/15
10	CW-SED-04	507154-10	Soil	07/09/15
11	CW-SED-05	507154-11	Soil	07/09/15
12	CW-SED-06	507154-12	Soil	07/09/15
13	CW-SED-DUP D2	507154-13	Soil	07/09/15
14	CW-BAF-01 D3	507154-16	Soil	07/09/15
15	CW-BAF-02	507154-17	Soil	07/09/15
16	CW-BAF-03	507154-18	Soil	07/09/15
17	CW-BAF-DUP D3	507154-21	Soil	07/09/15

LDC #: 34880D3b

SDG #: 507154

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/27/15

Reviewer: JVG

2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID	Lab ID	Matrix	Date
18	WF-CONC-01 D4	507154-22	Soil	07/09/15
19	WF-CONC-02	507154-23	Soil	07/09/15
20	WF-CONC-03	507154-24	Soil	07/09/15
21	WF-CONC-04	507154-25	Soil	07/09/15
22	WF-CONC-05	507154-26	Soil	07/09/15
23	WF-CONC-06	507154-27	Soil	07/09/15
24	WF-CONC-DUP D4	507154-30	Soil	07/09/15
25	WF-SED-01	507154-31	Soil	07/09/15
26	WF-SED-02	507154-32	Soil	07/09/15
27	WF-SED-03 D5	507154-33	Soil	07/09/15
28	WF-SED-04	507154-34	Soil	07/09/15
29	WF-SED-DUP D5	507154-35	Soil	07/09/15
30	CW-CONC-01	507154-36	Soil	07/09/15
31	CW-CONC-02	507154-37	Soil	07/09/15
32	CW-CONC-03	507154-38	Soil	07/09/15
33	CW-CONC-04	507154-39	Soil	07/09/15
34	CW-CONC-05	507154-40	Soil	07/09/15
35	SB-STEELWIPE-01	507154-41	Wipe	07/10/15
36	SB-SED-01 D6	507154-42	Soil	07/10/15
37	SB-SED-DUP D6	507154-43	Soil	07/10/15
38	SB-CONC-01	507154-44	Soil	07/10/15
39	SB-CONC-02 D7	507154-45	Soil	07/10/15
40	SB-CONC-DUP D7	507154-46	Soil	07/10/15
41	SB-CONC-04	507154-47	Soil	07/10/15
42	SB-SED-02	507154-48	Soil	07/10/15
43	SB-STEELWIPE-02	507154-51	Wipe	07/10/15
44	RINS-02	507154-52	Water	07/10/15
45	SB-CONC-03	507154-53	Soil	07/10/15
(03) 46 1	CW-SED-MS	507154-14MS	Soil	07/09/15
47 1	CW-SED-MSD	507154-15MSD	Soil	07/09/15
(02) 48 4	CW-BAF-MS	507154-19MS	Soil	07/09/15
49 4	CW-BAF-MSD	507154-20MSD	Soil	07/09/15
(02) 50 4	WF-CONC-MS	507154-28MS	Soil	07/09/15
51 4	WF-CONC-MSD	507154-29MSD	Soil	07/09/15
(02) 52 3	SB-SED-MS	507154-49MS	Soil	07/10/15

LDC #: 34880D3b
SDG #: 507154
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/27/15
Page: 3 of 3
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID	Lab ID	Matrix	Date
53	SB-SED-MSD	507154-50MSD	Soil	07/10/15
54				
55				
56				
57				

Notes:

1	05-1430 MB		(1-16, 46, 47)					
2	-1431		(17-21, 23, 24, 29-31)					(Rex 7/22 1530)
3	-1432		(32-34, 36-42, 45, 52, 53)					
4	-1530		(22, 25-28, 48-51)					
5	-1433		(35, 43)					
6	-1434		(44)					

Note: Print outs showed results after manual integration.

LDC #: 34880 D3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [illegible]

Method: ✓ GC ________ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?		✓		
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓	✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:____

LDC #: 34880 D3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?
Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	07/16/15	071543	Rear	V (+)	38.7	( )	05-1430 MB	J/UJ R/A
						( )		
						( )		
	07/18/15	071731		V (+)	37.8	( )	1-7, 9-13, 46, 47, (ND + Det)	
				BB (+)	21.5	( )	05-1431 MB	
						( )		
						( )		
	07/19/15	071770		V (+)	27.3	( )	24, 29-31 (ND)	
				BB (+)	21.9	( )		
						( )		
						( )		
	07/19/15	071782		V (+)	52.0	( )	32-36, 38-42, 45, (ND)	
				BB (+)	34.4	( )	05-1432 MB	
						( )		
						( )		
	07/20/15	073003		V (+)	25.6	( )	25-28, 48-51 (ND)	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

V = qual V - X
BB = qual Y - BB

LDC #: 34880 D3b

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG
2nd Reviewer: QP

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A If extract clean-up was performed, were extract clean-up blanks analyzed at the proper frequencies?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank extraction date: 07/14/15 **Blank analysis date:** 07/18/15 **Associated samples:** 17-21, 23, 24, 29-31 (ND)
Conc. units: mg/kg

Compound	Blank ID	Sample Identification								
	05-1431 MB									
Aroclor 1254	0.029									
Aroclor 1260	0.024									

Blank extraction date:______ **Blank analysis date:**______ **Associated samples:**______
Conc. units:______

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 34880 D3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	46/47	V	( )	( )	40 (20)	9	No qual (dil)
	(10x)		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC #: 34880 D3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?
Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?
Level IV/D Only
Y N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	05-1432 LCS/D	✓	( )	( )	22 (20)	32-34, 36-42, 45,	J/UJ/P
			( )	( )	( )	05-1432 MB	(qual V, W, X)
			( )	( )	( )	(All ND)	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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LDC#: 34880D3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Y N NA Were field duplicate pairs identified in this SDG?
Y/N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	8	13		
Aroclor 1016	2.0	1.8	11	
Aroclor 1254	5.6	5.2	7	

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	27	29		
Aroclor 1254	3.4	0.2U	178	J/~~R~~UJ/A

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	36	37		
Aroclor 1254	0.2U	0.51	87	J/~~R~~UJ/A

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LDC #: _34880D3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:__JVG__
2nd Reviewer:__Q__

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound		Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0429	4/29/2015	1260-2	(Signal 1)	NR	4.33E+07	4.96E+07	4.96E+07	18.5	18.3
			1260-2	(Signal 2)	NR	2.10E+08	2.01E+08	2.01E+08	12.3	12.3
2	ICAL pcb0721	7/21/2015	1260-1	(Signal 1)	NR	4.31E+07	4.94E+07	4.94E+07	16.3	16.3
			1260-1	(Signal 2)	NR	1.60E+08	1.99E+08	1.99E+08	18.4	18.4
2	ICAL pcb0730	7/30/2015	1260-1	(Signal 1)	NR	4.94E+07	5.35E+07	5.31E+07	10.7	9.2
			1260-1	(Signal 2)	NR	1.99E+08	1.65E+08	1.65E+08	16.1	16.1

LDC # _34880D3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	071543	7/15/2015	1260 Total (Sig 1)	1.000	0.991	0.990	NR	1.0
	(pcb0429)		1260 Total (Sig 2)	1.000	1.183	1.183	NR	18.3
2	071731	7/17/2015	1260 Total (Sig 1)	1.000	0.965	0.965	NR	3.5
			1260 Total (Sig 2)	1.000	1.215	1.215	NR	21.5
3	071752	7/17/2015	1260 Total (Sig 1)	5.000	4.800	4.779	NR	4.4
			1260 Total (Sig 2)	5.000	5.593	5.594	NR	11.9
4	071770	7/17/2015	1260 Total (Sig 1)	5.000	5.339	5.338	NR	6.8
			1260 Total (Sig 2)	5.000	6.093	6.095	NR	21.9
5	071782	7/17/2015	1260 Total (Sig 1)	1.000	1.098	1.098	NR	9.8
			1260 Total (Sig 2)	1.000	1.344	1.345	NR	34.5
6	072232	7/22/2015	1260 Total (Sig 1)	5.000	4.462	4.462	NR	10.8
	(pcb0721)		1260 Total (Sig 2)	5.000	4.144	4.144	NR	17.1
7	072303	7/23/2015	1260 Total (Sig 1)	1.000	0.908	0.908	NR	9.2
			1260 Total (Sig 2)	1.000	0.869	0.869	NR	13.1
8	073003	7/30/2015	1260 Total (Sig 1)	1.000	0.880	0.880	NR	12.0
			1260 Total (Sig 2)	1.000	0.977	0.977	NR	2.3

LDC #: 34880 D7b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG

2nd reviewer: ~~Q~~

METHOD: / GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Y	Sig 1	0.200	0.18	90	90	0

0.018 x 10 = 0.18

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 34880 D3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =((({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where
SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added
MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 52 / 53

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.833	0.833	0	0.718	0.708	? 62	86	85	85	31	1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34888D3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG

2nd Reviewer: [signature]

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =((({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 05-1431 LCS/D

Compound	Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
1260 (8082A)	0.833	0.833	0.812	0.854	97	97	103	103	4	5

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34880D3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 7 Compound Name 1254

Single Pt ICAL

Concentration = $\frac{(59856933)}{(30628974)}$ = 1.954

1254 Total = $\frac{1.954 + 2.044 + 2.546 + 2.322 + 2.243}{5}$ = 2.222

final conc. = $\frac{(2.222)(5ml)(10)}{(30g)(0.91)}$ = 4.069 ≅ 4.1 mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
			4.1		

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: September 3, 2015

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedmand & Bruya, Inc.

Sample Delivery Group (SDG): 507195

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-CONC-13	507195-01	Soil	07/13/15
SB-SED-08	507195-02	Soil	07/13/15
SB-CONC-27	507195-03	Soil	07/13/15
SB-SED-09	507195-04	Soil	07/13/15
SB-SED-06	507195-05	Soil	07/13/15
SB-CONC-28	507195-06	Soil	07/13/15
SB-CONC-24	507195-07	Soil	07/13/15
SB-CONC-26	507195-08	Soil	07/13/15
SB-CONC-23	507195-09	Soil	07/13/15
SB-CONC-30	507195-10	Soil	07/13/15
SB-SED-05	507195-11	Soil	07/10/15
SB-SED-03	507195-12	Soil	07/10/15
SB-SED-04	507195-13	Soil	07/10/15
SB-SEAL-02 (RESIN)	507195-15	Soil	07/13/15
SB-FIBWIPE-02	507195-16	Wipe	07/13/15
SB-CONC-18	507195-18	Soil	07/13/15
SB-CONC-32	507195-19	Soil	07/14/15
SB-CONC-33	507195-20	Soil	07/14/15
SB-CONC-34	507195-21	Soil	07/14/15
SB-CONC-35	507195-22	Soil	07/14/15
SB-CONC-36	507195-23	Soil	07/14/15
SB-CORK-03	507195-24	Soil	07/14/15
SB-SEALB-03	507195-25	Soil	07/14/15
SB-SEAL-04	507195-26	Soil	07/14/15
SB-SEALC-03	507195-27	Soil	07/14/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-CAULK-01	507195-28	Soil	07/14/15
SB-CORK-04	507195-29	Soil	07/14/15
SB-CONC-37	507195-30	Soil	07/14/15
SB-CONC-31	507195-31	Soil	07/13/15
SB-CONC-25	507195-32	Soil	07/13/15
SB-CONC-29	507195-33	Soil	07/13/15
SB-SED-07	507195-34	Soil	07/13/15
SB-CONC-DUP3	507195-35	Soil	07/13/15
SB-CONC-16	507195-38	Soil	07/13/15
SB-CONC-07	507195-39	Soil	07/13/15
SB-CONC-21	507195-40	Soil	07/13/15
SB-INTPC-01	507195-41	Soil	07/13/15
SB-CONC-22	507195-43	Soil	07/13/15
SB-CONC-06	507195-46	Soil	07/13/15
SB-CONC-10	507195-49	Soil	07/13/15
SB-SEALC-02	507195-50	Soil	07/13/15
SB-CORK-02	507195-51	Soil	07/13/15
SB-CONC-11	507195-52	Soil	07/13/15
SB-CONC-12	507195-53	Soil	07/13/15
SB-CONC-14	507195-54	Soil	07/13/15
SB-CONC-DUP	507195-55	Soil	07/13/15
SB-CONC-15	507195-56	Soil	07/13/15
SB-SEALA-01	507195-57	Soil	07/13/15
SB-CORK-DUP	507195-58	Soil	07/13/15
SB-FIBWIPE-01	507195-59	Wipe	07/13/15
SB-CORK-01	507195-60	Soil	07/13/15
SB-SEAL-01	507195-61	Soil	07/13/15
SB-SEAL-DUP	507195-63	Soil	07/13/15
SB-SEALB-01	507195-64	Soil	07/13/15
SB-SEALC-01	507195-65	Soil	07/13/15
SB-CONC-09	507195-66	Soil	07/13/15
SB-CONC-17	507195-67	Soil	07/13/15
SB-CONC-19	507195-68	Soil	07/13/15
SB-CONC-08	507195-69	Soil	07/13/15
SB-CONC-20	507195-70	Soil	07/13/15
SB-CONC-38	507195-71	Soil	07/14/15
SB-CONC-39	507195-72	Soil	07/14/15
SB-CONC-40	507195-73	Soil	07/14/15
SB-CAULK-03	507195-74	Soil	07/14/15
SB-SED-10	507195-75	Soil	07/14/15
SB-CAULK-02	507195-76	Soil	07/14/15
SB-SEALA-03	507195-77	Soil	07/14/15

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-INTLP-02	507195-78	Soil	07/14/15
FB-PGCONC-01	507195-79	Soil	07/14/15
FB-PGCONC-02	507195-80	Soil	07/14/15
FB-PGCONC-DUP	507195-81	Soil	07/14/15
AB-SEAL-07	507195-82	Soil	07/14/15
AB-SEAL-09	507195-83	Soil	07/14/15
AB-SEAL-10	507195-84	Soil	07/14/15
PC-07	507195-85	Soil	07/14/15
SB-SEAL-MS	507195-17MS	Soil	07/13/15
SB-SEAL-MSD	507195-14MSD	Soil	07/13/15
SB-CONC-MS2	507195-37MS	Soil	07/13/15
SB-CONC-MSD2	507195-36MSD	Soil	07/13/15
SB-CORK-MS	507195-44MS	Soil	07/13/15
SB-CORK-MSD	507195-42MSD	Soil	07/13/15
SB-CONC-MS	507195-47MS	Soil	07/13/15
SB-CONC-MSD	507195-48MSD	Soil	07/13/15
SB-SEAL-MS	507195-62MS	Soil	07/13/15
SB-CONC-40MS	507195-73MS	Soil	07/14/15
SB-CONC-05	507195-45	Soil	07/13/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
07/30/15	073019	Rear	Aroclor-1260	24.3	SB-CONC-29 SB-SED-07 SB-CONC-DUP3 SB-CONC-16 SB-CONC-07 SB-CONC-21 SB-INTPC-01 SB-CONC-22 SB-CONC-06 SB-CONC-10 SB-SEALC-02 SB-CORK-02 SB-CONC-05	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) UJ (all non-detects)	A
08/03/15	080303	Rear	Aroclor-1016	51.6	SB-CONC-11 SB-CONC-12	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compounds	Flag	A or P
08/03/15	080325	Rear	Aroclor-1016	44.0	SB-CONC-14 SB-CONC-DUP SB-CONC-15 SB-CONC-09 SB-CONC-17	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
08/04/15	080335	Rear	Aroclor-1016	24.3	SB-SEALA-01 SB-CORK-DUP SB-CORK-01 SB-SEAL-01 SB-CONC-08 SB-CONC-38	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A
08/04/15	080357	Rear	Aroclor-1016	28.6	SB-SEAL-DUP SB-SEALB-01 SB-SEALC-01 SB-CONC-19 SB-CONC-20 SB-CONC-39	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A
08/05/15	080378	Rear	Aroclor-1016	38.2	SB-CONC-31 SB-CONC-25	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A
08/05/15	080503	Rear	Aroclor-1016	40.6	SB-SEAL-04 SB-CORK-04 SB-CORK-02 SB-CONC-11 SB-CORK-DUP AB-SEAL-10 PC-07	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for samples SB-CORK-MS/MSD, SB-CONC-MS/MSD, SB-CONC-MS/MSD2, SB-SEAL-MS/MSD, and SB-CONC-40MS. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples SB-CAULK-01 and SB-CONC-DUP3, samples SB-CONC-06 and SB-CONC-DUP, samples SB-CORK-DUP and SB-CORK-01, samples SB-SEAL-DUP and SB-SEALC-01, and samples FB-PGCONC-02 and FB-PGCONC-DUP were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (mg/Kg)				
Compound	SB-CORK-DUP	SB-CORK-01	RPD (Limits)	Flag	A or P
Aroclor-1248	19	1100	193 (≤20)	J (all detects)	A

	Concentration (mg/Kg)				
Compound	SB-SEAL-DUP	SB-SEALC-01	RPD (Limits)	Flag	A or P
Aroclor-1016	7700	10U	199 (≤20)	J (all detects) UJ (all non-detects)	A
Aroclor-1248	10000	1500	148 (≤20)	J (all detects)	A

	Concentration (mg/Kg)				
Compound	FB-PGCONC-02	FB-PGCONC-DUP	RPD (Limits)	Flag	A or P
Aroclor-1254	180	160	12 (≤20)	-	-

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 507195	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, field duplicates RPD, and compounds reported below the RL, data were qualified as estimated in seventy-six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 507195

Sample	Compound	Flag	A or P	Reason
SB-CONC-29 SB-SED-07 SB-CONC-DUP3 SB-CONC-16 SB-CONC-07 SB-CONC-21 SB-INTPC-01 SB-CONC-22 SB-CONC-06 SB-CONC-10 SB-SEALC-02 SB-CORK-02 SB-CONC-05	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
SB-CONC-11 SB-CONC-12 SB-CONC-14 SB-CONC-DUP SB-CONC-15 SB-CONC-09 SB-CONC-17 SB-CONC-31 SB-CONC-25 SB-SEAL-04 SB-CORK-04 SB-CORK-02 SB-CONC-11 SB-CORK-DUP AB-SEAL-10 PC-07	Aroclor-1016 Aroclor-1221 Aroclor-1232	UJ (all non-detects) UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)
SB-SEALA-01 SB-CORK-DUP SB-CORK-01 SB-SEAL-01 SB-CONC-08 SB-CONC-38 SB-SEAL-DUP SB-SEALB-01 SB-SEALC-01 SB-CONC-19 SB-CONC-20 SB-CONC-39	Aroclor-1016 Aroclor-1221 Aroclor-1232	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
SB-CORK-DUP SB-CORK-01	Aroclor-1248	J (all detects)	A	Field duplicates (RPD)
SB-SEAL-DUP SB-SEALC-01	Aroclor-1016	J (all detects) UJ (all non-detects)	A	Field duplicates (RPD)
SB-SEAL-DUP SB-SEALC-01	Aroclor-1248	J (all detects)	A	Field duplicates (RPD)

Sample	Compound	Flag	A or P	Reason
SB-CONC-13 SB-SED-08 SB-CONC-27 SB-SED-09 SB-SED-06 SB-CONC-28 SB-CONC-24 SB-CONC-26 SB-CONC-23 SB-CONC-30 SB-SED-05 SB-SED-03 SB-SED-04 SB-SEAL-02 (RESIN) SB-FIBWIPE-02 SB-CONC-18 SB-CONC-32 SB-CONC-33 SB-CONC-34 SB-CONC-35 SB-CONC-36 SB-CORK-03 SB-SEALB-03 SB-SEAL-04 SB-SEALC-03 SB-CAULK-01 SB-CORK-04 SB-CONC-37 SB-CONC-31 SB-CONC-25 SB-CONC-29 SB-SED-07 SB-CONC-DUP3 SB-CONC-16 SB-CONC-07 SB-CONC-21 SB-INTPC-01 SB-CONC-22 SB-CONC-06 SB-CONC-10 SB-SEALC-02 SB-CORK-02 SB-CONC-11 SB-CONC-12 SB-CONC-14 SB-CONC-DUP SB-CONC-15 SB-SEALA-01 SB-CORK-DUP SB-FIBWIPE-01 SB-CORK-01 SB-SEAL-01 SB-SEAL-DUP SB-SEALB-01 SB-SEALC-01 SB-CONC-09 SB-CONC-17 SB-CONC-19 SB-CONC-08 SB-CONC-20 SB-CONC-38 SB-CONC-39 SB-CONC-40 SB-CAULK-03 SB-SED-10 SB-CAULK-02 SB-SEALA-03	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Sample	Compound	Flag	A or P	Reason
SB-INTLP-02 FB-PGCONC-01 FB-PGCONC-02 FB-PGCONC-DUP AB-SEAL-07 AB-SEAL-09 AB-SEAL-10 PC-07 SB-CONC-05	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 507195

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 507195

No Sample Data Qualified in this SDG

LDC #: 34880E3b

SDG #: 507195

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 08/28/15

Reviewer: JVG

2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r✓ ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS/D * *
IX.	Field duplicates	SW	D = 26/33; 39/46; 49/51; 53/55; 70/71
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB-CONC-13	507195-01	Soil	07/13/15
2	SB-SED-08	507195-02	Soil	07/13/15
3	SB-CONC-27	507195-03	Soil	07/13/15
4	SB-SED-09	507195-04	Soil	07/13/15
5	SB-SED-06	507195-05	Soil	07/13/15
6	SB-CONC-28	507195-06	Soil	07/13/15
7	SB-CONC-24	507195-07	Soil	07/13/15
8	SB-CONC-26 D1	507195-08	Soil	07/13/15
9	SB-CONC-23	507195-09	Soil	07/13/15
10	SB-CONC-30	507195-10	Soil	07/13/15
11	SB-SED-~~06~~ 5	507195-11	Soil	07/10/15
12	SB-SED-03	507195-12	Soil	07/10/15
13	SB-SED-04	507195-13	Soil	07/10/15
14	SB-SEAL-02 (RESIN)	507195-15	Soil	07/13/15
15	SB-FIBWIPE-02	507195-16	Wipe	07/13/15
16	SB-CONC-18	507195-18	Soil	07/13/15
17	SB-CONC-32	507195-19	Soil	07/14/15

LDC #: 34880E3b

SDG #: 507195

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 08/28/15

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID		Lab ID	Matrix	Date
18	SB-CONC-33		507195-20	Soil	07/14/15
19	SB-CONC-34		507195-21	Soil	07/14/15
20	SB-CONC-35		507195-22	Soil	07/14/15
21	SB-CONC-36		507195-23	Soil	07/14/15
22	SB-CORK-03		507195-24	Soil	07/14/15
23	SB-SEALB-03		507195-25	Soil	07/14/15
24	SB-SEAL04		507195-26	Soil	07/14/15
25	SB-SEALC-03		507195-27	Soil	07/14/15
26	SB-CAULK-01		507195-28	Soil	07/14/15
27	SB-CORK-04		507195-29	Soil	07/14/15
28	SB-CONC-37		507195-30	Soil	07/14/15
29	SB-CONC-31		507195-31	Soil	07/13/15
30	SB-CONC-25		507195-32	Soil	07/13/15
31	SB-CONC-29		507195-33	Soil	07/13/15
32	SB-SED-07		507195-34	Soil	07/13/15
33	SB-CONC-DUP3	D1	507195-35	Soil	07/13/15
34	SB-CONC-16		507195-38	Soil	07/13/15
35	SB-CONC-07		507195-39	Soil	07/13/15
36	SB-CONC-21		507195-40	Soil	07/13/15
37	SB-INTPC-01		507195-41	Soil	07/13/15
38	SB-CONC-22		507195-43	Soil	07/13/15
39	SB-CONC-06	D2	507195-46	Soil	07/13/15
40	SB-CONC-10		507195-49	Soil	07/13/15
41	SB-SEALC-02		507195-50	Soil	07/13/15
42	SB-CORK-02		507195-51	Soil	07/13/15
43	SB-CONC-11		507195-52	Soil	07/13/15
44	SB-CONC-12		507195-53	Soil	07/13/15
45	SB-CONC-14		507195-54	Soil	07/13/15
46	SB-CONC-DUP	D2	507195-55	Soil	07/13/15
47	SB-CONC-15		507195-56	Soil	07/13/15
48	SB-SEALA-01		507195-57	Soil	07/13/15
49	SB-CORK-DUP	D3	507195-58	Soil	07/13/15
50	SB-FIBWIPE-01		507195-59	Wipe	07/13/15
51	SB-CORK-01	D3	507195-60	Soil	07/13/15
52	SB-SEAL-01		507195-61	Soil	07/13/15

LDC #: 34880E3b
SDG #: 507195
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/28/15

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

	Client ID	Lab ID	Matrix	Date
53	SB-SEAL-DUP D4	507195-63	Soil	07/13/15
54	SB-SEALB-01	507195-64	Soil	07/13/15
55	SB-SEALC-01 D4	507195-65	Soil	07/13/15
56	SB-CONC-09	507195-66	Soil	07/13/15
57	SB-CONC-17	507195-67	Soil	07/13/15
58	SB-CONC-19	507195-68	Soil	07/13/15
59	SB-CONC-08	507195-69	Soil	07/13/15
60	SB-CONC-20	507195-70	Soil	07/13/15
61	SB-CONC-38	507195-71	Soil	07/14/15
62	SB-CONC-39	507195-72	Soil	07/14/15
63	SB-CONC-40	507195-73	Soil	07/14/15
64	SB-CAULK-03	507195-74	Soil	07/14/15
65	SB-SED-10	507195-75	Soil	07/14/15
66	SB-CAULK-02	507195-76	Soil	07/14/15
67	SB-SEALA-03	507195-77	Soil	07/14/15
68	SB-INT~~O~~LP-02	507195-78	Soil	07/14/15
69	FB-PGCONC-01	507195-79	Soil	07/14/15
70	FB-PGCONC-02 D5	507195-80	Soil	07/14/15
71	FB-PGCONC-DUP D5	507195-81	Soil	07/14/15
72	AB-SEAL-07	507195-82	Soil	07/14/15
73	AB-SEAL-09	507195-83	Soil	07/14/15
74	AB-SEAL-10	507195-84	Soil	07/14/15
75	PC-07	507195-85	Soil	07/14/15
(04) 76 2	SB-SEAL-MS	507195-17MS	Soil	07/13/15
(01) 77 2	SB-SEAL-MSD	507195-14MSD	Soil	07/13/15
(23) 78 3	SB-CONC-MS2	507195-37MS	Soil	07/13/15
79 3	SB-CONC-MSD2	507195-36MSD	Soil	07/13/15
(01) 80 3	SB-CORK-MS	507195-44MS	Soil	07/13/15
81 3	SB-CORK-MSD	507195-42MSD	Soil	07/13/15
07 82 3	SB-CONC-MS	507195-47MS	Soil	07/13/15
83 3	SB-CONC-MSD	507195-48MSD	Soil	07/13/15
(04) 84 5	SB-SEAL-MS	507195-62MS	Soil	07/13/15
85	SB-CONC-40MS	507195-73MS	Soil	07/14/15
86	SB-CONC-05	-45		07/13/15
87				

LDC #: 34880E3b
SDG #: 507195
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 08/28/15

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

	Client ID	Lab ID	Matrix	Date
88				
89				
90				

Notes:

-1	05-1473 MB		(1-11)					
-2	05-1479		(12-14, 16-30)					
-3	05-1480		(31-42, 86)					
-4	05-1481		(63-75)					

-5 65-1482 (43-49, 51-62)
-6 05-1433

Note: Print-outs showed results after manual integration.

LDC #: 34880 E3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG

2nd Reviewer:

Method: ✓ GC ________ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of $\geq$ 0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) $\leq$ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) $\leq$ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?		✓		
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?			✓	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 34860 E36

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 34880 E36

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 2
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A — Was at least one standard run daily to verify the working curve? (Y)

Y N N/A — Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%? (N)

Level IV/D Only

Y N N/A — Were the retention times for all calibrated compounds within their respective acceptance windows? (Y)

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	07/20/15	072006	Rear	V (+)	47.5	( )	05-1473 MB	J/UJR/A
				BB (+)	27.9	( )		
						( )		
						( )		
	07/30/15	073019	Rear	BB (-)	24.3	( )	31-42, 86, 05-1480 MB	
						( )	(ND + Det)	
						( )		
						( )		
	08/03/15	080303	Rear	V (+)	51.6	( )	43, 44, 05-1482 MB	(ND)
						( )		
						( )		
	08/03/15	080325	Rear	V (+)	44.0	( )	45-47, 56, 57 (ND)	
						( )		
						( )		
	08/03/15	080335	Rear	V (+)	24.3	( )	48, 49, 51, 52, 59, 61 (ND+Det)	
						( )		
						( )		
	08/04/15	080344	Rear	V (+)	38.7	( )	76, 84	
						( )		
						( )		
	08/04/15	080357	Rear	V (+)	28.6	( )	53-55, 58, 60, 62 (ND+Det)	
						( )		
						( )		

QC

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

V = qual V - X
BB = qual Y - BB

CONCAL.wpd

LDC #: 34880E 3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?
Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only

Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	08/05/15	080378	Rear	V (+)	38.2	( )	29, 30 (ND)	J/UJ R/A
						( )		
						( )		
	08/05/15	080503	Rear	V (+)	40.6	( )	24, 27, 42, 43, 49, (ND)	
						( )	74, 75	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

LDC #: 34880 E36

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?
Y N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	27 (50x)	NS	A	15 (30-150)	No qual (dil)
				( )	
	8 (10x)			160 ( )	
				( )	
	43 (10x)			155 ( )	
				( )	
				( )	
	4, 14, 22, 23,			0 ( )	
	25, 26, 28, 37,			( )	
	49, 51, 52, 53,			( )	
	68			( )	
				( )	
	(50 - 50000x)			( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 34860 E 3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	80/81	V	20 (29-135)	( )	67 (15)	51	No qual (dil)
	(5000x)	BB	146 (↓)	140 (29-135)	( )	↓	
			( )	( )	( )		
			( )	( )	( )		
	82/83	V	( )	( )	41 (15)	No asst'd sple	
	(10x)	BB	( )	( )	43 (20)	↓	
			( )	( )	( )	(from 507154)	
			( )	( )	( )		
	78/79	V	( )	( )	17 (15)	9	
	(10x)		( )	( )	( )		
			( )	( )	( )		
	76/77	V	200 (29-135)	0 (29-135)	200 (15)	24	
	(5000x)	BB	( )	0 (↓)	200 (20)		
			( )	( )	( )		
			( )	( )	( )		
	85	V	0 (29-135)	( )	( )	63	
	(50x)	BB	0 (↓)	( )	( )	↓	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

MSD.3S.wpd

LDC#: 34880E3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	49	51		
Aroclor 1248	19	1100	193	Jdets/A

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	53	55		
Aroclor 1016	7700	10U	199	~~J/R/A~~ J/UJ/A
Aroclor 1248	10000	1500	148	JdetsA

Compound	Concentration (mg/Kg)		RPD (20%)	Qualifications (Parent only)
	70	71		
Aroclor 1254	180	160	12	

V:\Josephine\FIELD DUPLICATES\34880E3b mwh anacortes.wpd

LDC #: _34880E3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:__JVG__
2nd Reviewer:________

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0429	4/29/2015	1260-2 (Signal 1)	NR	4.33E+07	4.96E+07	4.96E+07	18.5	18.3
			1260-2 (Signal 2)	NR	2.10E+08	2.01E+08	2.01E+08	12.3	12.3
2	ICAL pcb0721	7/21/2015	1260-1 (Signal 1)	NR	4.31E+07	4.94E+07	4.94E+07	16.3	16.3
			1260-1 (Signal 2)	NR	1.60E+08	1.99E+08	1.99E+08	18.4	18.4
2	ICAL pcb0730	7/30/2015	1260-1 (Signal 1)	NR	4.94E+07	5.35E+07	5.31E+07	10.7	9.2
			1260-1 (Signal 2)	NR	1.99E+08	1.65E+08	1.65E+08	16.1	16.1

LDC # 34880E3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	072006	7/20/2015	1260 Total (Sig 1)	1.000	1.074	1.074	NR	7.4
	(pcb0429)		1260 Total (Sig 2)	1.000	1.279	1.279	NR	27.9
2	072403	7/24/2015	1260 Total (Sig 1)	1.000	0.938	0.938	NR	6.2
	(pcb0721)		1260 Total (Sig 2)	1.000	0.940	0.940	NR	6.0
3	072414	7/24/2015	1260 Total (Sig 1)	5.000	4.558	4.558	NR	8.8
			1260 Total (Sig 2)	5.000	4.503	4.503	NR	9.9
4	072422	7/24/2015	1260 Total (Sig 1)	1.000	0.969	0.969	NR	3.1
			1260 Total (Sig 2)	1.000	0.968	0.968	NR	3.2
5	072432	7/24/2015	1260 Total (Sig 1)	5.000	4.552	4.553	NR	8.9
			1260 Total (Sig 2)	5.000	4.416	4.416	NR	11.7
6	073019	7/30/2015	1260 Total (Sig 1)	5.000	4.267	4.267	NR	14.7
	(pcb0730)		1260 Total (Sig 2)	5.000	3.783	3.783	NR	24.3
7	073038	7/30/2015	1260 Total (Sig 1)	5.000	4.317	4.316	NR	13.7
			1260 Total (Sig 2)	5.000	4.616	4.617	NR	7.7
8	073055	7/30/2015	1260 Total (Sig 1)	5.000	4.429	4.428	NR	11.4
			1260 Total (Sig 2)	5.000	4.479	4.480	NR	10.4

LDC # 34880E3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
9	073066	8/1/2015	1260 Total (Sig 1)	5.000	4.334	4.333	NR	13.3
	(pcb0730)		1260 Total (Sig 2)	5.000	4.711	4.711	NR	5.8
10	080303	8/3/2015	1260 Total (Sig 1)	1.000	0.926	0.926	NR	7.4
			1260 Total (Sig 2)	1.000	1.160	1.160	NR	16.0
11	080325	8/3/2015	1260 Total (Sig 1)	1.000	0.869	0.869	NR	13.1
			1260 Total (Sig 2)	1.000	1.125	1.126	NR	12.6
12	080335	8/4/2015	1260 Total (Sig 1)	5.000	4.168	4.167	NR	16.7
			1260 Total (Sig 2)	5.000	5.103	5.103	NR	2.1
13	080344	8/4/2015	1260 Total (Sig 1)	1.000	0.890	0.890	NR	11.0
			1260 Total (Sig 2)	1.000	1.057	1.057	NR	5.7
14	080357	8/4/2015	1260 Total (Sig 1)	1.000	0.925	0.925	NR	7.5
			1260 Total (Sig 2)	1.000	1.031	1.031	NR	3.1
15	080368	8/4/2015	1260 Total (Sig 1)	5.000	4.458	4.457	NR	10.9
			1260 Total (Sig 2)	5.000	4.688	4.689	NR	6.2
16	080378	8/5/2015	1260 Total (Sig 1)	1.000	0.926	0.926	NR	7.4
			1260 Total (Sig 2)	1.000	1.072	1.072	NR	7.2
17	080503	8/5/2015	1260 Total (Sig 1)	1.000	0.908	0.908	NR	9.2
			1260 Total (Sig 2)	1.000	1.062	1.062	NR	6.2

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
18	072303	7/23/2015	1260 Total (Sig 1)	1.000	0.908	0.908	NR	9.2
			1260 Total (Sig 2)	1.000	0.869	0.869	NR	13.1
19	072313	7/23/2015	1260 Total (Sig 1)	5.000	4.696	4.696	NR	6.1
			1260 Total (Sig 2)	5.000	4.375	4.375	NR	12.5

LDC #: 34580E3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: Q

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Y	Sig 1	0.200	0.21	105	105	0

0.021 x 10 = 0.21

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 34880 E3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG

2nd Reviewer: CL

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =((({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration, SC = Sample concentration, SA = Spike added, MS = Matrix spike, MSD = Matrix spike duplicate

MS/MSD samples: 78 / 79 (MSD / MS)

Compound	Spike Added (mg/kg) MS	Spike Added (mg/kg) MSD	Sample Conc. (mg/kg) ---	Spike Sample Concentration (mg/kg) MS	Spike Sample Concentration (mg/kg) MSD	Matrix spike Percent Recovery Reported	Matrix spike Percent Recovery Recalc.	Matrix Spike Duplicate Percent Recovery Reported	Matrix Spike Duplicate Percent Recovery Recalc.	MS/MSD RPD Reported	MS/MSD RPD Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.833	0.833	0	0.538	0.642	64	64.6	77	77	18	18

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34880 E3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: q

METHOD: / GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 05-1480 LCS/D

Compound	Spike Added (mg/kg)		Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
1260 (8082A)	0.833	0.833	0.686	0.702	82	82	84	84	2	2

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Y N N/A — Were all reported results recalculated and verified for all level IV samples?
Y N N/A — Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 4 Compound Name 1254

Single pt. ICAL

Concentration = $\frac{(14308391)}{(19061921)}$ = ~~0.7506~~ 0.7506

1254 Total = $\frac{0.7506 + 0.931 + 1.036 + 1.200 + 1.228}{5}$ = 1.029

final conc. = $\frac{(1.029)(5\ ml)(0.2)(10000)}{(6g)(0.89)}$ = 1926.97 ≈ 1900 mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
			1900		

Comments:

Appendix D3. Data Gap Investigation Laboratory Analytical Data

1 – Laboratory Data Validation Report - 7.2016

2 –AWTP 605479

3 –AWTP 606032

4 – Anacortes asbestos results

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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
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June 27, 2016

Ken Lederman
Foster Pepper LLC
1111 3rd Ave Suite 3400
Seattle, WA 98101

Dear Mr. Lederman:

Included are the results from the testing of material submitted on May 25, 2016 from the AWTP, F&BI 605479 project. There are 73 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: ledek@foster.com
NAA0627R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 25, 2016 by Friedman & Bruya, Inc. from the Foster Pepper LLC AWTP, F&BI 605479 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper LLC
605479 -01	SB-SOIL-12-01
605479 -02	SB-SOIL-36-01
605479 -03	SB-SOIL-12-02
605479 -04	SB-SOIL-36-02
605479 -05	SB-SOIL-12-09
605479 -06	SB-SOIL-36-09
605479 -07	SB-SOIL-12-10
605479 -08	SB-SOIL-36-10
605479 -09	SB-SOIL-12-04
605479 -10	SB-SOIL-36-04
605479 -11	SB-SOIL-12-06
605479 -12	SB-SOIL-36-06
605479 -13	FB-SOIL-12-02
605479 -14	FB-SOIL-36-02
605479 -15	FB-SOIL-12-01
605479 -16	FB-SOIL-36-01
605479 -17	FB-SOIL-12-06
605479 -18	FB-SOIL-36-06
605479 -19	FB-SOIL-12-05
605479 -20	FB-SOIL-36-05
605479 -21	FB-SOIL-12-Dup
605479 -22	FB-SOIL-12-04
605479 -23	FB-SOIL-36-04
605479 -24	FB-SOIL-12-03
605479 -25	FB-SOIL-36-03
605479 -26	RINSATE-01
605479 -27	SB-SOIL-12-07
605479 -28	SB-SOIL-36-07
605479 -29	SB-SOIL-12-05
605479 -30	SB-SOIL-36-05
605479 -31	SB-SOIL-12-03
605479 -32	SB-SOIL-36-03
605479 -33	SB-SOIL-12-08
605479 -34	SB-SOIL-36-08
605479 -35	SB-SOIL-12-Dup
605479 -36	CW-SED-01

CASE NARRATIVE (continued)

Laboratory ID	Foster Pepper LLC
605479 -37	CW-SED-02
605479 -38	CW-SED-Dup
605479 -39	CW-SED-03
605479 -40	CW-SED-04
605479 -41	CW-SED-05
605479 -42	CW-SED-06
605479 -43	RINSATE-02
605479 -44	SB-MASTIC-01
605479 -45	SB-MASTIC-02
605479 -46	FB-MASTIC-01
605479 -47	CW-MASTIC-01
605479 -48	Dup-MASTIC-01
605479 -49	AB-Wipe-01
605479 -50	AB-Wipe-02
605479 -51	AB-Wipe-03
605479 -52	AB-Wipe-04
605479 -53	AB-Wipe-05
605479 -54	AB-Wipe-06
605479 -55	AB-Wipe-07
605479 -56	AB-Wipe-08
605479 -57	AB-Wipe-09
605479 -58	AB-Wipe-10
605479 -59	AB-Wipe-11
605479 -60	AB-Wipe-12

The 8082A TCLP aroclor 1016 matrix spike and the associated relative percent difference failed the acceptance criteria. The laboratory control sample and laboratory control sample duplicate met the acceptance criteria, therefore the results were likely due to matrix effect.

