City of Portland, Oregon

Intergovernmental Agreement for
Remedial Investigation and Source Control Measures

DEQ No. LQVC-NWR-03-10

Source Investigation Update Report
City of Portland Outfall Basin 19

City of Portland Outfall Project
ECSI No. 2425

June 2010

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Printed on Recycled and Recyclable Paper

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Abbreviations and Acronyms

BEHP	bis(2-ethylhexyl)phthalate
BES	Bureau of Environmental Services
BMP	best management practice
City	City of Portland
CSM	conceptual site model
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DDx	sum of DDD, DDE and DDT
DEQ	Oregon Department of Environmental Quality
ECSI	Environmental Cleanup Site Information
EPA	U. S. Environmental Protection Agency
IGA	intergovernmental agreement
JSCS	Joint Source Control Strategy
LWG	Lower Willamette Group
mg/Kg	milligram(s) per kilogram
µg/Kg	microgram(s) per kilogram
MRL	method reporting limit
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCOI	potential contaminant of interest
PGE	Portland General Electric
Phase 1 Report	*Phase 1 Report for City of Portland Priority 1 Basins* (GSI, 2006)
PPA	prospective purchaser agreement
RI	remedial investigation
SCM	source control measure
SLV	screening level value
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbon(s)
XPA	Expanded Preliminary Assessment

SECTION 1

Introduction

This report presents the City of Portland's (City) evaluation of upland source investigation activities in Outfall Basin 19 since the submittal of the *Phase 1 Report for City of Portland Priority 1 Basins* (Phase 1 Report; GSI, 2006) to the Oregon Department of Environmental Quality (DEQ). This evaluation is provided as part of the City's ongoing remedial investigation (RI)/ source control measures (SCM) work associated with the Portland Harbor City of Portland Outfall Project being conducted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City.

This source investigation:

1. Summarizes and evaluates inline solids data collected from the Basin 19 conveyance system, including data from the City's 2003 to 2008 source investigations, and sediment trap data collected by the Lower Willamette Group (LWG) in 2007.
2. Presents an updated status summary and timeline of upland site source investigations and source control measures conducted within the basin.
3. Evaluates data spatially to determine if this dataset indicates that all significant sources have been identified.
4. Provides supporting information for the City's remedial investigation/source control measures (RI/SCM) Report for Basin 19, required under the IGA.

There has been substantial progress since the Phase 1 Report toward controlling upland sources of contaminants to the Basin 19 stormwater conveyance system and in identifying potentially significant ongoing sources that warrant further source control. The evaluation of inline solids data in this report, together with evaluation of the Basin 19 stormwater data included in the City's *Stormwater Evaluation Report* (BES, 2010) and other basin and upland documents, will support the development of the RI/SCM report for Basin 19, which will summarize how sources have been identified and controlled through the respective authorities of DEQ and the City.

SECTION 2

Background

2.1 Basin Characteristics and Conveyance System Configuration

The Basin 19 stormwater conveyance system drains approximately 490 acres; 70% of this acreage is Forest Park and the remaining is zoned industrial. Figure 1 provides an overview of Basin 19. The LWG sediment trap was situated in manhole AAP918, which is the convergence point for all stormwater in the basin (i.e., there are no connections between this manhole and the river). Two main storm lines converge at this manhole, a line from the northwest along NW Front Avenue (western[1] branch) and one from the south along NW Kittridge Avenue (eastern branch). A description of each branch and associated DEQ upland cleanup sites is provided below.

Western Branch. This branch includes a storm line along NW Front Ave., lines connecting the NW Front Ave. line with areas draining towards NW St. Helens Road (i.e., State Highway 30), and a line along NW St. Helens. This branch conveys runoff from Forest Park, State and local roads and industrial properties, including the following Environmental Cleanup Site Information (ECSI) facilities:

- Schnitzer-Kittridge Distribution Center (ECSI #2442);
- Front Avenue LP (Tube Forgings) (ECSI #1239);
- A large portion of the Chevron USA Asphalt Refinery (ECSI #1281);
- BNSF Willbridge Yard (ECSI #3395);
- A portion of the Unocal-Willbridge Terminal (ECSI #1549/177); and
- Anderson Brothers property (ECSI #970).

Most of the storm lines in this branch are not City lines; only the NW Front lines were constructed and are maintained by the City.

Eastern Branch – This branch includes storm lines along NW Kittridge, NW Yeon, NW St. Helens and NW Express. This branch conveys stormwater from Forest Park, State and local roads, and industrial properties. This branch is broken into two areas described below for discussion purposes.

Eastern Branch - Kittridge and Yeon lines. This branch includes all connections to the storm lines along NW Kittridge, NW Yeon and NW Express. ECSI facilities in this portion of the Eastern Branch are (from downstream to upstream; see Figure 1):

- Calbag Metals-Front property (ECSI #2454);
- Mt. Hood Chemical Property (ECSI #1328), Dura Industries (ECSI #111), Mt. Hood Chemical Corporation (ECSI #81), and Chapel Steel (ECSI #4920) – these sites

[1] For naming of the branches, the river is assumed to be due north.

discharge to NW Kittridge via two private multiparty lines (designated the "north private line" and the "south private line" for the purposes of this report; and
- Penske Truck Leasing (ECSI #5055).

Eastern Branch – St. Helens lines. Several storm lines along NW St. Helens connect to the NW Kittridge stormwater main at the upstream end of the stormwater main (see Figure 1). These lines conveys runoff the following ECSI sites:

- PGE – Forest Park (ECSI #2406);
- Brazil & Company (ECSI #1026); and
- Greenway Recycling (ECSI #4655).

2.2 Contaminants of Interest

Basin 19 was identified as a Priority 1 basin (CH2M Hill, 2004) based on surface sediment data collected by BES near City stormwater outfalls in 2002. The City defines a Priority 1 basin as having considerably elevated concentrations of contaminants in the river surface sediments near the outfall that may be associated with upland sources located within the drainage basin. Priority 1 basins are considered the highest priority for evaluating and, as needed, implementing upland source control measures. The Phase 1 Report identified potential contaminants of interest (PCOIs) for all Priority 1 basins, based on the 2002 inriver sediment data and known upland conditions, to assist in identifying and prioritizing upland source control actions. The following PCOIs were identified for Basin 19: polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), phthalates, and metals (chromium, copper, lead, nickel, zinc) (GSI, 2006).

The U.S. Environmental Protection Agency (EPA) and the LWG have identified an area of potential concern near Willamette River Mile 8.3 in the vicinity of Outfall 19, based on elevated concentrations of PCBs, pesticides, and other analytes causing benthic toxicity (e.g., metals) in river sediment.

SECTION 3

Updated Summary of Basin Solids Investigations and Upland Site Status

This section summarizes the inline solids source investigations conducted in the Basin 19 conveyance system and provides an update to the information presented in the Phase 1 Report for DEQ Cleanup sites within or in the vicinity of Basin 19. A general timeline of source investigations and control measures conducted in the basin from 2003 through 2009 is presented in Figure 2. This information provides context for interpretation of solids data from the various branches and lines of the Basin 19 conveyance system, as discussed in Sections 4 and 5.

3.1 Basin 19 Solids Investigations

Several source investigations have been conducted in the City's conveyance system in Basin 19. These investigations are briefly described below; results are presented in Section 4. Table 1 provides a summary of the chemical analyses conducted for each sample location.

October 2003 — City inline solids investigation. Because the 2002 inriver sediment data indicated the potential presence of upland contaminant sources within Basin 19, the City collected inline solids samples at eight locations in Basin 19 in October 2003. The resulting data were previously provided to DEQ and are presented in a technical memorandum included as Appendix A to this report.

May and November 2006 — City stormwater system investigation, former PGE-Forest Park property. The Portland General Electric (PGE) - Forest Park Property, located at the 4400 block of NW St. Helens Road, consists of approximately 2.3 acres of undeveloped land bordering Forest Park (see Figure 1). PGE remediated the site in 2000 and received a No Further Action (NFA) determination from DEQ in 2001. No stormwater evaluation was conducted as part of the site investigation.

As part of an agreement to purchase this property for the development of public trailhead access to Forest Park, the City conducted an investigation to confirm the configuration of the stormwater collection system adjacent to the site and to evaluate current or historical offsite stormwater migration pathways to the Basin 19 stormwater conveyance system. The investigation included a review of conveyance system construction drawings, collection and analysis of inline solids in the vicinity of this site and the upgradient Brazil property, and camera surveys of the conveyance systems adjacent to the property. The City abandoned several stormwater lines following the system investigation activities and submitted the results of this investigation to DEQ in 2007 (BES, 2007).

June 2007 — City inline solids sampling, former Calbag Metals site. Until 2003, Calbag Metals operated a metals recycling facility at 4927 NW Front Avenue (see Figure 1). DEQ identified this site as a potential source of PCBs, metals and phthalates to the Willamette River and subsequently worked with the site under the Voluntary Cleanup Program to

evaluate and control pollutant sources and pathways (DEQ, 2006). In 2005, the site implemented source control measures (including stormwater line cleanout and site repaving) and collected confirmatory stormwater samples; however, the stormwater samples were required to be analyzed only for total suspended solids and select metals. The City deployed sediment traps in the lateral connection from the former Calbag Metals site during spring 2007 to evaluate whether contaminants (including PCBs) were still being discharged to Basin 19 after the implementation of site source control measures. Results of this investigation were submitted to DEQ in 2008 (BES, 2008).

June 2007 — City catch basin solids sampling, adjacent to Greenway Recycling site. In early 2007, the City observed overland flow from the Greenway Recycling site (located at 4135 NW St. Helens Road) discharging into catch basins in St. Helens Road. Solids samples were collected in June 2007 from stormwater catch basins in the roadway adjacent to the Greenway site and submitted for laboratory analysis. The results of this investigation are provided in Appendix B.

July 2007 —LWG sediment trap sample collection. During the spring of 2007, the LWG collected stormwater and stormwater solids samples from Basin 19 as part of the LWG's stormwater sampling component of the Remedial Investigation/Feasibility Study for the Portland Harbor. Results of this sampling are included in the LWG's Round 3A and 3B Stormwater Data Report (Anchor and Integral, 2008).

June 2008 — City inline solids sampling, former Calbag Metals site. Between November 2007 and May 2008, the City deployed sediment traps in the lateral connection from the former Calbag Metals site. This investigation was conducted as a follow-up to the City's 2007 inline solids sampling at this location to obtain additional data to determine whether the site is an ongoing source of PCBs to the Basin 19 system. Results of this investigation were submitted to DEQ in 2009 (BES, 2009a).