All other quality control requirements were acceptable.

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-01 1/50
Date Analyzed:	06/07/16	Data File:	060705.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	3.3
Aroclor 1260	3.5

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-02 1/50
Date Analyzed:	06/07/16	Data File:	060706.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-03 1/50
Date Analyzed:	06/07/16	Data File:	060707.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	0.33
Aroclor 1260	0.29

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-04 1/50
Date Analyzed:	06/07/16	Data File:	060708.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-09	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-05 1/50
Date Analyzed:	06/07/16	Data File:	060709.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 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	0.33
Aroclor 1260	0.57

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-09	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-06 1/50
Date Analyzed:	06/07/16	Data File:	060710.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-10	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-07 1/50
Date Analyzed:	06/07/16	Data File:	060711.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-10	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-08 1/50
Date Analyzed:	06/07/16	Data File:	060712.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-09 1/50
Date Analyzed:	06/07/16	Data File:	060713.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-10 1/50
Date Analyzed:	06/07/16	Data File:	060714.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

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

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Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-11 1/50
Date Analyzed:	06/07/16	Data File:	060718.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-12 1/50
Date Analyzed:	06/07/16	Data File:	060719.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-13 1/50
Date Analyzed:	06/07/16	Data File:	060722.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-14 1/50
Date Analyzed:	06/07/16	Data File:	060723.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-15 1/50
Date Analyzed:	06/07/16	Data File:	060724.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	0.52
Aroclor 1260	0.54

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-16 1/50
Date Analyzed:	06/07/16	Data File:	060725.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	35 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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-17 1/50
Date Analyzed:	06/08/16	Data File:	060726.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	0.60
Aroclor 1260	0.72

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-18 1/50
Date Analyzed:	06/08/16	Data File:	060727.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45 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	0.33
Aroclor 1260	0.24

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-19 1/50
Date Analyzed:	06/08/16	Data File:	060728.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 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	0.57
Aroclor 1260	0.53

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-20 1/50
Date Analyzed:	06/08/16	Data File:	060729.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-Dup	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-21 1/50
Date Analyzed:	06/08/16	Data File:	060733.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	0.36
Aroclor 1260	0.35

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-22 1/50
Date Analyzed:	06/08/16	Data File:	060734.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	1.9
Aroclor 1260	1.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-23 1/50
Date Analyzed:	06/08/16	Data File:	060735.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 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	0.24
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-12-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-24 1/50
Date Analyzed:	06/08/16	Data File:	060738.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50 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	6.9
Aroclor 1260	8.7

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	FB-SOIL-36-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-25 1/50
Date Analyzed:	06/08/16	Data File:	060739.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-07	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-27 1/50
Date Analyzed:	06/08/16	Data File:	060809.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-07	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-28 1/50
Date Analyzed:	06/08/16	Data File:	060810.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-29 1/50
Date Analyzed:	06/08/16	Data File:	060811.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	1.2
Aroclor 1260	1.5

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-30 1/50
Date Analyzed:	06/08/16	Data File:	060812.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	40 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	0.28
Aroclor 1260	0.29

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-31 1/50
Date Analyzed:	06/08/16	Data File:	060813.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60 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	0.34
Aroclor 1260	0.20

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-32 1/50
Date Analyzed:	06/08/16	Data File:	060814.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	35 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-08	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-33 1/50
Date Analyzed:	06/08/16	Data File:	060815.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	30 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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-36-08	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-34 1/50
Date Analyzed:	06/08/16	Data File:	060816.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50 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	0.21
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SB-SOIL-12-Dup	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-35 1/50
Date Analyzed:	06/08/16	Data File:	060817.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-39 1/50
Date Analyzed:	06/08/16	Data File:	060818.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	<0.4
Aroclor 1232	<0.4
Aroclor 1016	<0.4
Aroclor 1242	<0.4
Aroclor 1248	<0.4
Aroclor 1254	0.67
Aroclor 1260	<0.4

Note: The reporting limits were raised due to high moisture content in the sample.

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-40 1/50
Date Analyzed:	06/08/16	Data File:	060823.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	115 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.4
Aroclor 1232	<0.4
Aroclor 1016	<0.4
Aroclor 1242	<0.4
Aroclor 1248	<0.4
Aroclor 1254	2.8
Aroclor 1260	<0.4

Note: The reporting limits were raised due to high moisture content in the sample.

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-41 1/50
Date Analyzed:	06/08/16	Data File:	060821.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	55 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	1.9
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	605479-42 1/50
Date Analyzed:	06/08/16	Data File:	060822.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	25 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	2.5
Aroclor 1260	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	06-1113 mb 1/5
Date Analyzed:	06/06/16	Data File:	060618.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	85	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 605479
Date Extracted:	06/06/16	Lab ID:	06-1115 mb 1/5
Date Analyzed:	06/06/16	Data File:	060619.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	92	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

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	SB-MASTIC-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-44
Date Analyzed:	06/09/16	Data File:	060844.D
Matrix:	Soil/Solid	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50	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	3.2
Aroclor 1260	1.7

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	SB-MASTIC-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-45
Date Analyzed:	06/09/16	Data File:	060845.D
Matrix:	Soil/Solid	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	43	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	3.1
Aroclor 1260	1.6

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	FB-MASTIC-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-46
Date Analyzed:	06/14/16	Data File:	061405.D
Matrix:	Soil/Solid	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

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

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	CW-MASTIC-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-47
Date Analyzed:	06/14/16	Data File:	061408.D
Matrix:	Soil/Solid	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

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

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	Dup-MASTIC-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-48
Date Analyzed:	06/14/16	Data File:	061409.D
Matrix:	Soil/Solid	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	25	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

Analysis For TCLP PCBs By EPA Method 8082A and 40 CFR PART 261

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	06-1151 mb3 1/0.5
Date Analyzed:	06/09/16	Data File:	060843.D
Matrix:	Soil/Solid	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	<0.05
Aroclor 1232	<0.05
Aroclor 1016	<0.05
Aroclor 1242	<0.05
Aroclor 1248	<0.05
Aroclor 1254	<0.05
Aroclor 1260	<0.05

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	RINSATE-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-26 1/0.25
Date Analyzed:	06/09/16	Data File:	060835.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	54	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-36 1/0.25
Date Analyzed:	06/09/16	Data File:	060836.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	0.85
Aroclor 1254	0.68
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-37 1/0.25
Date Analyzed:	06/09/16	Data File:	060837.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	44	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	0.71
Aroclor 1254	0.32
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	CW-SED-Dup	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-38 1/0.25
Date Analyzed:	06/09/16	Data File:	060838.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	0.58
Aroclor 1254	0.25
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	RINSATE-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	605479-43 1/0.25
Date Analyzed:	06/09/16	Data File:	060839.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	40	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 605479
Date Extracted:	06/07/16	Lab ID:	06-1151 mb2 1/0.25
Date Analyzed:	06/09/16	Data File:	060834.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-01	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-49
Date Analyzed:	06/03/16	Data File:	060308.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	96	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-02	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-50
Date Analyzed:	06/03/16	Data File:	060309.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	84	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-03	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-51
Date Analyzed:	06/03/16	Data File:	060310.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	99	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-04	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-52
Date Analyzed:	06/03/16	Data File:	060311.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	91	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-05	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-53
Date Analyzed:	06/03/16	Data File:	060312.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	92	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-06	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-54
Date Analyzed:	06/03/16	Data File:	060313.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	94	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-07	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-55
Date Analyzed:	06/03/16	Data File:	060314.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	86	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-08	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-56
Date Analyzed:	06/03/16	Data File:	060318.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	96	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-09	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-57
Date Analyzed:	06/03/16	Data File:	060319.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	17
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-10	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-58
Date Analyzed:	06/03/16	Data File:	060320.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	93	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-11	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-59
Date Analyzed:	06/03/16	Data File:	060321.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	95	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AB-Wipe-12	Client:	Foster Pepper LLC
Date Received:	05/25/16	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	605479-60
Date Analyzed:	06/03/16	Data File:	060322.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	98	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	43
Aroclor 1260	<10

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 605479
Date Extracted:	06/03/16	Lab ID:	06-1112 mb
Date Analyzed:	06/03/16	Data File:	060307.D
Matrix:	Wipe	Instrument:	GC7
Units:	ug/wipe	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	91	50	150

Compounds:	Concentration ug/wipe
Aroclor 1221	<10
Aroclor 1232	<10
Aroclor 1016	<10
Aroclor 1242	<10
Aroclor 1248	<10
Aroclor 1254	<10
Aroclor 1260	<10

Date of Report: 06/27/16
Date Received: 05/25/16
Project: AWTP, F&BI 605479

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

Laboratory Code: 605479-12 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	61	67	50-150	9
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	73	85	50-150	15

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	84	55-130	2
Aroclor 1260	mg/kg (ppm)	0.8	86	85	58-133	1

Date of Report: 06/27/16
Date Received: 05/25/16
Project: AWTP, F&BI 605479

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

Laboratory Code: 605479-23 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	82	75	50-150	9
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	97	86	50-150	12

Laboratory Code: 605479-39 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	90	91	50-150	1
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	88	90	50-150	2

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	83	81	55-130	2
Aroclor 1260	mg/kg (ppm)	0.8	86	83	58-133	4

Date of Report: 06/27/16
Date Received: 05/25/16
Project: AWTP, F&BI 605479

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

Laboratory Code: 605479-46 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	<0.1	46 vo	57	50-150	21 vo
Aroclor 1260	ug/L (ppb)	2.5	<0.1	55	65	50-150	17

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	0.63	62	64	37-136	3
Aroclor 1260	ug/L (ppb)	0.63	69	73	41-135	6

Date of Report: 06/27/16
Date Received: 05/25/16
Project: AWTP, F&BI 605479

**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 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	0.63	62	64	37-136	3
Aroclor 1260	ug/L (ppb)	0.63	69	73	41-135	6

Date of Report: 06/27/16
Date Received: 05/25/16
Project: AWTP, F&BI 605479

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WIPE 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/wipe	100	86	89	70-130	3
Aroclor 1260	ug/wipe	100	85	88	70-130	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.

605479

SAMPLE CHAIN OF CUSTODY

ME 05/25/16

LT-A2

Page # 1 of 7

Send Report To Ken Lederman

Company FOSTER Pepper LLC

Address 1111 3rd Ave, Suite 3400

City, State, ZIP Seattle, WA 98101

Phone # ______ Fax # ledek@foster.com

SAMPLERS (signature)

PROJECT NAME/NO. AWTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082					Notes
SB-SOIL-12-01	01	5/23/16	0855	SOIL	1							X					
SB-SOIL-36-01	02		0905		1							X					
SB-SOIL-12-02	03		0935		1							X					
SB-SOIL-36-02	04		0940		1							X					
SB-SOIL-12-09	05		1030		1							X					
SB-SOIL-36-09	06		1040		1							X					
SB-SOIL-12-10	07		1100		1							X					
SB-SOIL-36-10	08		1200		1							X					
SB-SOIL-12-04	09		1235		1							X					
SB-SOIL-36-04	10		1240		1							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:	RICHARD MALCOL	MWH	5/25/16	1340
Received by:	Eric Young	F&B	5/25/16	1340
Relinquished by:				
Received by:		Samples received at 4 °C		

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605479
[redacted]

SAMPLE CHAIN OF CUSTODY

ME 05/25/16
[redacted]

LT-A2

Page # 2 of 7

Send Report To Ken Lederman

Company Foster Pepper LLC

Address 1111 3rd Ave, Suite 3400

City, State, ZIP Seattle, WA 98101

Phone # ____ Fax # ledek@foster.com

SAMPLERS (signature)	
PROJECT NAME/NO. AWTP	PO#
REMARKS Privileged & Confidential	

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH ____
Rush charges authorized by ____

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [x] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082						Notes
SB-SOIL-12-06	11	5/23/16	1300	SOIL	1							X						
SB-SOIL-36-06	12 A-C		1310		3							X						MS/MSD
FB-SOIL-12-02	13		1415		1							X						
FB-SOIL-36-02	14		1420		1							X						
FB-SOIL-12-01	15		1435		1							X						
FB-SOIL-36-01	16		1440		1							X						
FB-SOIL-12-06	17		1450		1							X						
FB-SOIL-36-06	18		1455		1							X						
FB-SOIL-12-05	19		1520		1							X						
FB-SOIL-~~36~~-05	20		1530		~~3~~ 1 SA							X						~~MS/MSD~~ SA

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Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Richard Mallon	MWH	5/25/16	1340
Received by:	Eric Young	F&B	5/25/16	1340
Relinquished by:				
Received by:		Samples received at	4 °C	

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SAMPLE CHAIN OF CUSTODY

ME 05/25/16 [redacted]

LT-A2

Page # 3 of 7

Send Report To KEN LEDERMAN

Company FOSTER PEPPER LLC

Address 1111 3RD AVE SUITE 3400

City, State, ZIP SEATTLE WA 98101

Phone # ______ ~~Fax #~~ ledek@foster.com

SAMPLERS (signature)

PROJECT NAME/NO. AWTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082						Notes
FB-SOIL-12-DUP	21	5/23/16	1200	SOIL	1							X						
FB-SOIL-12-04	22		~~1635~~	~~16~~	1							X						
FB-SOIL-36-04	23A-C		1640		3							X						MS/MSD
FB-SOIL-12-03	24		1700		1							X						
FB-SOIL-36-03	25		1705		1							X						
RINSATE-01	26A-B		1720	QC	2							X						
SB-SOIL-12-07	27	5/24/16	0840	SOIL	1							X						
SB-SOIL-36-07	28		0845		1							X						
SB-SOIL-12-05	29		0900		1							X						
SB-SOIL-36-05	30		0905		1							X						

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Seattle, WA 98119-2029
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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	RICHARD MALLO	MWH	5/25/16	1340
Received by:	Eric Young	F&B	5/25/16	1340
Relinquished by:				
Received by:		Samples received at 4 °C		

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SAMPLE CHAIN OF CUSTODY

ME 05/25/16 [redacted]

LT-A2

Page # 4 of 7

Send Report To Ken Lederman

Company Foster Pepper LLC

Address 1111 3rd Ave, Suite 3400

City, State, ZIP Seattle, WA 98101

Phone # ______ Fax # ledek@foster.com

SAMPLERS (signature)

PROJECT NAME/NO. AWTP

PO#

REMARKS PRIVILEGED & CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082						Notes
SB-SOIL-12-03	31	5/24/16	1000	SOIL	1							X						
SB-SOIL-36-03	32		1015		1							X						
SB-SOIL-12-08	33		1050		1							X						
SB-SOIL-36-08	34		1055		1							X						
SB-SOIL-12-DUP	35		1200		1							X						
CW-SED-01	36A-B		1420	LIQUID	2							X						
CW-SED-02	37A-B		1430		2							X						
CW-SED-DUP	38A-B		1200		2							X						
CW-SED-03	39A-C		1440	Sediment	3							X						MS/MSD
CW-SED-04	40		1445	Sediment	1							X						

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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	RICHARD MALCOL	MWH	5/25/16	1340
Received by:	ERIC YOUNG	F&B	5/25/16	1340
Relinquished by:				
Received by:		Samples received at 4 °C		

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SAMPLE CHAIN OF CUSTODY ME 05/25/16

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Send Report To Ken Lederman

Company Foster Pepper LLC

Address 1111 3rd Ave, Suite 3400

City, State, ZIP Seattle, WA 98101

Phone # ______ Fax # ledeK@foster.com

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REMARKS

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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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082	PCBs TCLP					Notes
CW-SED-05	41	5/24/16	1450	Sediment	1							X						
CW-SED-06	42		1500	Sediment	1							X						
RWSATE-02	43 A-B		1115	QC	2							X						
SB-MASTIC-01	44	5/20/16	1045	Solid	1								X					
SB-MASTIC-02	45		1100		1								X					
FB-MASTIC-01	46 A-C		1120		3								X					MS/MSD
CW-MASTIC-01	47		1130		1								X					
DUP-MASTIC-01	48		1200		1								X					

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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Richard Malco	MWH	5/25/16	1340
Received by:	Eric Young	FB	5/25/16	1340
Relinquished by:				
Received by:		Samples received at 4 °C		

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ME 05/25/16

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PROJECT NAME/NO.	PO#
ANACORTES WTP	

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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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB						Notes
AB-WIPE-01	49	5/25/16	0855	WIPE	1							X						
AB-WIPE-02	60	5/25/16	0900	WIPE	1							X						
AB-WIPE-03	51	5/25/16	0905	WIPE	1							X						
AB-WIPE-04	52	5/25/16	0910	WIPE	1							X						
AB-WIPE-05	53	5/25/16	0915	WIPE	1							X						
AB-WIPE-06	54	5/25/16	0920	WIPE	1							X						
AB-WIPE-07	55	5/25/16	0925	WIPE	1							X						
AB-WIPE-08	56	5/25/16	0930	WIPE	1							X						
AB-WIPE-09	57	5/25/16	0935	WIPE	1							X						
AB-WIPE-10	58	5/25/16	0940	WIPE	1							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: [signature]	RICHARD MALLO	MWH	5/25/16	1340
Received by: [signature]	Eric Young	F&B	[illegible]	[illegible]
Relinquished by:				
Received by:		Samples received at 4 °C		

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605479

SAMPLE CHAIN OF CUSTODY

ME 05/25/16

Send Report To: Ken Lederman
Company: Foster Pepper LLC
Address:
City, State, ZIP:
Phone #: Fax #:

SAMPLERS (signature):

Page # 7 of 7

PROJECT NAME/NO.: AWTP

PO#:

REMARKS: Privileged & Confidential

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☒ Will call with instructions

4-A2

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB						Notes
AB-WIPE-11	59	5/25/16	0945	WIPE	1							X						
AB-WIPE-12	60	5/25/16	0950	WIPE	1							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:	Richard Maller	MWH	5/25/16	1340
Received by:	Eric Young	F&B	5/25/16	1340
Relinquished by:				
Received by:				

Samples received at 4 °C

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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

June 29, 2016

Ken Lederman, Esquire
Foster Pepper LLC
1111 3rd Ave, Suite 3400
Seattle, WA 98101

Dear Mr. Lederman:

Included are the results from the testing of material submitted on June 2, 2016 from the AWTP, F&BI 606032 project. There are 42 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: ledek@foster.com
NAA0629R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 2, 2016 by Friedman & Bruya, Inc. from the Foster Pepper LLC AWTP, F&BI 606032 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Foster Pepper LLC
606032 -01	SL-SOIL-01
606032 -02	SL-SOIL-02
606032 -03	SL-SOIL-03
606032 -04	SL-SOIL-04
606032 -05	SL-SOIL-DUP
606032 -06	PZ-FILT-04
606032 -07	PZ-SED-03
606032 -08	PZ-FILT-01
606032 -09	PZ-FILT-02
606032 -10	PZ-SED-04
606032 -11	PZ-SED-06 MS
606032 -12	PZ-SED-06 MSD
606032 -13	PZ-SED-06
606032 -14	TB
606032 -15	IDW-SOIL-COMP
606032 -16	IDW-GW-COMP
606032 -17	PZ-SED-07
606032 -18	PZ-SED-01
606032 -19	DUP-1
606032 -20	DUP-2
606032 -21	PZ-FILT-06
606032 -22	PZ-SED-08
606032 -23	DG-GW
606032 -24	PZ-SED-02
606032 -25	PZ-SED-09
606032 -26	PZ-SED-10

Methylene chloride and acetone were detected in the TCLP VOC sample IDW-SOIL-COMP as well as the method blank. The data were flagged as due to laboratory contamination. In addition the TCLP VOC methylene chloride laboratory control sample and laboratory control sample duplicate and the 1,2 dichlorobenzene laboratory control sample duplicate failed the acceptance criteria. The data were flagged accordingly.

CASE NARRATIVE (continued)

The 8270D benzoic acid laboratory control sample and laboratory control sample duplicate relative percent difference did not pass the acceptance criteria. The compound was not detected, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For TCLP Volatile Compounds By EPA Method 8260C and 40 CFR PART 261

Client Sample ID:	IDW-SOIL-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/14/16	Lab ID:	606032-15
Date Analyzed:	06/14/16	Data File:	061411.D
Matrix:	TCLP Extract	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	106	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	83 fb	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	48 fb jl	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 jl
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 TCLP Volatile Compounds By EPA Method 8260C and 40 CFR PART 261

Client Sample ID:	IDW-GW-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/14/16	Lab ID:	606032-16
Date Analyzed:	06/14/16	Data File:	061412.D
Matrix:	TCLP Extract	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	104	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 jl	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 jl
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<1	1,2,4-Trichlorobenzene	<1
Toluene	3.4	Hexachlorobutadiene	<1
trans-1,3-Dichloropropene	<1	Naphthalene	<1
1,1,2-Trichloroethane	<1	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For TCLP Volatile Compounds By EPA Method 8260C and 40 CFR PART 261

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 606032
Date Extracted:	06/14/16	Lab ID:	06-1094 mb
Date Analyzed:	06/14/16	Data File:	061410.D
Matrix:	TCLP Extract	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	105	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	78 lc	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	47 lc jl	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 jl
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 TCLP Semivolatile Compounds By EPA Method 8270D and 40 CFR PART 261

Client Sample ID:	IDW-SOIL-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/08/16	Lab ID:	606032-15
Date Analyzed:	06/14/16	Data File:	061410.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	57	32	162
Phenol-d6	37	10	170
Nitrobenzene-d5	90	50	150
2-Fluorobiphenyl	84	43	158
2,4,6-Tribromophenol	115	43	146
Terphenyl-d14	108	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D and 40 CFR PART 261

Client Sample ID:	IDW-GW-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/08/16	Lab ID:	606032-16
Date Analyzed:	06/14/16	Data File:	061411.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	60	32	162
Phenol-d6	49	10	170
Nitrobenzene-d5	84	50	150
2-Fluorobiphenyl	83	43	158
2,4,6-Tribromophenol	114	43	146
Terphenyl-d14	107	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis For TCLP Semivolatile Compounds By EPA Method 8270D and 40 CFR PART 261

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 606032
Date Extracted:	06/08/16	Lab ID:	06-1159 mb
Date Analyzed:	06/14/16	Data File:	061409.D
Matrix:	TCLP Extract	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	72	32	162
Phenol-d6	58	10	170
Nitrobenzene-d5	93	50	150
2-Fluorobiphenyl	93	43	158
2,4,6-Tribromophenol	106	43	146
Terphenyl-d14	108	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<2	2,6-Dinitrotoluene	<1
Bis(2-chloroethyl) ether	<0.2	3-Nitroaniline	<20
2-Chlorophenol	<2	Acenaphthene	<0.2
1,3-Dichlorobenzene	<0.2	2,4-Dinitrophenol	<6
1,4-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,2-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<1
Benzyl alcohol	<2	4-Nitrophenol	<6
Bis(2-chloroisopropyl) ether	<0.2	Diethyl phthalate	<2
2-Methylphenol	<2	Fluorene	<0.2
Hexachloroethane	<0.2	4-Chlorophenyl phenyl ether	<0.2
N-Nitroso-di-n-propylamine	<0.2	N-Nitrosodiphenylamine	<0.2
3-Methylphenol + 4-Methylphenol	<4	4-Nitroaniline	<20
Nitrobenzene	<0.2	4,6-Dinitro-2-methylphenol	<6
Isophorone	<0.2	4-Bromophenyl phenyl ether	<0.2
2-Nitrophenol	<2	Hexachlorobenzene	<0.2
2,4-Dimethylphenol	<2	Pentachlorophenol	<2
Benzoic acid	<10	Phenanthrene	<0.2
Bis(2-chloroethoxy)methane	<0.2	Anthracene	<0.2
2,4-Dichlorophenol	<2	Carbazole	<2
1,2,4-Trichlorobenzene	<0.2	Di-n-butyl phthalate	<2
Naphthalene	<0.2	Fluoranthene	<0.2
Hexachlorobutadiene	<0.2	Pyrene	<0.2
4-Chloroaniline	<20	Benzyl butyl phthalate	<2
4-Chloro-3-methylphenol	<2	Benz(a)anthracene	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
1-Methylnaphthalene	<0.2	Bis(2-ethylhexyl) phthalate	<3.2
Hexachlorocyclopentadiene	<0.6	Di-n-octyl phthalate	<2
2,4,6-Trichlorophenol	<2	Benzo(a)pyrene	<0.2
2,4,5-Trichlorophenol	<2	Benzo(b)fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(k)fluoranthene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)pyrene	<0.2
Dimethyl phthalate	<2	Dibenz(a,h)anthracene	<0.2
Acenaphthylene	<0.2	Benzo(g,h,i)perylene	<0.2

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	IDW-SOIL-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-15
Date Analyzed:	06/10/16	Data File:	606032-15.030
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	IDW-GW-COMP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-16
Date Analyzed:	06/10/16	Data File:	606032-16.031
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis for TCLP Metals By EPA Method 200.8 and 40 CFR PART 261

Client ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	I6-365 mb
Date Analyzed:	06/10/16	Data File:	I6-365 mb.025
Matrix:	TCLP Extract	Instrument:	ICPMS1
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Barium	<1	100
Cadmium	<1	1.0
Chromium	<1	5.0
Lead	<1	5.0
Mercury	<0.1	0.2
Selenium	<1	1.0
Silver	<1	5.0

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SL-SOIL-01	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	606032-01 1/50
Date Analyzed:	06/10/16	Data File:	061007.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SL-SOIL-02	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	606032-02 1/50
Date Analyzed:	06/10/16	Data File:	061008.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SL-SOIL-03	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	606032-03 1/50
Date Analyzed:	06/10/16	Data File:	061009.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SL-SOIL-04	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	606032-04 1/50
Date Analyzed:	06/10/16	Data File:	061010.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	SL-SOIL-DUP	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	606032-05 1/50
Date Analyzed:	06/10/16	Data File:	061011.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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 606032
Date Extracted:	06/09/16	Lab ID:	06-1153 mb2 1/5
Date Analyzed:	06/10/16	Data File:	061006.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	90	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

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-FILT-04	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-06 1/0.25
Date Analyzed:	06/09/16	Data File:	060855.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-03	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-07 1/0.25
Date Analyzed:	06/09/16	Data File:	060856.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	61	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-FILT-01	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-08 1/0.25
Date Analyzed:	06/09/16	Data File:	060857.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-FILT-02	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-09 1/0.25
Date Analyzed:	06/09/16	Data File:	060858.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	43	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-04	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-10 1/0.25
Date Analyzed:	06/09/16	Data File:	060859.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-06	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-13 1/0.25
Date Analyzed:	06/09/16	Data File:	060862.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	61	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-07	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-17 1/0.25
Date Analyzed:	06/09/16	Data File:	060863.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-01	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-18 1/0.25
Date Analyzed:	06/09/16	Data File:	060867.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	53	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	DUP-1	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-19 1/0.25
Date Analyzed:	06/09/16	Data File:	060868.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	66	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	DUP-2	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-20 1/0.25
Date Analyzed:	06/09/16	Data File:	060869.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	51	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-FILT-06	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-21 1/0.25
Date Analyzed:	06/09/16	Data File:	060870.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-08	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-22 1/0.25
Date Analyzed:	06/10/16	Data File:	060871.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	DG-GW	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-23 1/0.25
Date Analyzed:	06/10/16	Data File:	060872.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-02	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-24 1/0.25
Date Analyzed:	06/10/16	Data File:	060873.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	59	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-09	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-25 1/0.25
Date Analyzed:	06/10/16	Data File:	060874.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	45	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	PZ-SED-10	Client:	Foster Pepper LLC
Date Received:	06/02/16	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	606032-26 1/0.25
Date Analyzed:	06/10/16	Data File:	060875.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	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Foster Pepper LLC
Date Received:	Not Applicable	Project:	AWTP, F&BI 606032
Date Extracted:	06/07/16	Lab ID:	06-1150 mb2 1/0.25
Date Analyzed:	06/09/16	Data File:	060854.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	MP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	46	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.01
Aroclor 1232	<0.01
Aroclor 1016	<0.01
Aroclor 1242	<0.01
Aroclor 1248	<0.01
Aroclor 1254	<0.01
Aroclor 1260	<0.01

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

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

Laboratory Code: 606032-16 1/5 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	<5	<5	nm
Chloromethane	ug/L (ppb)	<50	<50	nm
Vinyl chloride	ug/L (ppb)	<1	<1	nm
Bromomethane	ug/L (ppb)	<5	<5	nm
Chloroethane	ug/L (ppb)	<5	<5	nm
Trichlorofluoromethane	ug/L (ppb)	<5	<5	nm
Acetone	ug/L (ppb)	<50	<50	nm
1,1-Dichloroethene	ug/L (ppb)	<5	<5	nm
Hexane	ug/L (ppb)	<5	<5	nm
Methylene chloride	ug/L (ppb)	<25	<25	nm
Methyl t-butyl ether (MTBE)	ug/L (ppb)	<5	<5	nm
trans-1,2-Dichloroethene	ug/L (ppb)	<5	<5	nm
1,1-Dichloroethane	ug/L (ppb)	<5	<5	nm
2,2-Dichloropropane	ug/L (ppb)	<5	<5	nm
cis-1,2-Dichloroethene	ug/L (ppb)	<5	<5	nm
Chloroform	ug/L (ppb)	<5	<5	nm
2-Butanone (MEK)	ug/L (ppb)	<50	<50	nm
1,2-Dichloroethane (EDC)	ug/L (ppb)	<5	<5	nm
1,1,1-Trichloroethane	ug/L (ppb)	<5	<5	nm
1,1-Dichloropropene	ug/L (ppb)	<5	<5	nm
Carbon tetrachloride	ug/L (ppb)	<5	<5	nm
Benzene	ug/L (ppb)	<1.7	<1.7	nm
Trichloroethene	ug/L (ppb)	<5	<5	nm
1,2-Dichloropropane	ug/L (ppb)	<5	<5	nm
Bromodichloromethane	ug/L (ppb)	<5	<5	nm
Dibromomethane	ug/L (ppb)	<5	<5	nm
4-Methyl-2-pentanone	ug/L (ppb)	<50	<50	nm
cis-1,3-Dichloropropene	ug/L (ppb)	<5	<5	nm
Toluene	ug/L (ppb)	<5	<5	nm
trans-1,3-Dichloropropene	ug/L (ppb)	<5	<5	nm
1,1,2-Trichloroethane	ug/L (ppb)	<5	<5	nm
2-Hexanone	ug/L (ppb)	<50	<50	nm
1,3-Dichloropropane	ug/L (ppb)	<5	<5	nm
Tetrachloroethene	ug/L (ppb)	<5	<5	nm
Dibromochloromethane	ug/L (ppb)	<5	<5	nm
1,2-Dibromoethane (EDB)	ug/L (ppb)	<5	<5	nm
Chlorobenzene	ug/L (ppb)	<5	<5	nm
Ethylbenzene	ug/L (ppb)	<5	<5	nm
1,1,1,2-Tetrachloroethane	ug/L (ppb)	<5	<5	nm
m,p-Xylene	ug/L (ppb)	<10	<10	nm
o-Xylene	ug/L (ppb)	<5	<5	nm
Styrene	ug/L (ppb)	<5	<5	nm
Isopropylbenzene	ug/L (ppb)	<5	<5	nm
Bromoform	ug/L (ppb)	<5	<5	nm
n-Propylbenzene	ug/L (ppb)	<5	<5	nm
Bromobenzene	ug/L (ppb)	<5	<5	nm
1,3,5-Trimethylbenzene	ug/L (ppb)	<5	<5	nm
1,1,2,2-Tetrachloroethane	ug/L (ppb)	<5	<5	nm
1,2,3-Trichloropropane	ug/L (ppb)	<5	<5	nm
2-Chlorotoluene	ug/L (ppb)	<5	<5	nm
4-Chlorotoluene	ug/L (ppb)	<5	<5	nm
tert-Butylbenzene	ug/L (ppb)	<5	<5	nm
1,2,4-Trimethylbenzene	ug/L (ppb)	<5	<5	nm
sec-Butylbenzene	ug/L (ppb)	<5	<5	nm
p-Isopropyltoluene	ug/L (ppb)	<5	<5	nm
1,3-Dichlorobenzene	ug/L (ppb)	<5	<5	nm
1,4-Dichlorobenzene	ug/L (ppb)	<5	<5	nm
1,2-Dichlorobenzene	ug/L (ppb)	<5	<5	nm
1,2-Dibromo-3-chloropropane	ug/L (ppb)	<50	<50	nm
1,2,4-Trichlorobenzene	ug/L (ppb)	<5	<5	nm
Hexachlorobutadiene	ug/L (ppb)	<5	<5	nm
Naphthalene	ug/L (ppb)	<5	<5	nm
1,2,3-Trichlorobenzene	ug/L (ppb)	<5	<5	nm

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF TCLP 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	126	123	25-158	2
Chloromethane	ug/L (ppb)	50	117	110	45-156	6
Vinyl chloride	ug/L (ppb)	50	121	118	50-154	3
Bromomethane	ug/L (ppb)	50	139	133	55-143	4
Chloroethane	ug/L (ppb)	50	133	131	58-146	2
Trichlorofluoromethane	ug/L (ppb)	250	115	108	50-150	6
Acetone	ug/L (ppb)	250	81	85	53-131	5
1,1-Dichloroethene	ug/L (ppb)	50	109	109	67-136	0
Hexane	ug/L (ppb)	50	110	109	57-137	1
Methylene chloride	ug/L (ppb)	50	25 vo	24 vo	39-148	4
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	113	111	64-147	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	112	112	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	110	109	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	109	107	55-143	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	113	114	80-123	1
Chloroform	ug/L (ppb)	50	106	106	80-121	0
2-Butanone (MEK)	ug/L (ppb)	250	125	121	57-149	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	102	101	73-132	1
1,1,1-Trichloroethane	ug/L (ppb)	50	108	106	83-130	2
1,1-Dichloropropene	ug/L (ppb)	50	112	112	77-129	0
Carbon tetrachloride	ug/L (ppb)	50	108	106	75-158	2
Benzene	ug/L (ppb)	50	111	111	69-134	0
Trichloroethene	ug/L (ppb)	50	110	109	80-120	1
1,2-Dichloropropane	ug/L (ppb)	50	114	114	77-123	0
Bromodichloromethane	ug/L (ppb)	50	112	113	81-133	1
Dibromomethane	ug/L (ppb)	50	112	112	82-125	0
4-Methyl-2-pentanone	ug/L (ppb)	250	125	126	65-138	1
cis-1,3-Dichloropropene	ug/L (ppb)	50	118	119	82-132	1
Toluene	ug/L (ppb)	50	88	91	72-122	3
trans-1,3-Dichloropropene	ug/L (ppb)	50	94	97	80-136	3
1,1,2-Trichloroethane	ug/L (ppb)	50	97	99	75-124	2
2-Hexanone	ug/L (ppb)	250	101	105	60-136	4
1,3-Dichloropropane	ug/L (ppb)	50	92	94	76-126	2
Tetrachloroethene	ug/L (ppb)	50	91	92	76-121	1
Dibromochloromethane	ug/L (ppb)	50	99	101	84-133	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	96	99	82-125	3
Chlorobenzene	ug/L (ppb)	50	90	91	83-114	1
Ethylbenzene	ug/L (ppb)	50	92	94	77-124	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	89	89	84-127	0
m,p-Xylene	ug/L (ppb)	100	92	94	83-125	2
o-Xylene	ug/L (ppb)	50	90	91	81-121	1
Styrene	ug/L (ppb)	50	94	97	84-119	3
Isopropylbenzene	ug/L (ppb)	50	92	93	85-117	1
Bromoform	ug/L (ppb)	50	95	98	74-136	3
n-Propylbenzene	ug/L (ppb)	50	90	88	74-126	2
Bromobenzene	ug/L (ppb)	50	88	87	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	89	87	78-123	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	93	92	66-126	1
1,2,3-Trichloropropane	ug/L (ppb)	50	89	87	67-124	2
2-Chlorotoluene	ug/L (ppb)	50	86	84	77-127	2
4-Chlorotoluene	ug/L (ppb)	50	89	87	78-128	2
tert-Butylbenzene	ug/L (ppb)	50	90	87	80-123	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	89	86	79-122	3
sec-Butylbenzene	ug/L (ppb)	50	91	87	80-125	4
p-Isopropyltoluene	ug/L (ppb)	50	90	87	81-123	3
1,3-Dichlorobenzene	ug/L (ppb)	50	87	85	85-116	2
1,4-Dichlorobenzene	ug/L (ppb)	50	86	84	84-121	2
1,2-Dichlorobenzene	ug/L (ppb)	50	87	84 vo	85-116	4
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	86	85	57-141	1
1,2,4-Trichlorobenzene	ug/L (ppb)	50	88	86	72-130	2
Hexachlorobutadiene	ug/L (ppb)	50	81	78	53-141	4
Naphthalene	ug/L (ppb)	50	92	90	64-133	2
1,2,3-Trichlorobenzene	ug/L (ppb)	50	90	88	65-136	2