3.2 Upland Site Status Updates

In the Phase 1 Report, upland ECSI sites that are located within or near Basin 19 were considered during development of the Basin 19 conceptual site model (CSM) to identify potential sources and migration pathways. The Phase 1 Report summarized information from the ECSI database and site-specific reports that were on file at DEQ for these sites at that time. As part of preparing this Source Investigation Update, the City reviewed the current list of upland ECSI sites within or adjacent to Basin 19 and information for these sites that has been developed and/or become available since completion of the Phase 1 Report, including reports and documents on file at DEQ and the City.

Several of the ECSI sites in Basin 19 have conducted, initiated, or agreed to conduct stormwater pathway evaluations under DEQ oversight since the Phase 1 Report was completed, and some of the sites have received final source control decisions and/or NFA determinations from DEQ. Although review of information for these sites indicates that information gaps related to source evaluation or control remain for some sites, the upland source evaluation/control actions completed constitute major progress toward the goal of identifying and controlling upland sources of contaminants to the Basin 19 stormwater conveyance system. Upland sites where stormwater pathway evaluations or follow-up

investigations appear to be warranted to help identify significant ongoing sources of contaminants to the system are discussed in Sections 4 and 5.

Table 2 summarizes key information for the site status updates and Figure 2 depicts the sequence of upland site investigation and source control activities. The upland site status updates are presented in Appendix C.

SECTION 4

Results

This section presents the results of the inline and catch basin solids investigations conducted in the Basin 19 stormwater conveyance system, identifies locations where contaminants exceed screening level values (SLVs) established in the Joint Source Control Strategy (JSCS) (DEQ and EPA, 2005), and identifies which sites discharge to these locations to determine if there are significant ongoing sources within the basin.

The discussion is organized geographically, by basin branch, beginning with information collected at the LWG inline sediment trap sampling location just upstream of Outfall 19 and proceeding upstream in each branch. Section 5 presents an evaluation of the data described below. Analytical results for the samples are summarized in Tables 3 through 6, which include SLVs for reference. Results for metals, total PCBs, DDx, total PAHs, and BEHP are shown on Figures 3, 4, 5, 6 and 7, respectively.

4.1 LWG Sediment Trap

The sample from the LWG's spring 2007 sediment trap deployment in the downstream portion of Basin 19 was collected at the location shown on Figure 1; results are provided in Tables 3 and 4. This sample is representative of all discharges from Basin 19.

Three metals (copper, lead and zinc), six PAH compounds, and phthalates (BEHP and dibutyl phthalate) exceeded JSCS Toxicity SLVs; however, concentrations of these analytes were within an order-of-magnitude of the SLVs, except for BEHP. Total PCB congeners and two pesticides (total DDX and chlordane) were detected at concentrations greater than JSCS Bioaccumulation SLVs (but less than Toxicity SLVs where available). All the PAH and phthalate results were either flagged as "estimated" or "rejected" (Anchor and Integral, 2008) and so these values may have more uncertainty associated with them than other results within the basin. All the other inline PAH and phthalate data within the system are much lower, often more than an order-of-magnitude lower, which suggests that these data may not be representative.

4.2 Western Branch

The City's 2003 source investigation included collecting three samples from the western branch of the Basin 19 system. The laboratory method reporting limits for pesticides and PCBs in all 2003 solids samples were elevated. The results are summarized in Table 3 and described below:

- The sample collected just upstream of manhole AAP910 represents discharges from NW Front and the Front Avenue LP site. Zinc was the only analyte detected in this sample at a concentration greater than the JSCS Toxicity SLV and the detected concentration only slightly exceeds the SLV (Figure 3). Cadmium, lead and mercury were detected at concentrations greater than the Bioaccumulation SLVs (but less than Toxicity SLVs). These data indicate the possible presence of minor sources of

metals to this portion of the NW Front stormwater line. Catch basin solids samples were collected in May 2008 at the Front Avenue LP site (see Table 2 and Appendix C). Several metals, including cadmium, lead, mercury and zinc were detected in the Front Avenue LP catch basin samples at concentrations greater than JSCS Toxicity and/or Bioaccumulation SLVs.

- The sample collected just downstream of manhole AAP912 represents discharges from the remainder of the western branch including five ECSI sites [Schnitzer Kittridge Distribution Center (Schnitzer-Kittridge), Chevron USA Asphalt Refinery (Chevron Asphalt), BNSF Willbridge Yard, a portion of the Unocal-Willbridge Terminal and the former Anderson Brothers property], Highway 30 and Forest Park. Arsenic, cadmium, copper, zinc and one PAH compound [indeno(1,2,3-cd)pyrene] were detected at concentrations exceeding the JSCS Toxicity SLVs. Copper, lead and selenium were detected at concentrations greater than the Bioaccumulation SLVs (but less than Toxicity SLVs).
- The sample collected from manhole AAP831 is also representative of discharges at manhole AAP912 with the exception of the Schnitzer-Kittridge and Chevron Asphalt sites. No analytes were detected at concentrations greater than JSCS Toxicity SLVs; arsenic, cadmium and lead were detected at concentrations slightly greater than Bioaccumulation SLVs.

Based on the lower concentrations at upstream manhole AAP831 compared with manhole AAP912, the Chevron Asphalt and/or the Schnitzer-Kittridge sites are potential sources of metals and PAHs to this portion of the western branch, although these elevated concentrations may relate to historical discharges. Metals and PAHs were detected at the Chevron Asphalt site in catch basin and inline samples, but the concentrations were lower than detected concentrations in manhole AAP912 (ARCADIS, 2009). Metals and TPH were also identified as site contaminants at the Schnitzer-Kittridge site. Site remediation and redevelopment was completed in 1996; capping and institutional controls implemented at the site provided source controls since that time, making it less likely that the site is a significant ongoing source to the western branch.

4.3 Eastern Branch

4.3.1 NW Kittridge and NW Yeon

The City collected inline solids samples from the main trunk line for the eastern branch (along NW Kittridge), from three private lines connecting directly into the NW Kittridge stormwater main (the lateral from the former Calbag Metals site and two private multiparty lines), and from NW Yeon. The sampling results are summarized in Table 4 and discussed below.

Eastern Branch Downstream Sample

The City's 2003 inline solids sample from the downstream end of NW Kittridge trunk line (just upstream of manhole AAP918) receives stormwater runoff from all lines discharging to the eastern branch. Five metals (chromium, copper, lead, silver and zinc), PCB Aroclor 1260 and BEHP were detected at concentrations greater than JSCS Toxicity SLVs, with only copper and lead concentrations at an order-of-magnitude greater than the SLVs. Arsenic,

cadmium, mercury, DDT and total PCBs concentrations were greater than Bioaccumulation SLVs (but less than Toxicity SLVs). These data indicate potential sources of metals, PCBs, pesticides and BEHP to the eastern branch.

Lateral from Former Calbag Metals Site

The City deployed sediment traps in the lateral connection from the former Calbag Metals site (see Figure 4) in spring 2007 and spring 2008. This sample location represents discharges solely from the former Calbag Metals site. Because of limited sediment volume, these two samples were tested for PCBs only. Total PCB Aroclors were detected in the 2007 sample at a concentration of 630 µg/Kg, and total PCB congeners were detected at a concentration of 2360 µg/Kg in the 2008 sample. The results indicate that the former Calbag Metals site continues to be a significant uncontrolled source of PCBs to the Basin 19 stormwater conveyance system, despite the control measures implemented at this site in 2005 (see Table 2 and Appendix C for summary of site activities and status).

Private Multiparty Lines

The City's 2003 source investigation included sampling at the downstream ends of the north and south private multiparty lines before they connect to manholes AAP931 and AAP932, respectively. In the north line, six metals (arsenic, cadmium, copper, lead, silver and zinc) and BEHP were detected at concentrations greater than JSCS Toxicity SLVs. In the south line, four metals (arsenic, lead, silver and zinc), total chlordane and BEHP were detected at concentrations greater than JSCS Toxicity SLVs. Other than the zinc concentration (22,100 mg/Kg) in the sample from the north line, the concentrations are generally within an order of magnitude of the Toxicity SLVs. Cadmium, mercury, and/or selenium were detected at concentrations greater than JSCS Bioaccumulation SLVs in the samples. Total PCBs were detected in the sample from the south private line at a concentration of 242 µg/Kg and were not detected in the sample from the north private line (although the detection limits were elevated).

Limited data are available for the industrial sites, including 4 ECSI sites, connected to these private stormwater lines. The 2007 DEQ site discovery sampling at the Chapel Steel site (ECSI #4920) provides the only additional stormwater solids data for either line. The sample collected from the Chapel Steel catch basin (which connects to the north private line) was tested for metals, pesticides, PCB congeners, PAHs, and phthalates. BEHP and three metals (lead, nickel, and zinc) were detected at concentrations greater than JSCS Toxicity and/or Bioaccumulation SLVs, but concentrations were within an order-of-magnitude of the SLVs (DEQ, 2007c). The total PCB concentration in the sample was 53 µg/Kg. No further stormwater pathway evaluation currently is planned at the Chapel Steel site, although DEQ recommended the site implement stormwater Best Management Practices (BMPs) to reduce contaminant input to the stormwater system (see Appendix C).

In 2000, the City's Illicit Discharge Elimination Program (IDEP) identified an illicit wastewater connection to the onsite stormwater system from a photoprocessor (Color Magic), located at the Mt. Hood Chemical Property (ECSI #1328). It is suspected that this connection was to the south private line, although available records are unclear. The City required the site to reroute the connection to the sanitary sewer in 2000. Silver, a common pollutant associated with photoprocessing, was significantly elevated in the south line (145 µg/Kg) although it was also elevated in the north line (77 µg/Kg).

The available data indicate one or more significant uncontrolled sources of zinc to the north private line. Additionally, the data indicate that sources of other metals, chlordane, PCBs and BEHP are discharging to these lines. The only site connected to these lines that has initiated or is planning a stormwater source control evaluation is Mt. Hood Chemical Corporation (see Table 2 and Appendix C). The stormwater source control evaluation at this site is reportedly underway, but data are not currently available to determine whether this site is a source of these constituents to the stormwater conveyance system. The City has requested that DEQ require cleaning of these private lines as part of the upland source control measures.

NW Yeon Line

The City collected an inline solids sample near the downstream end of the stormwater line along NW Yeon (at manhole AMZ077) during its 2003 source investigation. Only BEHP exceeded the JSCS Toxicity SLV, but the concentration was within an order-of-magnitude of the SLV. In addition to BEHP, lead was the only other analyte exceeding JSCS Bioaccumulation SLVs. These results do not indicate the presence of significant uncontrolled sources discharging to this line. The only DEQ Cleanup Site currently discharging to this line is the Penske Truck Leasing site (ECSI #5055). This site was remediated and redeveloped in 2007 in accordance with the City's Stormwater Manual (see Table 2 and Appendix C).

4.3.2 NW St. Helens

The downstream point of connection of stormwater lines along NW St. Helens to the stormwater main along NW Kittridge is at manhole AAT496 (see Figure 3 inset). Between 2003 and 2007, a total of 17 inline solids samples were collected in lines currently or formerly discharging to manhole AAT496. The sampling results are summarized in Tables 5 and 6 and are discussed below.

Downstream Connection/Sampling Point (Manhole AAT496)

One inline solids sample was collected at manhole AAT496 during the City's 2003 source investigation. The sample was collected directly from the manhole and represents discharge from all lines upstream of this point of connection to the NW Kittridge Avenue stormwater main. No analytes were detected at concentrations greater than JSCS Toxicity SLVs (see Table 5). Arsenic and BEHP were detected at concentrations greater than JSCS Bioaccumulation SLVs, but within an order-of-magnitude of the SLVs.

Active Connections to Manhole AAT496 (see Table 5 and Figure 4 inset)

<u>Lateral from Property Adjacent to Forest Park</u>

A lateral connecting a trash rack that conveys overland runoff from a private property adjacent to Forest Park was sampled at manhole AAT427 in May 2006 in conjunction with the stormwater system investigation in the vicinity of the former PGE – Forest Park property (BES, 2007). The sample was analyzed for PCB Aroclors and pesticides only. No analytes were detected at concentrations exceeding JSCS Toxicity SLVs. The total PCB concentration in this sample was 137 µg/Kg, which exceeded the JSCS Bioaccumulation SLV. This result indicates that the drainage area for the trash rack may include a PCB source(s).

Lateral from NW St. Helens Catch Basins

A lateral connecting to manhole AAT496 from the east discharges stormwater from two catch basins (AMZ147 and ANB320) located in NW St. Helens near the manhole. The City collected samples from both catch basins during the May 2006 stormwater system investigation activities. Because of sample size limitations, the samples were analyzed only for PCB Aroclors and pesticides. Aldrin was detected at a concentration slightly exceeding the JSCS Toxicity SLV. Total PCBs were detected in both samples at concentrations exceeding Bioaccumulation SLVs.

Lines in NW St. Helens

An 18-inch-diameter stormwater line connecting at manhole AAT496 extends to the northwest along NW St. Helens. No samples have been collected directly from this line; no DEQ Cleanup Sites connect to it and only Forest Park, United Rentals, and some highway drains to this line.

The 30-inch-diameter active stormwater line extending southeast along NW St. Helens also discharges at manhole AAT496. Several samples have been collected from locations along this line including (from downstream to upstream):

- Primary and duplicate samples just upstream of manhole AAT496 (May 2006)
- Immediately upstream and downstream of manhole AAT497 (May 2006)
- Immediately upstream and downstream of manhole AAT498 (May 2006)
- Catch basin AMZ188 adjacent to the Brazil & Co. site (May 2006)
- Three catch basins (AMZ192, AND207, and AAT525) adjacent to the Greenway Recycling site (June 2007)

All samples were analyzed for PCB Aroclors. No PCBs were detected at concentrations greater than JSCS Toxicity SLVs. Total PCBs were detected at concentrations greater than Bioaccumulation SLVs in the primary and duplicate samples collected upstream of manhole AAT496, in the catch basin adjacent to the Brazil site and in one of the catch basins adjacent to the Greenway Recycling site.

Pesticides were analyzed in the May 2006 samples and were not detected although the detection limits were somewhat elevated. Metals, PAHs and phthalates were analyzed in the 2007 catch basin samples. Copper, lead, indeno(1,2,3-cd)pyrene and BEHP were detected at concentrations greater than JSCS Toxicity SLVs in these samples, but none was more than an order-of-magnitude greater than Toxicity SLVs. Cadmium, lead and/or mercury were detected at concentrations greater than Bioaccumulation SLVs in the 2007 catch basin samples but no detections were greater than one order-of-magnitude of the Bioaccumulation SLVs.

Based on sampling results, potential PCB sources include the Brazil & Co. (ECSI #1026) and Greenway Recycling (ECSI #4655) sites. The 2007 catch basin samples were collected after site remediation was conducted at the Greenway Recycling site but before onsite stormwater treatment had been installed. No remediation or stormwater pathway evaluation has been conducted at the Brazil & Co. site (see Table 2 and Appendix C).

Abandoned Lines

In conjunction with an offsite migration investigation in the stormwater system adjacent to the PGE–Forest Park property, the City collected four inline solids samples from 6- and 12-inch-diameter lines along NW St. Helens in 2006 (see Figure 4); the lines were abandoned following the sampling. The samples from these lines were analyzed for PCB Aroclors and pesticides (see Table 6). PCBs and pesticides were detected in all four samples at concentrations greater than Toxicity and/or Bioaccumulation SLVs. The results indicate historical sources of PCBs and pesticides to these lines and abandonment of these lines removed legacy contaminants from the system to prevent migration to the river.

SECTION 5

Data Evaluation

Inline solids data collected by the LWG in Basin 19 (near the outfall) indicate the presence of metals, PCB, pesticide, BEHP and PAH sources to the City's stormwater conveyance system. This section looks at spatial patterns of these contaminants in relation to sources to evaluate whether this dataset indicates that all significant sources have been identified. The basinwide LWG sediment trap sample was collected in 2007 so it represents more recent conditions, compared to the upstream basin inline data. Most of the data from the major branches were collected in 2003, with the exception of additional inline data collected along St. Helens Road in 2006 and 2007. Data from the Calbag lateral were collected in 2007 and 2008. Upland site source controls have been implemented at some sites since 2007, so conclusions need to take into account these time differentials. The spatial patterns for each analyte group, in the context of source investigations conducted, are evaluated below for the analytes exceeding SLVs in the LWG sample.

5.1 Metals

Three metals (copper, lead and zinc) in the LWG sediment trap sample exceeded the Toxicity SLV but exceedances are low, generally less than 2 times the SLVs (Figure 3). These metals are covered under DEQ's industrial stormwater permits (NPDES), which permit sites to discharge metals in stormwater at concentrations exceeding JSCS SLVs.

In the western branch, one sample location (AAP912) had high arsenic, cadmium, and zinc. Two sites could affect this location: Chevron Asphalt and Schnitzer-Kittridge. The solids that were sampled may reflect historical discharges from these sites, though source control measures implemented at the Schnitzer-Kittridge site in 1996 may have reduced contaminant loading during the period between 1996 and when the sample was collected in 2003. The low volume of solids observed in the manhole (~ 1/8 inch) in 2003 and the fact that the LWG sample did not have high arsenic or cadmium concentrations supports that these legacy solids do not appear to be affecting current discharges.

In the eastern branch, the most significant sources appear to be those connected directly to the Kittridge storm line. The south and north private lines show elevated metals. Most sites connected to these lines have been identified in ECSI but have not conducted stormwater evaluations. It is not clear if the elevated metals are legacy or from current discharges. The high silver concentrations, traced to an illicit connection from a photoprocessor in 2000 and which was rerouted to sanitary in 2000, suggest that at least some of the contaminants in the line are from historic discharges. DEQ is currently working with one of the sites connected to these lines and the City has requested that DEQ facilitate line cleaning as part of this upland investigation.

The other likely source of metals is the Calbag-Front site. The City only had sufficient volume to analyze for PCBs at the site, which showed high concentrations (630 - 2,360 µg/Kg). Because metals and PCBs were both site contaminants, it is presumed

that elevated metals also continue to discharge to the City system. The City has requested that DEQ reopen this cleanup site to address these ongoing sources.

The elevated metals detected in 2003 just upstream of manhole AAP918 are significantly greater than metals detected in 2007 at manhole AAP918. The City's storm line was cleaned from manhole AAP918 to the Calbag lateral in 2005 as part of the site remediation implementation. Therefore, these 2003 results are not likely representative of current contributions to the City system.

5.2 PCBs

PCBs in the LWG sediment trap were relatively low (214 µg/Kg) in 2007 (see Figure 4). In the western branch, detection limits were elevated (<106 to <818 µg/Kg per Aroclor) so conclusions about sources are limited. PCBs were identified at the Schnitzer-Kittridge site in 1990 (Bridgewater, 2006a). Because this site was remediated and redeveloped in 1996, it is less likely to be a current source to Basin 19. Low level PCBs have been detected at other ECSI sites in this branch.

In the eastern branch, again detection limits were elevated (<112 to <1,030 µg/Kg per Aroclor) for the 2003 dataset so low level sources cannot be discerned. The highest inline concentrations were detected from the Calbag lateral (2,360 µg/Kg in 2008). Although DEQ issued an NFA determination for the Calbag-Front site in 2005, additional investigation is needed to identify continuing onsite sources of PCBs (and potentially other site contaminants) to the stormwater conveyance system.

PCBs were detected in the vicinity of the PGE-Forest Park and Brazil properties, although at lower concentrations (91 – 771 µg/Kg). The PGE-Forest Park site has been remediated and additional erosion controls were implemented to eliminate offsite migration. The storm lines immediately adjacent to these properties (where most of the higher concentrations were found) were abandoned to preclude legacy PCBs from discharging to the river. The City has requested that DEQ evaluate Brazil as a potential source. A historical PGE property just north of the PGE-Forest Park site may also be a PCB source, based on recent soil analyses.

Finally, other potential PCB sources may be associated with the two private lines in the eastern branch. The south line solids sample had a total PCBs concentration of 242 µg/Kg. The detection limits on the north line were high and therefore the presence of PCBs is not known. DEQ is currently working with one of the sites connected to these lines and the City has requested that DEQ facilitate line cleaning as part of this upland investigation.

5.3 Pesticides

Pesticides in the LWG sediment trap were either non-detect or below Toxicity SLVs. Total DDx (6 µg/Kg) and total chlordane (8 µg/Kg) were detected at concentrations greater than Bioaccumulation SLVs. Most of the inline samples within the eastern and western branches were non-detect but the detection limits were higher than detected concentrations in the sediment trap. Therefore, it is difficult to evaluate potential sources. The only detected DDx samples were collected in the now abandoned lines in the eastern branch adjacent to the

PGE- Forest Park and Brazil properties (see Figure 5). The source(s) are unknown; pesticides were not analyzed at the PGE-Forest Park site and no data are available for Brazil.

The only detected chlordanes above the Toxicity SLV was in the eastern branch, although most of the detection limits in the non-detected samples were well above detected values. The total chlordanes concentration in the south private line was 38 µg/Kg (see Table 4). The source is unknown but there were several facilities that historically handled chemicals that may have discharged to this line. There is insufficient information about these facilities to determine what types of materials they historically handled.

Other ECSI sites in the basin have detected low-level pesticides, including DDx and/or chlordane, in stormwater or soils/stormwater solids (see Appendix C).