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF TCLP 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	36	37	10-84	1
Bis(2-chloroethyl) ether	ug/L (ppb)	10	83	85	52-113	2
2-Chlorophenol	ug/L (ppb)	10	82	83	50-110	1
1,3-Dichlorobenzene	ug/L (ppb)	10	81	87	45-109	7
1,4-Dichlorobenzene	ug/L (ppb)	10	81	86	44-118	6
1,2-Dichlorobenzene	ug/L (ppb)	10	82	87	46-116	6
Benzyl alcohol	ug/L (ppb)	10	76	77	42-100	1
Bis(2-chloroisopropyl) ether	ug/L (ppb)	10	84	86	51-124	2
2-Methylphenol	ug/L (ppb)	10	74	72	38-100	2
Hexachloroethane	ug/L (ppb)	10	78	84	42-117	12
N-Nitroso-di-n-propylamine	ug/L (ppb)	10	87	89	48-124	2
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	10	71	70	40-105	1
Nitrobenzene	ug/L (ppb)	10	87	90	50-118	3
Isophorone	ug/L (ppb)	10	90	94	55-116	4
2-Nitrophenol	ug/L (ppb)	10	101	105	42-127	4
2,4-Dimethylphenol	ug/L (ppb)	10	64	61	11-135	5
Benzoic acid	ug/L (ppb)	65	18	14	10-110	25 vo
Bis(2-chloroethoxy)methane	ug/L (ppb)	10	87	91	55-115	4
2,4-Dichlorophenol	ug/L (ppb)	10	95	98	55-113	3
1,2,4-Trichlorobenzene	ug/L (ppb)	10	83	88	50-109	6
Naphthalene	ug/L (ppb)	10	86	90	53-112	5
Hexachlorobutadiene	ug/L (ppb)	10	81	87	50-109	7
4-Chloroaniline	ug/L (ppb)	20	85	87	30-109	2
4-Chloro-3-methylphenol	ug/L (ppb)	10	94	96	54-114	2
2-Methylnaphthalene	ug/L (ppb)	10	87	93	53-113	7
1-Methylnaphthalene	ug/L (ppb)	10	87	92	70-130	6
Hexachlorocyclopentadiene	ug/L (ppb)	10	86	92	10-121	7
2,4,6-Trichlorophenol	ug/L (ppb)	10	108	112	46-114	4
2,4,5-Trichlorophenol	ug/L (ppb)	10	107	110	57-122	3
2-Chloronaphthalene	ug/L (ppb)	10	90	95	52-112	5
2-Nitroaniline	ug/L (ppb)	10	99	101	47-128	2
Dimethyl phthalate	ug/L (ppb)	10	100	101	55-116	1
Acenaphthylene	ug/L (ppb)	10	94	98	52-112	4
2,6-Dinitrotoluene	ug/L (ppb)	10	104	106	49-126	2
3-Nitroaniline	ug/L (ppb)	20	93	96	21-125	3
Acenaphthene	ug/L (ppb)	10	92	96	52-114	4
2,4-Dinitrophenol	ug/L (ppb)	10	105	109	29-130	4
Dibenzofuran	ug/L (ppb)	10	93	96	53-113	3
2,4-Dinitrotoluene	ug/L (ppb)	10	105	109	48-129	4
4-Nitrophenol	ug/L (ppb)	10	42	45	10-80	7
Diethyl phthalate	ug/L (ppb)	10	93	95	55-116	2
Fluorene	ug/L (ppb)	10	93	96	54-115	3
4-Chlorophenyl phenyl ether	ug/L (ppb)	10	92	95	52-115	3
N-Nitrosodiphenylamine	ug/L (ppb)	10	96	100	51-112	4
4-Nitroaniline	ug/L (ppb)	20	103	110	42-115	7
4,6-Dinitro-2-methylphenol	ug/L (ppb)	10	106	112	40-128	6
4-Bromophenyl phenyl ether	ug/L (ppb)	10	95	99	53-114	4
Hexachlorobenzene	ug/L (ppb)	10	93	98	54-115	5
Pentachlorophenol	ug/L (ppb)	10	98	104	49-114	6
Phenanthrene	ug/L (ppb)	10	93	99	53-113	6

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF TCLP 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)
Anthracene	ug/L (ppb)	10	92	98	56-119	6
Carbazole	ug/L (ppb)	10	95	101	54-115	6
Di-n-butyl phthalate	ug/L (ppb)	10	90	97	54-115	7
Fluoranthene	ug/L (ppb)	10	91	99	55-116	6
Pyrene	ug/L (ppb)	10	98	106	54-121	8
Benzyl butyl phthalate	ug/L (ppb)	10	100	109	53-122	9
Benz(a)anthracene	ug/L (ppb)	10	93	98	52-114	5
Chrysene	ug/L (ppb)	10	95	100	54-119	5
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	10	96	107	54-122	11
Di-n-octyl phthalate	ug/L (ppb)	10	90	95	50-131	5
Benzo(a)pyrene	ug/L (ppb)	10	96	101	54-120	5
Benzo(b)fluoranthene	ug/L (ppb)	10	95	101	46-118	6
Benzo(k)fluoranthene	ug/L (ppb)	10	96	101	56-125	5
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	10	118	115	52-120	3
Dibenz(a,h)anthracene	ug/L (ppb)	10	119	120	54-122	1
Benzo(g,h,i)perylene	ug/L (ppb)	10	119	116	54-118	3

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL/SOLID SAMPLES
FOR TCLP METALS USING
EPA METHOD 200.8 AND 40 CFR PART 261**

Laboratory Code: 605537-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	106	105	70-130	1
Barium	mg/L (ppm)	5.0	<1	107	106	70-130	1
Cadmium	mg/L (ppm)	0.5	<1	110	108	70-130	2
Chromium	mg/L (ppm)	2.0	<1	106	106	70-130	0
Lead	mg/L (ppm)	1.0	<1	98	97	70-130	1
Mercury	mg/L (ppm)	1.0	<0.1	99	98	70-130	1
Selenium	mg/L (ppm)	0.5	<1	109	112	70-130	3
Silver	mg/L (ppm)	0.5	<1	110	112	70-130	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	106	85-115
Barium	mg/L (ppm)	5.0	106	85-115
Cadmium	mg/L (ppm)	0.5	109	85-115
Chromium	mg/L (ppm)	2.0	105	85-115
Lead	mg/L (ppm)	1.0	98	85-115
Mercury	mg/L (ppm)	1.0	98	85-115
Selenium	mg/L (ppm)	0.5	106	85-115
Silver	mg/L (ppm)	0.5	105	85-115

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

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

Laboratory Code: 606053-16 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	76	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	77	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	83	85	55-130	2
Aroclor 1260	mg/kg (ppm)	0.8	85	89	58-133	5

Date of Report: 06/29/16
Date Received: 06/02/16
Project: AWTP, F&BI 606032

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

Laboratory Code: 606032-13 1/0.25 (Matrix Spike) 1/0.25

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	0.63	<0.01	57	65	50-150	13
Aroclor 1260	ug/L (ppb)	0.63	<0.01	67	71	50-150	6

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	0.63	71	59	37-136	18
Aroclor 1260	ug/L (ppb)	0.63	75	70	41-135	7

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.

606032

SAMPLE CHAIN OF CUSTODY

ME 06/02/16

CT-A2

Page # 1 of 4

Send Report To Ken Lederman

Company FOSTER PEPPER LLC

Address 1111 3rd Ave, Suite 3400

City, State, ZIP Seattle, WA 98101

Phone # ______ Fax # ledek@foster.com

SAMPLERS (signature)

PROJECT NAME/NO.	PO#
AWTP	

REMARKS Privileged and Confidential

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCBs by 8082						Notes
SL-SOIL-01	01	5/25/16	1400	SOIL	1							X						
SL-SOIL-02	02		1410		1							X						
SL-SOIL-03	03		1420		1							X						
SL-SOIL-04	04		1425		1							X						
SL-SOIL-DUP	05		1500		1							X						
PZ-FILT-04	06 A-B	6.1.16	1246	GW	2							✓						
PZ-SED-03	07	6.1.16	1013	GW	2							✓						
PZ-FILT-01	08	6.1.16	1134	GW	2							✓						
PZ-FILT-02	09	6.1.16	1131	GW	2							✓						
PZ-SED-04	10	6.1.16	1014	GW	2							✓						

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:	D. Shelton	DANIEL SHELDON	MWH	6.2.16	1010
Received by:	[signature]	Nhan Phan	FeBT	6-2-16	1010
Relinquished by:					
Received by:			Samples received at 2		

606032

SAMPLE CHAIN OF CUSTODY

ME 06/02/16 LT- A2

[redacted]ge # 2 of 4

Send Report To KEN LEDERMAN

Company FOSTER PEPPER LLC

Address 1111 3rd AVE

City, State, ZIP SEATTLE, WA 98101

LEDEK@FOSTER.COM

Phone # ______ Fax # ______

SAMPLERS (signature) [illegible]

PROJECT NAME/NO. AWTP

PO#

REMARKS

PRIVILEGED AND CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's	VOC	SVOC	METALS			Notes
PZ-SED-06 MS	11 A-B	6.1.16	1500	GW	2							✓						
PZ-SED-06 MSD	12	6.1.16	1500	GW	2							✓						
PZ-SED-06	13	6.1.16	1500	GW	2							✓						
TB	14	6.1.16	1640	DI	2													
IDW-SOIL.COMP	15 A-D	6.1.16	1645	SOIL	4								✓	✓	✓			
IDW-GW-COMP	16 A-F	6.1.16	1710	GW	6								✓	✓	✓			

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: [illegible]	DANIEL SHELDON	MWH	6.2.16	1010
Received by: [illegible]	Nhan Phan	FeBI	6/2/16	1010
Relinquished by:				
Received by:		Samples received at 2 °C		

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606032

SAMPLE CHAIN OF CUSTODY ME 06/02/16

NP 3 LI-A2

Page # 1 of 4

Send Report To KEN LEDERMAN

Company FOSTER PEPPER LLC

Address 1111 3rd AVE, SUITE 3400

City, State, ZIP SEATTLE, WA 98101

LEDEK@FOSTER.COM

Phone # ______ Fax # ______

SAMPLERS (*signature*)

PROJECT NAME/NO. AWTP

PO#

REMARKS

PRIVILEGED AND CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's						Notes
PZ-SED-07	17 A-B	6.1.16	0832	GW	2							✓						
PZ-SED-01	18	5.31.16	1646	GW	2							✓						
DUP-1	19	5.31.16	1533	GW	2							✓						
DUP-2	20	6.1.16	1335	GW	2							✓						
PZ-FILT-06	21	6.1.16	1335	GW	2							✓						

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: [signature]	DANIEL SHELDON	MWH	6.2.16	1010
Received by: [signature]	Nhan Phan	FeBT	6/2/16	1010
Relinquished by:				
Received by:		Samples received at 2 °C		

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SAMPLE CHAIN OF CUSTODY ME 06/02/16

LT-A2

Page # ~~3~~ 4 of ~~1~~ 4 NP

Send Report To KEN LEDERMAN

Company FOSTER PEPPER LLC

Address 1111 3rd AVE, SUITE 3400

City, State, ZIP SEATTLE, WA 98101

LEDEK@FOSTER.COM

Phone # ______ Fax # ______

SAMPLERS (*signature*)

PROJECT NAME/NO.	PO#
AWTP	

REMARKS

PRIVILEGED AND CONFIDENTIAL

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 Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PCB's						Notes
PZ-SED-08	22 A-B	6.1.16	0757	GW	2							✓						
DG-GW	23	6.1.16	1355	GW	2							✓						
PZ-SED-02	24	5.31.16	1650	GW	2							✓						
PZ-SED-09	25	5.31.16	1533	GW	2							✓						
PZ-SED-10	26	5.31.16	1533	GW	2							✓						

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Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	DANIEL SHELDON	MWH	6.2.16	1010
Received by: [signature]	Nhan Phan	FeBI	6/2/16	1010
Relinquished by:				
Received by:		Samples received at 2 °C		

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NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

May 26, 2016

Donna Hewitt
DLH Environmental Consulting
2400 NW 80th Street #114
Seattle, WA 98117

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 1610630.00

Client Project: N-A
Location: N-A

Dear Ms. Hewitt,

Enclosed please find test results for the 5 sample(s) submitted to our laboratory for analysis on 5/20/2016.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both **EPA 600/M4-82-020**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116** Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Lori Tseng

Lori Tseng, PLM Analyst

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

1.888.NVL.LABS
1.888.(685.5227)
www.nvllabs.com

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p 206.547.0100 | f 206.634.1936

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p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: DLH Environmental Consulting
Address: 2400 NW 80th Street #114
Seattle, WA 98117

Attention: Ms. Donna Hewitt
Project Location: N-A

Batch #: 1610630.00
Client Project #: N-A
Date Received: 5/20/2016
Samples Received: 5
Samples Analyzed: 5
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 16220849 **Client Sample #: 01**
Location: N-A

Layer 1 of 3 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Mineral grains	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Asphalt/Binder	Synthetic fibers	1%	**None Detected ND**

Layer 3 of 3 **Description:** Brown crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler	Cellulose	<1%	**None Detected ND**

Lab ID: 16220850 **Client Sample #: 02**
Location: N-A

Layer 1 of 3 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Mineral grains	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Asphalt/Binder	Synthetic fibers	<1%	**None Detected ND**

Layer 3 of 3 **Description:** Brown crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler	Wollastonite	<1%	**None Detected ND**

Lab ID: 16220851 **Client Sample #: 02 DUP**
Location: N-A

Sampled by: Client
Analyzed by: Christina Molnar **Date:** 05/26/2016
Reviewed by: Lori Tseng **Date:** 05/26/2016

Lori Tseng

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: DLH Environmental Consulting
Address: 2400 NW 80th Street #114
Seattle, WA 98117

Attention: Ms. Donna Hewitt
Project Location: N-A

Batch #: 1610630.00
Client Project #: N-A
Date Received: 5/20/2016
Samples Received: 5
Samples Analyzed: 5
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 3 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Mineral grains	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Asphalt/Binder	Synthetic fibers	2%	**None Detected ND**

Layer 3 of 3 **Description:** Brown crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler	Cellulose	1%	**None Detected ND**

Lab ID: 16220852 **Client Sample #: 03**
Location: N-A

Layer 1 of 3 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Mineral grains	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Asphalt/Binder	Cellulose	1%	**None Detected ND**

Layer 3 of 3 **Description:** Brown crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler	Wollastonite	1%	**None Detected ND**

Lab ID: 16220853 **Client Sample #: 04**
Location: N-A

Layer 1 of 3 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Mineral grains	Cellulose	2%	**None Detected ND**

Sampled by: Client
Analyzed by: Christina Molnar **Date:** 05/26/2016
Reviewed by: Lori Tseng **Date:** 05/26/2016

Lori Tseng

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: DLH Environmental Consulting
Address: 2400 NW 80th Street #114
Seattle, WA 98117

Attention: Ms. Donna Hewitt
Project Location: N-A

Batch #: 1610630.00
Client Project #: N-A
Date Received: 5/20/2016
Samples Received: 5
Samples Analyzed: 5
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Asphalt/Binder	Synthetic fibers	<1%	**None Detected ND**

Layer 3 of 3 **Description:** Trace brown crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Christina Molnar **Date:** 05/26/2016
Reviewed by: Lori Tseng **Date:** 05/26/2016

Lori Tseng
Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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ASBESTOS LABORATORY SERVICES

Company DLH Environmental Consulting
Address 2400 NW 80th Street #114
Seattle, WA 98117
Project Manager Ms. Donna Hewitt
Phone (206) 632-3123
Cell: (206) 632-3123

NVL Batch Number 1610630.00
TAT 5 Days **AH** No
Rush TAT
Due Date 5/27/2016 **Time** 2:55 PM
Email dlhenvironmental@aol.com
Fax

Project Name/Number: N-A **Project Location:** N-A

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 5

Rush Samples

	Lab ID	Sample ID	Description	A/R
1	16220849	01		A
2	16220850	02		A
3	16220851	02 DUP		A
4	16220852	03		A
5	16220853	04		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Nora Haddad		NVL	5/20/16	1455
Analyzed by	Christina Molnar		NVL	5/26/16	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 5/20/2016
Time: 2:54 PM
Entered By: Nora Haddad

ASBESTOS LABORATORY SERVICES

NVL LABS

Company	DLH Environmental Consulting	**NVL Batch Number**	**1610630.00**
Address	2400 NW 80th Street #114 Seattle, WA 98117	**TAT**	5 Days **AH** No
		Rush TAT	
Project Manager	Ms. Donna Hewitt	**Due Date**	5/27/2016 **Time** 2:55 PM
Phone	(206) 632-3123	**Email**	dlhenvironmental@aol.com
Cell:	(206) 632-3123	**Fax**	

Project Name/Number: N-A **Project Location:** N-A

Subcategory PLM Bulk

Item Code ASB-02 **Method** EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 5 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	16220849	01	Blk mastic on Cement	A
2	16220850	02	" " " "	A
3	16220851	02 DUP	" " " "	A
4	16220852	03	" " " "	A
5	16220853	04	" " " "	A

	Print Name	Signature	Company	Date	Time
Sampled by	Client Donna Hewitt		DLH	5/20/16	
Relinquished by	Client Donna Hewitt		DLH	5/20/16	

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Nora Haddad		NVL	5/20/16	1455
Analyzed by			NVL		
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Entered By: Nora Haddad Date: 5/20/2016 Time: 2:54 PM

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Appendix D4. Data Gap Investigation Third Party Data Validation Summary

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DATA GAP INVESTIGATION DATA VALIDATION REPORT – JULY 27, 2016

Two samples delivery groups (SDGs - 605479 and 60632) resulting from the Data Gap Investigation activities were reviewed by a third party validator (Laboratory Data Consultants, Inc.) for precision, accuracy, representativeness, completeness, and comparability. The review was performed in accordance with the project Quality Assurance Project Plan (June 2015), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (August 2014), and EPA SW 846 Test Methods for Evaluating Solid Waste (as updated).

The following is a summary of the data quality evaluation and qualification of the sample results. The Data Validation Report from Laboratory Data Consultants, Inc. is included after this summary. Based on professional judgment, the data associated with these SDGs are usable for their intended purpose.

Precision in the laboratory is assessed through the calculation of relative percent differences (RPD) and relative standard deviations (RSD) for replicate samples. Field precision is assessed through the collection and measurement of field duplicates. With the following exceptions, the results from these quality control samples did not negatively affect the sample results associated with the target analytes for these data packages.

Qualifiers Based on Duplicate Analyses

Compound	FB-SOIL-12-05	FB-SOIL-12-Dup	RPD (Limits)	Flag
Aroclor-1254	0.57	0.36	45 (<20)	J (all detects)
Aroclor-1260	0.53	0.35	41 (<20)	J (all detects)

Compound	CW-SED-02	CW-SED-Dup	RPD (Limits)	Flag
Aroclor-1254	0.32	0.25	25 (<20)	J (all detects)

Qualifiers Based on Surrogate Recovery

Sample	Surrogate	%R (Limits)	Affected Compound	Flag
CW-SED-06	Tetrachloro-m-xylene	25 (30-150)	All compounds	J (all detects) UJ (all non-detects)
FB-MASTIC-01	Tetrachloro-m-xylene	29 (30-150)	All compounds	UJ (all non-detects)
CW-MASTIC-01	Tetrachloro-m-xylene	29 (30-150)	All compounds	UJ (all non-detects)
Dup-MASTIC-01	Tetrachloro-m-xylene	25 (30-150)	All compounds	UJ (all non-detects)

Accuracy in the laboratory is assessed through the analysis of MS/MSD, standard reference materials (SRM), laboratory control samples (LCS) and surrogate compounds, and the determination of percent recoveries. Accuracy in the field is assessed through the use of field blanks and through the adherence to sample handling, preservation and holding times. Quality control issues related to accuracy were not encountered.

Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, meeting sample holding times and analyzing and assessing field duplicate samples. With the exception explained above, quality control issues related to representativeness were not encountered.

Completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. Quality control issues related to completeness were not encountered.

Comparability was achieved by analyzing the samples according to the specified standard methods. The laboratory used USEPA methods for the analysis of the samples.

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Foster Pepper
1111 3rd Avenue, #3400
Seattle, Washington
98101-3299
ATTN: Mr. Ken Lederman

July 27, 2016

SUBJECT: Anacortes WTP, Data Validation

Dear Mr. Lederman,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on July 5, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36615:

SDG #	**Fraction**
605479, 606032	Polychlorinated Biphenyls

The data verification was performed under Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington, June 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist

Level IV	LDC #36615 (Foster Pepper - Seattle, WA / Anacortes WTP)																																			
LDC	SDG#	DATE REC'D	(3) DATE DUE	PCBs (8082A)																																
Matrix:	Water/Soil/Wipe			W	S	WP	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	605479	07/05/16	07/26/16	5	43	12																														
B	606032	07/05/16	07/26/16	16	5	0																														
Total	A/PG			21	48	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS/MSD, and DUPs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: July 20, 2016

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedman & Bruya, Inc.

Sample Delivery Group (SDG): 605479

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SB-SOIL-12-01	605479-01	Soil	05/23/16
SB-SOIL-36-01	605479-02	Soil	05/23/16
SB-SOIL-12-02	605479-03	Soil	05/23/16
SB-SOIL-36-02	605479-04	Soil	05/23/16
SB-SOIL-12-09	605479-05	Soil	05/23/16
SB-SOIL-36-09	605479-06	Soil	05/23/16
SB-SOIL-12-10	605479-07	Soil	05/23/16
SB-SOIL-36-10	605479-08	Soil	05/23/16
SB-SOIL-12-04	605479-09	Soil	05/23/16
SB-SOIL-36-04	605479-10	Soil	05/23/16
SB-SOIL-12-06	605479-11	Soil	05/23/16
SB-SOIL-36-06	605479-12	Soil	05/23/16
FB-SOIL-12-02	605479-13	Soil	05/23/16
FB-SOIL-36-02	605479-14	Soil	05/23/16
FB-SOIL-12-01	605479-15	Soil	05/23/16
FB-SOIL-36-01	605479-16	Soil	05/23/16
FB-SOIL-12-06	605479-17	Soil	05/23/16
FB-SOIL-36-06	605479-18	Soil	05/23/16
FB-SOIL-12-05	605479-19	Soil	05/23/16
FB-SOIL-36-05	605479-20	Soil	05/23/16
FB-SOIL-12-Dup	605479-21	Soil	05/23/16
FB-SOIL-12-04	605479-22	Soil	05/23/16
FB-SOIL-36-04	605479-23	Soil	05/23/16
FB-SOIL-12-03	605479-24	Soil	05/23/16
FB-SOIL-36-03	605479-25	Soil	05/23/16

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
RINSATE-01	605479-26	Water	05/23/16
SB-SOIL-12-07	605479-27	Soil	05/24/16
SB-SOIL-36-07	605479-28	Soil	05/24/16
SB-SOIL-12-05	605479-29	Soil	05/24/16
SB-SOIL-36-05	605479-30	Soil	05/24/16
SB-SOIL-12-03	605479-31	Soil	05/24/16
SB-SOIL-36-03	605479-32	Soil	05/24/16
SB-SOIL-12-08	605479-33	Soil	05/24/16
SB-SOIL-36-08	605479-34	Soil	05/24/16
SB-SOIL-12-Dup	605479-35	Soil	05/24/16
CW-SED-01	605479-36	Water	05/24/16
CW-SED-02	605479-37	Water	05/24/16
CW-SED-Dup	605479-38	Water	05/24/16
CW-SED-03	605479-39	Soil	05/24/16
CW-SED-04	605479-40	Soil	05/24/16
CW-SED-05	605479-41	Soil	05/24/16
CW-SED-06	605479-42	Soil	05/24/16
RINSATE-02	605479-43	Water	05/24/16
SB-MASTIC-01	605479-44	Soil	05/20/16
SB-MASTIC-02	605479-45	Soil	05/20/16
FB-MASTIC-01	605479-46	Soil	05/20/16
CW-MASTIC-01	605479-47	Soil	05/20/16
Dup-MASTIC-01	605479-48	Soil	05/20/16
AB-Wipe-01	605479-49	Wipe	05/25/16
AB-Wipe-02	605479-50	Wipe	05/25/16
AB-Wipe-03	605479-51	Wipe	05/25/16
AB-Wipe-04	605479-52	Wipe	05/25/16
AB-Wipe-05	605479-53	Wipe	05/25/16
AB-Wipe-06	605479-54	Wipe	05/25/16
AB-Wipe-07	605479-55	Wipe	05/25/16
AB-Wipe-08	605479-56	Wipe	05/25/16
AB-Wipe-09	605479-57	Wipe	05/25/16
AB-Wipe-10	605479-58	Wipe	05/25/16
AB-Wipe-11	605479-59	Wipe	05/25/16
AB-Wipe-12	605479-60	Wipe	05/25/16
FB-SOIL-36-04MS	605479-23MS	Soil	05/23/16
FB-SOIL-36-04MSD	605479-23MSD	Soil	05/23/16
CW-SED-03MS	605479-39MS	Soil	05/24/16
CW-SED-03MSD	605479-39MSD	Soil	05/24/16
FB-MASTIC-01MS	605479-46MS	Soil	05/20/16
FB-MASTIC-01MSD	605479-46MSD	Soil	05/20/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples RINSATE-01 and RINSATE-02 were identified as rinsates. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
CW-SED-06	Tetrachloro-m-xylene	25 (30-150)	All compounds	J (all detects) UJ (all non-detects)	P
FB-MASTIC-01	Tetrachloro-m-xylene	29 (30-150)	All compounds	UJ (all non-detects)	A
CW-MASTIC-01	Tetrachloro-m-xylene	29 (30-150)	All compounds	UJ (all non-detects)	P
Dup-MASTIC-01	Tetrachloro-m-xylene	25 (30-150)	All compounds	UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Affected Compounds	Flag	A or P
FB-MASTIC-01MS/MSD (FB-MASTIC-01)	Aroclor-1016	21 (≤20)	Aroclor-1016 Aroclor-1221 Aroclor-1232	NA	-

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples FB-SOIL-12-05 and FB-SOIL-12-Dup, samples SB-SOIL-12-08 and SB-SOIL-12-Dup, samples CW-SED-02 and CW-SED-Dup, and samples CW-MASTIC-01 and Dup-MASTIC-01 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (mg/Kg)				
Compound	FB-SOIL-12-05	FB-SOIL-12-Dup	RPD (Limits)	Flag	A or P
Aroclor-1254	0.57	0.36	45 (≤20)	J (all detects)	A
Aroclor-1260	0.53	0.35	41 (≤20)	J (all detects)	A

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	CW-SED-02	CW-SED-Dup			
Aroclor-1248	0.71	0.58	20 (≤20)	-	-
Aroclor-1254	0.32	0.25	25 (≤20)	J (all detects)	A

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 605479	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to surrogate %R, field duplicate RPD, and compounds reported below the RL, data were qualified as estimated in sixty samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 605479

Sample	Compound	Flag	A or P	Reason
CW-SED-06 CW-MASTIC-01 Dup-MASTIC-01	All compounds	J (all detects) UJ (all non-detects)	P	Surrogate spikes (%R)
FB-MASTIC-01	All compounds	UJ (all non-detects)	A	Surrogate spikes (%R)
FB-SOIL-12-05 FB-SOIL-12-Dup	Aroclor-1254 Aroclor-1260	J (all detects) J (all detects)	A	Field duplicates (RPD)
CW-SED-02 CW-SED-Dup	Aroclor-1254	J (all detects)	A	Field duplicates (RPD)

Sample	Compound	Flag	A or P	Reason
SB-SOIL-12-01 SB-SOIL-36-01 SB-SOIL-12-02 SB-SOIL-36-02 SB-SOIL-12-09 SB-SOIL-36-09 SB-SOIL-12-10 SB-SOIL-36-10 SB-SOIL-12-04 SB-SOIL-36-04 SB-SOIL-12-06 SB-SOIL-36-06 FB-SOIL-12-02 FB-SOIL-36-02 FB-SOIL-12-01 FB-SOIL-36-01 FB-SOIL-12-06 FB-SOIL-36-06 FB-SOIL-12-05 FB-SOIL-36-05 FB-SOIL-12-Dup FB-SOIL-12-04 FB-SOIL-36-04 FB-SOIL-12-03 FB-SOIL-36-03 RINSATE-01 SB-SOIL-12-07 SB-SOIL-36-07 SB-SOIL-12-05 SB-SOIL-36-05 SB-SOIL-12-03 SB-SOIL-36-03 SB-SOIL-12-08 SB-SOIL-36-08 SB-SOIL-12-Dup CW-SED-01 CW-SED-02 CW-SED-Dup CW-SED-03 CW-SED-04 CW-SED-05 CW-SED-06 RINSATE-02 SB-MASTIC-01 SB-MASTIC-02 FB-MASTIC-01 CW-MASTIC-01 Dup-MASTIC-01 AB-Wipe-01 AB-Wipe-02 AB-Wipe-03 AB-Wipe-04 AB-Wipe-05 AB-Wipe-06 AB-Wipe-07 AB-Wipe-08 AB-Wipe-09 AB-Wipe-10 AB-Wipe-11 AB-Wipe-12	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 605479

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 605479

No Sample Data Qualified in this SDG

LDC #: 36615A3b
SDG #: 605479
Laboratory: Friedman & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 9/14/16
Page: 1 of 3
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20% r² ICV ≤ 20%
III.	Continuing calibration	SW	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	R = 26, 43
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS D
IX.	Field duplicates	SW	D = 19/21, *33/35, 37/38, *47/48
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
*ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
+ 1	SB-SOIL-12-01	605479-01	Soil	05/23/16
− 2	SB-SOIL-36-01	605479-02	Soil	05/23/16
+ 3	SB-SOIL-12-02	605479-03	Soil	05/23/16
− 4	SB-SOIL-36-02	605479-04	Soil	05/23/16
+ 5	SB-SOIL-12-09	605479-05	Soil	05/23/16
− 6	SB-SOIL-36-09	605479-06	Soil	05/23/16
− 7	SB-SOIL-12-10	605479-07	Soil	05/23/16
− 8	SB-SOIL-36-10	605479-08	Soil	05/23/16
− 9	SB-SOIL-12-04	605479-09	Soil	05/23/16
− 10	SB-SOIL-36-04	605479-10	Soil	05/23/16
− 11	SB-SOIL-12-06	605479-11	Soil	05/23/16
− 12	SB-SOIL-36-06	605479-12	Soil	05/23/16
− 13	FB-SOIL-12-02	605479-13	Soil	05/23/16
− 14	FB-SOIL-36-02	605479-14	Soil	05/23/16
+ 15	FB-SOIL-12-01	605479-15	Soil	05/23/16
− 16	FB-SOIL-36-01	605479-16	Soil	05/23/16
+ 17	FB-SOIL-12-06	605479-17	Soil	05/23/16

LDC #: 36615A3b

SDG #: 605479

Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 07/14/16

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

	Client ID	Lab ID	Matrix	Date
+ 18	FB-SOIL-36-06	605479-18	Soil	05/23/16
+ 19	FB-SOIL-12-05 D1	605479-19	Soil	05/23/16
− 20	FB-SOIL-36-05	605479-20	Soil	05/23/16
+ 21	FB-SOIL-12-Dup D1	605479-21	Soil	05/23/16
+ 22	FB-SOIL-12-04	605479-22	Soil	05/23/16
+ 23	FB-SOIL-36-04	605479-23	Soil	05/23/16
+ 24	FB-SOIL-12-03	605479-24	Soil	05/23/16
− 25	FB-SOIL-36-03	605479-25	Soil	05/23/16
− 4 26	RINSATE-01	605479-26	Water	05/23/16
− 27	SB-SOIL-12-07	605479-27	Soil	05/24/16
+ 28	SB-SOIL-36-07	605479-28	Soil	05/24/16
+ 29	SB-SOIL-12-05	605479-29	Soil	05/24/16
+ 30	SB-SOIL-36-05	605479-30	Soil	05/24/16
+ 31	SB-SOIL-12-03	605479-31	Soil	05/24/16
− 32	SB-SOIL-36-03	605479-32	Soil	05/24/16
− 33	SB-SOIL-12-08 D2	605479-33	Soil	05/24/16
+ 34	SB-SOIL-36-08	605479-34	Soil	05/24/16
− 35	SB-SOIL-12-Dup D2	605479-35	Soil	05/24/16
+ 4 36	CW-SED-01	605479-36	Water	05/24/16
+ 4 37	CW-SED-02 D3	605479-37	Water	05/24/16
4 38	CW-SED-Dup D3	605479-38	Water	05/24/16
+ 39	CW-SED-03	605479-39	Soil	05/24/16
+ 40	CW-SED-04	605479-40	Soil	05/24/16
+ 41	CW-SED-05	605479-41	Soil	05/24/16
+ 42	CW-SED-06	605479-42	Soil	05/24/16
− 4 43	RINSATE-02	605479-43	Water	05/24/16
+ 3 44	SB-MASTIC-01 TCLP	605479-44	Soil	05/20/16
+ 3 45	SB-MASTIC-02	605479-45	Soil	05/20/16
− 3 46	FB-MASTIC-01	605479-46	Soil	05/20/16
− 3 47	CW-MASTIC-01 D4	605479-47	Soil	05/20/16
− 3 48	Dup-MASTIC-01 D4	605479-48	Soil	05/20/16
− 49	AB-Wipe-01	605479-49	Wipe	05/25/16
− 50	AB-Wipe-02	605479-50	Wipe	05/25/16
− 51	AB-Wipe-03	605479-51	Wipe	05/25/16
− 52	AB-Wipe-04	605479-52	Wipe	05/25/16

LDC #: 36615A3b
SDG #: 605479
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 07/14/16

Reviewer: JVG
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

	Client ID	Lab ID	Matrix	Date
+ 53	AB-Wipe-05	605479-53	Wipe	05/25/16
− 54	AB-Wipe-06	605479-54	Wipe	05/25/16
− 55	AB-Wipe-07	605479-55	Wipe	05/25/16
− 56	AB-Wipe-08	605479-56	Wipe	05/25/16
+ 57	AB-Wipe-09	605479-57	Wipe	05/25/16
− 58	AB-Wipe-10	605479-58	Wipe	05/25/16
− 59	AB-Wipe-11	605479-59	Wipe	05/25/16
+ 60	AB-Wipe-12	605479-60	Wipe	05/25/16
61	FB-SOIL-36-04MS	605479-23MS	Soil	05/23/16
62	FB-SOIL-36-04MSD	605479-23MSD	Soil	05/23/16
63	CW-SED-03MS	605479-39MS	Soil	05/24/16
64	CW-SED-03MSD	605479-39MSD	Soil	05/24/16
65	FB-MASTIC-01MS	605479-46MS	Soil	05/20/16
66	FB-MASTIC-01MSD	605479-46MSD	Soil	05/20/16
67				
68				
69				
70				
71				

Notes:

− 1 06-1113 MB 1/5							
− 2 06-1115 MB 1/5							
− 3 06-1151 MB3 1/0.5	(TCLP)						
− 4 06-1151 MB2 1/0.25	(W)						

− 5 06-1112 MB (wipes)

LDC #: 36615 A3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: Q

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?		✓		
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	~~✓~~	✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓	~~✓~~	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 36615 A3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:____

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

Y N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤20.0%?