5.4 PAHs and Phthalates

PAHs and phthalates in the LWG sediment trap exceeded Toxicity SLVs; all these data were flagged either as "estimated" or "rejected" indicating uncertainty related to the sample results. The total PAHs and phthalates, such as BEHP, were significantly higher than any other inline data collected in the system. Total PAHs were 15,490 µg/Kg at the LWG location in 2007, whereas all inline solids data ranged from 190 – 2,766 µg/Kg (see Figure 6). BEHP was 20,000 µg/Kg in the LWG sample, whereas all inline solids data ranged from <98 – 3,800 µg/Kg (see Figure 7). Therefore, conclusions about current inputs of these analytes are tentative.

Although most sites that have evaluated the stormwater pathway detected PAHs and phthalates, only a few of them had concentrations higher than the concentrations in the LWG sediment trap. The Calbag-Front site had significant concentrations before site remediation (e.g., 60,000 µg/Kg of BEHP in their system solids). This site did not analyze for PAHs but TPHs were high (e.g., 19,290 µg/Kg in their system solids) which suggests that PAHs may have been elevated. No post-remedial monitoring was done for PAHs or phthalates at this site to determine if the concentrations were significantly reduced, although it can be presumed since there was a reduction in PCBs as a result of the remedial activities, that other contaminants were likewise reduced. Storm system solids collected at the Anderson site had a maximum BEHP concentration of 29,000 µg/Kg and solids from the Chevron Asphalt system had total PAHs ranging to 18,366 µg/Kg. Source controls recently implemented at the Anderson and Chevron Asphalt sites under DEQ oversight will help to reduce current discharges of PAHs and phthalates to Basin 19.

In addition to the PAH and phthalate disparity between the LWG sediment trap compared to upstream solids both in-pipe and at upland sites, the stormwater data collected at the end of the outfall also do not appear significantly elevated (BES, 2010). Based on both of these lines of evidence, it appears that the LWG sediment trap data may not be representative of solids discharging to the river.

SECTION 6

Conclusions and Next Steps

The results of this source investigation update indicate substantial progress by the City and DEQ since the Phase 1 Report toward controlling upland sources of contaminants to the City's Basin 19 stormwater conveyance system and in identifying potentially significant ongoing sources that warrant further source control. Stormwater evaluations have been completed or are expected to be completed at a number of sites within the basin under DEQ's Cleanup Program. Two sites have been redeveloped under the City's Stormwater Manual, which requires onsite stormwater treatment.

Based on the evaluation of inline solids representative of the whole basin and from other locations within the basin, the following sites or areas need additional source control work:

- **Calbag-Front**: Investigations by the City in the lateral from this site show that significant concentrations of PCBs continue to discharge to the City's system post-remediation. Based on pre-remediation contaminants, metals, phthalates and PAHs could also be discharging at elevated concentrations. Calbag or the current owner/operator need to conduct additional pathway evaluations under the DEQ Cleanup Program to address this ongoing source (BES 2008; BES 2009a).
- **Brazil**: Storm line data adjacent to this site show elevated PCBs and pesticides. This site needs to investigate potential stormwater sources and pathways under the DEQ Cleanup Program to evaluate whether it is a current source to the river (BES, 2007).
- **Private Lines Connected to Kittridge**: Inline solids show elevated PCBs, metals, phthalates, PAHs, and pesticides in the north and south private lines. There are four ECSI sites that connect to these lines (Mt. Hood Chemical Property, Dura, Mt. Hood Chemical Corp., and Chapel Steel). Only Mt. Hood Chemical Corp. is currently active in the DEQ Cleanup program but no stormwater evaluation has been conducted to date. Catch basin data collected by DEQ Site Discovery at Chapel Steel showed elevated concentrations of phthalates, with minor exceedances of PCBs and metals. The City is coordinating with DEQ on the Mt. Hood Chemical Corp. upland work and has asked that the stormwater pathway workplan include line cleaning of both private lines to eliminate any legacy contaminants.

Additionally, preliminary data suggest that a former PGE property, located adjacent to the PGE-Forest Park ECSI site has PCBs in soil. The property owner will be working with the DEQ Cleanup Program regarding this site.

The Phase 1 Report identified all upland ECSI sites within or partially within the basin as potential sources. Since completion of the report, several of the sites have conducted or agreed to initiate stormwater pathway evaluations, and remedial activities (including source control measures) have been completed at several sites. These activities have reduced the number of sites that are considered likely to be significant ongoing sources to the Basin 19 stormwater conveyance system.

The City will incorporate the evaluation of stormwater solids data presented in this report, together with the evaluation of Basin 19 stormwater data presented in the City's recent *Stormwater Evaluation Report* (BES, 2010), into the Basin 19 RI/SCM report. The RI/SCM report will also integrate findings from upland site stormwater pathway evaluations conducted under DEQ oversight and other pertinent data to summarize how sources have been identified and controlled through the respective authorities of DEQ and the City. The Basin RI/SCM process will also consider the inriver remedial investigation, risk assessment, and feasibility study being completed by the LWG.

SECTION 7

References

AECOM. 2009. Subject: Counter Proposal for Work Plan Addendum as proposed by DEQ for Willbridge Yard. Memorandum to S. Rapp (DEQ) from M. Peterson (AECOM). July 14, 2009.

Anchor and Integral. 2008. Portland Harbor RI/FS. Round 3A and 3B Stormwater Data Report. Prepared for the Lower Willamette Group, Portland, OR. Anchor Environmental, L.L.C., Seattle, WA. September 2008.

ARCADIS. 2009. Source Control Evaluation Report, Former Chevron Willbridge Asphalt Plant No. 209293, 5501 NW Front Avenue, Portland, Oregon. May 2009.

ARCADIS BBL. 2007. Storm Water Sampling Plan, Former Chevron Willbridge Asphalt Plant No. 209293, DEQ ECSI Site #1281. August 1, 2007.

BBL. 2006a. Storm Water Evaluation Work Plan, Chevron Environmental Management Company, Former Chevron Willbridge Asphalt Plant No. 209/293, Portland, Oregon. September 2006.

BBL. 2006b. Revised Storm Water Evaluation Work Plan, Former Chevron Willbridge Asphalt Plant No. 209-293, 5501 NW Front Avenue, Portland, Oregon. November 22, 2006.

BES. 2007. Technical Memorandum, Stormwater System Investigation, PGE-Forest Park Property (ECSI No. 2406). City of Portland, Bureau of Environmental Services. May 18, 2007.

BES. 2008. City Outfall Basin 19 Inline Solids Sampling at the Former Calbag Metals Site. City of Portland, Bureau of Environmental Services. Technical Memorandum OF19-1. February 4, 2008.

BES. 2009a. City Outfall Basin 19 Inline Solids Sampling at the Former Calbag Metals Site. City of Portland, Bureau of Environmental Services. Technical Memorandum OF19-2. April 6, 2009.

BES. 2009b. Subject: Review of Source Control Evaluation Report, Former Chevron Willbridge Asphalt Plant No. 209293, dated May 2009. Letter to Mark Pugh (DEQ) from Linda Scheffler (BES). August 4, 2009.

BES. 2010. Stormwater Evaluation Report. City of Portland, Bureau of Environmental Services. February 2010.

Bridgewater. 2006a. Site Characterization Summary Report, Kittridge Distribution Center, 4959 NW Front Avenue, Portland, Oregon. May 1, 2006.

Bridgewater. 2006b. Land and Beneficial Water Use Report, 4959 NW Front Avenue, Portland, Oregon. May 1, 2006.

Bridgewater. 2006c. Baseline Human Health Risk Assessment Report, Kittridge Distribution Center, 4959 NW Front Avenue, Portland, Oregon. May 1, 2006.

Bridgewater. 2006d. Level 1 Ecological Risk Assessment Report, Kittridge Distribution Center, 4959 NW Front Avenue, Portland, Oregon. May 1, 2006.

Bridgewater. 2006e. Feasibility Study Report, Kittridge Distribution Center, 4959 NW Front Avenue, Portland, Oregon. May 1, 2006.

CH2M Hill. 2003. Sampling and Analysis Plan, Inline Solids in Basins M-1 and 18, City of Portland, Bureau of Environmental Services, Portland Harbor Source Control Pilot Project. August 2003.

CH2M Hill. 2004. Technical Memorandum. OF 19 Inline Sediment Investigation Data Report. July 30, 2004.

Creekside. 2006. Continued Evaluation of the Storm Water Discharge System. Prepared for Calbag Metals & DEQ. March 2006.

Delta. 2006. Storm Water Pathway Evaluation Work Plan, ConocoPhillips Company Portland Terminal, 5528 NW Doane Avenue, Portland, Oregon. Prepared for ConocoPhillips Company by Delta Consultants. October 20, 2006.

Delta. 2008. RE: Upland Storm Water Source Control Status Report, ConocoPhillips Company – Portland Terminal, 5528 NW Doane Avenue, Portland, Oregon. Letter to M. Romero (DEQ) from B. Pletcher (Delta Consultants). January 25, 2008.

DEQ. 1999. Environmental Cleanup Site Information (ECSI) Database Site Summary Full Report - Details for Site ID 2372, Lakeside Industries. Accessed February 4, 2010. http://www.deq.state.or.us/lq/ECSI/ecsidetailfull.asp?seqnbr=2372

DEQ. 2003. Environmental Cleanup Site Information (ECSI) Database Site Summary Full Report - Details for Site ID 2377, Shaver Transportation Company. Accessed February 4, 2010. http://www.deq.state.or.us/lq/ECSI/ecsidetailfull.asp?seqnbr=2377

DEQ. 2004. Re: Source Control Decision, Kittridge Distribution Center, 4959 NW Front Avenue, Portland, Oregon, ECSI No. 2442. Letter to T. Zelenka (Schnitzer Investment Corporation) from R. Struck (DEQ). June 8, 2004.

DEQ. 2005. Source Control Decision – Final, No Further Action Determination, Calbag Metals, 4927 NW Front Ave., Portland, OR. November 3, 2005.

DEQ. 2006. DEQ Site Summary Full Report – Details for ECSI Site ID 2454, Calbag Metals. DEQ Environmental Cleanup Site Information Database (ECSI), accessed January 2008. http://www.deq.state.or.us/lq/ECSI/ecsidetailfull.asp?seqnbr=2454

DEQ. 2007a. Selected Remedial Action Record of Decision for the Kittridge Distribution Center Site Portland, Oregon (ECSI #2442). January 9, 2007.

DEQ. 2007b. RE: ECSI #970 – Anderson Brothers Property, 5275 – 5315 NW St. Helens Road, Portland; partial No Further Action determination. Letter from Keith Johnson (DEQ) to John Anderson (Anderson Brothers). February 5, 2007.

DEQ. 2007c. Summary of 6/11/07 site discovery visit and sampling results, Chapel Steel.

DEQ. 2008a. Re: Catch Basin Sediment Sampling Results and Findings, Chapel Steel, ECSI #4920. Letter to E. Fitzgerald (Chapel Steel) from K Johnson (DEQ). May 14, 2008.

DEQ. 2008b. Staff Report – No Further Action Determination, Penske Truck Leasing, Inc., 4110 NW St. Helens Road, Portland, Oregon, Multnomah County, ECSI #5055. Memorandum to Bruce Gilles (Manager, DEQ NWR Cleanup and Emergency Response) from Chuck Harman, (DEQ NWR Cleanup and Emergency Response). October 10, 2008.

DEQ. 2008c. Proposed No Further Action, Greenway Recycling, Portland, Oregon. October 27, 2008.

DEQ. 2008d. No Further Action Determination, Penske Truck Leasing, Inc., Portland, Oregon, Multnomah County, ECSI #5055. December 2, 2008.

DEQ. 2009a. RE: Conditional No Further Action Determination, Greenway Recycling, 4135 NW Saint Helens Road, Portland, Oregon 97208, ECSI Site ID No. 4655. Letter to T. Garrett (Greenway) from K. Johnson (DEQ). February 23, 2009.

DEQ. 2009b. Milestone Report for Upland Source Control at the Portland Harbor Superfund Site. April 2009.

DEQ. 2009c. E-mail to M. Peterson (AECOM) from S. Rapp (DEQ) proposing revisions to the scope of work and analytes in the Willbridge Yard Expanded Preliminary Assessment Work Plan. May 11, 2009.

DEQ. 2009d. Review of Draft Source Control Decision, Anderson Brothers Inc., 9111 N. Vancouver Avenue, Portland, OR 97217, ECSI # 970. Letter from Karen Tarnow (DEQ) to Kristine Koch, Eric Blischke, and Chip Humphrey (EPA). July 15, 2009.

DEQ. 2009e. Re: Review of Source Control Decision, Anderson Brothers Inc., 9111 N. Vancouver Avenue, Portland, OR 97217, ECSI #970. Letter to K. Koch (EPA) from K. Tarnow (DEQ). November 24, 2009.

DEQ. 2009f. RE: No Further Action determination for the Anderson Brothers Property, 5275 – 5315 NW St. Helens Road, Portland, ECSI #970. Letter to J. Anderson (Anderson Brothers Inc.) from K. Tarnow (DEQ). December 11, 2009.

DEQ and EPA. 2005 (amended 2007). Portland Harbor Joint Source Control Strategy. Prepared by the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency. December 2005 (Table 3-1 updated July 2007). Available online at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm.

EFI Global Inc. 2008. Site Characterization and Excavation Report, Penske Truck Leasing Facility, 4285 Northwest Yeon Avenue, Portland, Oregon. January 9, 2008.

EPA. 2009. RE: Review of Source Control Decision, Anderson Brothers Inc., 9111 N. Vancouver Avenue, Portland, OR 97217, ECSI #970. Letter to K. Tarnow (DEQ) from K. Koch (EPA). September 28, 2009.

Evren Northwest. 2007. Independent Cleanup Report, Greenway Recycling Facility, 4135 NW St. Helens Road, Portland, Oregon. Prepared for Greenway Recycling. December 4, 2007.

GSI. 2006. Phase I Report for City of Portland Priority 1 Basins. Prepared by Groundwater Solutions, Inc. August 2006.

LWG, 2007. Portland Harbor RI/FS, Comprehensive Round 2 Report. February 21, 2007.

MFA. 2007. Stormwater Evaluation Work Plan, Front Avenue LP, Portland, Oregon. March 27, 2007.

MFA. 2008a. Updated Stormwater Evaluation Work Plan, Front Avenue LP, Portland, Oregon. April 16, 2008.

MFA. 2008b. RE: Results of Catch Basin Solids Sampling and Analyses, Tube Forgings of America, Inc./Front Avenue LP, 5200 NW Front Avenue, Portland, Oregon (DEQ ECSI No. 1239). Memorandum to Michael Romero (DEQ) from Anna St. John (Maul, Foster, Alongi). October 2, 2008.

MFA. 2009. RE: Results of November 2008 Stormwater Performance Monitoring, Tube Forgings of America, Inc./Front Avenue LP, 5200 NW Front Avenue, Portland, Oregon (DEQ ECSI No. 1239). Memorandum to Michael Romero (DEQ) from Anna St. John (Maul, Foster, Alongi). February 13, 2009.

RETEC Group, Inc. 2006. Preliminary Assessment and Expanded Preliminary Assessment Work Plan for the BNSF Railway Company (BNSF) Willbridge Yard Site (ECSI Site ID No. 3395). August 21, 2006.

Wohlers. 2008. Stormwater Source Control Evaluation Report, Industrial Properties, 5275 & 5315 N.W. St. Helens Road, Portland, Oregon 97210. Prepared for Anderson Brothers, Inc. September 19, 2008.

Tables

Table 1. Summary of Basin 19 Inline Solids Sample Analyses.

Location		Sample ID	Sample Date	Analytical Testing (1)								
Branch / Line	Manhole / Catch Basin ID			Total Solids	TOC	Metals	Pesticides	Herbicides	PCB Congeners	PCB Aroclors	PAHs & Phthalates	SVOCs
Whole basin (LWG sample)	AAP918	LW3-STW-S10-CF19	07/03/07	X	X	X	X	X	X		X	X
Western	AAP910	FO031017	10/07/03	X	X	X	X			X	X	X
	AAP912	FO031018	10/07/03	X	X	X	X			X	X	X
	AAP831	FO031023	10/08/03	X	X	X	X			X	X	X
Eastern / NW Kittridge	AAP918	FO031019	10/07/03	X	X	X	X			X	X	X
Eastern / Calbag Metals Lateral	Calbag Sampling Manhole	FO070810	06/18/07	X						X		
		FO08655	06/02/08	X	X				X			
Eastern / North Private	AAP931	FO031020	10/07/03	X	X	X	X			X	X	X
Eastern / South Private	AAP932	FO031021	10/07/03	X	X	X	X			X	X	X
Eastern / NW Yeon	AMZ077	FO031024	10/08/03	X	X	X	X			X	X	X
Eastern / Active Lines in NW St. Helens	AAT496	FO031022	10/08/03	X	X	X	X			X	X	X
	AAT427	FO060544	05/02/06				X			X		
	AMZ147	FO060545	05/02/06				X			X		
	ANB320	FO060546	05/02/06				X			X		
	AAT496	FO060543	05/02/06				X			X		
		FO060553	05/02/06				X			X		
	AAT497	FO060547	05/02/06				X			X		
		FO060548	05/02/06				X			X		
	AAT498	FO060549	05/02/06				X			X		
		FO060550	05/02/06				X			X		
	AMZ188	FO060551	05/02/06				X			X		
	AMZ192	FO070815	06/22/07	X	X	X				X	X	X
	AND207	FO070816	06/22/07	X	X	X				X	X	X
	AAT525	FO070817	06/22/07	X	X	X				X	X	X
Eastern / Abandoned Lines in NW St. Helens	6IN-1	FO061296	10/11/06				X			X		
	6IN-2	FO061297	10/11/06				X			X		
	ANB502	FO060552	05/02/06				X			X		
	6IN-3	FO061298	10/11/06				X			X		
	12IN-4	FO061299	10/11/06				X			X		

(1) TOC = total organic carbon; PCBs = polychlorinated biphenyls; PAHs = polycyclic aromatic hydrocarbons; SVOCs = semivolatile organic compounds.

Table 2. Basin 19 ESCI Site Status Update.

Basin 19 Branch/Line	Site (ECSI #)	Site Investigation / Source Control Activities 2003 – 2009	Status Update
Upland Sites Located Within or Partially Within Basin 19			
Western	Front Avenue LP (#1239) – Tube Forgings	Catch basin sampling (2008); stormwater sampling (2008 – 2009)	Stormwater pathway evaluation underway
	Schnitzer Kittridge Distribution Center (# 2442)	Site characterization summary; land and beneficial water use assessment; human health risk assessment; Level 1 ecological risk assessment; and feasibility study (May 2006)	DEQ issued Conditional NFA determination (January 2007)
	Chevron USA Asphalt Refinery (#1281)	Catch basin cleanout and solids sampling (September 2006, August 2007); stormwater line cleanout, solids sampling and a video survey of various onsite and offsite stormwater drain lines (February, June 2007); stormwater sampling (October 2007 – March 2008); final Source Control Evaluation Report submitted to DEQ (May 2009).	DEQ Source Control Decision pending
	Anderson Brothers (#970)	Line cleanout and solids sampling (August 2006); stormwater sampling (December 2006 – December 2007); implementation of source control measures including new asphalt surfacing, catch basin, and shallow "soakage trench" to capture roof drainage before discharge to the stormwater system (2007).	DEQ issued final NFA determination and SCD (December 2009)
	Unocal - Willbridge Terminal(#1549/#177)	Stormwater pathway evaluation activities, including catch basin solids sampling and stormwater sampling (2007 – 2009).	Stormwater pathway evaluation underway
	BNSF Willbridge Yard (#3395)	Preliminary Assessment (PA) and Expanded PA (XPA) work plan submitted (September 2006); agreement reached for XPA to include stormwater pathway evaluation.	Stormwater pathway evaluation is underway

Table 2. Basin 19 ESCI Site Status Update.

Basin 19 Branch/Line	Site (ECSI #)	Site Investigation / Source Control Activities 2003 – 2009	Status Update
Eastern / Main line (NW Kittridge)	Calbag Metals – Front Ave. (#2454)	Site investigation and cleanout of onsite catch basins and stormwater lines and adjacent City stormwater line; site repaving; and stormwater sampling (2005).	DEQ issued final Source Control Decision and NFA (November 2005). City requested DEQ to reevaluate decision based on new data (BES, 2008, 2009a).
Eastern / Private lines to NW Kittridge	Chapel Steel (#4920)	DEQ site discovery / sampling of catch basin solids (June 2007)	No changes to site status (a stormwater pathway evaluation has not been initiated at this site).
	Dura Industries (#111)	None	No changes to site status (a stormwater pathway evaluation has not been initiated at this site).
	Mt. Hood Chemical Corp. (#81)	Stormwater assessment and source control initiated by agreement with DEQ (2008); initiation of soil and groundwater remediation (2009)	Stormwater pathway work plan is pending.
	Mt. Hood Chemical Property (#1328)	None	No changes to site status (a stormwater pathway evaluation has not been initiated at this site).
Eastern / NW Yeon line	Penske Truck Leasing (#5055)	Site remediation activities and redevelopment in accordance with the City's Stormwater Manual (2007)	DEQ issued NFA determination (December 2008)
Eastern / NW St. Helens lines	PGE-Forest Park (#2406)	Unused stormwater lines at and in the vicinity of the site were abandoned in 2006. Interim source control measures were implemented by City to prevent offsite migration (2007).	No changes to site status (site has been remediated and remains undeveloped)
	Brazil & Co. (#1026)	None	No changes to site status (a stormwater pathway evaluation has not been initiated at this site).