Level IV/D Only

Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 20.0)	RT (Limits)	Associated Samples	Qualifications
	06/02/16	D66203	Sig 1	BB	30.9	( )	06-1113 MB 1/5	J/UJ/A
						( )		(Jusl Y, Z, AA, BB)
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: JVG
2nd Reviewer: [signature]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?
Y N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
	42 (ND + Det)		A	25 (30-150)	J/UJ/P
				( )	
	46 (ND)			29 ( )	J/UJ/A
				( )	
	47			29 ( )	J/UJ/P
				( )	
	48			25 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 36615 A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC PCBs (EPA SW 846 Method 8082A)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	65/66	V	( )	( )	21 (20)	46 (ND)	J dets/A
			( )	( )	( )		(qual V, W, X)
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 36615A3b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/Kg)		RPD (≤20%)	Qualifications (Parent Only)
	19	21		
Aroclor 1254	0.57	0.36	45	Jdets/A
Aroclor 1260	0.53	0.35	41	Jdets/A

Compound	Concentration (ug/L)		RPD (≤35%)	Qualifications (Parent Only)
	37	38		
Aroclor 1248	0.71	0.58	20	
Aroclor 1254	0.32	0.25	25	Jdets/A

V:\Josephine\FIELD DUPLICATES\36615A3b foster pepper anacortes.wpd

LDC #: _36615A3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 2
Reviewer: JVG
2nd Reviewer:

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calcul

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (1 std)	Recalculated CF (1 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL pcb0602	6/2/2016	1260-1 (Signal 1)	6.763E+07	6.763E+07	7.088E+07	7.088E+07	12.13	12.12
			1260-1 (Signal 2)	2.566E+08	2.566E+08	2.766E+08	2.766E+08	13.96	13.96
2	ICAL pcb0422	4/22/2016	1260-1 (Signal 1)	5.684E+07	5.684E+07	6.002E+07	6.002E+07	10.37	10.37
			1260-1 (Signal 2)	see r2 calc					

LDC#: 36615A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer: CJ

Method: GC PCBS (EPA SW 846 Method 8082A)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Concentration
4/22/2016	GC7	1260-1	1	3817347.880000	0.01
			2	9218186.110000	0.03
	Signal 2		3	16669268.470000	0.05
			4	32181456.830000	0.10
			5	130390716.830000	0.50
			6	243109691.400000	1.00
			7	588296732.600000	2.50
			8	1136268080.960000	5.00
			9	2253248778.500000	10.00
			10	5384780954.700000	20.00

Regression Output		*Calculated*	*Reported WLR*
Constant	b =	*0.203263*	*NR*
Std Err of Y Est			
R Squared	r^2 =	*0.993563*	*0.992840*
Degrees of Freedom			
X Coefficient(s)	m1 =	*262026711.4669*	*NR*
Std Err of Coef.			
Correlation Coefficient		*0.996776*	
Coefficient of Determination (r^2)		*0.993563*	*0.992840*

042216 1260-1 sig2 L

LDC # _36615A3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:__

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound	CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	060613	6/6/2016	1260 (Signal 1)	2.500	2.332	2.332	NR	6.7
			1260 (Signal 2)	2.500	2.095	2.094	NR	16.2
2	060825	6/8/2016	1260 (Signal 1)	5.000	4.505	4.505	NR	9.9
			1260 (Signal 2)	5.000	4.357	4.357	NR	12.9
3	060841	6/8/2016	1260 (Signal 1)	5.000	4.462	4.462	NR	10.8
			1260 (Signal 2)	5.000	4.222	4.222	NR	15.6
4	061403	6/14/2016	1260 (Signal 1)	2.500	2.223	2.224	NR	11.0
			1260 (Signal 2)	2.500	2.044	2.045	NR	18.2
5	060303	6/3/2016	1260 (Signal 1)	2.500	2.259	2.259	NR	9.6
			1260 (Signal 2)	2.500	2.134	2.134	NR	14.6
6	060316	6/3/2016	1260 (Signal 1)	5.000	4.618	4.618	NR	7.6
			1260 (Signal 2)	5.000	4.422	4.422	NR	11.6

LDC # _36615A3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:__JVG__
2nd Reviewer:______

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound		CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
7	060203	6/2/2016	1260	(Signal 1)	2.500	3.272	3.272	NR	30.9
			1260	(Signal 2)	2.500	2.774	2.774	NR	11.0
8	060703	6/7/2016	1260	(Signal 1)	2.500	2.316	2.317	NR	7.3
			1260	(Signal 2)	2.500	2.405	2.405	NR	3.8
9	060716	6/7/2016	1260	(Signal 1)	5.000	4.452	4.452	NR	11.0
			1260	(Signal 2)	5.000	4.280	4.281	NR	14.4
10	060731	6/8/2016	1260	(Signal 1)	5.000	4.403	4.403	NR	11.9
			1260	(Signal 2)	5.000	4.284	4.284	NR	14.3
11	060807	6/8/2016	1260	(Signal 1)	2.500	2.272	2.272	NR	9.1
			1260	(Signal 2)	2.500	2.231	2.231	NR	10.8

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG

2nd reviewer:

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
TCMX	Sig 1	0.200	0.015 (10)	75	75	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 61 / 62

Compound	Spike Added (mg/Kg)		Sample Conc (mg/Kg)	Spike Sample Concentration (mg/Kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.83	0.83	0	0.808	0.715	97	97	86	86	12	12

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

$MS = \frac{(0.485)(5)(10)}{(30)} = 0.808$ $MSD = \frac{(0.429)(5)(10)}{(30)} = 0.715$

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG

2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 06-1112 LCS/D

Compound	Spike Added (ug/wipe)		Spike Sample Concentration (ug/wipe)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
1260 (8082A)	100	100	85.48	87.6	85	85	88	88	3	3

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. LCS = 4.274 (20) = 85.48
LCSD = 4.38 (20) = 87.6

LDC #: 36615A3b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 1 Compound Name 1260

1260-1

Concentration = $\frac{(114.9e6)}{(7.088e7)}$ = 1.621

1260 Ave = $\frac{1.621 + 1.779 + 2.125 + 1.828 + 1.866}{5}$ = 1.764

final conc. = $\frac{(1.764)(5ml)(10)}{(30g)(0.83)}$ = 3.542 mg/kg

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
	1	1260	3.5		

Comments:

SAMPCALCnew.wpd

LDC Report# 36615B3b

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Anacortes WTP

LDC Report Date: July 20, 2016

Parameters: Polychlorinated Biphenyls

Validation Level: Level IV

Laboratory: Friedman & Bruya, Inc.

Sample Delivery Group (SDG): 606032

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SL-SOIL-01	606032-01	Soil	05/25/16
SL-SOIL-02	606032-02	Soil	05/25/16
SL-SOIL-03	606032-03	Soil	05/25/16
SL-SOIL-04	606032-04	Soil	05/25/16
SL-SOIL-DUP	606032-05	Soil	05/25/16
PZ-FILT-04	606032-06	Water	06/01/16
PZ-SED-03	606032-07	Water	06/01/16
PZ-FILT-01	606032-08	Water	06/01/16
PZ-FILT-02	606032-09	Water	06/01/16
PZ-SED-04	606032-10	Water	06/01/16
PZ-SED-06	606032-13	Water	06/01/16
PZ-SED-07	606032-17	Water	06/01/16
PZ-SED-01	606032-18	Water	05/31/16
DUP-1	606032-19	Water	05/31/16
DUP-2	606032-20	Water	06/01/16
PZ-FILT-06	606032-21	Water	06/01/16
PZ-SED-08	606032-22	Water	06/01/16
DG-GW	606032-23	Water	06/01/16
PZ-SED-02	606032-24	Water	05/31/16
PZ-SED-09	606032-25	Water	05/31/16
PZ-SED-10	606032-26	Water	05/31/16
PZ-SED-06 MS	606032-13MS	Water	06/01/16
PZ-SED-06 MSD	606032-13MSD	Water	06/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Quality Assurance Project Plan for Anacortes Water Treatment Plant, Mount Vernon, Washington (June 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

Samples PZ-SED-09 and DUP-1, samples DUP-2 and PZ-FILT-06, and samples SL-SOIL-04 and SL-SOIL-DUP were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 606032	All compounds reported below the RL.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compounds reported below the RL, data were qualified as estimated in twenty-one samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Anacortes WTP
Polychlorinated Biphenyls - Data Qualification Summary - SDG 606032

Sample	Compound	Flag	A or P	Reason
SL-SOIL-01 SL-SOIL-02 SL-SOIL-03 SL-SOIL-04 SL-SOIL-DUP PZ-FILT-04 PZ-SED-03 PZ-FILT-01 PZ-FILT-02 PZ-SED-04 PZ-SED-06 PZ-SED-07 PZ-SED-01 DUP-1 DUP-2 PZ-FILT-06 PZ-SED-08 DG-GW PZ-SED-02 PZ-SED-09 PZ-SED-10	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Anacortes WTP
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG 606032

No Sample Data Qualified in this SDG

Anacortes WTP
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG 606032

No Sample Data Qualified in this SDG

LDC #: 36615B3b

SDG #: 606032

Laboratory: Friedman & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 07/14/16

Page: 1 of 2

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	ICAL ≤ 20 % r^2 ICV ≤ 20 %
III.	Continuing calibration	A	CCV ≤ 20 %
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS /D
IX.	Field duplicates	ND	D = 20/14, 15/16, 4/5
X.	Compound quantitation/RL/LOQ/LODs	A	
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1 1	SL-SOIL-01	606032-01	Soil	05/25/16
2 1	SL-SOIL-02	606032-02	Soil	05/25/16
3 1	SL-SOIL-03	606032-03	Soil	05/25/16
4 1	SL-SOIL-04 D	606032-04	Soil	05/25/16
5 1	SL-SOIL-DUP D	606032-05	Soil	05/25/16
6	PZ-FILT-04	606032-06	Water	06/01/16
7	PZ-SED-03	606032-07	Water	06/01/16
8	PZ-FILT-01	606032-08	Water	06/01/16
9	PZ-FILT-02	606032-09	Water	06/01/16
10	PZ-SED-04	606032-10	Water	06/01/16
11	PZ-SED-06	606032-13	Water	06/01/16
12	PZ-SED-07	606032-17	Water	06/01/16
13	PZ-SED-01	606032-18	Water	05/31/16
14	DUP-1	606032-19	Water	05/31/16
15	DUP-2 D	606032-20	Water	06/01/16
16	PZ-FILT-06 D	606032-21	Water	06/01/16
17	PZ-SED-08	606032-22	Water	06/01/16

LDC #: 36615B3b
SDG #: 606032
Laboratory: Friedmand & Bruya, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 07/14/16
Page: 2 of 2
Reviewer: JG
2nd Reviewer: Q

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082)

	Client ID	Lab ID	Matrix	Date
18	DG-GW	606032-23	Water	06/01/16
19	PZ-SED-02	606032-24	Water	05/31/16
20	PZ-SED-09	606032-25	Water	05/31/16
21	PZ-SED-10	606032-26	Water	05/31/16
22	PZ-SED-06 MS	606032-13MS	Water	06/01/16
23	PZ-SED-06 MSD	606032-13MSD	Water	06/01/16
24				
25				
26				
27				
28				
29				
30				

Notes:

1	06-1153 MB2 1/5						
2	06-1150 MB2 1/0.25						

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: ✓ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?				
Were target compounds detected in the field blanks?				
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 36615 B3b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: ________

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: _36615B3b_

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calcula

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported CF (1 std)	Recalculated CF (1 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	6/2/2016	1260-1 (Signal 1)	6.763E+07	6.763E+07	7.088E+07	7.088E+07	12.13	12.12
	pcb0602		1260-1 (Signal 2)	2.566E+08	2.566E+08	2.766E+08	2.766E+08	13.96	13.96

LDC # _36615B3b_

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: Q

METHOD: GC PCBs (EPA SW 846 Method 8082A)

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration percent difference (%D) values were recalculated for the compounds identified below using the following calculation:

Percent difference (%D) = 100 * (N - C)/N

Where:
N = Initial Calibration Factor or Nominal Amount
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount

#	Standard ID	Calibration Date	Compound		CCV Conc	Reported Conc	Recalculated Conc	Reported % D	Recalculated %D
1	060852	6/8/2016	1260	(Signal 1)	5.000	4.473	4.473	NR	10.5
			1260	(Signal 2)	5.000	4.140	4.140	NR	17.2
2	060865	6/8/2016	1260	(Signal 1)	5.000	4.510	4.510	NR	9.8
			1260	(Signal 2)	5.000	4.178	4.178	NR	16.4
3	061003	6/10/2016	1260	(Signal 1)	2.500	2.247	2.247	NR	10.1
			1260	(Signal 2)	2.500	2.107	2.107	NR	15.7

LDC #: 36515B36

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: JVG
2nd reviewer: [illegible]

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
TCMX	Sig 1	0.2	0.014	70	70	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	1-Chlorooctadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-DCPA
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36615B36

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration
SC = Sample concentration
SA = Spike added

MS = Matrix spike
MSD = Matrix spike duplicate

MS/MSD samples: 22/23

Compound	Spike Added (ug/L)		Sample Conc (ug/L)	Spike Sample Concentration (ug/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
1260 (8082A)	0.625	0.625	0	0.417	0.445	67	67	71	71	6	6

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36615B3b

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: 06-1153 LCS/D

Compound	Spike Added (mg/Kg)		Spike Sample Concentration (mg/Kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
1260 (8082A)	0.83	0.83	0.71	0.74	85	85	89	89	5	5

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

$LCS = \frac{(4.246)(5ml)}{(30g)} =$

LCSCLCNew.wpd

LDC #: 36615 B 2b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd Reviewer: Q

METHOD: ✓ **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration = $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. All ND   Compound Name 1260

LCS - 1153

1260-1 Concentration = $\frac{(307.9e6)}{(70874679)} = 4.344$

1260 Ave = $\frac{4.344 + 4.295 + 4.019 + 4.314 + 4.258}{5} = 4.246$

final conc. = $\frac{(4.246)(5ml)}{(30g)} = 0.71$

#	Sample ID	Compound	Reported Concentrations (mg/kg)	Recalculated Results Concentrations ( )	Qualifications
	LCS	1260	0.71		

Comments:

SAMPCALCnew.wpd

Appendix E. Terrestrial Ecological Evaluation

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Terrestrial Ecological Evaluation for the Anacortes Water Treatment Plant

Summary

Potential impacts associated with low levels of polychlorinated biphenyls (PCBs) in shallow soil at the Anacortes Water Treatment Plant were evaluated under a Simplified Terrestrial Ecological Evaluation (TEE). Based on the lack of habitat for terrestrial animals adjacent to contaminated soil, the Simplified TEE process concluded that ecological impacts are unlikely and no further ecological evaluation is necessary.

Introduction

A TEE was performed to evaluate low levels of PCBs in soil resulting from weathering of the paint/coating on inactive settling basins at the former Anacortes Water Treatment Plant. The settling basins were painted/coated with a PCB-containing material when the facility was constructed in approximately 1969 to 1970, and this material has cracked and chipped over time, such that flakes have fallen off the walls and PCBs have been detected in shallow soils in the immediate vicinity of the settling basins. For the purposes of this TEE, the "Site" is defined as the area of contaminated soils. Note, for clarification purposes, the "Site" for the separate Remedial Investigation Report includes the area of contamination plus the decommissioned structures associated with the former Water Treatment Plant, including the Sedimentation Basin, Filtration Basin, Clearwell, and Administration Building. The Property is defined as Skagit County Parcel #21669 at 14549 River Bend Road in Mt. Vernon, Washington (the "Property"). The decommissioned Sedimentation Basins, Administration Building, and Clearwell, paved areas, the new Water Treatment Facility structures, and three lagoons comprise a portion of the overall Property. Space between structures and paved areas is landscaped with irrigated lawn. The Property is a fenced operating facility that is staffed 24 hour per day; adjacent properties are crop land and rural residences.

The Site and surrounding Property provide minimal attractants for terrestrial wildlife, and only small animals that are tolerant of high levels of disturbance are likely to utilize any portion of the Site. The fence, in addition to more attractive open space in adjacent areas along the river, limit the potential for herbivorous browsers such as deer to utilize the Site. Bird species such as the American robin may utilize lawn areas to forage on invertebrates, however, the single tree on the Property provides limited cover compared with adjacent properties. The National Wetlands Inventory (NWI) on-line wetlands mapper identified one mapped PEM1Cx wetland on the Property. The NWI map and a description of the PEM1Cx classification are presented in Attachment 1. However, it should be noted that the "x" in PEM1Cx indicates that the wetland channel was excavated by humans. Additionally, the seasonally wet depression mapped in the NWI is not consistent with current conditions on the Property.

Soil containing detectable concentrations of PCBs is located directly adjacent to structures. Although soil samples were collected from lawns where species such as the American robin may forage, these areas do not represent quality ecological habitat. Locations of soil samples are shown in Figure 1, and concentrations of PCBs detected in soil are presented in Table 1. Sample results presented in Table 1 indicate that PCBs are present at concentrations that warrant further assessment in the TEE process. Therefore, a TEE was completed to assess potential impacts to land-based plants and animals from exposure to PCB contaminated soil, as described below.

Primary Exclusions

The first step of the TEE process is to determine if the Site qualifies for any of four primary exclusions from further evaluation using the criteria in WAC 173-340-7491. These exclusions are (1) contaminant analysis, (2) incomplete exposure pathway, (3) area of contiguous undeveloped land, and (4) natural background. As indicated in Form 1, none of these exclusions apply to the Site:

1. PCBs were detected in samples collected from ground surface to one foot below ground surface (bgs) at concentrations exceeding the total PCBs wildlife criterion in Table 749-3 (refer to Table 1).

2. Current surface conditions at sample locations are comprised of lawn and gravel (two locations); thus, there is no significant physical barrier to prevent exposures to plants and wildlife.

3. The Site has detections of PCB mixtures, identified as a Hazardous Substance of Concern, and therefore should have no more than 0.25 acres of contiguous undeveloped land on or within 500 feet of contaminated soil. All land within the Site and surrounding Property has been developed, and open space consists of irrigated lawn. Although this open space does not provide quality habitat, it is conservatively assumed that there is more than 0.25 acres available to small terrestrial animals that are adapted to ruderal habitats.

4. Data is not readily available to estimate background concentrations of PCBs in soil in the region. Therefore, all detected concentrations are considered to be above background levels.

Terrestrial Ecological Evaluation

The second step of the TEE process involves determining whether a simplified or site-specific evaluation is necessary. The Site can be evaluated under Simplified TEE because none of the conditions in Form 2 apply.

1. The Site is part of an active facility, and adjacent to farm land. The Skagit River is located approximately 500 feet to the west of potentially contaminated soil, however, the river bank is a levee with grass and non-native shrubs such as Scotch broom.

2. Soil contamination is located adjacent to structures that are an active part of the water treatment plant; only species that are very tolerant of disturbance (i.e., American robin, raccoon, etc.) are likely to utilize this space. Vegetation over areas of soil contamination consists of lawn.

3. No areas of native vegetation ten acres or larger in size are located on the Property.

4. No determination regarding risk to wildlife populations has been made.

The Simplified TEE described in WAC 173-340-7492 consists of five screening criteria in three analysis categories: exposure analysis, pathway analysis, and contaminant analysis. If any one of the five criteria applies to the Site, no further evaluation is necessary. These steps are presented in Form 3.

<u>Exposure Analysis</u>:

1. The total area of soil contamination at the Site is greater than 350 square feet, and does not meet the criteria for no further evaluation under Exposure Analysis criteria #1.

2. According to criteria in Table 749-1, land use at the Site and surrounding area allow for wildlife exposure. It should be noted that there is a total of approximately nine acres of undeveloped land within a 500-foot radius of the Site. However, per WAC 173-340-7490(1)(c)(iii), “contiguous

undeveloped land means an area of undeveloped land that is not divided into smaller areas by highways, extensive paving or similar structures that are likely to reduce the potential use of the overall area by wildlife." The undeveloped portions of the Site and surrounding Property that may support foraging by small mammals and birds is highly fragmented by Water Treatment Plant infrastructure and pavement (Figure 2). The largest contiguous portion of undeveloped land at or within 500 feet of the area of soil contamination is 1.6 acres (Figure 2).

Based on Exposure Analysis criterion #2, above, no further ecological evaluation is warranted.

Conclusions

The Simplified TEE is a streamlined process that is designed to identify potential ecological impacts at sites with limited contamination. At the Anacortes Water Treatment Plant, the Simplified TEE process indicates limited potential for exposure of wildlife to contaminants in soil when all open space areas within 500 feet of the area of contamination are considered. Ruderal wildlife species that are adapted to disturbance may utilize this non-native habitat that is highly fragmented by treatment plant infrastructure and pavement (Figure 2). However, the largest contiguous portion of undeveloped land at or within 500 feet of the area of contamination is 1.6 acres. Based on Step 2 of the Simplified TEE, Exposure Analysis criterion #2, no further ecological evaluation is warranted.

Attachments

Figure 1	Soil Sample Locations
Figure 2	Undeveloped Land Area Calculation for Step 2 of the Simplified TEE
Table 1	PCB Sampling Results
Table 749-1	Terrestrial Ecological Evaluation Process- Simplified Evaluation
Form 1	Terrestrial Ecological Evaluation Process – Primary Exclusions
Form 2	Terrestrial Ecological Evaluation Process – Simplified or Site-Specific Process?
Form 3	Terrestrial Ecological Evaluation Process – Simplified Evaluation
Attachment 1	National Wetland Inventory Map

LEGEND

- SOIL BORING / MONITORING WELL
- SOIL BORING

0 12.5 25 50
SCALE: FEET
1"=50'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

SOIL SAMPLE LOCATIONS

MWH®

FIGURE 1

S:\STAFF Share\Rich Malcolm\Anacortes WTP\Figures\ANAC-WTP_ECOLOGY-1.dwg

LEGEND

- SOIL BORING / MONITORING WELL
- SOIL BORING
- UNDEVELOPED LAND AREA

NOTES:

1. TOTAL UNDEVELOPED LAND AREA WITHIN 500' IS 390,557 SQUARE FEET OR 8.9 ACRES

0 50 100 200
SCALE: FEET
1"=200'

ANACORTES WTP
REMEDIAL INVESTIGATION
MT. VERNON, WASHINGTON

UNDEVELOPED LAND AREA CALCULATION
FOR TABLE 749-1 OF THE SIMPLIFIED
TERRESTRIAL ECOLOGICAL EVALUATION

MWH®

FIGURE 2

S:\STAFF Share\Rich Malcolm\Anacortes WTP\Figures\ANAC-WTP_ECOLOGY-2.dwg

Table 1
Anacortes Water Treatment Plant Terrestrial Ecological Evaluation
Polychlorinated Biphenyl Sample Results

Sample Location	Soil 0-1 foot bgs			Soil 1-3 feet bgs		
	Aroclor 1254	**Aroclor 1260**	**Total Aroclors**	**Aroclor 1254**	**Aroclor 1260**	**Total Aroclors**
FB-SOIL-01	0.52	0.54	**1.06**	--	--	< 0.2 U
FB-SOIL-02	--	--	< 0.2 U	--	--	< 0.2 U
FB-SOIL-03	**6.9**	**8.7**	**15.6**	--	--	< 0.2 U
FB-SOIL-04	**1.9**	**1.2**	**3.1**	0.24	< 0.2 U	0.24
FB-SOIL-05	0.57	0.53	**1.1**	--	--	< 0.2 U
FB-SOIL-05 (dup)	0.36	0.35	**0.71**			
FB-SOIL-06	0.60	**0.72**	**1.32**	0.33	0.24	0.57
SB-SOIL-01	**3.3**	**3.5**	**6.8**	--	--	< 0.2 U
SB-SOIL-02	0.33	0.29	0.62	--	--	< 0.2 U
SB-SOIL-03	0.34	0.20	0.54	--	--	< 0.2 U
SB-SOIL-04	--	--	< 0.2 U	--	--	< 0.2 U
SB-SOIL-05	**1.2**	**1.5**	**2.7**	0.28	0.29	0.57
SB-SOIL-06	--	--	< 0.2 U	--	--	< 0.2 U
SB-SOIL-07	--	--	< 0.2 U	--	--	< 0.2 U
SB-SOIL-08	--	--	< 0.2 U	0.21	--	0.21
SB-SOIL-08 (dup)	--	--	< 0.2 U			
SB-SOIL-09	0.33	0.57	**0.90**	--	--	< 0.2 U
SB-SOIL-10	--	--	< 0.2 U	--	--	< 0.2 U

Notes:

All results are in milligrams per kilogram (mg/kg)
Bold indicates an exceedance of the Table 749-3 Ecological Indicator Soil Concentration for Protection of Terrestrial Plants and Animals of 0.65 mg/kg for polychlorinated biphenyl (PCB) mixtures (total). Exceedances of the Table 749-3 concentration indicate that the Site is not eligible for exclusion from a Terrestrial Ecological Evaluation.

-- - this individual Aroclor was not detected

bgs - below ground surface

dup - duplicate sample

U - indicates that the compound was not detected above the detection limit of 0.2 milligrams per kilogram

Table 749-1

Anacortes Water Treatment Plant

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	7
Area (acres) / Points: 0.25 or less — 4 0.5 — 5 1.0 — 6 1.5 — 7 2.0 — 8 2.5 — 9 3.0 — 10 3.5 — 11 4.0 or more — 12	
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	3
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	1
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	9

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Washington State Department of Ecology
Toxics Cleanup Program

Form 1

Anacortes Water Treatment Plant

Terrestrial Ecological Evaluation Process - Primary Exclusions

Documentation Form

Exclusion #	Exclusion Detail	Yes or No?	Are Institutional Controls Required If The Exclusion Applies?
1	Will soil contamination be located at least 6 feet beneath the ground surface and less than 15 feet?	Yes / No	Yes
	Will soil contamination located at least 15 feet beneath the ground surface?	Yes / No	No
	Will soil contamination located below the conditional point of compliance?	Yes / No	Yes
2	Will soil contamination be covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed?	Yes / No	Yes
3	Is there less than 1.5 acres of contiguous undeveloped land on the site, or within 500 feet of any area of the site affected by hazardous substances **other than** those listed in the table of Hazardous Substances of Concern? And Is there less than 0.25 acres of contiguous undeveloped land on or within 500 feet of any area of the site affected by hazardous substances **listed in** the table of Hazardous Substances of Concern?	Yes / No / NA Yes / No	Other factors determine
4	Are concentrations of hazardous substances in the soil less than or equal to natural background concentrations of those substances at the point of compliance	Yes / No	No

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Form 2

Anacortes Water Treatment Plant

Terrestrial Ecological Evaluation Process- Simplified or Site-Specific Evaluation? Documentation Form

	Terrestrial Concern	Response (Circle One)
*1	Is the site is located on or directly adjacent to an area where management or land use plans will maintain or restore native or semi-native vegetation?	Yes / No
*2a	Is the site used by a threatened or endangered species?	Yes / No
*2b	Is the site used by a wildlife species classified by the state department of fish and wildlife as a "priority species" or "species of concern" under Title 77 RCW?	Yes / No
*2c	Is the site used by a plant species classified by the Washington state department of Natural Resources natural heritage program as "endangered," "threatened," or "sensitive" under Title 79 RCW.	Yes / No
*3	Is the site (area where the contamination is located) located on a property that contains at least ten acres of native vegetation within 500 feet of the area where the contamination is located?	Yes / No
4	Has the department determined that the site may present a risk to significant wildlife populations?	Yes / No

*1 This includes for example, green-belts, protected wetlands, forestlands, locally designated environmentally sensitive areas, open space areas managed for wildlife, and some parks or outdoor recreation areas. This does not include park areas used for intensive sport activities such as baseball or football.

*2a What are the threatened or endangered species in Washington state?

*2b Which plant species are classified as threatened, endangered, or sensitive? Where can I find out more information about this topic?

*2c For plants, "used" means that a plant species grows at the site or has been found growing at the site. For animals, "used" means that individuals of a species have been observed to live, feed or breed at the site.

*3 For this analysis, do not include native vegetation beyond the property boundary.

The following sources shall be used in making this determination: Natural Vegetation of Oregon and Washington, J.F. Franklin and C.T. Dyrness, Oregon State University Press, 1988, and L.C. Hitchcock, C.L. Hitchcock, J.W. Thompson and A. Cronquist, 1955-1969, Vascular Plants of the Pacific Northwest(5 volumes). Areas planted with native species for ornamental or landscaping purposes shall not be considered to be native vegetation. [WAC 173-340-7491(2)(c)(i)]

(Here's a link to the Seattle Public Library and the Washington State Library to borrow a copy of Natural Vegetation of Oregon and Washington, J.F. Franklin and C.T. Dyrness, Oregon State University Press, 1988, or you may purchase it through your favorite bookseller. Here's an additional link to a useful online Field Guide to Selected Rare Plants of Washington developed by the Washington State Department of Natural Resources' Natural Heritage Program (WNHP) and the Spokane District of the U.S.D.I. Bureau of Land Management (BLM) which contains fact sheets for 139 vascular plant species and one lichen species.

Here is an aid to calculating area and an aerial photo depicting a site, its 500 foot boundary and several labeled circles identifying various areas for reference in judging the area of native vegetation within the 500 foot radius.

Washington State Department of Ecology
Toxics Cleanup Program

Form 3

Anacortes Water Treatment Plant

Terrestrial Ecological Evaluation Process- Simplified Evaluation

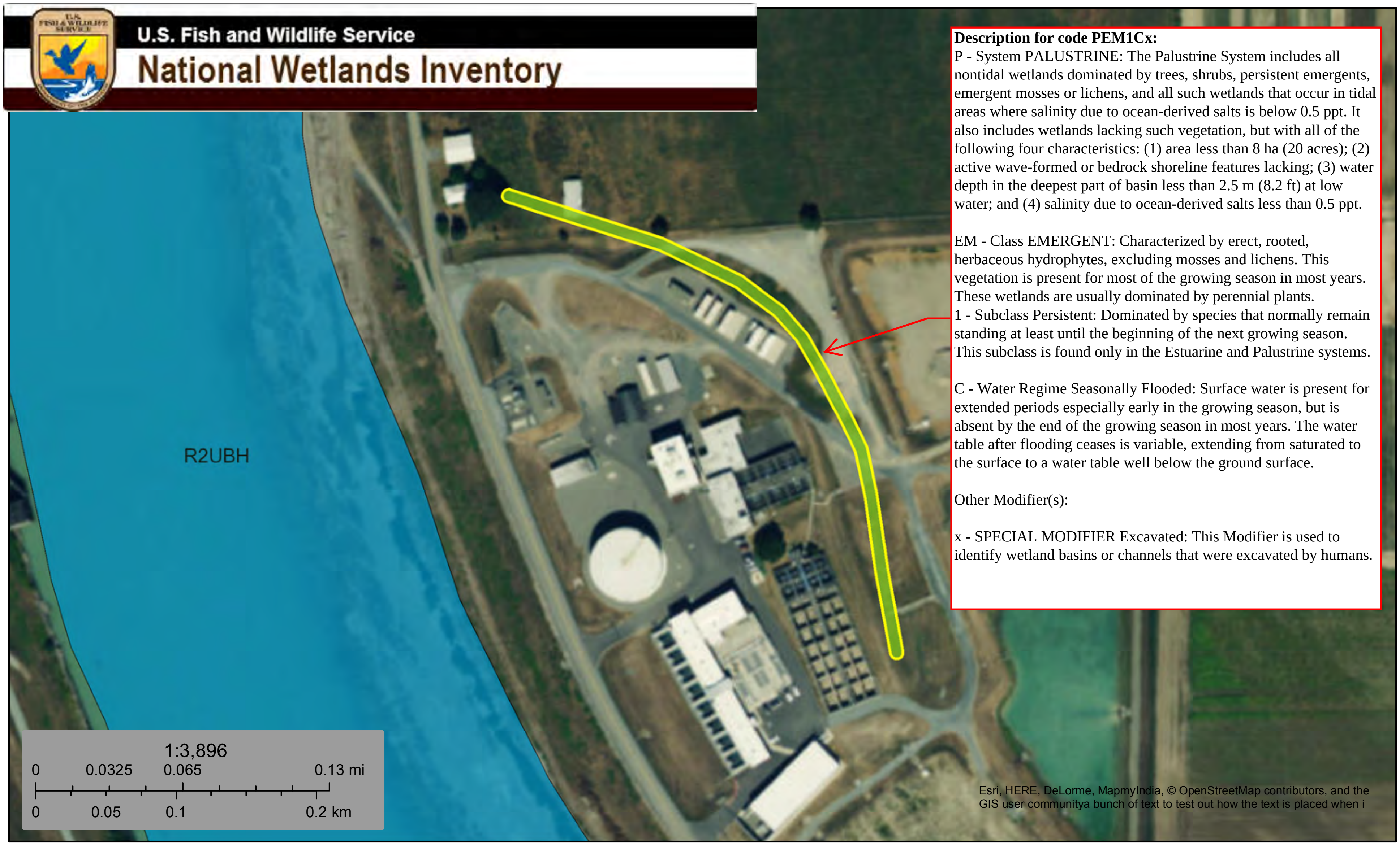
Documentation Form

Criteria # (Concern)	Criteria	Response (Circle One)
1 (exposure)	Is the total area of soil contamination at the site less than or equal to 350 square feet	**Yes (End TEE) / No**
2 (exposure)	Does land use at the site and surrounding area make substantial wildlife exposure unlikely based on completion of Table 749-1?	**Yes (End TEE) / No**
3 (pathway)	Is there a potential exposure pathway from soil contamination to soil biota, plants, or wildlife?	**Yes / No (End TEE)**
4 (contaminant)	Are the hazardous substances at your site listed in Table 749-2 and is (or will) their location in the soil at your site be at a depth not exceeding the point of compliance, and at concentrations that do not exceed the values provided in Table 749-2.	**Yes (End TEE) / No** **Note: You must perform bioassays for contaminants at your site if no table value is provided.**
5 (contaminant)	Will hazardous substances listed in Table 749-2 be present in the soil at your site within 6 feet of the ground surface at concentrations likely to be toxic, or with the potential to bioaccumulate, based on bioassays using methods approved by the department.	**Yes / No (End TEE)**

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation]
[Site-Specific Ecological Evaluation] [WAC 173-340-7493] [Index of Tables]

[TEE Home]

Attachment 1 - NWI Wetland Map
Anacortes Water Treatment Plant Terrestrial Ecological Evaluation Wetland



September 16, 2016

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix F. Site Information and Documents

1 – Details for Parcel P21669

2 – Skagit County Parcel Map

3 – Order on Special Use Permit PL10-0048

4 – Title Notification – Special Flood Hazard Area

5 – Coverage under the Water Treatment Plant General Permit

6 – National Wetlands Inventory Anacortes WTP Wetland PEM1Cx

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Details for Parcel: P21669

Jurisdiction: SKAGIT COUNTY

Skagit County - Agricultural-Natural Resource Lands

Zoning Designation:

Recorded Documents

Septic System

Documents scanned and recorded by the Auditor's office

Septic system information

Parcel Number	**XrefID**	**Quarter**	**Section**	**Township**	**Range**
P21669	340313-0-007-0005	02	13	34	03

Owner Information

CITY OF ANACORTES & FINANCE DEPT
PO BOX 547
ANACORTES, WA 98221

Site Address(es) .

14489 RIVER BEND ROAD
[Old Address: 2809 RIVERBEND RD]
14553 RIVER BEND ROAD
[Old Address: 2809 RIVERBEND RD]
14513 RIVER BEND ROAD
14495 RIVER BEND ROAD
Skagit County, WA *(Jurisdiction, State)*
Zip Code Lookup | Site Address Information

Map Links

Open in iMap
Assessor's Parcel Map:
PDF | DWF

Current Legal Description **Abbreviation Definitions**

(9.9300 ac) LT 4 LESS TAX 25 44 DK 17

2016 Values for 2017 Taxes* **Exemption**

Building Market Value	$57,000,000.00
Land Market Value	+$173,300.00
Total Market Value	$57,173,300.00
Assessed Value	$57,173,300.00
Taxable Value	$.00

Sale Information

Deed Type
Sale Date
Sale Price $.00
Sale requires NRL disclosure (more info)

2017 Property Tax Summary

2017 Taxes will be available after 2/15/2017
.
Use the Taxes link above for 2016 taxes

* *Effective date of value is January 1 of the assessment year (2016)*

Legal Description at time of Assessment

***Land Use**	(490) OTHER TRANSPORT/COMMUNI/UTILITIES NOT ELSEWHERE	WAC 458-53-030
Neighborhood	(6EMMISC) ALL COUNTY EXEMPT MISC	

Levy Code	2755	**Fire District**	F02
School District	SD320	**Exemptions**	City Owned
Utilities	PWR-U,WTR-P,SEP	**Acres**	9.93

Improvement 1 Attributes Summary

Building Style	COMMERCIAL REAL PROPERTY		
Year Built		**Foundation**	
Above Grade Living Area		**Exterior Walls**	
Finished Basement		**Roof Covering**	
***Total Living Area**		**Heat/Air Conditioning**	
Unfinished Basement		**Fireplace**	
***Total Garage Area**		**Bedrooms**	
Bathrooms			

For additional information on individual segments see Improvements tab

* Land Use codes are for assessment administration purposes and do not represent jurisdictional zoning. Please contact the appropriate planning department in your jurisdiction for land use questions.

* Total living area includes above grade living area and finished basement area.

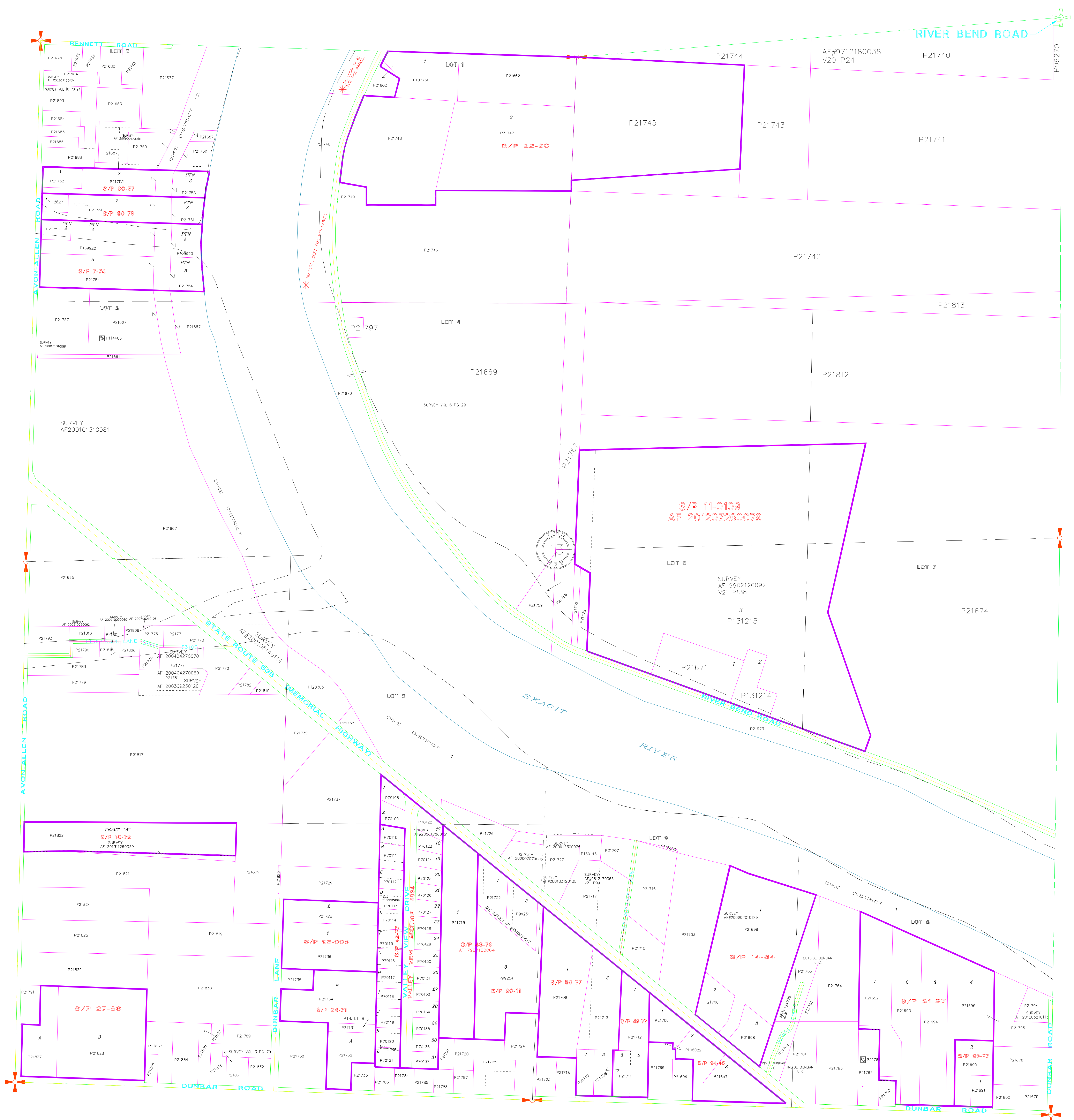
* Garage square footage includes all garage areas; basement garages, attached garages, detached garages, etc.