Table 2. Basin 19 ESCI Site Status Update.

Basin 19 Branch/Line	Site (ECSI #)	Site Investigation / Source Control Activities 2003 – 2009	Status Update
	Greenway Recycling (#4655)	Independent (i.e., not under DEQ oversight) investigation and remedial work, including removal of contaminated soil (2004) and groundwater monitoring (2006 – 2008). Site redevelopment in accordance with City's Stormwater Manual, including stormwater treatment (2007).	DEQ issued a Conditional NFA determination (February 2009).
Nonpoint Sources and Pathways Located Near Outfall 19			
N/A (stormwater not conveyed to Basin 19 system)	Lakeside Industries (#2372)	Two site drywells closed in 2003.	Need for stormwater pathway evaluation under consideration
	Shaver Transportation (#2377)	None	DEQ issued NFA determination (June 2003).

Notes:

N/A = not applicable

Table 3
Basin 19 Inline Solids Sample Results:
Western Branch

Downstream ----------> **Upstream**

Class	Analyte	Units	Whole Basin LWG Sample: Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Western Branch: Manhole AAP910 Incoming 24" Line Adj to Tube Forging FO031017 10/07/03	Western Branch: Manhole AAP912 Outgoing 42" Line Adj. to Chevron & Schnitzer FO031018 10/07/03	Western Branch: Manhole AAP831 From manhole Adj to BNSF Yard FO031023 10/08/03	JSCS[1] Screening Level Values: Toxicity	JSCS[1] Screening Level Values: Bioaccumulation
Total Organic Carbon[2]								
	TOC	%	5.57	1.03	2.59	0.576	--	--
Total Solids (EPA 160.3M or SM 2540G)								
	TS	%	47.1	82.4	21.2	73.7	--	--
Metals (EPA 6010/6020)								
	Aluminum	mg/Kg	9220	NA	NA	NA	--	--
	Antimony	mg/Kg	2.58 J	NA	NA	NA	64	--
	Arsenic	mg/Kg	5.6	6.02	**465**	**28.8**	33	7
	Barium	mg/Kg	NA	NA	2740	NA	--	--
	Cadmium	mg/Kg	**2.07** J	**1.16**	**18.3**	**1.12**	4.98	1
	Chromium	mg/Kg	74.3	52.4	48.7	36.4	111	--
	Copper	mg/Kg	164	126	222	81.1	149	--
	Lead	mg/Kg	**139** J	**107**	**96.4**	**70.3**	128	17
	Mercury[3]	mg/Kg	**0.213**	**0.46**	**0.38**	0.05	1.06	0.07
	Nickel	mg/Kg	30.4	NA	NA	NA	48.6	--
	Selenium	mg/Kg	0.4 J	NA	**2.22**	NA	5	2
	Silver	mg/Kg	0.733	NA	0.21	NA	5	--
	Zinc	mg/Kg	964 J	470	4130	300	459	--
Organochlorine Pesticides (EPA 8081A or 8082)								
	2,4'-DDD	µg/Kg	3.3 U	NA	NA	NA	--	--
	2,4'-DDE	µg/Kg	0.93 U	NA	NA	NA	--	--
	2,4'-DDT	µg/Kg	6.6 U	NA	NA	NA	--	--
	4,4'-DDD	µg/Kg	4.1 U	203 UJ	81.1 U	23.7 U	--	--
	4,4'-DDE	µg/Kg	6.3 NJ	203 UJ	81.1 U	23.7 U	--	--
	4,4'-DDT	µg/Kg	25 U	203 UJ	81.1 U	23.7 U	--	--
	DDD[4]	µg/Kg	4.1 U	ND	ND	ND	31.3	0.33
	DDE[4]	µg/Kg	**6.3** NJ	ND	ND	ND	28	0.33
	DDT[4]	µg/Kg	25 U	ND	ND	ND	62.9	0.33
	Estimated Total DDx[5]	µg/Kg	**6.3** NJ	ND	ND	ND	--	0.33
	Aldrin	µg/Kg	2.5 U	102 UJ	40.6 U	11.9 U	40	--
	alpha-Endosulfan	µg/Kg	7.9 U	102 UJ	40.6 U	11.9 U	--	--
	alpha-Hexachlorocyclohexane	µg/Kg	4.1 U	102 UJ	40.6 U	11.9 U	--	--
	beta-Endosulfan	µg/Kg	12 U	203 UJ	81.1 U	23.7 U	--	--
	beta-Hexachlorocyclohexane	µg/Kg	14 U	102 UJ	40.6 U	11.9 U	--	--
	alpha-Chlordane[6]	µg/Kg	0.63 U	102 UJ	40.6 U	11.9 U	--	--
	beta-Chlordane[6]	µg/Kg	8	102 UJ	40.6 U	11.9 U	--	--
	Total Chlordane[7]	µg/Kg	**8**	ND	ND	ND	17.6	0.37

Table 3
Basin 19 Inline Solids Sample Results:
Western Branch

Downstream ----------> **Upstream**

Class	Analyte	Units	Whole Basin LWG Sample: Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Western Branch: Manhole AAP910 Incoming 24" Line Adj to Tube Forging FO031017 10/07/03	Western Branch: Manhole AAP912 Outgoing 42" Line Adj. to Chevron & Schnitzer FO031018 10/07/03	Western Branch: Manhole AAP831 From manhole Adj to BNSF Yard FO031023 10/08/03	JSCS[1] Screening Level Values: Toxicity	JSCS[1] Screening Level Values: Bioaccumulation
	cis-Nonachlor	µg/Kg	7.7 U	NA	NA	NA	--	--
	delta-Hexachlorocyclohexane	µg/Kg	2.3 U	102 UJ	40.6 U	11.9 U	--	--
	Dieldrin	µg/Kg	4.1 U	203 UJ	81.1 U	23.7 U	61.8	0.0081
	Endosulfan sulfate	µg/Kg	14 U	203 UJ	81.1 U	23.7 U	--	--
	Endrin	µg/Kg	1.5 U	203 UJ	81.1 U	23.7 U	207	--
	Endrin aldehyde	µg/Kg	4.9 NJ	203 UJ	81.1 U	23.7 U	--	--
	Endrin ketone	µg/Kg	0.59 U	203 UJ	81.1 U	23.7 U	--	--
	gamma-Hexachlorocyclohexane	µg/Kg	2 U	102 UJ	40.6 U	11.9 U	4.99	--
	Heptachlor	µg/Kg	4.1 U	102 UJ	40.6 U	11.9 U	10	--
	Heptachlor epoxide	µg/Kg	4.9 U	102 UJ	40.6 U	11.9 U	16	--
	Methoxychlor	µg/Kg	7.7 U	1020 UJ	406 U	119 U	--	--
	Mirex	µg/Kg	2.5 U	NA	NA	NA	--	--
	oxy-Chlordane	µg/Kg	13 U	NA	NA	NA	--	--
	Toxaphene	µg/Kg	290 U	10200 UJ	4060 U	1190 U	--	--
	trans-Nonachlor	µg/Kg	6.9 J	NA	NA	NA	--	--
Herbicides (EPA 8151A)								
	2,4,5-T	µg/Kg	85 U	NA	NA	NA	--	--
	2,4-D	µg/Kg	110 U	NA	NA	NA	--	--
	2,4-DB	µg/Kg	800 U	NA	NA	NA	--	--
	Dalapon	µg/Kg	660 U	NA	NA	NA	--	--
	Dicamba	µg/Kg	75 U	NA	NA	NA	--	--
	Dichlorprop	µg/Kg	64 U	NA	NA	NA	--	--
	Dinoseb	µg/Kg	140 U	NA	NA	NA	--	--
	MCPA	µg/Kg	11000 U	NA	NA	NA	--	--
	MCPP	µg/Kg	5400 U	NA	NA	NA	--	--
	Silvex	µg/Kg	77 U	NA	NA	NA	--	--
Polychlorinated Biphenyl Congeners (EPA 1668A)								
	Total PCBs[8][9]	µg/Kg	**214** J	NA	NA	NA	676	0.39
Polychlorinated Biphenyls (PCBs) (EPA 8082)								
	Aroclor 1016	µg/Kg	NA	106 U	410 U	116 U	530	--
	Aroclor 1221	µg/Kg	NA	213 U	819 U	231 U	--	--
	Aroclor 1232	µg/Kg	NA	106 U	410 U	116 U	--	--
	Aroclor 1242	µg/Kg	NA	106 U	410 U	116 U	--	--
	Aroclor 1248	µg/Kg	NA	106 U	410 U	116 U	1500	--
	Aroclor 1254	µg/Kg	NA	106 U	410 U	116 U	300	--
	Aroclor 1260	µg/Kg	NA	106 U	410 U	116 U	200	--
	Aroclor 1262	µg/Kg	NA	NA	NA	NA	--	--
	Aroclor 1268	µg/Kg	NA	NA	NA	NA	--	--
	Total PCBs[8]	µg/Kg	NA	ND	ND	ND	676	0.39

Table 3
Basin 19 Inline Solids Sample Results:
Western Branch

Downstream ----------> **Upstream**

Class	Analyte	Units	Whole Basin LWG Sample: Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Western Branch: Manhole AAP910 Incoming 24" Line Adj to Tube Forging FO031017 10/07/03	Western Branch: Manhole AAP912 Outgoing 42" Line Adj. to Chevron & Schnitzer FO031018 10/07/03	Western Branch: Manhole AAP831 From manhole Adj to BNSF Yard FO031023 10/08/03	JSCS[1] Screening Level Values: Toxicity	JSCS[1] Screening Level Values: Bioaccumulation
Polynuclear Aromatic Hydrocarbons (EPA 8270C or 8270-SIM)								
	2-Methylnaphthalene	µg/Kg	R	76.9 U	24.4 U	76.4 U	200	--
	Acenaphthene	µg/Kg	160 J	76.9 U	24.4 U	76.4 U	300	--
	Acenaphthylene	µg/Kg	R	76.9 U	13.8 J	76.4 U	200	--
	Anthracene	µg/Kg	300 J	76.9 U	13.1	40 J	845	--
	Benzo(a)anthracene	µg/Kg	1100 J	76.9 U	91.4	76.4 U	1050	--
	Benzo(a)pyrene	µg/Kg	1100 J	76.9 U	62.1	76.4 U	1450	--
	Benzo(b)fluoranthene	µg/Kg	1800 J	NA	NA	NA	--	--
	Benzo(g,h,i)perylene	µg/Kg	1700 J	76.9 U	188	76.4 U	300	--
	Benzo(k)fluoranthene	µg/Kg	500 J	NA	NA	NA	13000	--
	Benzofluoranthenes[10]	µg/Kg	NA	76.9 U	271	539	--	--
	Chrysene	µg/Kg	1700 J	76.9 U	66.7	76.4 U	1290	--
	Dibenzo(a,h)anthracene	µg/Kg	R	76.9 U	24.4 U	76.4 U	1300	--
	Fluoranthene	µg/Kg	2200 J	85.9	87.6	131	2230	37000
	Fluorene	µg/Kg	130 J	76.9 U	24.4 U	76.4 U	536	--
	Indeno(1,2,3-cd)pyrene	µg/Kg	1100 J	76.9 U	146	76.4 U	100	--
	Naphthalene	µg/Kg	R	76.9 U	24.4 U	76.4 U	561	--
	Phenanthrene	µg/Kg	1200 J	63.9 J	27.3	76.4 U	1170	--
	Pyrene	µg/Kg	**2500** J	124	82	125	1520	1900
	Total PAHs[8]	µg/Kg	15490 J	273.8 J	1049 J	835 J	--	--
Phthalates (EPA 8270C or 8270-SIM)								
	Bis(2-ethylhexyl) phthalate (BEHP)	µg/Kg	**20000** J	308 U	97.5 U	306 U	800	330
	Butylbenzyl phthalate	µg/Kg	2500 J	385 U	122 U	382 U	--	--
	Dibutyl phthalate	µg/Kg	**850** J	308 U	97.5 U	306 U	100	60
	Diethyl phthalate	µg/Kg	R	308 U	97.5 U	306 U	600	--
	Dimethyl phthalate	µg/Kg	3900 J	308 U	97.5 U	306 U	--	--
	Di-n-octyl phthalate	µg/Kg	1400 J	308 U	97.5 U	306 U	--	--
Semivolatile Organic Compounds (EPA 8081A or 8270SIM)[11]								
	Dibenzofuran	ug/Kg	R	308 U	97.5 U	306 U	--	--
	Hexachlorobenzene	ug/Kg	1.4 U	308 U	97.5 U	306 U	100	19
	Hexachlorobutadiene	ug/Kg	2.9 U	308 U	97.5 U	306 U	600	--
	Hexachloroethane	ug/Kg	3.3 U	308 U	97.5 U	306 U	--	--

Table 3
Basin 19 Inline Solids Sample Results:
Western Branch

Downstream ----------> **Upstream**

Class	Analyte	Units	Whole Basin LWG Sample	Western Branch			JSCS[1] Screening Level Values	
			Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Manhole AAP910 Incoming 24" Line Adj to Tube Forging FO031017 10/07/03	Manhole AAP912 Outgoing 42" Line Adj. to Chevron & Schnitzer FO031018 10/07/03	Manhole AAP831 From manhole Adj to BNSF Yard FO031023 10/08/03	Toxicity	Bioaccumulation

Notes:

J = Estimated value

N = Presumptive evidence of a compound

U = The analyte was not detected above the reported sample quantification limit

R = Rejected

NA = Not analyzed

ND = Not detected

-- = No JSCS screening level available.

µg/Kg = Micrograms per kilogram

mg/Kg = Milligrams per kilogram

(1) JSCS = Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007)

(2) TOC analyzed using Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound; ASTM D4129-82M; EPA 415.1; or EPA 9060.

(3) Mercury analysis by EPA 7471A or WPCL SOP-M-10.01

(4) The toxicity SLV represents the sum of the 2,4' and 4,4' isomers

(5) Estimated Total DDx is the sum of DDE, DDD and DDT

(6) Alpha-Chlordane also is known as cis-Chlordane. Beta-Chlordane also is known as trans-Chlordane.

(7) Total Chlordane is the sum of alpha-, and beta-isomers.

(8) Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.

(9) Refer to Anchor and Integral. 2008. Portland Harbor RI/FS. Round 3A and 3B Stormwater Data Report, for all 209 congener results.

(10) Benzofluoranthenes include benzo(b)fluoranthene and benzo(k)fluoranthene.

(11) Additional SVOCs and VOCs that were analyzed in samples collected in 2003 are not listed; all results were ND (see Appendix A).

= concentration exceeds JSCS Toxicity Screening Level Value.

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value.

Table 4
Basin 19 Inline Solids Sample Results:
Eastern Branch - NW Kittridge and NW Yeon Lines

			Downstream						Upstream		
			Whole Basin LWG Sample	NW Kittridge Main Line	Calbag Metals Lateral		North Private Line	South Private Line	NW Yeon		
Class	Analyte	Units	Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Manhole AAP918 Incoming 48" Line FO031019 10/07/03	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO070810 06/18/07	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO08655 06/02/08	Manhole AAP931 Incoming 18" Line FO031020 10/07/03	Manhole AAP932 Incoming 18" Line FO031021 10/07/03	Manhole AMZ077 Outgoing 27" Line FO031024 10/08/03	JSCS[1] Screening Level Values Toxicity	JSCS[1] Screening Level Values Bioaccumulation
Total Organic Carbon[2]											
	TOC	%	5.57	0.393	NA	15.9	3.69	8.27	0.866	--	--
Total Solids (EPA 160.3M or SM 2540G)											
	TS	%	47.1	81.2	51.3	46.2	15.6	25	79.8	--	--
Metals (EPA 6010/6020)											
	Aluminum	mg/Kg	9220	NA	NA	NA	NA	NA	NA	--	--
	Antimony	mg/Kg	2.58 J	NA	NA	NA	NA	NA	NA	64	--
	Arsenic	mg/Kg	5.6	**12.2**	NA	NA	**137**	**67.3**	4.36	33	7
	Barium	mg/Kg	NA	228	NA	NA	3950	324	NA	--	--
	Cadmium	mg/Kg	**2.07** J	**1.23**	NA	NA	**94.5**	**2.55**	0.75	4.98	1
	Chromium	mg/Kg	74.3	262	NA	NA	96.6	72.8	65.9	111	--
	Copper	mg/Kg	164	3310	NA	NA	620	144	72.4	149	--
	Lead	mg/Kg	**139** J	**3690**	NA	NA	**260**	**226**	**81.3**	128	17
	Mercury[3]	mg/Kg	**0.213**	**0.917**	NA	NA	**0.347**	**0.277**	0.047	1.06	0.07
	Nickel	mg/Kg	30.4	NA	NA	NA	NA	NA	NA	48.6	--
	Selenium	mg/Kg	0.4 J	1 U	NA	NA	**4.36**	1.02	NA	5	2
	Silver	mg/Kg	0.733	34.9	NA	NA	76.9	145	NA	5	--
	Zinc	mg/Kg	964 J	733	NA	NA	22100	850	338	459	--
Organochlorine Pesticides (EPA 8081A or 8082)											
	2,4'-DDD	µg/Kg	3.3 U	NA	NA	NA	NA	NA	NA	--	--
	2,4'-DDE	µg/Kg	0.93 U	NA	NA	NA	NA	NA	NA	--	--
	2,4'-DDT	µg/Kg	6.6 U	NA	NA	NA	NA	NA	NA	--	--
	4,4'-DDD	µg/Kg	4.1 U	22.4 U	NA	NA	153 U	57.6 U	22.7 U	--	--
	4,4'-DDE	µg/Kg	6.3 NJ	22.4 U	NA	NA	153 U	57.6 U	22.7 U	--	--
	4,4'-DDT	µg/Kg	25 U	36.7	NA	NA	153 U	57.6 U	22.7 U	--	--
	DDD[4]	µg/Kg	4.1 U	ND	NA	NA	ND	ND	ND	31.3	0.33
	DDE[4]	µg/Kg	**6.3** NJ	ND	NA	NA	ND	ND	ND	28	0.33
	DDT[4]	µg/Kg	25 U	**36.7**	NA	NA	ND	ND	ND	62.9	0.33
	Estimated Total DDx[5]	µg/Kg	**6.3** NJ	**36.7**	NA	NA	ND	ND	ND	--	0.33
	Aldrin	µg/Kg	2.5 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	40	--
	alpha-Endosulfan	µg/Kg	7.9 U	22.4 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	alpha-Hexachlorocyclohexane	µg/Kg	4.1 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	beta-Endosulfan	µg/Kg	12 U	22.4 U	NA	NA	76.6 U	57.6 U	22.7 U	--	--
	beta-Hexachlorocyclohexane	µg/Kg	14 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	alpha-Chlordane[6]	µg/Kg	0.63 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	beta-Chlordane[6]	µg/Kg	8	11.2 U	NA	NA	76.6 U	38.3	11.4 U	--	--
	Total Chlordane[7]	µg/Kg	**8**	ND	NA	NA	ND	**38.3**	ND	17.6	0.37
	Chlordane (tech)	µg/Kg	NA	NA	NA	NA	NA	NA	NA		
	cis-Nonachlor	µg/Kg	7.7 U	NA	NA	NA	NA	NA	NA	--	--
	delta-Hexachlorocyclohexane	µg/Kg	2.3 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	Dieldrin	µg/Kg	4.1 U	22.4 U	NA	NA	153 U	57.6 U	22.7 U	61.8	0.0081

Table 4
Basin 19 Inline Solids Sample Results:
Eastern Branch - NW Kittridge and NW Yeon Lines