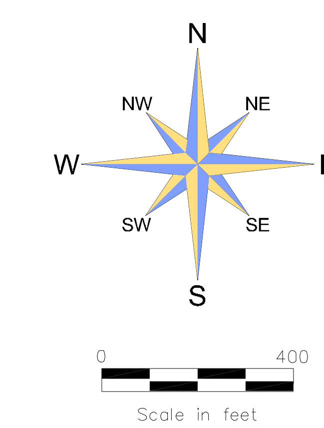
Assessment data for improvements is based on exterior inspections. Please contact the Assessor's office if the information does not accurately reflect the interior characteristics.

SKAGIT COUNTY

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

T 34 N R 03 E





✳ ATTENTION

THIS MAP CONTAINS A PARCEL ACCOUNT THAT HAS BEEN PLACED WITH THE BEST AVAILABLE INFORMATION. THE EXACT LOCATION OF THIS PARCEL IS UNKNOWN.

These maps were created from available public records and existing map sources, not from field surveys. Map features from all sources have been adjusted to achieve a "best fit" registration to the Ownership Parcels map. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. The relative positioning of map features to one another results from combining different map sources without field "ground truthing".

* THIS MAP IS NOT A SUBSTITUTE FOR FIELD SURVEY *

	DATE	INIT.
DRAWN BY	4/20/95	KB
REVISED	12/5/13	DP
PLOTTED	12/5/13	DP
MAP PRODUCED BY SKAGIT COUNTY MAPPING SERVICES		

Section 13

T 34 N R 03 E

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Skagit County Auditor
11/19/2010 Page 1 of 2 2:04PM

AFTER RECORDING RETURN TO:
SKAGIT COUNTY HEARING EXAMINER
1800 CONTINENTAL PLACE
MOUNT VERNON, WA 98273

DOCUMENT TITLE: ORDER ON SPECIAL USE PERMIT PL10-0048

HEARING OFFICER: SKAGIT COUNTY HEARING EXAMINER

APPLICANT: CITY OF ANACORTES

PARCEL NUMBER: P21669, P21797

LEGAL DESCRIPTION: The project is located at 14489 Riverbend Road, Mount Vernon, WA; a portion of the SE ¼ of the NW ¼ and NE ¼ of the SW ¼ of Section 13, Township 34 North, Range 3 East, W.M., Skagit County, Washington.

Permits Plus Receipt Dates: 2/19 and 7/30/10

NOTICE OF DECISION

BEFORE THE SKAGIT COUNTY HEARING EXAMINER

Applicant:	City of Anacortes Attn: Matt Reynolds PO Box 547 Anacortes, WA 98221
Contact:	HDR Engineering, Inc. Attn: Ron Grina, Planner 325 E. George Hopper Road, Suite 201A Burlington, WA 98233
Request/File No:	Special Use Permit for Major Utility Development PL10-0048
Location:	14489 River Bend Road, Mount Vernon, WA within the SE ¼ of the NW ¼ and the NE ¼ of the SW ¼ of Section 13, Township 34 North, Range 3 East, W.M., Skagit County, Washington (Parcels P21669 & P21797)
Land Use Designation:	Agricultural-Natural Resource Land
Summary of Proposal:	Special Use Permit for a Major Utility Development for an upgrade of a pre-existing, non-conforming water treatment plant.
SEPA Compliance:	Mitigated Determination of Non-Significance (MDNS) was issued July 12, 2010. No comments were received.
Public Hearing:	November 3, 2010. Witnesses were sworn and the hearing was held. Planning and Development Services (PDS) recommended approval.
Decision:	Approval, subject to conditions.
Date of Decision:	November 19, 2010
Reconsideration/Appeal:	A Request for Reconsideration may be filed with PDS within 10 days of this decision (SCC 14.06.180). The decision may be appealed to the Board of County Commissioners by filing an Appeal with PDS within 14 days of the date of the decision or decision on reconsideration, if applicable (SCC 14.06.120(9)).
Online Text:	The entire decision can be viewed at: www.skagitcounty.net/hearing examiner

200209100127
Skagit County Auditor
9/10/2002 Page 1 of 1 10:28AM

Return Name & Address:

American Tower Corp
6802 South 220th Street
Kent, WA 98032
Attn: Madeline Chaney

TITLE NOTIFICATION - SPECIAL FLOOD HAZARD AREA

Pursuant to SCC 14.34.110

Property Owner: CITY OF ANACORTES
Legal Description: Sec 13 Twp 34 Range 03
Property I.D. #: P21669 **Tax Account #:** 340313-0-007-0005
Parcel Address or Location: 14489 RIVER BEND ROAD MV
Flood Hazard Zone: A21 **Firm Panel #:** 530151 0250 C
Base Flood Elevation: 30 M.S.L. or DEPTH **Building Permit BP02-0934**

Notice: This parcel is located in a "Special Flood Hazard Area" as identified on the Flood Insurance Rate Map (FIRM) and as adopted by Skagit County. This parcel is subject to periodic flooding and may also be prone to other hazards caused by flooding. The Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994 mandate the purchase of flood insurance as a condition of Federal or Federally related financial assistance for acquisition and/or construction of buildings in Special Flood Hazard Areas. Skagit County participates in the National Flood Insurance Program (NFIP) thereby making all properties eligible for flood insurance.

All new construction or substantial improvements to structures are subject to Skagit County Building Codes per SCC Title 15 and Skagit County Flood Damage Prevention Ordinance Title 14. Any building determined to be in violation of state or local floodplain management regulations or ordinances cannot be covered by flood insurance nor can an existing policy be renewed where violations occur. The Skagit County Planning and Permit Center maintains information related to state and local regulations, flood protection measures, flood hazard zones and in some cases potential flood depths.

Property Owner's signature H Dean Maxwell

State of Washington, County of Skagit.
On this 9th day of September, year of 2002 before me
Carol A Yates Notary Public, personally appeared
H. Dean Maxwell, Mayor known to me to be the person whose name is subscribed to this instrument, and acknowledged that he/~~she~~ executed it.

CAROL A. YATES
COMMISSION EXPIRES
NOTARY
PUBLIC
12-9-05
STATE OF WASHINGTON

Witness my hand and official seal: Carol A Yates
Notary's Signature Carol A Yates Notary Public in and for the State of Washington
residing at Anacortes My Commission expires: 12/9/05

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

July 16, 2014

Mr. Jamie LeBlanc
Manager
Anacortes WTP
14489 River Bend Rd
Anacortes, WA 98273-7285

RE: Coverage under the Water Treatment Plant General Permit

Permit number:	**WAG643002**
Facility Name:	**Anacortes WTP**

Dear Mr. LeBlanc:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Water Treatment Plant General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on September 1, 2014. **Please retain this permit coverage letter with your permit (enclosed) and any other documents required on site (e.g., operation and maintenance manual, solid waste control plan, stormwater pollution prevention plan, spill contingency plan, and monitoring reports).** These materials are part of the official record of permit coverage for your facility.

Please take time to read the entire permit, and contact Ecology if you have any questions.

The Anacortes water treatment plant discharges to the Skagit River, which is listed as a water body impaired for pH. Therefore, as long as the treated filter backwash wastewater discharge has pH values ranging only within the limits of 6.0 to 9.0 standard units, permit Special Condition S-2.3, bullet 2 will not come into play. However, if the pH of the Anacortes water treatment plant discharge is either less than 6.0 or greater than 9.0 standard units, you must then demonstrate that the discharge will cause no further degradation of the pH of the Skagit River, identify steps that you can take to reduce the discharge of that out-of-range wastewater, and incrementally implement those steps.

Appeal Process

You or a third party have a right to appeal coverage under this general permit to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information:

Street Addresses:	Mailing Addresses:
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board (PCHB) 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WQWebDMR)

This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you already have a SAW account, simply go to: https://secureaccess.wa.gov/ecy/wqwebportal.

If you have questions, contact Tonya Wolfe at (360) 407-7097 (Olympia area), (800) 633-6193/option 3, or email: WQWebPortal@ecy.wa.gov.

Questions or Additional Information

Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/wtp/index.html. If you have questions about the water treatment plant general permit, please contact Tonya Lane, tlan461@ecy.wa.gov, 425-649-7050.

Sincerely,

FOR Kevin C. Fitzpatrick
Water Quality Section Manager
Water Quality Program
Northwest Regional Office

Enclosure

Issuance Date:	July 16, 2014
Effective Date:	September 1, 2014
Expiration Date:	August 31, 2019

WATER TREATMENT PLANT GENERAL PERMIT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE GENERAL PERMIT
for
Water Treatment Plants

State of Washington
Department of Ecology
Olympia, Washington 98504-7600

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Until this permit expires, is modified, or revoked, Permittees that have properly obtained coverage under this permit are hereby authorized to discharge in accordance with the Special and General Conditions contained herein.

Heather R. Bartlett

Heather R. Bartlett, Manager
Water Quality Program
Washington State Department of Ecology

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GENERAL CONDITIONS

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APPENDICES

SUMMARY OF REQUIRED SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S-6.3.3	Discharge Monitoring Report (a)	Monthly	October 15, 2014
S-3.1	Operations and Maintenance Manual (a)	Once	January 1, 2015
S-3.2	Solid Waste Control Plan (a)	Once	January 1, 2015
S-3.3	Stormwater Pollution Prevention Plan (a) (b)	Once	January 1, 2015
S-3.4	Spill Contingency Plan (a)	Once	January 1, 2015
G-2.6	Application for Permit Renewal (a)	Once per permit cycle	March 1, 2019
S-3.1	Operations and Maintenance Manual Update (a)	As necessary	
S-3.2	Solid Waste Control Plan Update (a)	As necessary	
S-3.3	Stormwater Pollution Prevention Plan Update (a)	As necessary	
S-3.4	Spill Contingency Plan Update (a)	As necessary	
S-6.2.1	Notification of Non-Compliance	As necessary	
S-4.2.1 S-6.2.2	Notification of Planned Bypass	As necessary	
S-6.2.3 G-4.7	Permit Application Supplement or Notification of Significant Change in Process or Discharge	As necessary	
S-6.3.1	Additional Monitoring Results	As necessary	
G-2.7	Notification of Spills or Other Discharges	As necessary	
G-2.10	Other Information	As necessary	
G-4.2	Signature Authorization	As necessary	
G-4.11	Notice of Permit Transfer	As necessary	

(a) Electronic submittal is required via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

(b) Submission of a Stormwater Pollution Prevention Plan is required by only those Permittees that discharge stormwater associated with industrial activity at their sites to surface water or to a separate stormwater sewer system.

SPECIAL CONDITIONS

S-1 PERMIT COVERAGE

S-1.1 Activities, Discharges, and Facilities that require this Permit

This general permit covers all water treatment plants (WTPs) that discharge backwash effluent to surface water and that meet all of the following criteria:

1. Produce potable water or "industrial" water (primary treatment/settled water) where the treatment and distribution of water is the primary function of the facility.

2. Have an actual production rate equal to or greater than 35,000 gallons per day of treated product water (finished water) as determined on an average monthly basis. "Actual production rate" is the amount of finished water that a treatment facility actually produces on any given day. To calculate the value of the actual production rate on an average monthly basis, add the value of each daily production rate during a calendar month, and divide the sum by the total number of days in the month. The Washington State Department of Ecology (Ecology) reserves the right to determine that permit coverage is needed for facilities with actual production rates less than 35,000 gallons per day in order to protect water quality.

3. The wastewater discharge is from water treatment filtration processes (filter backwash, sedimentation/pre-sedimentation basin washdown, sedimentation/clarification, or filter-to-waste).

4. The water treatment works are not part of a larger, permitted facility, such as a pulp and paper mill.

S-1.2 Discharges Authorized under this Permit

S-1.2.1 Process Wastewater

Beginning on the effective date of this permit, all WTP facilities covered under the WTP general permit effective in September 2009 and that reapplied by March 1, 2014, are authorized to discharge filter backwash water associated with finished water production to surface waters of the State subject to the limits identified in this permit.

S-1.2.2 Non-Routine and Unanticipated Wastewater

Non-routine and unanticipated wastewater consists of process wastewater not identified in Special Condition S-1.2.1 (Process Wastewater), not routinely discharged, and not anticipated at the time of permit application, such as waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

This reissued general permit authorizes non-routine and unanticipated discharges under certain conditions. The Permittee must characterize the non-routine wastewater for pollutants and examine the opportunities for reuse. Prior to discharging the non-routine wastewater, the Permittee must obtain approval from Ecology on a case-by-case basis.

Any discharges not specified in Special Condition S-1.2.1 (Process Wastewater) must be addressed in accordance with the terms and conditions of this section.

1. Beginning on the effective date of this permit, prior to any discharge of non-routine and unanticipated wastewater, the Permittee must contact Ecology and provide the following information at a minimum:

   (a) The proposed discharge location.
   (b) The nature of the activity that will generate the discharge.
   (c) Any alternatives to the discharge, such as reuse, storage, or recycling of the water.
   (d) The total volume of water it expects to discharge.
   (e) The results of the chemical analysis of the water.
   (f) The date of the proposed discharge.
   (g) The expected rate of discharge, in gallons per minute.

2. The Permittee must analyze the wastewater for all parameters with effluent limits in this permit and must report the results as required by Special Condition S-5 (Monitoring Requirements), along with any other parameter deemed necessary by Ecology, using the methods and quantitation levels specified by Ecology.

3. Depending on the nature and extent of pollutants in the wastewater and any opportunities for reuse, Ecology may:

   - Authorize the facility to discharge the wastewater.
   - Require the facility to treat the wastewater.
   - Require the facility to reuse the wastewater.

   All discharges must comply with the effluent limits established in Special Condition S-2 (Limits and Standards); water quality standards; and any other limits imposed by Ecology.

4. The discharge may not proceed until Ecology has reviewed the Permittee's request and has authorized the discharge by Administrative Order. Once approved and if the proposed discharge is to a municipal storm drain, the Permittee must obtain prior approval from the municipality and notify it when it plans to discharge.

S-1.3 Covered Geographic Area

The geographic area covered by this general permit is the entire State of Washington.

S-1.4 Activities, Discharges, and Facilities Excluded from Coverage under this Permit

Discharges to surface water of wastewaters produced from ion exchange, reverse osmosis, or slow sand filtration water treatment processes are excluded from coverage under this permit and may be required to apply for an individual permit.

Discharges of wastewater from water treatment filtration processes to publicly-owned treatment works are excluded from coverage under this permit.

Discharges of wastewater from water treatment filtration processes to the land are excluded from coverage under this permit only if that discharged wastewater has no potential, during all weather conditions, to runoff or overflow into surface water. The operator of a facility that discharges such wastewater to the land must inform the appropriate Ecology Regional Office, identified in Special Condition S-6.2.1 (Notification of Non-Compliance) so that Ecology may determine whether that facility must apply for coverage under an individual State waste discharge permit to ensure that waters of the State (both underground and surface) are protected from degradation.

Ecology may require facilities that meet the requirements of Special Condition S-1.1 (Activities, Discharges, and Facilities that Require this Permit) but cannot meet the water quality requirements of Special Condition S-2.2 (Discharge Limits) to apply for an individual permit. Such facilities with coverage under this general permit will retain permit coverage until the effective date of the individual permit.

S-2 LIMITS AND STANDARDS

S-2.1 Compliance with Standards

The Permittee must comply with the technology- and water quality-based effluent limits and standards described in this Condition. Ecology has based these limits, as described in the accompanying Fact Sheet, on either:

- Technology-based limits, after considering the monitoring data reported by the WTP Permittees from 2009 through 2013, and the expected implementation of all known, available, and reasonable methods of prevention, control, and treatment (AKART); or

- Surface water quality criteria for the protection of human health and aquatic biota, after accounting for a mixing zone consistent with Chapter 173-201A WAC. The resultant fresh water mixing zones were:

  Acute exposure: 30 feet downstream from the point of discharge with an effluent unit volume no greater than 2.5 percent of the receiving water unit volume.

  Chronic exposure: 300 feet downstream from the point of discharge with an effluent unit volume no greater than 25 percent of the receiving water unit volume.

S-2.2 Discharge Limits

The Permittee must comply with effluent limits for settleable solids, pH, and total residual chlorine. While the discharge limits for settleable solids and pH will remain constant for the entire 5-year term of this permit, the discharge limits for total residual chlorine will decrease for existing Permittees after the first year (September 2014 through August 2015). Existing Permittees will thereby have sufficient time to adjust their treatment processes, if necessary, to achieve the smaller daily limit during the remaining 4 years of the term of this permit (September 2015 through August 2019).

EFFLUENT LIMITS			
Parameter	**Effective Term**	**Average Monthly Discharge Limit (a)**	**Maximum Daily Discharge Limit (b)**
Settleable Solids	Sept 2014 – Aug 2019	0.1 mL/L	0.2 mL/L
Total Residual Chlorine	Sept 2014 – Aug 2015	0.07 mg/L	0.15 mg/L
Total Residual Chlorine	Sept 2015 – Aug 2019	Not applicable	0.07 mg/L
Parameter	**Effective Term**	**Daily Minimum**	**Daily Maximum**
pH (c)	Sept 2014 – Aug 2019	6.0 S.U.	9.0 S.U.

(a) The average monthly discharge limit is defined as the greatest average of daily discharges allowed for a calendar month, calculated as the sum of all the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. Where only one sample is measured in a month, its value may not exceed the monthly average.

(b) The maximum daily discharge limit is defined as the greatest daily discharge allowed during a calendar day. Except for pH, if a parameter is measured more than once within a single calendar day, the daily discharge is the arithmetic average of the values from that single day.

(c) The averaging of pH values is not allowed.

S-2.3 Impaired Water Bodies and TMDL Requirements

The Permittee must comply with any applicable total maximum daily load (TMDL) determination that is completed and accepted by the U.S. Environmental Protection Agency (EPA) as of either the effective date of this permit or the effective date of facility coverage under this permit, whichever is later.

If the Permittee discharges to a water body listed as impaired per the 303(d) list approved by the U.S. EPA on December 21, 2012, the Permittee must monitor for the listed pollutant(s) unless it demonstrates that the listed pollutant(s) is not present in its discharge. The applicable listing of impairment is the listing that is final as of the effective date of this permit or the effective date of facility coverage under this permit, whichever is later. Ecology will set the monitoring schedule by administrative order.

1. A new facility may not cause or contribute to an exceedance of the listed pollutant(s).

2. An existing facility that has the potential to cause or contribute to impairment of a listed water body must demonstrate that its discharge will cause no increase in the pollutant(s) of concern, identify steps that it can take to reduce the discharge of those pollutant(s), and incrementally implement those steps. Ecology will either set the schedule for meeting this requirement with an administrative order or require an individual permit for the facility.

S-3 PLANNING REQUIREMENTS

S-3.1 Operations and Maintenance Manual

The Permittee must prepare an operations and maintenance (O&M) manual in accordance with WAC 173-240-150. New facilities must submit their O&M manual within 30 days of receiving coverage under this permit. Existing facilities must consider any necessary updates and submit their updated O&M manual no later than **January 1, 2015**. The Permittee must submit its O&M manual to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

The O&M manual must identify the main water treatment processes employed by the facility and document the procedures for operating and maintaining the wastewater treatment and discharge systems (e.g., the filter backflush systems). At a minimum the O&M manual must include:

1. Maintenance schedule and procedures for treatment and discharge systems.

2. Monitoring necessary to assure proper functioning of treatment and discharge systems.

3. Emergency shut down and containment procedures in the event of uncontrolled discharge due to plant maintenance activities, severe stormwater events, start ups or shut downs, or other causes.

The Permittee must update the O&M manual as necessary to reflect changes in the water treatment processes and procedures and must keep the manual on site and available for inspection by Ecology.

S-3.2 Solid Waste Control Plan

The Permittee must maintain a solid waste control plan. New facilities must submit their solid waste control plan within 30 days of receiving coverage under this permit. Existing facilities must submit their updated solid waste control plan by **January 1, 2015**. The Permittee must submit its solid waste control plan to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

The plan must include, at a minimum, a description of the solid waste, identification of the source of the solid waste, the generation rate of the solid waste, and identification of the disposal methods of the solid waste. The plan must comply with any applicable requirements of the jurisdictional health department and any local requirements for a solid waste permit. The Permittee must update the plan as necessary to reflect changes in solid waste handling and disposal and keep the plan on site and available for inspection by Ecology.

S-3.3 Stormwater Pollution Prevention Plan

Permittees that discharge stormwater associated with industrial activity from their sites to surface water or to a separate stormwater sewer system must prepare a stormwater pollution prevention plan (SWPPP). New facilities must submit their SWPPP before receiving coverage under this permit and complete or implement all best management practices (BMPs) prior to producing the authorized discharge. Existing facilities must update their SWPPP and submit it to Ecology by **January 1, 2015**. The Permittee must submit its SWPPP to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

Existing facilities must implement operational or source control BMPs within the first 6 months following the effective date of this permit and complete treatment BMPs, if required, within the first year following the effective date of this permit.

1. The SWPPP must include the following:

   (a) Assessment and description of existing and potential pollutant sources.
   (b) Description of the operational BMPs.
   (c) Description of selected source-control BMPs.
   (d) When necessary, a description of the erosion and sediment control BMPs.
   (e) When necessary, a description of the treatment BMPs.
   (f) Implementation schedule.

2. The descriptions of BMPs must include the following:

   (a) Operational Source Control BMPs: Operational BMPs are common to all facilities and include at the minimum:

      i. Responsible Party: Identification by name or position the person responsible for stormwater management.

      ii. Good Housekeeping: Listing of ongoing maintenance and cleanup activities, as appropriate, of areas that may contribute pollutants to stormwater discharges.

      iii. Preventive Maintenance: Schedule for inspection and maintenance of the stormwater drainage and treatment systems (if any) and plant equipment and systems that could fail and result in contamination of stormwater.

(b) Structural Source Control BMPs: Source control BMPs eliminate or minimize the exposure of stormwater to pollutants.

(c) Treatment BMPs: Treatment BMPs reduce the amount of pollutants in stormwater and maintain compliance with water quality standards.

(d) Erosion and Sediment Control BMPs: Erosion and sediment control BMPs prevent soil erosion. The SWPPP must identify the locations on site with the potential for soil erosion that could contaminate stormwater.

The Permittee must update the SWPPP as necessary to reflect changes in potential pollutant sources and BMPs and must keep the plan on site and available for inspection by Ecology.

S-3.4 Other Spill Contingency Plan

The Permittee must have, maintain, and implement a spill plan for preventing the accidental release of pollutants to State waters and for minimizing damages if such a spill occurs. New facilities must submit their spill plan within 30 days of receiving coverage under this permit. Existing facilities must submit their updated spill plan by **January 1, 2015**. The Permittee must submit its updated spill plan to Ecology electronically, in a portable document format (pdf), via the Permittee's SecureAccess Washington account at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html.

At a minimum, the plan must include the following:

1. Documentation of the procedures the Permittee will employ for the prevention, containment, and control of spills or unplanned discharges of the following:

   (a) Oil and petroleum products.

   (b) Materials which, when spilled or otherwise released into the environment, are designated dangerous waste or extremely hazardous waste by the procedures set forth in WAC 173-303-070.

   (c) Other materials that may become pollutants or cause pollution upon reaching waters of the State, such as untreated hyper-chlorinated water.

2. A description of the reporting system that will alert responsible managers and legal authorities in the event of a spill.

3. A description of the preventive measures and facilities that prevent, contain, or treat spills (including an overall facility plot showing drainage patterns).

4. A list of all oil and chemicals used, processed, or stored at the facility that may be spilled into State waters.

For the purpose of meeting this requirement, plans and manuals, or portions thereof, required by 33 CFR 154; 40 CFR 109; 40 CFR 110; 40 CFR Part 112; the Federal Oil Pollution Act of 1990, Chapter 173-181; and contingency plans required by Chapter 173-303 WAC may be included by reference as long as they are available on site.

The Permittee must review the plan at least annually and update it as necessary. The reviewer must initial and date the plan and note any updates to the plan to keep it current. This plan must be kept on site and be available for inspection by Ecology.

S-4 OPERATIONAL REQUIREMENTS

S-4.1 Operation and Maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed to achieve compliance with this permit. Where design criteria have been established, the Permittee may not allow flows or waste loadings to exceed approved design criteria or approved revisions thereto.

Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that the Permittee installs only when their operation is necessary to achieve compliance with this permit.

S-4.2 Operational Restrictions

S-4.2.1 Bypass Prohibition and Procedures

Bypass, which is the intentional diversion of a wastestream from any portion of a treatment facility, is prohibited, and Ecology may take enforcement action against a Permittee for bypass unless one of the following three circumstances is applicable.

1. Bypass for Essential Maintenance without the Potential to Cause Violation of Permit Limits or Conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limits or other Conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee shall submit prior notice, if possible, at least 10 days before the date of the bypass.

2. Bypass which is Unavoidable, Unanticipated, and Results in Non-Compliance with this Permit. This bypass is permitted only if:

   Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass; and

There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility; and

Ecology is properly notified of the bypass as required in General Condition G-2.7 (Notification of Non-Compliance).

3. Bypass which is Anticipated and has the Potential to Result in Non-Compliance with this Permit.

   For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. Analyses of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing, and of the cost-effectiveness of alternatives, including comparative resource damage assessment, must be considered during preparation of the engineering report or facilities plan and plans and specifications and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following factors prior to issuing an administrative order for this type bypass:

   (a) Whether the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   (b) Whether feasible alternatives to the bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   (c) Whether the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

   After consideration of the above factors, the anticipated adverse effects of the proposed bypass, and any other relevant factors, Ecology will approve or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under Chapter 90.48 RCW.

S-4.2.2 Application of Products

Any addition of chemicals to treat the wastewater (discharge) must comply with manufacturers' recommendations and be administered only at a rate appropriate for treatment. The addition of excessive quantities of treatment chemicals to the wastewater is prohibited. The use of treatment chemicals that will result in a water quality violation in the receiving water is prohibited.

S-4.2.3 Solid Waste Management

The Permittee must handle and dispose of all solid waste in such a manner as to prevent its entry into waters of the State, either ground water or surface water.

S-4.2.4 Spill Prevention and Control

The Permittee must prevent or control pollutant discharges from site runoff, spillage and leaks, sludge and waste disposal, and materials handling and storage.

S-5 MONITORING REQUIREMENTS

S-5.1 Monitoring Objectives

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored discharge or pollutant, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality. Monitoring must occur at intervals sufficiently frequent to yield data that reasonably characterize the nature of the monitored discharge or pollutant.

Ecology may require by administrative order monitoring of intake water, influent to treatment facilities, internal waste streams, and/or receiving waters to verify compliance with net discharge limits or removal requirements, to verify the maintenance of proper waste treatment or control practices, or to determine the effects of the discharge on the waters and sediments of the State.

S-5.2 Sampling Procedures

S-5.2.1 Event Criteria, Frequency, and Timing

Permittees must monitor the wastewater (discharge) in accordance with the testing schedule appropriate for their facilities, based on the design maximum production capacity of product water (drinking and industrial water) and the source of the raw source water (surface water or ground water). The "design maximum production capacity" is the amount of finished water that a treatment facility is designed to produce at peak output and 24-hour production. For the purpose of determining whether the source of raw water is surface water or ground water, Ecology will use the same classification method as the Washington State Department of Health (DoH), which additionally specifies a third source of raw water: "ground water under the direct influence of surface water" (GWI). Potential GWI sources are defined as all infiltration galleries, Ranney wells, springs, and wells less than 50 feet deep located within 200 feet of surface water. Ecology will consider these sources the same as surface water unless the DoH designates a specific source at a particular WTP as ground water.

WTP facilities are divided into two monitoring groups as follows:

- **Group 1:** Facilities designed to produce less than 4 million gallons per day (gpd) or use only ground water for their source water. Group 1 facilities must follow testing schedule A below.

- **Group 2:** Facilities designed to produce 4 million gallons per day or more and treat surface water or GWI. Group 2 facilities must follow testing schedule B below.

	< 4 Million gpd	**≥ 4 Million gpd**
Surface Water / GWI	Group 1	Group 2
Ground Water	Group 1	Group 1

Testing Schedule A: Monitoring Methods and Frequency for Group 1 WTP Facilities

Parameter	Analytical Method (Accuracy)	Detection Limit	Quantitation Level	Sampling Frequency	Sample Type
Settleable Solids	SM 2540F – Imhoff Cone (±0.1 mL/L or ±1.0%)	0.1 mL/L	0.1 mL/L	Monthly	Grab
pH	SM 4500-H^+ B – Meter (±0.02 standard units)	NA	NA	Monthly	Grab
Total Residual Chlorine	SM 4500 Cl G – Photometer (±0.01 mg/L)	0.01 mg/L	0.02 mg/L	Monthly	Grab
Turbidity	EPA 180.1 – Nephelometric (±0.5 NTU ±1.0%)	0.1 NTU	0.5 NTU	Monthly	Grab
Total Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Dissolved Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Total Daily Volume of Discharge	Meter or Estimate (±30 gallons)	10 gallons per event	10 gallons per event	Daily Year 1: If available Years 2-5: Required	NA
Total Daily Number of Discharge Events	Count	Count	Count	Daily Year 1: If available Years 2-5: Required	NA

Testing Schedule B: Monitoring Methods and Frequency for Group 2 WTP Facilities

Parameter	Analytical Method (Accuracy)	Detection Limit	Quantitation Level	Sampling Frequency	Sample Type
Settleable Solids	SM 2540F – Imhoff Cone (±0.1 mL/L or ±1.0%)	0.1 mL/L	0.1 mL/L	Weekly	Grab
pH	SM 4500-H^+ B – Meter (±0.02 standard units)	NA	NA	Weekly	Grab
Total Residual Chlorine	SM 4500 Cl G – Photometer (±0.01 mg/L)	0.01 mg/L	0.02 mg/L	Weekly	Grab
Turbidity	EPA 180.1 – Nephelometric (±0.5 NTU ±1.0%)	0.1 NTU	0.5 NTU	Weekly	Grab
Total Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Dissolved Arsenic	EPA 200.8 – ICP/MS (±0.1 µg/L)	0.1 µg/L	0.5 µg/L	Monthly Third year only	Grab
Total Daily Volume of Discharge	Meter or Estimate (±30 gallons)	10 gallons per event	10 gallons per event	Daily Year 1: If available Years 2-5: Required	NA
Total Daily Number of Discharge Events	Count	Count	Count	Daily Year 1: If available Years 2-5: Required	NA

Analytical methods are from "Methods for Chemical Analysis of Water and Wastes," U.S. EPA, Environmental Monitoring Systems Laboratory – Cincinnati, EPA-600/4-020, Revised March 1983 and 1979; and "Precision and Recovery Statements for Methods for Measuring Metals," Appendix D of 40 CFR Part 136.

(a) Detection Limit:
The minimum concentration of an analyte that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR Part 136, Appendix B.

(b) Quantitation Level: (also known as minimum level of quantitation)
  (1) The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the laboratory has used all method-specified sample weights, volumes, and cleanup procedures. The quantitation level is calculated by multiplying the method detection limit by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer. (64 FR 30417)
  (2) The smallest detectable concentration of analyte greater than the method detection limit where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs, Submitted to the U.S. EPA December 2007.)

The first monitoring period begins on the effective date of this permit.

During the first year of this permit term, i.e., from September 2014 through August 2015, Permittees must report the total daily volume of their discharge and the total daily number of discharge events only if that information is readily available. Beginning in the second year of this permit term, i.e., beginning in September 2015, all Permittees must monitor for and report these two flow parameters.

Monitoring for total and dissolved arsenic is required for only the 12 monitoring periods of the third year of this permit term, i.e., from September 2016 through August 2017 for existing and covered Permittees, or for the first 12 months of coverage for new Permittees whose coverage begins after September 2016.

Based on the results of arsenic monitoring, Ecology may modify this permit by extending the term when monitoring for arsenic is required; adding one or more effluent limits for arsenic or other parameters; adding monitoring requirements for other parameters; adding monitoring requirements for other environmental matrices, such as raw water sources and receiving waters; or changing the activities, discharges, and facilities that require this permit or are excluded from coverage under this permit.

S-5.2.2 Field Documentation

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all measurements and analyses.

S-5.2.3 Location

The Permittee must conduct all monitoring as close to the point of discharge to surface water (end of pipe) as is reasonably possible.

S-5.2.4 Sampling Methods

Sampling methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the "Guidelines Establishing Test Procedures for the Analysis of Pollutants" contained in 40 CFR Part 136, (or as applicable in 40 CFR subchapters N [Parts 400-471] or O [Parts 501-503]) unless otherwise specified in this permit. Ecology may specify alternative methods only for parameters without limits or without a U.S. EPA-approved test method in 40 CFR Part 136. Sampling must yield samples representative of the wastewater discharged by the Permittee.

S-5.3 Analytical Procedures

S-5.3.1 Laboratory Accreditation

All monitoring data required by Ecology must be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, "Accreditation of Environmental Laboratories." Flow, temperature, settleable solids, specific conductance, pH, turbidity, and internal process control parameters are exempt from this requirement, except that specific conductance, pH, and turbidity must be accredited if the laboratory must otherwise be registered or accredited. An accredited laboratory must provide arsenic and chlorine data.

S-5.3.2 Laboratory Documentation

All laboratory reports providing monitoring data must include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory reporting limit or practical quantitation level (PQL), reporting units, and concentration detected. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for each parameter.

S-5.3.3 Laboratory Methods

The Permittee must analyze all wastewater samples for the parameters and using the methods, MDLs, and PQLs specified in Special Conditions S-5.2.1 (Event Criteria, Frequency, and Timing) and S-5.2.4 (Sampling Methods) unless:

- Another permit condition specifies other methods, MDLs, or PQLs; or
- The method used produces measureable results in the sample, and the U.S. EPA has listed it as an EPA-approved method in 40 CFR Part 136.

The analyses must also include any other parameter deemed necessary by Ecology. If the Permittee uses an alternative method, not specified in the permit and allowed as above, it must report the test method, MDL, and PQL on the discharge monitoring report or other required report. If the Permittee is unable to obtain the required MDL or PQL in its effluent due to matrix effects, the Permittee must submit a matrix-specific MDL and PQL to Ecology along with appropriate laboratory documentation.

S-5.4 Supporting Documentation

The Permittee must maintain supporting documentation for all field and laboratory measurements and any calculations used to determine the total daily volume of discharges and total daily number of discharge events.

S-6 REPORTING AND RECORDKEEPING REQUIREMENTS

S-6.1 Permit-Required Submittals

Unless otherwise specified in this permit, the Permittee must use the on-line "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html to submit all permit-required reports by the specified due dates. Where another condition of this permit requires submission of hardcopy paper documentation, the Permittee must ensure that the submission is postmarked or received by Ecology no later than the specified due date. The

Permittee must submit hardcopy paper documentation to the water quality permit coordinator at the appropriate address provided in Special Condition S-6.2.1 (Notification of Non-Compliance).

S-6.2 Notification and Posting Requirements

S-6.2.1 Notification of Non-Compliance

In the event that the Permittee fails to comply with any of the terms and conditions of this permit, or in the event of a spill or other discharge not authorized by this permit, such that the resulting non-compliance may threaten human health or the environment, the Permittee must:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges and otherwise stop the non-compliance, correct the problem, and minimize any adverse impacts to waters of the State.

2. Immediately notify Ecology of a spill by calling the appropriate regional Emergency Response Tracking System (ERTS) phone number and the regional permit administrator. The phone numbers are provided below:

Ecology Central Regional Office Water Quality Program 15 West Yakima Avenue, Suite 200 Yakima, WA 98902-33887 509-575-2490 TDY: 711 or 1-800-833-6341	**Counties** Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima
Ecology Eastern Regional Office Water Quality Program North 4601 Monroe Spokane, WA 99205-1295 509-329-3400 TDY: 711 or 1-800-833-6341	**Counties** Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman
Ecology Northwest Regional Office Water Quality Program 3190 - 160th Avenue SE Bellevue, WA 98008-5452 (425) 649-7000 TDY: 711 or 1-800-833-6341	**Counties** Island, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom
Ecology Southwest Regional Office Water Quality Program P.O. Box 47775 Olympia, WA 98504-7775 360-407-6300 TDY: 711 or 1-800-833-6341	**Counties** Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, and Wahkiakum

3. Notify the Ecology regional permit administrator of any other non-compliance, including any unanticipated bypass and/or upset that exceeds any effluent limit in the permit, orally within 24 hours from the time the Permittee becomes aware of the non-compliance.

4. If applicable, repeat the sampling and analysis that identified the non-compliance, and submit the results to Ecology within 5 days of becoming aware of the non-compliance.

5. Submit a detailed written report to Ecology at the appropriate address provided in Step 2 above within 5 days of the time the Permittee becomes aware of the non-compliance. The report must include all of the following information, at a minimum:

   (a) A description of the nature and cause of the non-compliance, including the quantity and quality of any unauthorized discharges.

   (b) The period of non-compliance, including the beginning and ending dates and times of the non-compliance, or if the Permittee has not yet corrected the non-compliance, the anticipated date and time when the Permittee will return to compliance.

   (c) The results of any additional sampling and analyses.

   (d) A description of the corrective action taken or planned by the Permittee.

   (e) Steps the Permittee has taken or plans to take to reduce, eliminate, and prevent a recurrence of the non-compliance.

   (f) Any other pertinent information.

6. Ecology may temporarily waive the written report required in Step 5, above, on a case-by-case basis upon written request if it has received a timely oral report, but in no case for more than 30 days after the Permittee becomes aware of the non-compliance.

Reportable failures of compliance include, but are not limited to:

1. Any bypass that exceeds any effluent limit in this permit.

2. Any upset that exceeds any effluent limit in this permit.

3. Any exceedance of a maximum daily discharge limit for any of the pollutants listed in Special Condition S-2 (Limits and Standards).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with any of the terms and conditions of this permit or from any resulting liability for failure to comply.

S-6.2.2 Notification of an Anticipated Bypass

The Permittee must notify Ecology at least 30 days before the planned date of any bypass which is anticipated and has the potential to result in non-compliance with this permit. The notice must contain: (1) A description of the bypass and its cause; (2) An analysis of all known alternatives that would eliminate, reduce, or mitigate the need for bypassing; (3) A cost-effectiveness analysis of alternatives including comparative resource damage assessment; (4) The minimum and maximum duration of the bypass under each alternative; (5) A recommendation for the preferred alternative for conducting the bypass; (6) The projected date of bypass initiation; (7) A statement of compliance with SEPA; (8) A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated; and (9) Steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

S-6.2.3 Notification of a Change in Covered Activities

The Permittee must report to Ecology any facility expansion, production increase, or significant process modification that may cause a new or increased discharge of pollutants that may cause either an exceedance of an effluent limit or a discharge beyond that reported in the original application for coverage. This report must be in the form of a new application or a supplement to the original application.

Significant process changes include a substantially increased discharge of pollutants or a change in the nature of the discharge of pollutants, including:

- A wastewater discharge increase of 25% more than the previous permit covered;
- A new source of raw water that requires different treatment processes, consequently altering the characteristics of the discharged wastewater; or
- A change or addition of treatment to remove a substance not previously removed, consequently altering the characteristics of the discharged wastewater.

S-6.3 Required Reports

S-6.3.1 Additional Monitoring by Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S-5 (Monitoring Requirements) of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's discharge monitoring report.

S-6.3.2 Bypasses

The Permittee must report bypasses to Ecology as described in Special Condition S-4.2.1 (Bypass Prohibition and Procedures).

S-6.3.3 Discharge Monitoring Report (DMR)

The Permittee must submit a DMR each calendar month, whether or not a discharge occurred. If the facility did not discharge during a given monitoring period, the Permittee must submit a completed DMR with "No Discharge" entered as the DMR Reporting Code. Submission of DMRs must be completed by no later than the 15th day of the month following the completed monitoring period.

Permittees must sign up for and submit monitoring data through the Ecology WebDMR program via the Permittee's SecureAccess Washington account, which is accessible at https://secureaccess.wa.gov/ecy/wqwebportal/. More information is available at the "Water Quality Permitting Portal" at http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html and at "About WQWebDMR" at http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html.

Permittees unable to submit electronically (e.g., those who do not have an Internet connection) must contact the Ecology water treatment plant permit administrator at the locations provided in General Condition G-2.7 (Notification of Non-Compliance) to request a waiver and obtain instructions on how to obtain a hardcopy paper DMR. Permittees with waivers must submit hardcopy paper DMRs to be received by Ecology no later than the 15th day of the month following the completed monitoring period.

All DMRs must contain the following information:

1. Include data for each of the parameters for which monitoring is required by Special Condition S-5 (Monitoring Requirements) and as required by the DMR entry screen or hardcopy paper form. Report a value for each day sampling occurred and for the monthly values.

2. If the Permittee did not discharge wastewater during a given monitoring period, enter the "no discharge" reporting code.

3. Record onto the DMR those analytical values reported as "less than the detection limit" by entering "<" followed by the numeric value of the detection limit (e.g., < 2.0). If the method used did not achieve the detection limit or quantitation level identified in Special Condition S-5.2.1 (Event Criteria, Frequency, and Timing), report the actual detection limit and quantitation level in the DMR comments section or other location provided.

4. Report the analytical test method actually used in the DMR comments section or other location provided if the laboratory used an alternative method not specified in the permit and as allowed in Special Condition S-5.2.1 (Event Criteria, Frequency, and Timing).

5. Calculate average and total values (unless otherwise specified in the permit) using:

   (a) For all quantitative results measured at levels equal to or greater than the agency-required detection limit value: The reported numeric value.

(b) For results reported at less than the detection limit numerically (e.g., <0.01 mg/L or not detected with a specified detection limit value): One-half the reported detection limit value.

(c) For results reported as less than the detection limit non-numerically (e.g., ND or not detected) and without a specified detection limit value,

i. If the same parameter was detected in another sample from the same monitoring point for the reporting period: One-half the detection limit value reported for the other sample.

ii. If the same parameter was not detected in another sample from the same monitoring point for the reporting period: Zero.

6. Submit an electronic copy of the laboratory report as an attachment using the link for "About WQWebDMR" or as a paper copy along with the hardcopy paper DMR form. Laboratory reports must include a record of the chain of custody, QA/QC results, and documentation of accreditation for each parameter.

S-6.4 Record Retention

The Permittee must retain records of all monitoring information resulting from any monitoring activity required as a condition of the application for or as a condition of coverage under this permit for a minimum of 5 years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S-7 PERMIT ADMINISTRATION

S-7.1 Application for Coverage

S-7.1.1 Who May Apply for Coverage

New facilities or facilities currently operating without permit coverage that qualify under Special Condition S-1 (Permit Coverage) must apply for coverage under this general permit.

S-7.1.2 How to Obtain Coverage

An applicant must submit to Ecology a completed and signed application for coverage (an electronic notice of intent, or eNOI) specifically prescribed by Ecology for this general permit.

All such applications for coverage must be submitted within 180 days prior to commencement of the activity which may result in the discharge of any pollutant to waters of the State.

All applications for coverage under this permit must:

1. Contain sufficient information necessary for adequate program implementation;
2. Contain the legal name and address of the owner or operator, the facility name and address, type of facility and discharges, and the receiving water bodies;
3. Bear a certification of correctness;
4. Be signed by a responsible person, as identified in General Condition G-4.2 (Certification and Signature Requirements); and
5. Include any other information that Ecology deems relevant.

S-7.1.3 Public Notice

All new applicants for this permit and any existing Permittee that plans a significant process change, as described in Special Condition S-6.3.2 (Notification of a Change in Covered Activities), must cause notice to be circulated within the geographical area of the proposed discharge and certify this fact to Ecology. Such notice must:

1. Be published twice, with at least a 1-week interval between, in the newspaper of greatest general circulation within the county in which the discharge is proposed to occur;
2. Be circulated by any other method as Ecology may direct; and
3. Contain, at a minimum, the following:

   (a) The name, address, and location of the facility requesting coverage under this permit;

   (b) The applicant's activities or operations that result in a discharge;

   (c) The name of the general permit under which coverage is requested; and

   (d) The following statement: "Any person desiring to present their views to Ecology regarding this application may do so in writing, within 30 days of the last date of publication of this notice. Comments should be submitted to Ecology. Any person interested in Ecology's action on this application may notify Ecology of their interest within 30 days of the last date of publication of this notice."

S-7.1.4 Proof of Compliance with SEPA

All new applicants must submit to Ecology, along with an application for coverage, proof and certification that their facility has met all applicable requirements of the State Environmental Policy Act (SEPA) under Chapter 197-11 WAC.

GENERAL CONDITIONS

G-1 OPERATION AND MAINTENANCE

G-1.1 Activities and Discharges Authorized by this Permit

All activities and discharges authorized by this permit must be consistent with the terms and conditions of this permit. The Permittee is at all times responsible for continuous compliance with the terms and conditions of this permit. The discharge of any pollutant more frequently than or at a concentration or amount in excess of that authorized by this permit constitutes a violation of the terms and conditions of this permit.

G-1.2 Discharges from Activities Not Covered by this Permit

The discharge of pollutants resulting from activities not covered under this permit for which the discharger has requested coverage is a violation of this permit.

G-1.3 Maintaining Compliance if Treatment System Fails

The Permittee, in order to maintain compliance with this permit, must control production and all discharges such that, in the event of reduction, loss, failure, or bypass of any portion of the treatment system, the Permittee maintains compliance with this permit until the treatment system is fully restored or an alternate method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment system is reduced, lost, or fails.

G-1.4 Removed Substances

The Permittee must not allow collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment or control of the wastewater and/or stormwater covered by this permit to be resuspended or reintroduced to the storm sewer system or to waters of the State.

G-1.5 Upset

An upset is an exceptional incident in which an unintentional and temporary non-compliance with technology-based permit effluent limits occurs due to factors beyond the reasonable control of the Permittee. An upset does not include non-compliance to the extent caused by operational error, improperly designed treatment facilities, inadequate storage or treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limits if the requirements of this paragraph are met. No determination made during administrative review of claims that non-compliance was caused by upset, and before an action for non-compliance, is a final administrative action, subject to judicial review. A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed contemporaneous operating logs or other relevant evidence, that:

1. An upset occurred, and that the Permittee can identify the cause(s) of the upset;
2. The permitted facility was being properly operated at the time of the upset;
3. The Permittee submitted notice of the upset as required in Special Condition S-6 (Reporting and Recordkeeping Requirements) of this permit; and
4. The Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G-2 OTHER DUTIES AND RESPONSIBILITIES

G-2.1 Additional Monitoring Requirements

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G-2.2 Compliance with Other Laws and Regulations

Nothing in this permit excuses the Permittee from any requirement for compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

The Permittee must comply with effluent standards and prohibitions for toxic pollutants established under Section 307(a) of the Clean Water Act, the Resource Conservation and Recovery Act (Public Law 95.190), the Hazardous Waste Management Act (Chapter 70.105 RCW), the Solid Waste Management–Reduction and Recycling Act (Chapter 70.95 RCW), and all other applicable requirements of 40 CFR 122.41 and 122.42 within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G-2.3 Duty to Comply with this Permit

The Permittee must comply with all Conditions of this permit. Any permit non-compliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G-2.4 Duty to Mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge, use, or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

G-2.5 Duty to Provide Information

The Permittee must provide to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also provide to Ecology, upon request, copies of records required to be kept by this permit.

G-2.6 Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must reapply for coverage under this permit (or under an individual permit) at least 180 days prior to the specified expiration date of this permit. An expired general permit and coverage under the general permit continue in force and effect until Ecology issues a new general permit (or a new individual permit) or until Ecology cancels the general permit. Coverage under this permit continues for only those Permittees who reapply for coverage.

G-2.7 Notification of Spills and Other Discharges

If the Permittee has knowledge of a discharge or spill that could constitute a threat to human health, welfare, or the environment, the Permittee must:

1. Take appropriate action to correct or minimize the threat to human health, welfare, and the environment.

2. Notify the Ecology regional office and other appropriate spill response authorities immediately, but in no case later than within 24 hours of obtaining that knowledge.

3. Immediately report spills or other discharges which might cause bacterial contamination of marine waters to the Ecology regional office and to the Department of Health, Shellfish Program.

4. Immediately report spills or discharges of oils or hazardous substances to the Ecology regional office and to the Washington Emergency Management Division.

The relevant 24-hour phone numbers are:

- Department of Ecology Northwest Regional Office (425) 649-7000
- Department of Ecology Southwest Regional Office (360) 407-6300
- Department of Ecology Central Regional Office (509) 575-2490
- Department of Ecology Eastern Regional Office (509) 329-3400

- Washington Emergency Management Division (800) 258-5990
- Department of Health Shellfish Program (360) 789-8962

G-2.8 Plan Review Required

Prior to constructing or modifying any wastewater control facilities, the Permittee must provide all engineering reports and detailed plans and specifications to Ecology for approval in accordance with Chapter 173-240 WAC. Submission of engineering reports, plans, and specifications must occur in accordance with a compliance schedule issued by Ecology or at least 30 days before the time approval is desired. Construction and operation of the facilities must occur in accordance with the approved plans.

G-2.9 Prohibited Discharges

Discharge of pollutants by the Permittee to waters of the State are prohibited except as authorized through coverage under this permit.

This permit does not authorize any person to discharge any of the following:

1. Any radiological, chemical, or biological warfare agent or high-level radioactive waste into waters of the State.

2. Any pollutants that the Secretary of the Army acting through the Chief, Corps of Engineers, finds would substantially impair anchorage and navigation.

3. Any pollutant that the U.S. EPA, not having waived its right to object pursuant to Section 402(e) of the Clean Water Act, has objected to in writing pursuant to Section 402(d) of the Clean Water Act.

4. Any pollutant in conflict with plans or amendment thereto approved pursuant to Section 208(b) of the Clean Water Act.

5. Any pollutant subject to a toxic pollutant discharge prohibition under Section 307 of the Clean Water Act.

6. Any dangerous waste, as defined in the dangerous waste regulations, Chapter 173-303 WAC, into a subsurface disposal system, such as a well or drainfield.

G-2.10 Reporting Other Information

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to Ecology, the Permittee must promptly submit such facts or information.

G-3 ENFORCEMENT AND PENALTIES

G-3.1 Enforcement

Ecology, with the assistance of the attorney general, may sue in courts of competent jurisdiction to enjoin any threatened or continuing violation of this permit or the Conditions thereof without the necessity of a prior revocation of coverage under this permit. Any violation of the terms and conditions of this permit, the state Water Pollution Control Act, or the federal Clean Water Act are subject to the enforcement sanctions, direct and indirect, as provided for in WAC 173-226-250.

G-3.2 Penalties for Tampering

Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, by imprisonment for not more than 2 years per violation, or by both fine and imprisonment. If a conviction of a person is for a violation committed after a first conviction of such person under this Condition, punishment shall be a fine of not more than $20,000 per day of violation, by imprisonment of not more than 4 years, or by both fine and imprisonment.

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, by imprisonment for not more than 6 months per violation, or by both fine and imprisonment.

G-3.3 Penalties for Violating Permit Conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is guilty of a crime and, upon conviction thereof, may be punished by a fine of up to $10,000 and costs of prosecution, by imprisonment, or by both fine and imprisonment, in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of this permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to $10,000 for every such violation. Each and every such violation is a separate and distinct offense, and in the case of a continuing violation, every day's continuance may be deemed a separate and distinct violation.

G-3.4 Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

G-3.5 Right of Inspection and Entry

The Permittee must allow Ecology or its authorized representative, upon the presentation of credentials and such other documents as may be required by law, at reasonable times, for the purpose of inspecting and investigating (a) Conditions relating to the pollution or the possible pollution of any waters of the State, or (b) Actual or suspected violations of water quality standards, effluent standards or limits, or the terms and conditions of this permit:

1. To enter upon the premises, public or private, in which an effluent source or discharge is located or where any records must be kept under the terms and conditions of this permit.

2. To have access to and to copy at reasonable cost any records that must be kept under the terms and conditions of this permit.

3. To investigate, inspect, or monitor any facility, operation, or practice regulated by or required under this permit, including:

   (a) Postings.
   (b) Collection, control, treatment, pollution management, and discharge facilities.
   (c) Monitoring equipment or methods.

4. To sample or monitor any discharge, internal waste stream, substances, or parameters at any location, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

"Reasonable times" includes regular business hours and any other times when Ecology suspects the occurrence or evidence of a violation requiring immediate inspection.

G-4 PERMIT MANAGEMENT AND COORDINATION

G-4.1 Appeal

Any person may appeal the terms and conditions of this general permit, as they apply to the appropriate class of dischargers, within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

Any person may appeal the terms and conditions of this general permit, as they apply to an individual discharger, within 30 days of the effective date of coverage of that discharger, in accordance with Chapter 43.21B RCW. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or inapplicability to that individual discharger.

The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G-4.2 Certification and Signature Requirements

The Permittee must sign and certify as correct all applications, reports, or information that it provides to Ecology. The person who provides such signature and certification must be any of the following:

1. In the case of corporations, a responsible corporate officer who may be:

   (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy- or decision-making functions for the corporation; or

   (b) The manager of one or more manufacturing, production, or operating facilities, provided:

      i. The manager is authorized to make management decisions which govern the operation of the permitted facility or activity, including having the explicit or implicit duties of making major capital investment recommendations and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations;

      ii. The manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

      iii. Where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. In the case of a partnership, a general partner.

3. In the case of a sole proprietorship, the proprietor.

4. In the case of a municipal, state, or other public facility or activity, either a principal executive officer or ranking elected official.

5. A duly authorized representative of a person identified among items 1 through 4 of this Condition. A person is a duly authorized representative only if:

   (a) A person identified among items 1 through 4 of this Condition makes the authorization in writing and submits it to Ecology; and

   (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or a position having overall responsibility for environmental matters for the Permittee. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

If an authorization under item 5 of this Condition is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or activity, the Permittee must provide to Ecology a new authorization satisfying the requirements of this Condition prior to or together with any applications, reports, or information to be signed by an authorized representative.

Any person signing a document under this Condition must make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G-4.3 Dates of Coverage under this Permit

Unless Ecology responds in writing to a Notice of Intent application for coverage under this general permit, coverage of a discharger under this general permit will automatically commence on the latter of the following:

1. The effective date of this general permit.
2. The 31st day following the end of the 30-day comment period following the issuance of the final general permit, as required in WAC 173-226-130(4).
3. The 31st day following receipt by Ecology of that discharger's completed Notice of Intent application for coverage under this general permit.
4. The coverage date specified in this general permit.

When a Permittee has made a timely and sufficient application for the renewal of coverage under this permit prior to its expiration, this permit remains in effect and enforceable until Ecology:

1. Denies the application;
2. Issues a replacement permit; or
3. Cancels the expired permit.

Coverage under an expired general permit for Permittees who fail to submit a timely and sufficient application expires on the expiration date of the general permit.

G-4.4 Severability

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit are not affected thereby.

G-4.5 Payment of Fees

The Permittee must provide payment of fees associated with this permit as assessed by Ecology pursuant to Chapter 173-224 WAC until the permit is either terminated or revoked.

G-4.6 Termination of Coverage upon Issuance of an Individual Permit

When an NPDES waste discharge individual permit is issued to a discharger otherwise subject to this general permit, the applicability of this general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G-4.7 Reporting a Cause for Modification or Revocation

The Permittee must provide a new application or information supplemental to the previous application whenever:

1. The Permittee anticipates a significant change to the permitted activity or in the quantity or type of discharge authorized by this permit; or

2. The Permittee knows, or has reason to believe, that any activity has occurred or will occur which would constitute cause for modification or revocation pursuant to 40 CFR 122.62.

A significant change includes, but is not limited to, any facility expansion, production increase, or process modification that would change the nature or increase the quantity of pollutants discharged such as to cause either non-compliance with effluent limits or discharges beyond those reported in the previous application for coverage. The Permittee must provide its plans, supplemental information, or new application for coverage to Ecology at least 60 days prior to any proposed changes. This reporting to Ecology does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G-4.8 Request to be Excluded from Coverage under this Permit

Any discharger authorized by this general permit may request to be excluded from coverage under this general permit by applying for an individual permit. Such discharger must provide to Ecology an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request for exclusion from coverage under this permit. These reasons must fully document how an individual permit will apply to the applicant in a way that this general permit cannot.

Ecology may require the applicant to provide information to support the request for exclusion from coverage under this general permit. Ecology will either issue an individual permit or deny the request with a statement explaining the reason for the denial.

G-4.9 Modification, Revocation, and Termination of this General Permit

Ecology may modify, revoke and reissue, or terminate this permit during its term for cause in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, any of the following:

1. A change in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

2. Promulgation of effluent limit standards or guidelines pursuant to the Clean Water Act or Chapter 90.48 RCW for the category of dischargers covered under this permit.

3. Approval by Ecology of a water quality management plan containing requirements applicable to the category of dischargers covered under this permit.

4. Receipt of information that indicates that cumulative effects on the environment from dischargers covered under this permit are unacceptable.

5. Establishment by the U.S. Environmental Protection Agency of a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) under Section 307(a) of the Clean Water Act for a toxic pollutant which is more stringent than any limit upon such pollutant in this permit.

In the event that a material change occurs in the condition of the waters of the State, Ecology may, by appropriate order, modify permit Conditions or specify additional Conditions in permits previously issued.

The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated non-compliance does not stay any permit Condition.

G-4.10 Termination of Coverage under this Permit

Ecology may revoke coverage for any discharger under this permit for cause in accordance with Chapter 173-226 WAC. The discharger has 30 days during which to respond to any notification from Ecology of termination of coverage under this permit before coverage under this permit is automatically revoked. Cases where coverage may be terminated include, but are not limited to, any of the following:

1. Violation of any term or condition of this permit.

2. Failure or refusal of the Permittee to comply with an interim or final requirement contained in this permit or submitted as part of its application for coverage under this permit.
3. Misrepresentation or failure to disclose fully all relevant facts when applying for and obtaining coverage under this permit.
4. A material change in the quantity or type of waste disposed or in any other condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.
5. A determination that the permitted activity endangers human health or the environment or contributes to a water quality standard violation.
6. Incorporation of an approved local pretreatment program into a municipality's permit.
7. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5) when applicable.
8. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090 and General Condition G-3.5 (Right of Inspection and Entry).
9. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

Ecology may require any discharger, whether or not already covered under this general permit, to apply for and obtain coverage under an individual permit or another more appropriate general permit.

Permittees whose coverage has been revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided that the request is made within 90 days from the time of revocation and is submitted along with a complete individual permit application.

G-4.11 Transfer of Permit Coverage

Coverage under this permit is not transferable to any person except after notice to Ecology.

In the event of any change in control or ownership of the facility or activity from which the authorized discharge emanates, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, and provide a copy of that letter to Ecology.

A Permittee may transfer coverage under this permit to a succeeding owner or operator of the facility or activity producing the discharge, including owners or operators of lots or parcels within a common plan of development or sale, by:

1. Preparing a written agreement, signed by both the current Permittee and the new discharger, that specifies the proposed date of the transfer of coverage, responsibility, and liability for this permit; and

2. Submitting to Ecology a copy of that written and signed agreement at least 30 days prior to the proposed transfer date; and

Provided that:

Ecology does not notify the current Permittee and the new discharger by the proposed transfer date of its intent to modify, to revoke and reissue, or to terminate permit coverage. If Ecology does not notify the current Permittee and the new discharger, the transfer of permit coverage is effective on the date specified in the written agreement between the current Permittee and the new discharger.

When a current Permittee of a construction stormwater discharge site transfers control or ownership of a portion of that permitted site to another person, the current Permittee must also submit an updated application for coverage to Ecology indicating the acreage remaining after the transfer.

Upon consent of the Permittee, Ecology may transfer coverage under this permit to a succeeding Permittee by a minor modification in accordance with 40 CFR 122.63(d) to identify the new Permittee and incorporate such other requirements as Ecology may deem necessary.

Appendix A. Acronyms and Units of Measure

Acronym	Meaning
AKART	All known, available, and reasonable methods of prevention, control, and treatment
BMP	Best management practice
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
CWA	Clean Water Act
DoH	Washington State Department of Health
DMR	Discharge monitoring report
Ecology	Washington State Department of Ecology
eNOI	Electronic notice of intent
EPA	Environmental Protection Agency
ERTS	Emergency Response Tracking System
GWI	Ground water under the direct influence of surface water
MDL	Method detection limit
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
pdf	Portable document format
PQL	Practical quantitation level
QA/QC	Quality assurance and quality control
RCW	Revised Code of Washington State
SEPA	State Environmental Policy Act, RCW 43.21C
SWPPP	Stormwater pollution prevention plan
TMDL	Total maximum daily load
U.S.	United States
USC	United States Code
WAC	Washington Administrative Code
WTP	Water treatment plant

Unit of Measure	Meaning
gpd	Gallons per day
µg/L	Micrograms per liter
mg/L	Milligrams per liter
mL/L	Milliliters per liter
NTU	Nephelometric turbidity units
S.U.	Standard units

Appendix B. Definitions

303(d) List
The list of water bodies in Washington State that do not meet the water quality standards specified in Chapter 173-201A WAC. The Washington State Department of Ecology (Ecology) prepares and the U.S. Environmental Protection Agency approves this list periodically (every 2 years). The list is posted on the Ecology web site at http://www.ecy.wa.gov/programs/wq/303d/2008/index.html.

Action
Any human project or activity.

Activity
A discernible set of related actions or processes conducted within a facility, operation, or site that may cause a discharge of pollutants. Examples include, but are not limited to, construction; manufacturing; production or use of raw materials, products, or wastes; transportation; and cleanup or treatment of machinery, structures, land, or water.

Acute Toxicity
The adverse effects of a substance or a combination of substances on an organism that result either from a single exposure or from multiple exposures in a short period of time (usually from 48 to 96 hours).

All known, available, and reasonable methods of prevention, control, and treatment (AKART)
A technology-based approach of decision making for limiting pollutants from discharges. AKART represents the most current methodology for preventing, controlling, and abating pollution that can be installed or used at a reasonable cost.

Application for coverage
A formal request for coverage under this general permit using the paper or electronic form developed by the Washington State Department of Ecology for that purpose.

Average monthly discharge limit (same as Average monthly effluent limit)
The greatest average of daily discharges allowed for a calendar month. To calculate the value of the actual average monthly discharge for comparison with the limit, add the value of each daily discharge measured during a calendar month, and divide this sum by the total number of daily discharges measured.

Average monthly effluent limit (same as Average monthly discharge limit)
The greatest average of daily discharges allowed for a calendar month. To calculate the value of the actual average monthly discharge for comparison with the limit, add the value of each daily discharge measured during a calendar month, and divide this sum by the total number of daily discharges measured.

Background
The biological, chemical, physical, and radiological conditions that exist in the absence of any influences from outside an area potentially influenced by a specific activity.

Best management practice (BMP)
Activity, prohibition, maintenance procedure, or other physical, structural, and/or managerial practice to prevent or reduce pollution of and other adverse impacts to the waters of Washington State. BMPs include treatment systems, operating schedules and procedures, and practices used singularly or in combination to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

Bypass
The diversion of stormwater or a wastestream from any portion of a treatment facility. A bypass may be intentional or unintentional.

Calendar Day
A period of 24 consecutive hours starting at 12:01 A.M. and ending at the following 12:00 P.M. (midnight).

Carcinogen
Any substance or agent that produces or tends to produce cancer in humans. The term carcinogen applies to substances on the U.S. Environmental Protection Agency lists of A (known human) and B (probable human) carcinogens, and any substance which causes a significant increased incidence of benign or malignant tumors in a single, well conducted animal bioassay, consistent with the weight of evidence approach specified in the U.S. Environmental Protection Agency Guidelines for Carcinogenic Risk Assessment.

Chlorine
A chemical used to disinfect wastewaters of pathogens harmful to human health. Chlorine is extremely toxic to aquatic life.

Chronic toxicity
The adverse effects of a substance or combination of substances on an organism that result from exposure over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity may affect survival, reproduction or growth rates, or other health-related conditions.

Clean Water Act (CWA)
The primary federal law in the United States governing water pollution and that includes goals for eliminating releases of large amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters will meet standards necessary for human sports and recreation by 1983. (Federal Water Pollution Control Act, Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117, and 100-4; USC 1251, et seq.)

Color
The optical density at the visual wavelength of maximum absorption, relative to distilled water. One hundred percent transmittance is equivalent to zero optical density. The analytical procedure for measuring this parameter is typically Standard Methods for the Examination of Water and Wastewater, Method 204.

Compliance schedule
A schedule of remedial measures that includes an enforceable sequence of actions or operations leading to compliance with an effluent or other limit, prohibition, or standard.

Contaminant
Any biological, chemical, physical, or radiological substance that does not occur naturally in a given environmental medium or that occurs at concentrations greater than those in the natural or background conditions.

Control
1. To direct, oversee, supervise, manage, perform, or give instruction about any decision, action, or operation of the specific facility, site, field, wastestream, or other object "under control."
2. The partial removal or complete eradication of native plants, non-native non-noxious plants, algae, noxious or quarantine-list weeds, or other nonnative invasive organisms from a water body. The purpose of control activities may be to protect some of the beneficial uses of a water body, such as swimming, boating, water skiing, fishing access, etc. The goal may be to maintain some native aquatic vegetation for habitat, while accomplishing some removal for beneficial use protection. Control activities may include the application of chemical(s) to all or part of a water body.

Conveyance
A mechanism for transporting water, wastewater, or stormwater from one location to another location, including, but not limited to, gutters, ditches, pipes, and/or channels.

Criteria
The numeric values and the narrative standards that represent contaminant concentrations which are not to be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.

Daily discharge
The amount of a pollutant discharged during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limits expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limits expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant throughout the day.

Dangerous waste
Any discarded, useless, unwanted, or abandoned nonradioactive substances, including but not limited to certain pesticides, or any residues or containers of such substances which are disposed of in such quantity or concentration as to pose a substantial present or potential hazard to human

health, wildlife, or the environment because such wastes or constituents or combinations of such wastes: (1) Have short-lived, toxic properties that may cause death, injury, or illness or have mutagenic, teratogenic, or carcinogenic properties; or (2) Are corrosive, explosive, flammable, or may generate pressure through decomposition or other means. The exact definition of dangerous waste is provided at WAC 173-303-040.

Detection limit
The minimum observed result such that the lower 100(1- α) percent confidence limit of the result is greater than the mean of the method blanks.

Detention
The temporary collection of water into a storage device or pond, with the subsequent release of that water either at a rate slower than the collection rate or after a specified time period has passed since the time of collection. The purposes of detention include, but are not limited to, improving the quality of the water released and reducing or smoothing the mass flow rate of its discharge over time.

Detention pond
Man-made structure constructed specifically to collect and manage stormwater. Detention ponds are generally dry until a significant storm event and subsequently gradually release the accumulated stormwater through an outlet.

Dilution factor (DF)
A measure of the amount of mixing of effluent and receiving water that occurs at the mixing zone boundary, expressed as the inverse of the effluent fraction. For example, a dilution factor of 16 means that, assuming complete mixing at the mixing zone boundary, the effluent comprises 6.25 percent by volume, and the receiving water comprises 93.75 percent by volume of the mixture of effluent and receiving water [DF = 1/(6.25/100) = 16].

Discharge (the noun form is the same as Effluent)
To release or add material to waters of the State, including via surface runoff.

Discharge limit (same as Effluent limit)
Any restriction, including schedules of compliance, established by the local government, the Washington State Department of Ecology, or the U.S. Environmental Protection Agency on quantities, rates, and/or concentrations of biological, chemical, physical, radiological, and/or other characteristics of material discharged into any site including, but not limited to, waters of the State of Washington.

Discharge monitoring report (DMR)
A report submitted periodically (usually monthly or quarterly) by a Permittee to the Washington State Department of Ecology that provides the results of effluent monitoring tests conducted by or on the behalf of the Permittee.

Discharger
An owner or operator of any facility, operation, or activity subject to regulation under Chapter 90.48 of the Revised Code of Washington State or the federal Clean Water Act.

Domestic wastewater
Waste and wastewater containing human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground-water infiltration or surface waters as may be present.

Effluent (same as the noun form of Discharge)
Material (usually an aqueous liquid) released to waters of the State, including via surface runoff.

Effluent limit (same as Discharge limit)
Any restriction, including schedules of compliance, established by the local government, the Washington State Department of Ecology, or the U.S. Environmental Protection Agency on quantities, rates, and/or concentrations of biological, chemical, physical, radiological, and/or other characteristics of material discharged into any site including, but not limited to, waters of the State of Washington.

Entity (same as Party)
Any person or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

Erosion
The detachment and movement of soil or rock fragments and the wearing away of the land surface by precipitation, running water, ice, wind, or other geological agents, including processes such as gravitational creep.

Erosion and sediment control best management practices (ESC BMPs)
Best management practices (BMPs) intended to prevent erosion, sedimentation, or the release of sediment-laden water from the site. Examples include preserving natural vegetation, seeding, mulching and matting, and installation of plastic covering, filter fences, sediment traps, or ponds. (synonymous with stabilization and structural BMPs)

Facility (same as Operation)
The physical premises (including the land and appurtenances thereto) owned or operated by a Permittee from which wastewater or stormwater is discharged subject to regulation under the National Pollutant Discharge Elimination System program.

Fact Sheet
A document prepared by the Washington State Department of Ecology and issued with every permit which summarizes the general activities of the Permittee, explains the reasoning behind the Conditions of the permit, and tells how the public may comment.

Federal Water Pollution Control Act (FWPCA) (same as Clean Water Act)
The primary federal law in the United States governing water pollution and that includes goals for eliminating releases of large amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters will meet standards necessary for human sports and recreation by 1983. (Clean Water Act, Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117, and 100-4; USC 1251, et seq.)

General permit
A single permit that covers multiple characteristically similar dischargers of a point source category within a designated geographical area, in lieu of many individual permits that are specifically tailored and issued separately to each discharger.

Ground water (same as Underground water)
The water located in a saturated zone or stratum beneath the surface of the land or below a surface water body. Ground water is a water of the State and includes interflow, which is a type of perched water, and water in all other saturated soil pore spaces and rock interstices, whether perched, seasonal, or artificial. Although underground water within the vadose zone (unsaturated zone) also is a type of ground water, the Washington State ground water quality standards do not specifically protect soil pore water or soil moisture located in the vadose zone.

Hardness
The amount of calcium and magnesium salts present in water, typically expressed as milligrams of calcium carbonate per liter. The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 314.

Hazardous waste
That waste designated by 40 CFR Part 261, and regulated by the U.S. Environmental Protection Agency.

Individual permit
A permit that covers only a single point source, discharger, or facility.

Interflow
Underground water derived directly from rainfall or snowmelt that percolates into the shallow soil, travels a relatively short distance laterally through the soil near the land surface, and subsequently seeps either: (1) Back onto the land surface where it may evaporate, mix with runoff, or discharge to a surface water body, or (2) Below the surface into a surface water body. The presence and amount of interflow is a function of the soil system depth, permeability, and water-holding capacity.

Jurisdiction

1. The practical authority granted to a formally constituted legal body to deal with and make pronouncements on legal matters and, by implication, to administer justice within a defined area of responsibility.
2. The geographical area or subject-matter to which such practical authority applies.

Load allocation (LA)

Within the context of a total maximum daily load, that portion of the loading capacity of a pollutant entering a water body attributed to: (1) Existing or future nonpoint sources of pollution (i.e., all sources not covered by a National Pollutant Discharge Elimination System permit); and (2) Natural background sources. Wherever possible, nonpoint source loads and natural loads should be distinguished. LA does not include reserves for future growth or a margin of safety.

Loading capacity

The greatest amount of pollutant that a water body can receive and still meet water quality standards.

Method detection limit (MDL)

Minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, and is determined from analysis of a sample in a given matrix containing the analyte. The MDL (or simply "detection limit") is the smallest measured amount or concentration of analyte in a sample that gives rise to a Type I error tolerance of alpha under the null hypothesis that the true amount or concentration of analyte in the sample is equal to that of a blank. (The alternative hypothesis is that the true amount or concentration of analyte is greater than that of a blank).

Mixing zone (same as Dilution zone)

That portion of a water body adjacent to an effluent discharge point where mixing dilutes the effluent with the receiving water. The water within this zone need not meet numeric water quality criteria, but must allow passage of aquatic organisms and not upset the ecological balance of the receiving water. The permit specifies the mixing area or volume fraction of the receiving water surrounding the discharge point.

Monthly average

The sum of all daily measurements obtained during a calendar month divided by the number of days measured during that month (arithmetic mean).

Municipality

A political unit incorporated for local self-government, such as a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or pursuant to state law; an authorized Indian tribe or tribal organization; or a designated and approved management agency under Section 208 of the Clean Water Act. Municipalities include special districts created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity.

National Pollutant Discharge Elimination System (NPDES)
The federal wastewater permitting system for discharges of pollutants from point sources to the navigable waters of the United States authorized under Section 402 of the Clean Water Act. The U.S. Environmental Protection Agency has authorized the State of Washington to issue and administer NPDES permits for non-federal point sources within the State.

Nonpoint source
A source from which pollutants may enter waters of the State that is not readily discernible, such as any dispersed land-based or water-based activities including, but not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas, or forest lands; subsurface or underground sources; or discharges from boats or marine vessels not otherwise regulated under the National Pollutant Discharge Elimination System program.

Operation (same as Facility)
The physical premises (including the land and appurtenances thereto) owned or operated by a Permittee from which wastewater or stormwater is discharged subject to regulation under the National Pollutant Discharge Elimination System program.

Operational source control best management practice (Operational source control BMP)
The schedule of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial best management practices to prevent or reduce the pollution of waters of the State.

Organism
Any individual life form: an animal, plant, fungus, protistan, or moneran.

Outfall
The location of a point source where a discharge leaves a facility, site, or municipal separate storm sewer system and flows into waters of the State. Outfalls do not include open conveyances connecting two municipal separate storm sewers; or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State (e.g., culverts).

Party (same as Entity)
Any person or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

Permeable
Porous; capable of allowing liquids or gases to pass through.

Permit
An authorization, license, or equivalent control document issued by a formally constituted legal body, such as the Washington State Department of Ecology, to a facility, activity, or entity to treat, store, dispose, or discharge materials or wastes, specifying the waste treatment and control requirements and waste discharge conditions. Unless the context requires differently, "permit" refers to individual and general permits authorized under the National Pollutant Discharge Elimination System program.

Permittee
The entity who receives notice of coverage under this general permit.

Person
Any individual or organization, including, but not limited to, cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees.

pH
A measure of the acidity or alkalinity of water. A pH of 7.0 is defined as neutral. Large variations above or below 7.0 are harmful to most aquatic life. Mathematically, pH is the negative logarithm of the activity of the hydronium ion (often expressed as the negative logarithm of the molar concentration of the hydrogen ion). The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 423.

Point source
Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters of the State, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft. Point source does not include agricultural stormwater discharges and return flows from irrigated agriculture. See 40 CFR 122.3 for exclusions.

Pollutant (in water)
Any discharged substance or pathogenic organism that would: (1) Alter the biological, chemical, physical, radiological, or thermal properties of any water of the State, or (2) Would be likely to create a nuisance or render such water harmful, detrimental, or injurious (a) to the public health, safety, or welfare, (b) to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or (c) to any animal or plant life, either terrestrial or aquatic, either directly from the environment or indirectly by ingestion through the food chain.

Pollutants may include, but are not limited to, the following: solid waste, incinerator residue, garbage, sewage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, dredged spoil, rock, sand, cellar dirt, and other industrial, municipal, and agricultural wastes.

Pollutant does not mean: (1) Sewage from marine vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces, within the meaning of Section 312 of the Clean Water Act (CWA); (2) Dredged or fill material discharged in accordance with a permit issued under Section 404 of the CWA; or (3) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal is approved by authority of the Washington State Department of Ecology (Ecology), and if Ecology determines that such injection or disposal will not result in the degradation of ground-water or surface water resources.

Pollution (of water)
The man-made or man-induced contamination or other alteration of the biological, chemical, physical, or radiological properties of any water of the State, including change in temperature, taste, odor, color, or turbidity of the water; or such discharge of any solid, liquid, gaseous, or other substance into any water of the State that will, or is likely to, create a nuisance or render such water harmful, detrimental, or injurious to: (1) The public health, safety, or welfare; (2) Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or (3) Any animal or plant life, either terrestrial or aquatic, either directly from the environment or indirectly by ingestion through the food chain.

Pretreatment
The reduction of the amount or concentration of pollutants, elimination of pollutants, or alteration of the nature of pollutant properties to a less harmful state prior to or in lieu of discharging wastewater to a treatment plant. This reduction or alteration may be obtained by biological, chemical, or physical processes, by process changes, or by other means, except by diluting the pollutants.

Publicly-owned treatment works (POTW)
1. A sewage treatment plant and its collection system that is owned by a municipality, the State of Washington, or the federal government. A POTW includes the sewers, pipes and other conveyances that convey wastewater to the treatment plant, and any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature.
2. The municipality or other entity that has jurisdiction over the indirect discharges to and the discharges from the treatment works.

Putrescible waste
Solid waste that contains material capable of being decomposed by micro-organisms.

Quantitation level (QL)
The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. The QL is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and

cleanup procedures have been employed. The QL may be calculated by multiplying the method detection limit (MDL) by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10n, where n is an integer.

Receiving water
The water body at the point of discharge, whether that discharge is through a point source or via sheet flow. If the discharge is to a stormwater conveyance system, either surface or subsurface, the receiving water is the water body to which the stormwater conveyance system discharges. Systems designed for ground-water drainage, redirecting stream natural flows, or conveyance of irrigation water/return flows that coincidentally convey stormwater, are considered the receiving water. Receiving waters may also be ground water to which surface runoff is directed by infiltration.

Representative (sample)
A sample that yields data that accurately characterizes the nature of a discharge or other sampled matrix for the parameters of concern. A representative sample should account for the factors that contribute to the variability of the parameters, such as the quantity of the discharge, the date and time of the sampling event, and whether the particular sampling location or associated physical events may affect the material sampled. Combining grab samples collected from multiple outfalls from a designated area of the facility during a certain time range to create a flow-weighted composite sample may be required to obtain a representative sample.

A random sample may not be a representative sample. Representative sampling schemes should vary based on the population distribution and variability. For a relatively constant discharge, a grab sample is representative. For a discharge that varies greatly over time or space, a grab sample would likely not be representative.

Runoff
Water derived directly from rainfall or snowmelt that travels across the land surface and discharges: (1) To water bodies either directly or through a constructed collection and conveyance system, or (2) To the subsurface through a constructed collection and conveyance system.

Sanitary sewer
A sewer designed to convey domestic wastewater.

Saturated zone
The subsurficial zone in which all soil pore spaces and rock interstices are completely filled with ground water. Saturated zones include aquifers, whether or not they produce a significant yield, areas of perched ground water, and interflow.

Sediment
The fragmented material that originates from the weathering and erosion of rocks, unconsolidated deposits, or unpaved yards; and is suspended in, transported by, or deposited by water.

Sedimentation
The deposition or formation of sediment.

Settleable solids
The material that settles out of suspension within a certain timespan measured volumetrically. The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 209E.

Site
1. The land or water area where any facility, operation, or activity is physically located or conducted, including any adjacent land or buffer areas used in connection with such facility, operation, or activity.
2. The land or water area receiving any effluent discharged from any facility, operation, or activity.

Solid waste
All putrescible, nonputrescible, solid, and semisolid waste. Examples of solid waste are: garbage, rubbish, ashes, industrial wastes, swill, demolition and construction wastes, abandoned vehicles or parts thereof, discarded commodities, sludge from wastewater treatment plants and septic tanks, woodwaste, contaminated soils, contaminated dredged material, dangerous waste, and problem wastes.

Source control best management practice (Source control BMP)
Best management practice intended to prevent or reduce the release of pollutants. Two types of source control BMPs exist: (1) Structural, which include physical, structural, or mechanical devices or facilities (e.g., roofs covering storage and working areas); and (2) Operational, which include management of activities that are sources of pollutants (e.g., directing wash water and similar discharges to the sanitary sewer or a dead-end sump).

State
The State of Washington.

State Environmental Policy Act (SEPA)
The Washington State law intended to prevent or eliminate damage to the environment that requires State and local agencies to consider the likely environmental consequences of development proposals prior to their approval (Chapter 43.21C RCW, as implemented through Chapter 197-11 WAC).

Stormwater
Water derived directly from rainfall or snowmelt that either: (1) Travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system; or (2) Percolates into the shallow soil, travels laterally through the soil near the land surface, and subsequently seeps back onto the land surface where it mixes with runoff or discharges to a surface water body. (Same as Runoff plus Interflow)

Stormwater Management Manual (SWMM)
The two technical manuals published by the Washington State Department of Ecology (Ecology) for use by local governments that describe stormwater management techniques and contain descriptions of and design criteria for best management practices to prevent, control, or treat pollutants in stormwater. One of the manuals applies to sites in eastern Washington (SWMMEW), and the other to sites in western Washington (SWMMWW). Ecology periodically updates the two manuals.

Stormwater pollution prevention plan (SWPPP)
The written plan that describes the measures to be employed at a facility to identify, prevent, and control the contamination of point source discharges of stormwater.

Substantial
Of considerable size, quality, value, degree, amount, extent, or importance.

Surface water
Lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, and all other fresh or brackish waters and water courses, plus drainages to those water bodies. Surface waters do not include hatchery ponds, raceways, pollution abatement ponds, and wetlands constructed solely for wastewater treatment.

Surface waters of the State of Washington
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.2, and all waters defined as "waters of the state" in RCW 90.48.020 excluding underground waters. These include lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, and all other fresh or brackish waters and water courses, within the jurisdiction of the State of Washington, plus drainages to those water bodies. Surface waters of the State do not include hatchery ponds, raceways, pollution abatement ponds, and wetlands constructed solely for wastewater treatment.

Technology-based discharge limit (same as Technology-based effluent limit)
A permit limit that is based on the ability of a treatment method to reduce the amount (e.g., concentration) of a pollutant.

Technology-based effluent limit (same as Technology-based discharge limit)
A permit limit that is based on the ability of a treatment method to reduce the amount (e.g., concentration) of a pollutant.

Total maximum daily load (TMDL)
1. An estimate of the maximum amount of a pollutant that a specific impaired water body or water-body segment can receive in a day and still be protective of its designated beneficial uses, i.e., meet water quality standards. The TMDL must incorporate seasonal variation, include a margin of safety, and account for all of the point and nonpoint sources that contributed to the impairment of the specific water body.
2. A water cleanup plan and a mechanism for establishing water quality-based controls on all point and nonpoint sources of pollutants within a watershed basin, sub-basin, or hydrographic

segment associated with a specific impaired water body. Percentages of the TMDL of a single pollutant are allocated to the various pollutant sources as waste load allocations for point sources and load allocations for nonpoint sources and background. A TMDL becomes effective after the U.S. Environmental Protection Agency has reviewed and approved it.

Total residual chlorine
The amount of chlorine remaining in water or wastewater, which is equivalent to the sum of the combined residual chlorine (non-reactive) and the free residual chlorine (reactive). The analytical procedure for determining this amount is typically Standard Methods for the Examination of Water and Wastewater, Method 408.

Toxic
Causing death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in any organism or its offspring upon exposure, ingestion, inhalation, or assimilation.

Treat
1. To apply an algaecide, herbicide, or other control product to the water, vegetation, or soil to control or kill algae, vegetation, insects, or some other pest or target species, or to remove or inactivate bioavailable phosphorus.
2. To remove a pollutant from wastewater or to perform some other manipulation of wastewater to reduce or control the adverse effects of a pollutant therein.

Treatment
1. The application of an algaecide, herbicide, or other control product to the water, vegetation, or soil to control or kill algae, vegetation, insects, or some other pest or target species, or to remove or inactivate bioavailable phosphorus.
2. The removal of a pollutant from wastewater or some other manipulation of wastewater to reduce or control the adverse effects of a pollutant therein.

Treatment best management practice (Treatment BMP)
Best management practice intended to remove pollutants from wastewater, such as detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Turbidity
The optical property of water that causes light to be scattered and absorbed rather than transmitted in a straight line. Turbidity in water is caused by suspended matter, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms. Turbidity is a measure of water clarity using a calibrated turbidimeter according to the analytical procedure described typically by Standard Methods for the Examination of Water and Wastewater, Method 214A.

Upset
An exceptional incident in which an unintentional and temporary non-compliance with technology-based, permit effluent limits occurs due to factors beyond the reasonable control of the permittee. An upset does not include non-compliance to the extent caused by operational

error, improperly designed treatment facilities, inadequate storage or treatment facilities, lack of preventive maintenance, or careless or improper operation.

Vadose zone
The subsurficial zone where soil pore spaces and rock interstices are typically occupied at least partially by air. The vadose zone may extend from the surface of the ground down to the top of the water table, i.e., the top of the saturated zone, whether perched or not.

Waste
Any discarded, abandoned, unwanted, or unrecovered material, except the following are not waste materials for the purposes of this permit: (1) Discharges into the ground or ground water of return flow, unaltered except for temperature, from a ground-water heat pump used for space heating or cooling, provided that such discharges do not have significant potential, either individually, or collectively, to affect ground-water quality or uses; and (2) Discharges of stormwater that are not contaminated or potentially contaminated by industrial or commercial sources.

Water quality (WQ)
The biological, chemical, physical, and radiological characteristics of water, usually with respect to its suitability for a particular purpose.

Water quality-based discharge limit (same as Water quality-based effluent limit)
A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water. The limit may include a dilution factor if all known, available, and reasonable methods of prevention, control, and treatment have been accomplished and other restrictions are met.

Water quality-based effluent limit (same as Water quality-based discharge limit)
A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water. The limit may include a dilution factor if all known, available, and reasonable methods of prevention, control, and treatment have been accomplished and other restrictions are met.

Waters of the State of Washington
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.2, and all waters defined as "waters of the state" in RCW 90.48.020. These waters of the State include lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, underground waters, and all other fresh or brackish waters and water courses within the jurisdiction of the State of Washington, plus drainages to those waters.

Waters of the United States
All waters within the geographic boundaries of the State of Washington defined as "waters of the United States" in 40 CFR 122.

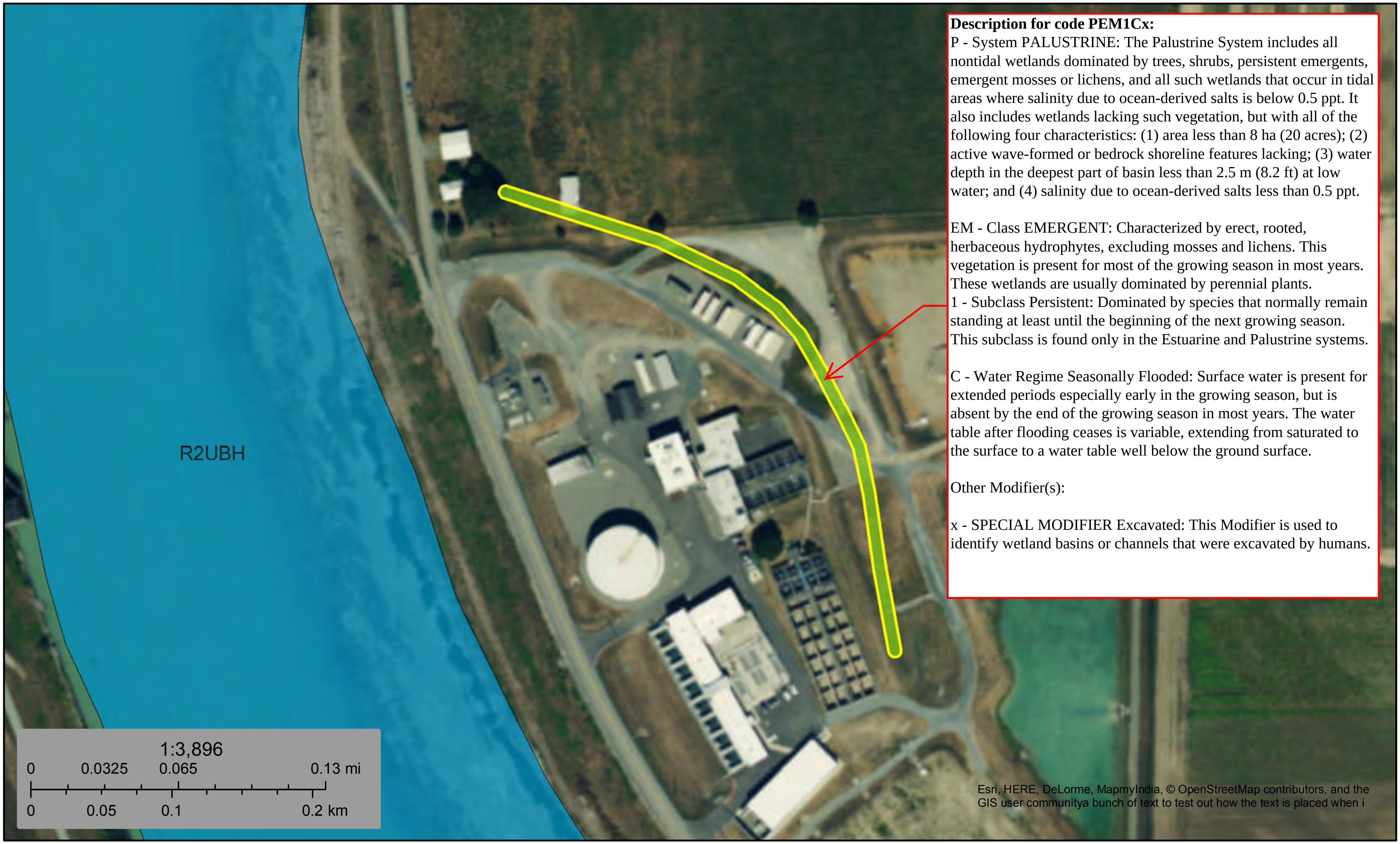
Well
A bored, drilled, or driven shaft, or dug hole whose depth is greater than the largest surface dimension.

Wetland
Any area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Jurisdictional wetlands are wetlands that have been identified as such by local, state, or federal agencies. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

U.S. Fish and Wildlife Service

National Wetlands Inventory

Anacortes WTP Wetland PEM1Cx



September 16, 2016

Estuarine and Marine Deepwater	Freshwater Forested/Shrub Wetland
Estuarine and Marine Wetland	Freshwater Pond
Freshwater Emergent Wetland	Lake
Other	Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

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Appendix G. Limitations

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Appendix G – Limitations

This RI Report was prepared exclusively for the City of Anacortes by Stantec Consulting Services Inc. (Stantec). The quality of information and conclusions contained herein are consistent with the level of effort involved in Stantec services and is based on: i) information available at the time of preparation; ii) data supplied by outside sources; and, iii) the assumptions, conditions and qualifications set forth in this report. This RI Report is intended to be used solely by the City of Anacortes subject to the terms and conditions of its contract with Stantec. The use of this RI Report by any other party shall be at such party's sole risk and expense and without warranty or covenant, expressed or implied, by Stantec or the City of Anacortes. Stantec disclaims any and all responsibility and representations relating to such use.

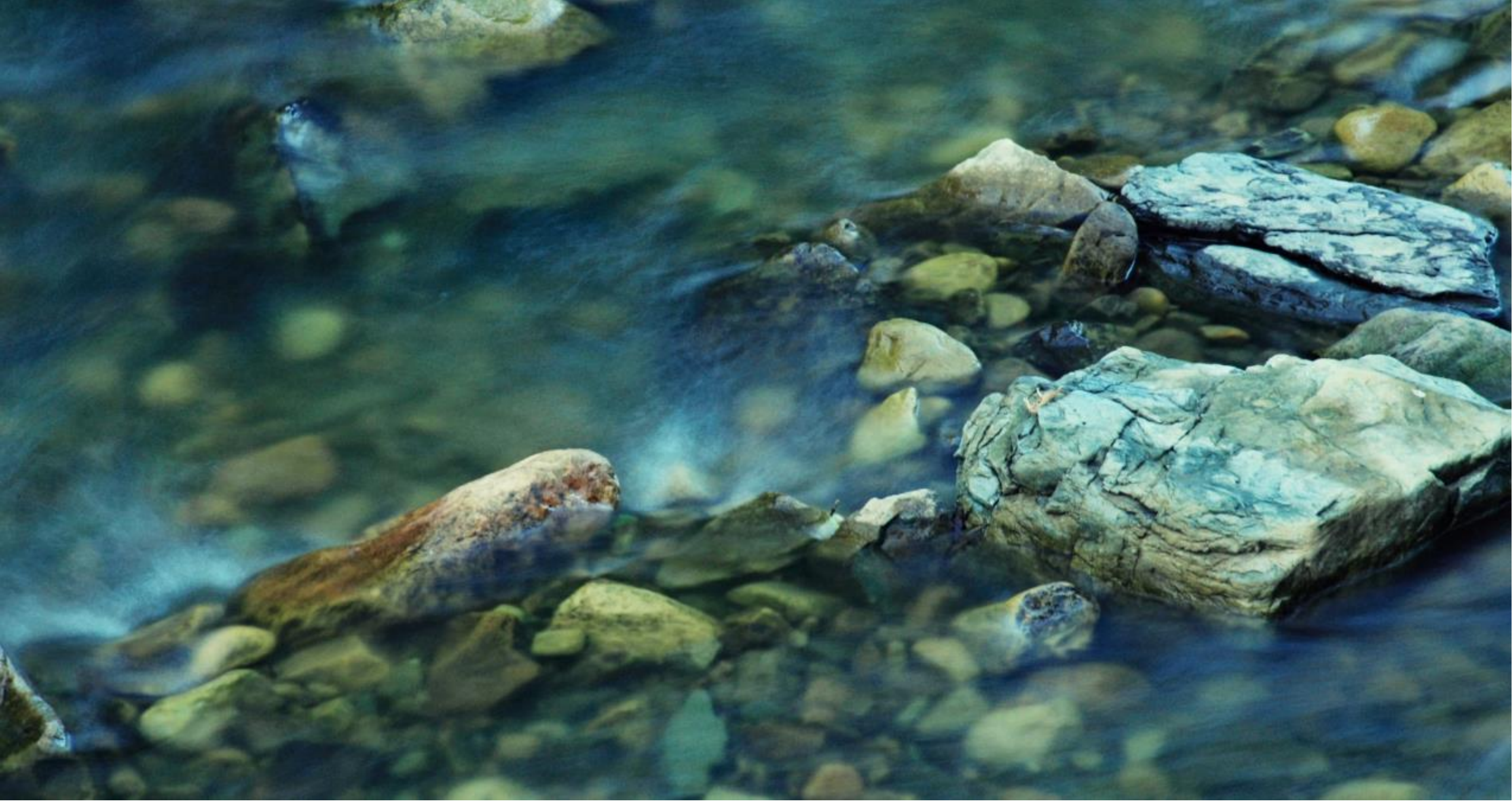
The findings contained herein are relevant to the dates of Stantec site visits and should not be relied upon to represent conditions at a later date. In the event that changes in the nature, usage, or layout of the Property or nearby properties are made, the conclusions and recommendations contained in this report may not be valid. If additional information becomes available, it should be provided to Stantec so the original conclusions can be reviewed as necessary.

Stantec services have been performed in accordance with the normal and reasonable standard of care exercised by similar professionals performing services under similar conditions and geographic locations. Except for our stated standard of care, no other warranties or guarantees are offered as part of Stantec's services.

The boring logs and related information included in this report are indicators of subsurface conditions only at the specific locations and times noted. Subsurface conditions, including groundwater levels, at other locations of the subject site may differ significantly from conditions that exist at the sampling locations. Note, too, that the passage of time may affect conditions at the sampling location.

Finally, it should be noted that no subsurface exploration can be thorough enough to exclude the possible presence of hazardous materials or wastes at a given site. In cases where contaminants have not been discovered through exploration, this should not be construed as a guarantee that contaminants do not exist. At a given site, environmental conditions may exist that cannot be identified by visual observation. Where sample collection and testing have been performed, Stantec's professional opinions are based in part on the interpretation of data from discrete sampling locations that may not represent conditions at locations not sampled.

Attachment B
Final Feasibility Study



May 2020
Former Anacortes Water Treatment Plant

Final Feasibility Study
Former Anacortes Water Treatment Plant

Prepared for the Washington State Department of Ecology
On Behalf of the City of Anacortes, Washington

This report was prepared by the staff of Anchor QEA, LLC, under the supervision of the Engineer whose seal and signature appears hereon, as required by Chapters 18.43 and 18.220, Revised Code of Washington (RCW).

The finding, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering practice. No warranty is expressed or implied.

May 2020
Former Anacortes Water Treatment Plant

Final Feasibility Study
Former Anacortes Water Treatment Plant

Prepared for
Washington State Department of Ecology
Bellingham Field Office
913 Squalicum Way, Unit 101
Bellingham, Washington 98225

Prepared by
Anchor QEA, LLC
1605 Cornwall Avenue
Bellingham, Washington 98225

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APPENDICES

ABBREVIATIONS

Ag-NRL	Agricultural-Natural Resources Lands
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
City	City of Anacortes
COC	contaminant of concern
DCA	disproportionate cost analysis
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
FWTP	Former Water Treatment Plant
Method A:I	Model Toxics Control Act Method A Industrial
Method A:U	Model Toxics Control Act Method A Unrestricted Land Use
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NTR	National Toxics Rule
OSHA	Occupational Safety and Health Act/Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POC	point of compliance
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	Remedial Investigation
SEPA	State Environmental Policy Act
Site	City of Anacortes municipal water treatment plant at 14489 River Bend Road, Mount Vernon, Washington
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TEE	Terrestrial Ecologic Evaluation
TSDF	Treatment, Storage, and Disposal Facility
USC	United States Code

USDOT	U.S. Department of Transportation
VOC	volatile organic compound
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WRD	Washington Industrial Safety and Health Act Regional Directives
WSDOT	Washington State Department of Transportation
WTP	Water Treatment Plant

Executive Summary

The City of Anacortes (City) operates a municipal water treatment plant at 14489 River Bend Road in Mount Vernon, Washington (Site; Figure 1-1). The current water treatment plant became operational in 2013 and replaced the Former Water Treatment Plant (FWTP) that was constructed between 1969 and 1970. The FWTP facilities included an Administration Building, a Sedimentation Basin, a Filtration Basin, and a Clear Well (Figure 1-2).

During decommissioning activities performed in 2015, contaminants of potential concern were found in FWTP building materials and in shallow soils immediately adjacent to the FWTP structures. In 2016, a Remedial Investigation (RI) was performed in accordance with the Model Toxics Control Act (MTCA; Washington Administrative Code [WAC] 173-340-740) to characterize the nature and extent of contaminants in soil and groundwater at the Site. The results of the RI (Stantec 2019) confirmed that certain limited FWTP building materials were the source of contaminants at the property; specifically, the exterior coatings on some structures that contain polychlorinated biphenyls (PCBs). PCB concentrations in soil above MTCA Unrestricted Land Use cleanup levels were limited to the upper 1 foot of soil immediately adjacent to the exterior of the Sedimentation and Filtration Basins. No impacts to groundwater were identified.

In response to these findings, the City conducted an Evaluation of Potential Human Health Risks (Intertox 2017) associated with contamination at the FWTP and determined that no adverse health effects are likely to have occurred to customers, workers, or water plant visitors as a result of PCBs at the former plant. Additionally, the City conducted regular sampling of drinking water produced from the FWTP beginning in 1976 and continuing throughout operation. No samples of drinking water contained detectable concentrations of PCBs.

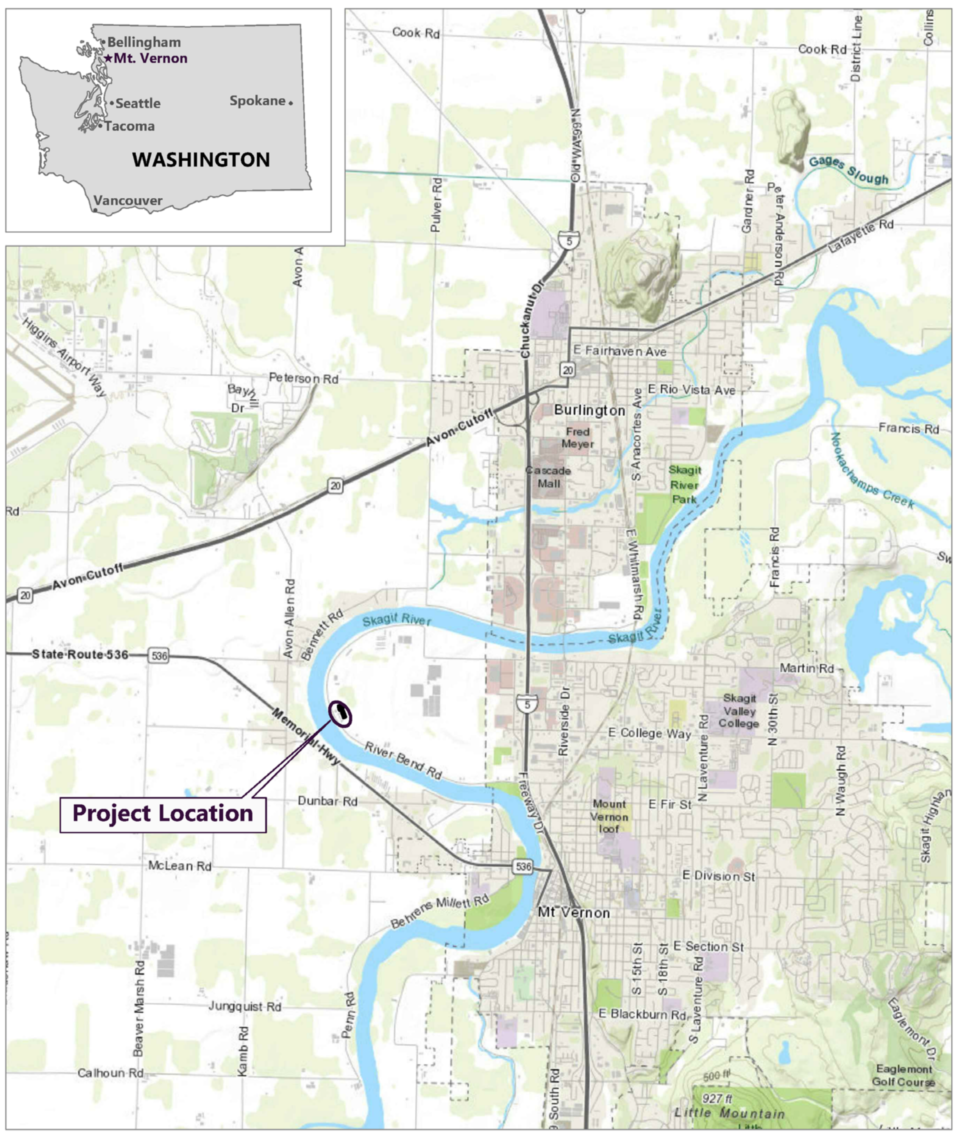
Studies have determined that the coatings on the structures pose no current risk to human health (Intertox 2017). The City plans to demolish the FWTP structures, and to achieve permanent source control and prepare the area for possible future reuse. Demolition of FWTP structures will remove the source of contamination, thereby preventing any future migration of PCBs from exterior building coatings to soil. Demolition, transport, and disposal will be performed in compliance with applicable laws to prevent releases of contaminated material during the demolition process. A detailed demolition plan will be developed prior to demolition activities.

The following two remedial alternatives were evaluated for addressing soil contamination at the Site: 1) partial removal with soil capping (Alternative 1); and 2) full removal of soils exceeding the MTCA Method A Unrestricted Land Use cleanup level for PCBs (Alternative 2). Following the Washington State Department of Ecology's expectations and guidance for selecting cleanup actions, Alternative 2 was determined to be the most practicable, permanent remedial action alternative to further protect human health and the environment.

1 Introduction

The City of Anacortes (City) operates a municipal water treatment plant at 14489 River Bend Road in Mount Vernon, Washington (Site; Figure 1-1). The current facilities, which became operational in 2013, replaced the Former Water Treatment Plant (FWTP) that was constructed between 1969 and 1970. The FWTP facilities included an Administration Building, a Sedimentation Basin, a Filtration Basin, and a Clear Well (Figure 1-2).

Figure 1-1
Vicinity Map



SOURCE: Esri, et al

0 1
Miles

Figure 1-2
Site Map and Structures

SOURCE: Google Earth Pro dated July 15, 2018

During decommissioning activities performed in 2015, contaminants of potential concern were found in decommissioned FWTP building materials and in shallow soils immediately adjacent to the FWTP structures. In 2016, a Remedial Investigation (RI) was performed in accordance with the Model Toxics Control Act (MTCA), Chapter 70.105D Revised Code of Washington (RCW), and Chapter 173-340 Washington Administrative Code (WAC) to characterize the nature and extent of contaminants in Site environmental media (i.e., soil and groundwater). The results of the RI (Stantec 2019) confirmed that exterior coatings containing polychlorinated biphenyls (PCBs) on the Sedimentation Basin and

Filtration Basin of the FWTP were the source of PCBs in soil. PCB concentrations in soil above MTCA Method A Unrestricted Land Use (Method A:U) cleanup levels were limited to the upper 1 foot of soil immediately adjacent to the exterior of the Sedimentation and Filtration Basins. No impacts to groundwater were identified.

In 2017, the City conducted an Evaluation of Potential Human Health Risks (Intertox 2017) for the FWTP and determined that no adverse health effects are likely to have occurred to customers, workers, or water plant visitors as a result of PCBs at the former plant. The City conducted regular sampling of drinking water produced from the FWTP beginning in 1976 and continuing throughout operation of the FWTP. No samples of drinking water ever contained detectable concentrations of PCBs.

Pursuant to Agreed Order No. DE16576 between the City and the Washington State Department of Ecology (Ecology), this Feasibility Study (FS) was prepared to evaluate options to remediate the contaminants identified in soil during the RI. The FS also provides an overview of the remaining FWTP decommissioning activities that the City will perform to further control sources of contaminants at the Site. Based on the information in the RI and FS, Ecology will select a cleanup action for the Site and will issue a cleanup action plan and associated agreement for public review.

2 Summary of Site Investigations

Multiple investigations within the last 10 years have characterized Site conditions. Previous Site investigations are summarized in Table 2-1. The results and implications of these investigations, as they pertain to this FS, are discussed in this section.

Table 2-1
Previous Site Investigations

Investigation	Performed By	Year	Summary of Investigation Activities
Geotechnical Investigation	Shannon & Wilson, Inc.	2010	Geotechnical investigation and review of historical site geotechnical data for engineering design of the current WTP. Work included sampling of eight soil borings and geotechnical testing (e.g., water content, grain size, Atterberg limits) to characterize subsurface conditions (e.g., soil properties, depth to groundwater) at the Site.
Hazardous Materials Assessment	DLH Environmental Consulting	2015	Evaluation of FWTP building materials for deconstruction. Work included sampling of concrete, paint, and building materials and testing for metals, SVOCs, PAHs, PCBs, and asbestos. In addition, one composite soil sample was collected from the exterior of the Sedimentation Basin and tested for metals, SVOCs, PAHs, and PCBs.
Remedial Investigation	Stantec Consulting Services, Inc.	2015 to 2017	Phased remedial investigation of Site building materials, soil, and groundwater to identify the nature and extent of contamination identified in the Hazardous Materials Assessment (DLH 2015). FWTP building materials (basin coatings, concrete, paint chips) were tested for PCBs, with a subset of samples also tested for TCLP (leachable) SVOCs, TCLP VOCs, and TCLP metals. Soil and groundwater samples were collected and analyzed for PCBs.
Human Health Risk Assessment	Intertox, Inc.	2017	Toxicity assessment of the possible human health risks associated with exposure to PCBs and other chemicals from building materials at the FWTP. This assessment used data from previous investigations and established toxicity criteria to evaluate human health risks. The assessment determined that no adverse health effects are likely to have occurred to customers, workers, or water plant visitors as a result of PCBs at the former plant.
Conceptual Site Model Refinement	Anchor QEA, LLC	2019	Assessment of PCB concentrations in the exterior walls of the Sedimentation and Filtration Basins of the FWTP. Depth integrated sampling of concrete, coatings, and subgrade mastic was conducted to profile the nature and extent of PCBs in the exterior walls.

2.1 Environmental Setting

The Site is located in rural Skagit County next to the Skagit River, west of the city of Mount Vernon. The Site is included in the Agricultural-Natural Resources Lands (Ag-NRL) zoning district. The current land use for the Site is classified as Major Utility Development (PL10-0048) under a Special Use Permit issued on November 9, 2010, for the current Water Treatment Plant (WTP). There are no plans for the Site use to change in the future; however, the Administration Building, Sedimentation Basin, Filtration Basin (including a concrete waste well that is used when flushing the basin), and Clear Well associated with the FWTP are being considered for demolition. Access to the Site is restricted to employees and approved visitors by a locked fence with access-controlled vehicle gates to prevent unpermitted access (Stantec 2019).

A simplified Terrestrial Ecologic Evaluation (TEE) was conducted as part of the RI. The evaluation found that there is limited potential for exposure of wildlife to contaminants in soil when all open space areas within 500 feet of the Site are considered. Based on Step 2 of the Simplified TEE, Exposure Analysis Condition 2, no further ecological evaluation is warranted for the Site (Stantec 2019).

Soil borings from previous investigations indicate that a fill unit of silty fine-grained sand with some gravel extends to approximately 25 feet below ground surface (bgs) throughout the Site and is underlain by native sand with varying amounts of silt. Shallow silty sands represent imported fill placed on Site during construction of the Filtration Basin and Sedimentation Basin in the late 1960s. The thickness of fill ranges from approximately 8.5 to 16.5 feet bgs throughout the Site (Stantec 2019, Shannon & Wilson 2010).

Site groundwater is typically encountered in native soils at depths greater than 17 feet bgs with some variation related, in part, to normal seasonal variation and precipitation event conditions which influence stage levels in the Skagit River. As such, there is a significant distance between shallow Site soils and the water table. Site groundwater flow is generally northwest toward the Skagit River (Stantec 2019, Shannon & Wilson 2010).

2.2 Nature and Extent of Contaminants in Building Materials

2.2.1 Interior of FWTP Structures

Previous Site investigations have detected lead, asbestos, and PCBs in building materials from the FWTP structures. Lead was detected in paints used for exterior coatings on pipes and other equipment in the pump rooms (lower levels) of the Administration Building. Asbestos-containing material was identified in tile floor mastic in the interior of the Administration Building. PCBs were identified in window caulk, glaze, and surface wipe samples inside the Administration Building. These findings are consistent with research performed by the U.S. Environmental Protection Agency (EPA; 2015), which concluded that PCBs were widely used in building materials (e.g., caulking and elastic sealants) at schools and other buildings built or renovated from approximately the 1950s through the 1970s. For structures of this era, PCBs are commonly detected in caulk in buildings, including schools, with concentrations ranging from below 50 milligrams per kilogram (mg/kg) to greater than 440,000 mg/kg (EPA 2015).

Contaminants detected in interior building materials, such as those found in the Administration Building, are contained (i.e., isolated from migration to external environmental media) and therefore have limited exposure potential. Because the Administration Building is intact and is no longer in use, these PCB results are not considered to represent a source of soil and/or groundwater impacts or a potential future source to Site receptors. Furthermore, the Site Human Health Risk Assessment (Intertox 2017) concluded that no adverse health effects are likely to have occurred to customers, workers, or trespassers at the FWTP based on exposure to these contaminants.

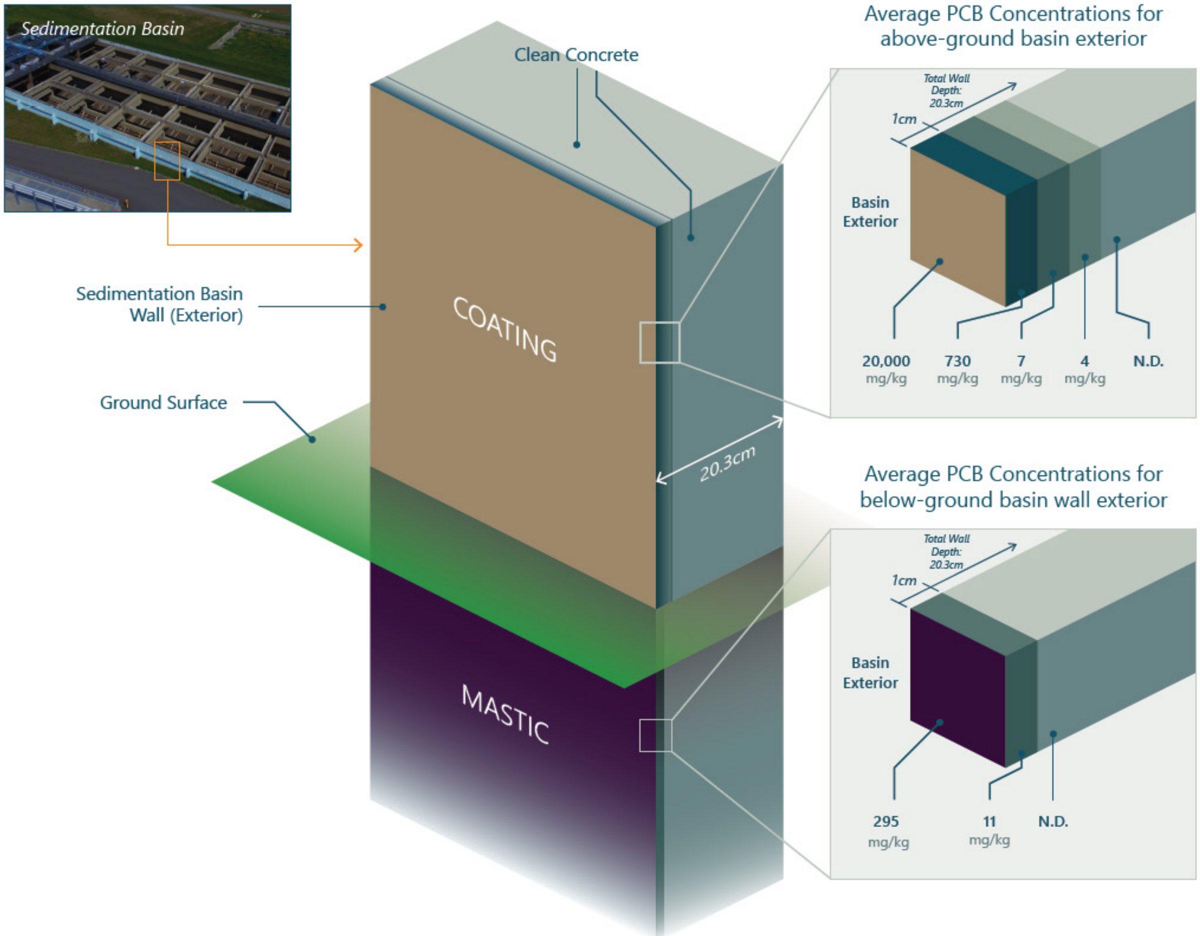
2.2.2 Exterior of FWTP Structures

Previous studies verified that SVOCs and PAHs were not contained in exterior materials of the FWTP structures. Lead-containing paint was identified in two isolated instances: the guard rails for the Sedimentation Basin and the Filtration Basin. Previous studies identified PCBs in industrial coatings on the exterior of the Sedimentation Basin and the Filtration Basin of the FWTP at total PCB concentrations ranging from approximately 10,000 to 30,000 mg/kg (Stantec 2019).

The exterior walls of the basins are 20.3 centimeters (approximately 8 inches) thick. Results of depth-integrated concrete sampling (i.e., sampling every centimeter) in 2019 indicate that PCBs are present at elevated levels in the outer 2 to 3 centimeters of concrete, where coated, of the Filtration Basin and Sedimentation Basin exterior walls, likely as a result of some PCBs in the coating migrating into the shallow concrete (Figure 2-1). The average total PCB concentration in the first centimeter of concrete (0 to 1 centimeter; below the coating) is approximately 730 mg/kg. This average total PCB concentration decreases significantly in the 1-to-2-centimeter interval (i.e., to 7 mg/kg) and the 2-to-3-centimeter interval (4 mg/kg) to non-detectable in samples deeper than 3 centimeters.

Below-grade, exterior walls of the Sedimentation Basin and the Filtration Basin consist of concrete with a thin mastic coating (Figure 2-1). Based on the results of 2019 sampling, the average total PCB concentration of the mastic (within the top 2 feet below-grade) is approximately 295 mg/kg. The average total PCB concentration in the top centimeter below the mastic is approximately 11 mg/kg, with all deeper samples below detection limits. The average PCB concentration in the mastic coating is not indicative of a PCB source. Based on this trend, PCBs from the above-grade exterior wall coatings likely migrated downward into the exterior subgrade mastic and concrete.

Figure 2-1
Source Material Characteristics



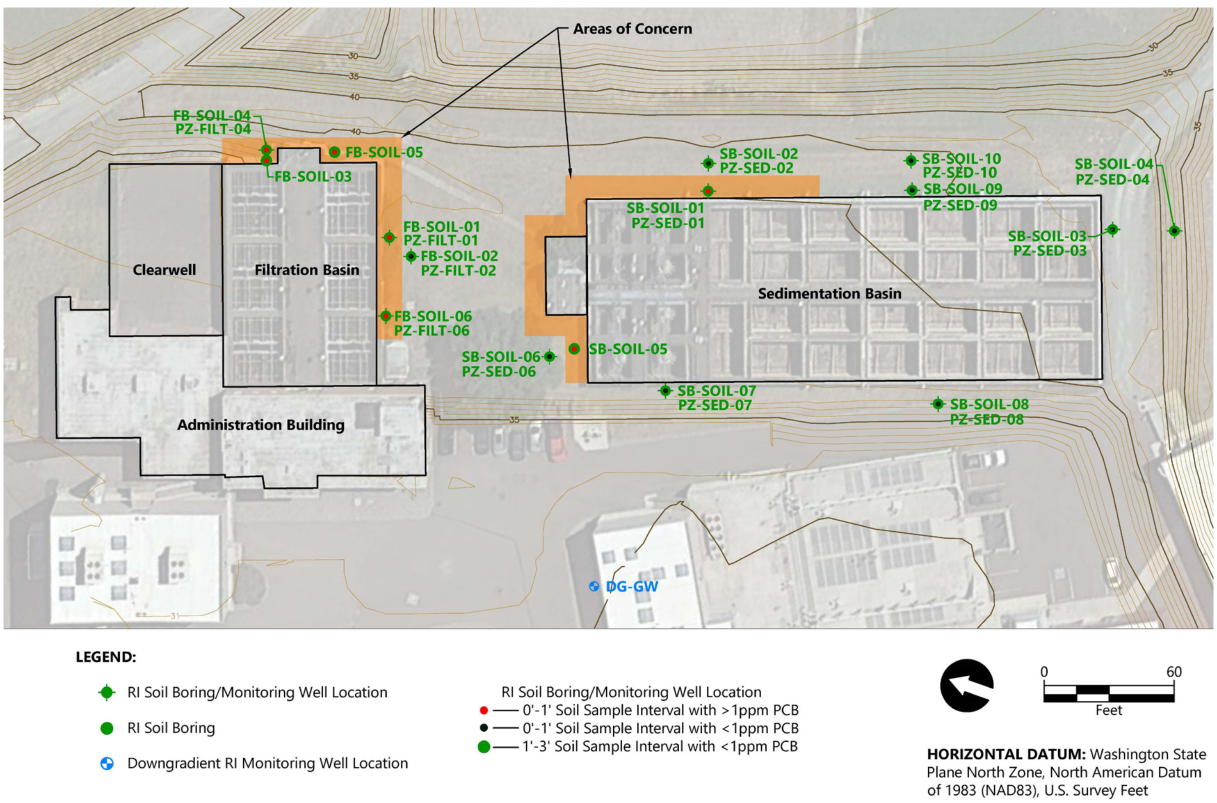
This graphic provides an illustration of the migration pathway of PCBs from the primary source material (i.e., the thin veneer coating on the exterior of the concrete basin walls located above the ground surface) as it was adsorbed into the adjacent concrete. Downward leaching also resulted in PCBs being adsorbed into the below-ground mastic layer and adjacent concrete. The migration of PCBs was very limited.

2.3 Nature and Extent of Contaminants in Environmental Media

The 2015 Hazardous Materials Assessment indicated PCBs as the contaminant of potential concern for the Site; therefore, the RI focused on the nature and extent of PCBs in soil and groundwater (DLH 2015). During the RI, 32 soil samples and 16 groundwater samples were collected for PCB analysis. PCBs were detected in 13 soil samples, with 7 soil concentrations above the Method A:U soil cleanup level (1 mg/kg; Figure 2-2). PCBs were not detected in any groundwater samples (Stantec 2019).

Shallow soil samples collected as part of the RI identified PCB concentrations ranging from non-detect to 15.6 mg/kg. Seven shallow soil borings contained PCBs over 1 mg/kg. These samples are located closest to the exterior walls of the Filtration Basin and the Sedimentation Basin, as shown in Figure 2-2. Only the shallowest soil samples (i.e., from 0 to 1 foot deep) contained detectable concentrations of PCBs above 1 mg/kg; PCB concentrations in samples from 1 to 3 feet deep in the same borings were below 1 mg/kg (Stantec 2019).

Figure 2-2
Areas of Concern



No PCBs have been detected in drinking water generated from the FWTP or the current WTP.

The Site Human Health Risk Assessment (Intertox 2017) concluded that no adverse health effects are likely to have occurred to customers, workers, or trespassers at the FWTP based on exposure to PCBs.

2.4 Conceptual Site Model

Industrial coatings on the exterior of the Sedimentation Basin and the Filtration Basin were found to be the source of PCBs at the Site. As graphically described in Figure 2-1, the PCB source exists as a paper-fine veneer on the outer walls of the basins. Over time, PCBs were adsorbed by the outer 1 to 3 centimeters of the concrete and migrated vertically to below the soil line. Shallow Site soils were impacted through periodic weathering of the coating.

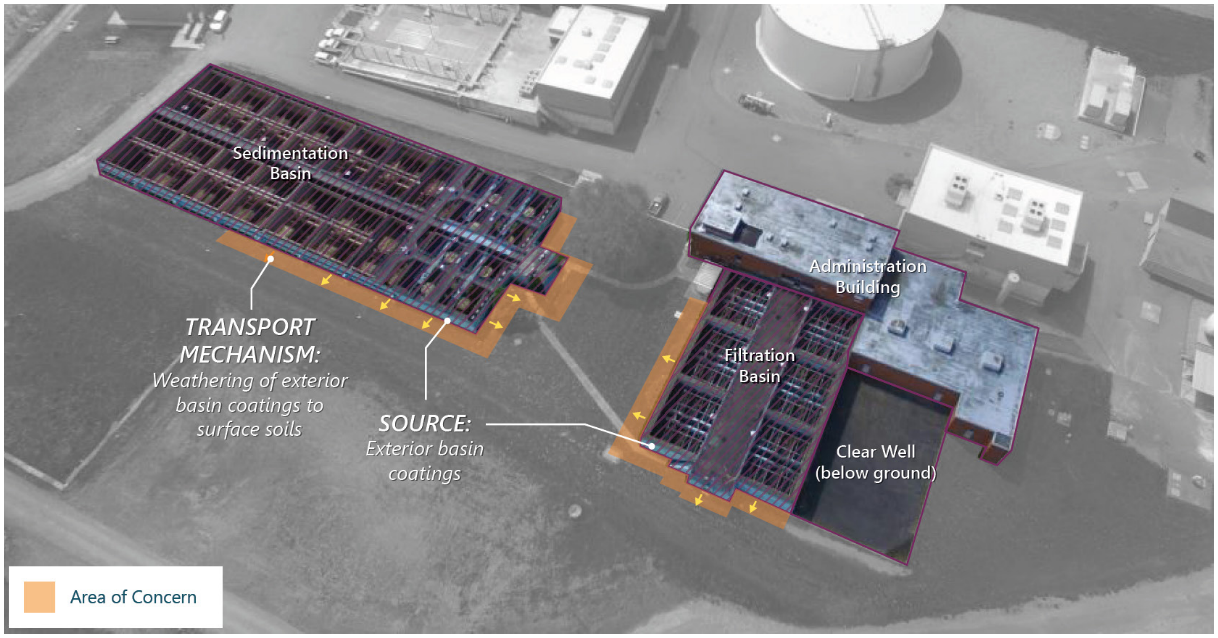
Current and future receptors to evaluate for potential exposure to impacted Site soils, if left in place, consist of WTP workers, contractors, visitors, and trespassers. Possible soil exposure pathways include incidental ingestion and dermal contact through non-routine activities such as excavation, grading, or other soil disturbance. However, any current or future exposure is very unlikely because no workers, contractors, or visitors routinely access the decommissioned FWTP structures at the Site, as access to the FWTP is not needed for operation of the current WTP facility. Due to the secured nature of the Property, which is fully enclosed by high fencing and other security devices, it is unlikely for trespassers to access the Site. Source control measures should be evaluated to restrict future PCB impacts to Site soil.

Based on the results of the RI, the following two Areas of Concern (AOCs) have been defined:

1. Soils along the south and east sides of the Filtration Basin
2. Soils along the northern side and the north half of the eastern side of the Sedimentation Basin

The conceptual site model and Site AOCs are shown in Figure 2-3. Shallow soil samples from two AOCs contained PCBs exceeding the Method A:U soil cleanup level. The AOCs include only shallow soils (0 to 1 foot bgs). The remainder of this FS focuses on evaluating remedial options for these AOCs. No cleanup actions are necessary for other environmental media at the Site.

Figure 2-3
Conceptual Site Model



The source of PCBs in soil is the coating on the exterior basin walls. The extent of impacted soils is limited. There is no current risk to human health from PCBs contained in coatings on the exterior basin walls.

3 Cleanup Requirements

This section describes the cleanup action requirements that must be met by the cleanup of the Site. Consistent with MTCA requirements, this section addresses the following three types of requirements:

- **Remedial Action Objectives (RAOs).** RAOs are specific goals to be achieved by the remedial alternatives and are designed to adequately protect human health and the environment under a specific land use. RAOs address the threats that Site contaminants pose to humans and the environment.
- **Applicable Local, State, and Federal Laws.** All cleanup actions conducted under MTCA must comply with applicable local, state, and federal laws.
- **Cleanup Standards.** Cleanup standards include both cleanup levels (chemical- and media-specific concentration of a contaminant that is protective of human health and the environment via all exposure pathways) and a point of compliance (the location where the cleanup level must be attained to achieve protectiveness). Cleanup standards will be consistent with the current and anticipated future land use.

3.1 Remedial Action Objectives

The RAOs for this Site are the following:

- Source control to prevent migration of PCBs from exterior building coatings to soil
- Protection of human health and the environment by preventing direct contact with PCB-impacted soils

3.2 Applicable Local, State, and Federal Laws

MTCA requires that cleanup actions comply with local, state, and federal laws determined to be Applicable or Relevant and Appropriate Requirements (ARARs). Though a cleanup action performed under formal MTCA authorities (e.g., an order or consent decree) is exempt from the procedural requirements of most state and all local environmental laws, the action must comply with the substantive requirements of such laws (RCW 70.105D.090 and WAC 173-340-710). ARARs include applicable laws; legally applicable requirements that specifically address a hazardous substance, cleanup action, location, or other circumstances at the Site; and relevant or appropriate requirements. In addition, any applicable federal permits must be obtained prior to implementation of the cleanup. Appendix A provides a preliminary list of ARARs that could be applicable to either source control (i.e., building demolition), remediation (i.e., soil removal and/or material placement), or both. For remediation elements required under MTCA, some local requirements may be met through substantive equivalency (e.g., Washington State Shoreline Management Act [RCW 90.58] and City of Mount Vernon Shoreline Master Program, Ordinance No. 3535).

3.3 Cleanup Standards

A cleanup standard defines the point of compliance (POC) and concentration of a hazardous substance in media above which the impacted media may pose a risk to human health and the environment through a specified exposure pathway (i.e., the cleanup level). The MTCA Cleanup Regulations (WAC 173-340-720, 173-340-730, and 173-340-740) establish procedures to develop cleanup levels for surface water, groundwater, and soil.

MTCA Method A cleanup standards are applicable to sites that have few hazardous substances and will undergo a routine cleanup action as defined in WAC 173-340-200. Groundwater has not been impacted by the limited PCB concentrations in shallow soil, as no groundwater samples exceeded the MTCA Method A cleanup level for groundwater. The only environmental media with detected concentrations of PCBs on the Site was shallow soil directly adjacent to the Sedimentation Basin and the Filtration Basin. Therefore, based on the limited nature and extent of Site contaminants of concern (COCs), expected current and future land use of the Site and the limited risk to potential receptors, MTCA Method A cleanup levels are appropriate.

Table 3-1 summarizes the two Method A soil cleanup levels listed in Tables 740-1 and 745-1 in MTCA. These cleanup levels are based on the federal Toxic Substances Control Act under 40 Code of Federal Regulations (CFR) 761.61. Remedial actions alternatives developed as part of this FS will consider both cleanup levels. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the POC shall be established in the soils throughout the Site from the ground surface to 15 feet bgs.

Table 3-1
Soil Cleanup Levels

Site COC	MTCA Method	Cleanup Level (mg/kg)	Comments
Total PCBs	A – Unrestricted Land Use	1	No institutional controls or deed restrictions are required.
	A – Industrial Properties	10	Value may be used only if the PCB contaminated soils are capped and the cap is maintained as required by 40 CFR 761.61. Deed restrictions would also be required.

4 Remedial Alternatives

This section develops two remedial alternatives that achieve RAOs, comply with ARARs, and meet the cleanup standards developed in Section 3. Both remedial alternatives include source control through building demolition and off-Site disposal of building materials with total PCBs averaging greater than the Method A:U cleanup level, consistent with future Site land use.

4.1 Source Control

As discussed in the RI (Section 2.2.2), the exterior coating of two FWTP structures has been identified as the source of PCBs to shallow soil along some walls of some structures. While studies have determined that the coatings on these structures pose no risk to human health (Intertox 2017), the City plans to demolish the FWTP structures to achieve a more permanent source control action and prepare the area for potential redevelopment. Demolition, transport, and disposal will be performed in compliance with applicable laws to ensure that contaminated material is not released during the demolition process. A detailed demolition plan will be developed prior to demolition activities.

Source control measures other than demolition and disposal (e.g., scarifying PCB-containing coating and encapsulating contaminated material on Site) are not considered viable because they are not consistent with future Site land use, as on-Site containment of materials would require deed restrictions and engineering controls.

Building materials that have average concentrations of less than the Method A:U soil cleanup level may be demolished and used as fill during post-demolition grading. Demolition of the Clear Well and Administration Building is not required to achieve source control at the Site.

4.2 Soil Remediation

In addition to source control, the remedial alternatives include the remediation of contaminated soil through excavation and off-Site disposal and capping with clean soil.

4.2.1 Remedial Technologies

Excavation and off-Site disposal are common remedial technologies that use standard earthwork construction equipment. Due to the shallow extent of contaminated soil at the Site, no shoring or water management would be needed during construction. Contaminated soil would be excavated and placed directly in a lined truck, covered, and transported to a landfill. Soil would likely be disposed of in a Subtitle D landfill, consistent with all applicable laws and regulations. After excavation is complete, earthwork equipment would be decontaminated prior to leaving the Site. Compliance monitoring would be performed following the removal action to ensure that RAOs were met by the removal. The excavation area would be regraded as part of Site redevelopment activities.

Physical barrier capping is also a common remedial technology used to prevent direct contact with impacted soils. Clean soil would be spread and compacted using standard earthwork equipment and stabilized with hydroseed. Institutional controls and cover maintenance and monitoring would be employed to verify the integrity of the cover over time.

4.2.2 Remedial Alternatives

The remedial technologies are combined into the following two remedial alternatives: 1) partial removal with soil capping (Alternative 1); and 2) full removal of soils exceeding the MTCA Method A:U cleanup level for PCBs (Alternative 2).

Alternative 1 involves excavation and off-Site disposal of soil with PCB concentrations that exceed the MTCA Method A Industrial (Method A:I) soil cleanup level of 10 mg/kg, then soil capping of all other areas exceeding the Method A:U soil cleanup level (1 mg/kg) with a 1-foot soil cap. Following construction, the capped areas would be monitored annually for physical integrity and institutional controls would prohibit the disturbance of contaminated soil (without appropriate environmental controls).

Alternative 2 involves excavation and off-Site disposal of soil with PCB concentrations that exceed the Method A:U cleanup level (1 mg/kg). Post-construction compliance monitoring would verify that the removal achieved the RAOs and cleanup standards. Alternative 2 represents the most permanent and protective cleanup action alternative per MTCA regardless of cost considerations.

4.3 Evaluation of Remedial Alternatives

This evaluation follows the evaluation criteria specified in WAC 173-340-360 at a level of detail appropriate for this routine remedial action. MTCA specifies the minimum requirements for cleanups, which can be grouped as threshold requirements, reasonable restoration time frame, and disproportionate cost analysis (DCA), which considers multiple criteria including public concerns.

4.3.1 Threshold Requirements

The MTCA threshold requirements for a selected cleanup action are as follows (WAC 173-340-360(2)(a)):

- Protect human health and the environment.
- Comply with cleanup standards (established in Section 3.3).
- Comply with applicable state and federal laws (identified in Section 3.2).
- Provide for compliance monitoring.

Both remedial alternatives protect human health and the environment. Alternative 1 protects human health and the environment through source control, removal of soils exceeding Method A:I soil cleanup levels, and capping of soils exceeding Method A:U soil cleanup levels. Alternative 2 protects human health and the environment through source control and removal of soils exceeding Method A:U soil cleanup levels.

Both remedial alternatives comply with cleanup standards identified in Section 3.3. Alternative 1 meets cleanup standards through off-Site disposal and the use of a soil cap, and Alternative 2 meets cleanup standards through off-Site disposal.

Both remedial alternatives comply with applicable state and federal laws. During source control, all demolition and waste management activities will comply with laws and regulations that will be included in a detailed demolition plan. During soil remediation, both alternatives would comply with applicable ARARs for remediation.

Both remedial alternatives include post-construction compliance monitoring to demonstrate that RAOs are met or trigger contingency actions if needed.

4.3.2 Reasonable Restoration Time Frame

Another minimum requirement under MTCA is that the alternative must provide for a reasonable restoration time frame (WAC 173-340-360(4)). MTCA places a preference on those alternatives that, while equivalent in other respects, can be implemented in a shorter period of time. MTCA includes a summary of factors that can be considered in evaluating whether a cleanup action provides for a reasonable restoration time frame.

Since both remedial alternatives meet cleanup levels following construction, both are considered to have a reasonable restoration time frame.

4.3.3 Disproportionate Cost Analysis

The MTCA uses the DCA to evaluate if remedial alternatives use permanent solutions to the maximum extent practicable. Costs are disproportionate to benefits if the incremental costs of a more permanent remedial alternative are greater than the incremental degree of environmental benefits achieved by that alternative over that of lower cost remedial alternatives (WAC 173-340(3)(e)(i)). Remedial alternatives that exhibit disproportionate costs are considered "impracticable." This determination is made based on the DCA process in which the most practicable, permanent remedial alternative serves as the baseline and the benefits of the remedial alternatives to human health and the environment are evaluated and compared to the costs.

Table 4-1 describes each criterion in the DCA and rates the alternatives for each on a scale of 1 (low benefit score) to 5 (high benefit score). The DCA only applies to the soil remediation alternatives and does not rate or provide costs for demolition activities. Summaries of the cost estimates are included in Appendix B.

Table 4-1
Disproportionate Cost Analysis

Criterion	Alternative 1	Alternative 2
Protectiveness: Overall protectiveness of human health and the environment includes the degree of overall risk reduction, the time required to reduce risk and attain cleanup levels, on-site and off-site risks resulting from implementing the alternatives, and the improved overall quality of the environment at a site.	**4:** Eliminates the exposure pathway to contaminated soil, but includes institutional controls and capping to meet cleanup standards	**5:** Removes all soil exceeding cleanup standards and does not rely on institutional controls
Permanence: The long-term success of an alternative can be measured by the degree to which an alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the originally impacted material and post-treatment residual materials.	**3:** Leaves some contaminated soil on Site to be permanently managed	**4:** Reduces toxicity and volume of contaminants by removing all soil exceeding cleanup standards from the Site and disposing of contaminated soil at an approved off-Site disposal facility
Long-Term Effectiveness: An alternative's long-term effectiveness is based on the reliability of treatment technologies to meet and maintain cleanup levels and, if using engineering or institutional controls, on their reliability to manage residual risks. Long-term reliability is also influenced by uncertainties associated with potential long-term risk management.	**2:** Rated lower because the alternative includes some on-Site containment, institutional controls, and long-term maintenance	**5:** Rated higher because the alternative includes off-Site disposal in an engineered, lined, monitored facility
Short-term Risk Management: Short-term risk management evaluates the risk posed by the cleanup action during its implementation (including construction and operation) based on potential impacts to the community, workers, and the environment and the effectiveness and reliability of protective or mitigative measures.	**5:** Any foreseeable risks to WTP employees, cleanup workers, and the public are easily controlled prior to and during implementation to prevent exposure	**5:** Any foreseeable risks to WTP employees, cleanup workers, and the public are easily controlled prior to and during implementation to prevent exposure

Criterion	Alternative 1	Alternative 2
Implementability: An alternative's implementability is evaluated on the basis of whether it is easy or difficult to implement depending on practical, technical, or legal difficulties that may be associated with construction and implementation, including scheduling delays. The implementability also depends upon the ability to measure the remedy's effectiveness and its consistency with MTCA and other regulatory requirements.	**4:** Highly constructible, but caps will need to integrate with any redevelopment involving the Site	**5:** Highly constructible; full removal integrates easily with any redevelopment involving the Site
Consideration of Public Concerns: Potential public concerns, whether from individuals, community groups, local governments, tribes, or federal and state agencies, about a proposed cleanup alternative are addressed by means of the MTCA public involvement process during Ecology's remedy selection process.	**3:** Community is likely to support extensive source control efforts and soil excavation and disposal but may be less supportive of capping	**5:** Community is likely to support extensive source control efforts and soil excavation and disposal that removes all soil exceeding cleanup standards
Total Benefit Score (Maximum Score = 30)	**21**	**29**
Cost: Cost considerations include design, construction, and installation costs; the net present value of long-term costs; and agency oversight costs. Long-term costs include operation and maintenance, monitoring, equipment replacement, and maintaining institutional controls.	**$223,000**	**$229,000**
Cost [$] /Benefit [#] Ratio (Divided by 1,000)	**10.6**	**7.9**

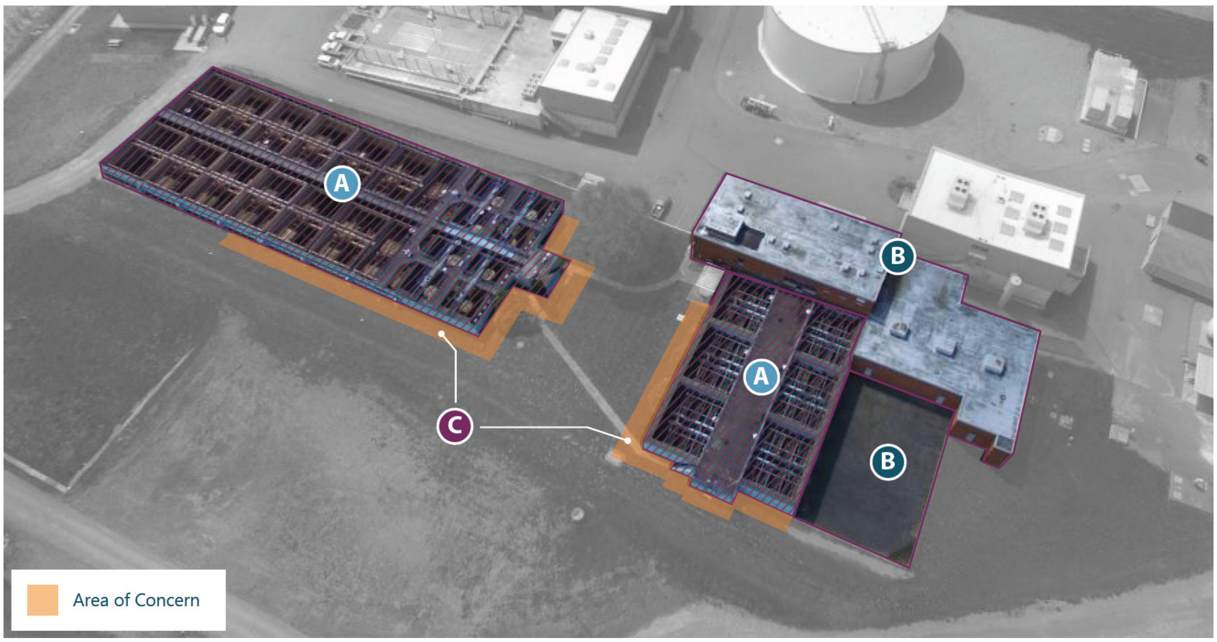
Note:
Costs are limited to soil remediation activities and do not include demolition costs.

The ratio of costs to benefit scores is one metric commonly used to evaluate whether or not costs are disproportionate among remedial alternatives. The ratio provides a quantitative value for which alternatives can be ranked with respect to cost effectiveness, with a lower ratio indicating greater cost effectiveness. Another approach includes assessing the incremental increases in cost and benefit score among alternatives. The benefit score associated with Alternative 2 of 7.9 is 38% greater than the benefit score associated with Alternative 1 of 10.6 for only a 2.7% increase in cost. Based on this information, Alternative 2 is considered permanent to the maximum extent practicable and is selected as the preferred alternative.

5 Recommended Remedial Approach

Alternative 2 is selected as the preferred alternative the City plans to implement in order to further prevent the potential for impacts to human health and the environment at the Site. It consists of source control through demolition and disposal, excavation of soil with total PCBs concentrations exceeding cleanup levels, and confirmation sampling to verify that contaminated soil has been removed. Figure 5-1 provides an overview of the location of the source control and soil remediation activities.

Figure 5-1
Preferred Alternative Overview



A Structures to be demolished for Source Control

B Decommissioned structures to be demolished as required by Site reuse

C Soil remediation AOCs to be excavated and backfilled

The anticipated steps for implementation of the preferred alternative are the following:

- Finalization of this FS, including public review
- Development of a draft Cleanup Action Plan (CAP) and State Environmental Policy Act (SEPA) determination for public review
- Ecology approval of a final CAP

- Design, permitting, and planning to occur in parallel for source control and soil remediation (activities will include drawings, specifications, final identification of ARARs, waste and demolition material management planning, community and worker health and safety planning, and environmental monitoring and control planning)
- Contracting and development of contractor work plans
- Construction of the source control action (demolition of the Sedimentation Basin and the Filtration Basin at the FWTP), followed by soil remediation, compliance monitoring, and Site-area restoration
- Reporting to Ecology

The timeline for implementation is proposed as follows (this timeline is subject to change):

- Development of CAP: 2020
- Design, permitting, and planning: 2020 to 2021
- Construction: 2022

6 Conclusions

Previous studies found PCBs in FWTP building materials and in shallow soils immediately adjacent to FWTP structures decommissioned in 2013. PCB concentrations in soil above the MTCA Unrestricted Land Use cleanup level (1 mg/kg) are limited to the upper 1 foot of soil immediately adjacent to the exterior of the Sedimentation and Filtration Basins at the FWTP. No impacts to groundwater have been identified. The results of the RI (Stantec 2019) confirmed that certain limited FWTP building materials (i.e., exterior coatings on some FWTP structures) were the source of PCBs in soils at the property.

A Site-specific human health risk assessment determined that no adverse health effects are likely to have occurred to customers, workers, or water plant visitors as a result of PCBs at the FWTP (Intertox 2017). In addition, no samples of drinking water from the FWTP have ever contained detectable concentrations of PCBs.

The City plans to demolish the FWTP structures, which will remove the source of PCBs from the Site. During construction, all demolition and waste management activities will comply with applicable laws and regulations and activities will be guided by a detailed demolition plan, which will include protocols for protecting the environment during implementation. The preferred alternative (Alternative 2) to address on-Site soil contamination includes full removal and off-Site disposal of soils exceeding the MTCA Method A Unrestricted Land Use cleanup level for PCBs. Alternative 2 is the most protective and permanent remedy for human health and the environment.

7 References

DLH (DLH Environmental Consulting), 2015. *City of Anacortes Water Treatment Plant Hazardous Materials Assessment*. Former Anacortes Water Treatment Plant. January 28, 2015.

EPA (U.S. Environmental Protection Agency), 2015. PCBs in Building Materials – Questions & Answers. Accessed from: https://www.epa.gov/sites/production/files/2016-03/documents/pcbs_in_building_materials_questions_and_answers.pdf. Accessed on November 19, 2019.

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Shannon & Wilson (Shannon & Wilson, Inc.), 2010. *Geotechnical Data Report, Anacortes Water Treatment Plant, Mount Vernon, Washington*. Former Anacortes Water Treatment Plant. September 24, 2010.

Stantec (Stantec Consulting Services, Inc.), 2019. *Remedial Investigation Report*. Public Review Draft. Former Anacortes Water Treatment Plant. March 11, 2019.

Appendix A
Applicable or Relevant and Appropriate Requirements

Appendix A
Applicable or Relevant and Appropriate Requirements

Authorizing Statute	Criteria	Citation	Description
Clean Water Act/ National Toxics Rule	Federal Ambient Water Quality Criteria	33 USC 1251 40 CFR 131	Requires the establishment of guidelines and standards to control the discharge of pollutants to waters of the United States. Human health criteria contained in the NTR are State Water Criteria under WAC 173-201a.
Federal Clean Air Act	National Ambient Air Quality Standards Ambient Air Quality Monitoring Standards of Performance for New Stationary Sources National Emission Standards for Hazardous Air Pollutants National Emission Standards for Hazardous Air Pollutants for Source Categories	42 USC 7401 42 USC 7671 40 CFR 50 40 CFR 58 40 CFR 60 40 CFR 61 40 CFR 63 40 CFR 82	Establishes air quality standards for protection of human health. Applies to asbestos abatement, pre-demolition activities (associated with recovery of CFCs), and demolition activities.
Washington Clean Air Act	General Regulations for Air Pollution Sources Controls for New Sources for Toxic Air Pollutants Ambient Air Quality Standards for Particulate Matter Emission Standards and Controls for Sources Emitting VOCs	Chapters 70.94 and 43.21A RCW WAC 173-400 WAC 173-460 WAC 173-470 WAC 173-490	Establishes air quality standards for protection of human health. Applies to demolition activities.
OSHA/Asbestos Worker Protection Rule	OSHA and state standards for handling asbestos-containing materials	40 CFR 763 Subpart G	Worker protection requirements that pertain to the demolition of buildings that contain asbestos.
Washington State Asbestos Laws		WAC 296-62 WAC 296-65 WRD 23.10 WRD 23.25 WRD 23.30 WRD 23.35	
Toxic Substances Control Act	Criteria for the management of PCBs	40 CFR 761	Worker protection requirements that pertain to the demolition of buildings that contain asbestos.
NPDES	Point source discharge of pollutants to surface waters of the United States	40 CFR Parts 122–125	Applicable construction work requires a Washington State NPDES Construction Stormwater General permit to manage stormwater during construction.
Discharge Permit Program		Chapter 90.48 RCW Chapter 173-226 WAC	
State of Washington Water Pollution Control Act	Management of stormwater from construction activities	Chapter 90.48	Regulations for developing stormwater pollution prevention plans and implementing sediment, erosion, and pollution prevention control measures.
Solid Waste Disposal Act	Regulation of any handling, treatment, or off-site disposal of non-hazardous solid waste	40 CFR 257–258	These regulations establish federal and statewide minimum standards for solid waste management and handling (including beneficial reuse of inert building materials).
Solid Waste Handling Standards		Chapter 173-350 WAC Chapter 70.95 RCW	

Appendix A
Applicable or Relevant and Appropriate Requirements

<table>
<tr><th>Authorizing Statute</th><th>Criteria</th><th>Citation</th><th>Description</th></tr>
<tr><td>RCRA</td><td rowspan="2">Generation and transportation of hazardous waste and waste management activities at TSDFs; consideration of off-site land disposal; state equivalent of RCRA requirements for designating certain solid wastes as "dangerous waste"</td><td>42 USC 6921–6922
40 CFR Parts 260–263, 268, 273, and 279</td><td rowspan="2">Any hazardous and/or dangerous waste transported from the Site must be managed in accordance with these regulations.</td></tr>
<tr><td>Washington Hazardous Waste Management Act</td><td>Chapter 173-303 WAC
Chapter 70.105 RCW
Chapter 173-303</td></tr>
<tr><td>NEPA</td><td rowspan="2">Consideration, evaluation, and analysis of environmental impacts of major proposed actions and definition of appropriate measures for impact mitigation</td><td>42 USC Chapter 43.21C</td><td rowspan="2">A SEPA checklist is expected to satisfy these requirements. Requirements are the functional equivalent of NEPA. Construction activities associated with implementing a MTCA CAP and demolition activities.</td></tr>
<tr><td>SEPA</td><td>Chapter 197-11 WAC</td></tr>
<tr><td>OSHA</td><td rowspan="2">Governance of worker safety during the cleanup action implementation</td><td>29 CFR 1910 and 1926</td><td rowspan="2">Compliance is met through preparation and implementation of Site-specific Health and Safety Plan(S) with appropriate controls, worker training and certifications, and occupational monitoring.</td></tr>
<tr><td>WISHA</td><td>Chapter 296-62 WAC
Chapter 296-65 WAC</td></tr>
<tr><td>Washington State Water Well Construction Regulations</td><td>Regulation of groundwater well construction as part of the cleanup action</td><td>Chapter 18.104 RCW
Chapter 173-160 WAC</td><td>These regulations establish minimum standards for the construction and decommissioning of all wells in the State of Washington.</td></tr>
<tr><td>USDOT/WSDOT</td><td>Regulation of transport of hazardous materials</td><td>49 CFR Parts 105, 107, and 171–180</td><td>These regulations apply if excavated soils and demolition materials need to be transported off site as part of the cleanup action.</td></tr>
<tr><td>Hazardous Materials Transportation Act</td><td>Regulation of transport of hazardous materials</td><td>49 USC 5101–5128</td><td>Transportation of hazardous demolition debris or other hazardous materials.</td></tr>
<tr><td>Endangered Species Act</td><td>Effects on listed endangered or threatened species</td><td>16 USC 1531 et seq.
50 CFR Part 17</td><td>Actions authorized, funded, or carried out by federal agencies may not jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.</td></tr>
<tr><td>Skagit County, Washington State</td><td>County code regulating construction and demolition projects</td><td>Title 1–16</td><td>These codes apply to aspects of construction, including but not limited to: work hours, noise ordinances, demolition permits, environmental controls, and transportation regulations.</td></tr>
<tr><td>City of Mount Vernon, Washington State</td><td>City code regulating construction and demolition projects</td><td>Titles 1–19</td><td>These codes apply to aspects of construction, including but not limited to: work hours, noise ordinances, demolition permits, environmental controls, and transportation regulations.</td></tr>
</table>

Appendix B
Cost Estimate for Soil Remediation Alternatives

Appendix B
Cost Estimate for Soil Remediation Alternatives

Work Item		Unit Price	Unit	Alternative 1: Partial Removal and Capping		Alternative 2: Full Removal	
				Quantity	Cost	Quantity	Cost
Pre-Construction							
1	Mobilization/Demobilization/ Submittals	$30,000	LS	1	$30,000	1	$30,000
2	Environmental Controls	$10,000	LS	1	$10,000	1	$10,000
Excavation, Disposal, Capping							
3	Soil Excavation	$25	CY	10	$250	260	$6,500
4	Excavation Backfill	$45	CY	10	$450	160	$7,200
5	Soil Cover	$45	CY	260	$11,700	0	$0
6	Transportation and Disposal (Nonhazardous Subtitle D Waste)	$90	Ton	16	$1,440	416	$37,440
Subtotal Construction Costs					*$53,840*		*$91,140*
Construction Contingency (30%)					*$16,160*		*$27,350*
Non-Construction							
7	Design and Permitting	$80,000	LS	1	$90,000	1	$80,000
8	Engineering Oversight	$30,000	LS	1	$25,000	1	$30,000
9	Long-Term Monitoring and Maintenance (30-years, NPV)	$38,000	LS	1	$38,000	0	$0
Subtotal Non-Construction Costs					*$153,000*		*$110,000*
Total Estimated Cost for Soil Remediation					*$223,000*		*$228,490*
Total Estimated Cost for Soil Remediation (Rounded)					***$223,000***		***$229,000***

Notes:

1. This cost estimate is a preliminary, planning-level cost estimate and is not probable. Anchor QEA prepared this estimate using current and generally accepted engineering cost estimation methods. Actual costs may be affected by known and unknown risks, including but not limited to changes in general economic and business conditions, site conditions that were unknown to Anchor QEA at the time the estimate was prepared, future changes in site conditions, regulatory or enforcement policy changes, and delays in performance. Actual costs may vary from these estimates, and such variations may be material. Anchor QEA is not licensed as accountants or securities attorneys and therefore makes no representations that these cost estimates form an appropriate basis for complying with financial reporting requirements for such costs. Expected range of accuracy for this cost estimate is -35% to +50%.
2. CY: cubic yard
   LS: lump sum
   NPV: net present value
3. All prices are based on 2019 U.S. dollars, and are based on quotes received and/or Anchor QEA experience. Where applicable, estimated costs assume the use of prevailing wages for Skagit County, Washington.
4. This estimate does not include costs associated with demolition, including source control activities, as they are not included in the disproportionate cost analysis evaluation.
5. Nonhazardous Subtitle D Waste cost estimate includes labor and equipment to load and transport excavated soil for disposal as a nonhazardous waste at a Subtitle D landfill. Transport estimate is based on assumed transportation distance of up to 100 miles from the site location and assumes the bulk density of soil is 1.6 tons per CY.
6. Design and Permitting cost estimate includes labor, equipment, and materials to develop the remediation design and obtain permits (or permit equivalencies) to perform the remediation activities.