			Downstream						Upstream		
			Whole Basin LWG Sample	NW Kittridge Main Line	Calbag Metals Lateral		North Private Line	South Private Line	NW Yeon		
Class	Analyte	Units	Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Manhole AAP918 Incoming 48" Line FO031019 10/07/03	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO070810 06/18/07	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO08655 06/02/08	Manhole AAP931 Incoming 18" Line FO031020 10/07/03	Manhole AAP932 Incoming 18" Line FO031021 10/07/03	Manhole AMZ077 Outgoing 27" Line FO031024 10/08/03	JSCS[1] Screening Level Values Toxicity	JSCS[1] Screening Level Values Bioaccumulation
	Endosulfan sulfate	µg/Kg	14 U	22.4 U	NA	NA	153 U	57.6 U	22.7 U	--	--
	Endrin	µg/Kg	1.5 U	22.4 U	NA	NA	153 U	57.6 U	22.7 U	207	--
	Endrin aldehyde	µg/Kg	4.9 NJ	22.4 U	NA	NA	153 U	57.6 U	22.7 U	--	--
	Endrin ketone	µg/Kg	0.59 U	22.4 U	NA	NA	76.6 U	28.8 U	11.4 U	--	--
	gamma-Hexachlorocyclohexane	µg/Kg	2 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	4.99	--
	Heptachlor	µg/Kg	4.1 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	10	--
	Heptachlor epoxide	µg/Kg	4.9 U	11.2 U	NA	NA	76.6 U	28.8 U	11.4 U	16	--
	Methoxychlor	µg/Kg	7.7 U	112 U	NA	NA	766 U	288 U	114 U	--	--
	Mirex	µg/Kg	2.5 U	NA	NA	NA	NA	NA	NA	--	--
	oxy-Chlordane	µg/Kg	13 U	NA	NA	NA	NA	NA	NA	--	--
	Toxaphene	µg/Kg	290 U	1120 U	NA	NA	7660 U	2880 U	1140 U	--	--
	trans-Nonachlor	µg/Kg	6.9 J	NA	NA	NA	NA	NA	NA	--	--
Herbicides (EPA 8151A)											
	2,4,5-T	µg/Kg	85 U	NA	NA	NA	NA	NA	NA	--	--
	2,4-D	µg/Kg	110 U	NA	NA	NA	NA	NA	NA	--	--
	2,4-DB	µg/Kg	800 U	NA	NA	NA	NA	NA	NA	--	--
	Dalapon	µg/Kg	660 U	NA	NA	NA	NA	NA	NA	--	--
	Dicamba	µg/Kg	75 U	NA	NA	NA	NA	NA	NA	--	--
	Dichlorprop	µg/Kg	64 U	NA	NA	NA	NA	NA	NA	--	--
	Dinoseb	µg/Kg	140 U	NA	NA	NA	NA	NA	NA	--	--
	MCPA	µg/Kg	11000 U	NA	NA	NA	NA	NA	NA	--	--
	MCPP	µg/Kg	5400 U	NA	NA	NA	NA	NA	NA	--	--
	Silvex	µg/Kg	77 U	NA	NA	NA	NA	NA	NA	--	--
Polychlorinated Biphenyl Congeners (EPA 1668A)											
	Total PCBs[8][9]	ug/Kg	**214** J	NA	NA	**2360**	NA	NA	NA	676	0.39
Polychlorinated Biphenyls (PCBs) (EPA 8082)											
	Aroclor 1016	µg/Kg	NA	110 U	32 U	NA	516 U	329 U	112 U	530	--
	Aroclor 1221	µg/Kg	NA	220 U	63 U	NA	1030 U	657 U	225 U	--	--
	Aroclor 1232	µg/Kg	NA	110 U	32 U	NA	516 U	329 U	112 U	--	--
	Aroclor 1242	µg/Kg	NA	110 U	32 U	NA	516 U	329 U	112 U	--	--
	Aroclor 1248	µg/Kg	NA	110 U	190	NA	516 U	329 U	112 U	1500	--
	Aroclor 1254	µg/Kg	NA	110 U	32 U	NA	516 U	329 U	112 U	300	--
	Aroclor 1260	µg/Kg	NA	231	440	NA	516 U	242 J	112 U	200	--
	Aroclor 1262	µg/Kg	NA	NA	32 U	NA	NA	NA	NA	--	--
	Aroclor 1268	µg/Kg	NA	NA	120 U	NA	NA	NA	NA	--	--
	Total PCBs[8]	µg/Kg	NA	**231**	**630**	NA	ND	**242** J	ND	676	0.39

Table 4
Basin 19 Inline Solids Sample Results:
Eastern Branch - NW Kittridge and NW Yeon Lines

			Downstream						Upstream		
			Whole Basin LWG Sample	NW Kittridge Main Line	Calbag Metals Lateral		North Private Line	South Private Line	NW Yeon		
			Manhole AAP918 Outgoing 42" Line LW3-STW-S10-CF19 07/03/07	Manhole AAP918 Incoming 48" Line FO031019 10/07/03	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO070810 06/18/07	Sampling Manhole at Former Calbag Site Outgoing 21" Line FO08655 06/02/08	Manhole AAP931 Incoming 18" Line FO031020 10/07/03	Manhole AAP932 Incoming 18" Line FO031021 10/07/03	Manhole AMZ077 Outgoing 27" Line FO031024 10/08/03	JSCS[1] Screening Level Values	
Class	**Analyte**	**Units**								**Toxicity**	**Bioaccumulation**
Polynuclear Aromatic Hydrocarbons (EPA 8270C or 8270-SIM)											
	2-Methylnaphthalene	µg/Kg	R	24.4 UJ	NA	NA	34.3 U	208 U	73.2 U	200	--
	Acenaphthene	µg/Kg	160 J	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	300	--
	Acenaphthylene	µg/Kg	R	95.8 J	NA	NA	34.3 U	208 U	73.2 U	200	--
	Anthracene	µg/Kg	300 J	73.6 J	NA	NA	34.3 U	208 U	73.2 U	845	--
	Benzo(a)anthracene	µg/Kg	1100 J	280 J	NA	NA	17.6 J	208 U	73.2 U	1050	--
	Benzo(a)pyrene	µg/Kg	1100 J	75.4 UJ	NA	NA	34.3 U	893	73.2 U	1450	--
	Benzo(b)fluoranthene	µg/Kg	1800 J	NA	NA	NA	NA	NA	NA	--	--
	Benzo(g,h,i)perylene	µg/Kg	1700 J	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	300	--
	Benzo(k)fluoranthene	µg/Kg	500 J	NA	NA	NA	NA	NA	NA	13000	--
	Benzofluoranthenes[10]	µg/Kg	NA	350 J	NA	NA	73.8	790	553	--	--
	Chrysene	µg/Kg	1700 J	292 J	NA	NA	34.3 U	208 U	73.2 U	1290	--
	Dibenzo(a,h)anthracene	µg/Kg	R	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	1300	--
	Fluoranthene	µg/Kg	2200 J	372 J	NA	NA	48.1	412	234	2230	37000
	Fluorene	µg/Kg	130 J	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	536	--
	Indeno(1,2,3-cd)pyrene	µg/Kg	1100 J	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	100	--
	Naphthalene	µg/Kg	R	75.4 UJ	NA	NA	34.3 U	208 U	73.2 U	561	--
	Phenanthrene	µg/Kg	1200 J	135 J	NA	NA	26.7 J	139 J	110	1170	--
	Pyrene	µg/Kg	**2500** J	552 J	NA	NA	52	532	649	1520	1900
	Total PAHs[8]	µg/Kg	15490 J	2150 J	NA	NA	218.2 J	2766 J	1546	--	--
Phthalates (EPA 8270C or 8270-SIM)											
	Bis(2-ethylhexyl) phthalate (BEHP)	µg/Kg	**20000** J	**1050** J	NA	NA	**941**	**2200**	**1470**	800	330
	Butylbenzyl phthalate	µg/Kg	2500 J	377 UJ	NA	NA	1040 U	172 U	366 U	--	--
	Dibutyl phthalate	µg/Kg	**850** J	302 UJ	NA	NA	831 U	137 U	293 U	100	60
	Diethyl phthalate	µg/Kg	R	302 UJ	NA	NA	831 U	137 U	293 U	600	--
	Dimethyl phthalate	µg/Kg	3900 J	302 UJ	NA	NA	831 U	137 U	293 U	--	--
	Di-n-octyl phthalate	µg/Kg	1400 J	302 UJ	NA	NA	831 U	137 U	293 U	--	--
Semivolatile Organic Compounds (EPA 8081A or 8270-SIM)[11]											
	Dibenzofuran	µg/Kg	R	302 UJ	NA	NA	137 U	831 U	293 U	--	--
	Hexachlorobenzene	µg/Kg	1.4 U	302 UJ	NA	NA	137 U	831 U	293 U	100	19
	Hexachlorobutadiene	µg/Kg	2.9 U	302 UJ	NA	NA	137 U	831 U	293 U	600	--
	Hexachloroethane	µg/Kg	3.3 U	302 UJ	NA	NA	137 U	831 U	293 U	--	--

Notes:

J = Estimated value

N = Presumptive evidence of a compound

U = The analyte was not detected above the reported sample quantification limit

R = Rejected

NA = Not analyzed

ND = Not detected

-- = No JSCS screening level available.

µg/Kg = Micrograms per kilogram

mg/Kg = Milligrams per kilogram

Table 4
Basin 19 Inline Solids Sample Results:
Eastern Branch - NW Kittridge and NW Yeon Lines

			Downstream						Upstream		
			Whole Basin LWG Sample	NW Kittridge Main Line	Calbag Metals Lateral		North Private Line	South Private Line	NW Yeon		
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Class	**Analyte**	**Units**								**Toxicity**	**Bioaccumulation**

[1] JSCS = Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007)

[2] TOC analyzed using Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound; ASTM D4129-82M; EPA 415.1; or EPA 9060.

[3] Mercury analysis by EPA 7471A or WPCL SOP-M-10.01

[4] The toxicity SLV represents the sum of the 2,4' and 4,4' isomers

[5] Estimated Total DDx is the sum of DDE, DDD and DDT

[6] Alpha-Chlordane also is known as cis-Chlordane. Beta-Chlordane is also known as trans-Chlordane.

[7] Total Chlordane is the sum of alpha-, and beta-isomers.

[8] Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.

[9] Refer to Anchor and Integral, 2008, Portland Harbor RI/FS, Round 3A and 3B Stormwater Data Report, for individual congener results in the LWG sample. Refer to BES, 2009a, City Outfall Basin 19 Inline Solids Sampling at the Former Calbag Metals Site, for individual congener results in the City sample.

[10] Benzofluoranthenes include benzo(b)fluoranthene and benzo(k)fluoranthene.

[11] Additional SVOCs and VOCs that were analyzed in samples collected in 2003 are not listed; all results were ND.

= concentration exceeds JSCS Toxicity Screening Level Value.

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value.

Table 5
Basin 19 Inline Solids Sample Results:
Eastern Branch - Active Lines in NW St. Helens

Class	Analyte	Units	Downstream ---------->												Upstream		JSCS [1] Screening Level Values	
			Manhole AAT496 From Manhole FO031022 10/8/03	Manhole AAT427 From Manhole (Drains to AAT496) FO060544 05/02/06	Manhole AAT496 Incoming 30" Line from St Helens FO060543 05/02/06	Manhole AAT496 Incoming 30" Line from St Helens FO060553 (duplicate sample) 05/02/06	Catch Basin AMZ147 NW of PGE-FP (Drains to AAT496) FO060545 05/02/06	Catch Basin ANB320 NW of PGE-FP (Drains to AAT496) FO060546 05/02/06	Manhole AAT497 (Drains to AAT496) Outgoing 30" Line FO060547 05/02/06	Manhole AAT497 (Drains to AAT496) Incoming 30" Line FO060548 05/02/06	Manhole AAT498 (Drains to AAT497) Outgoing 30" Line FO060549 05/02/06	Manhole AAT498 (Drains to AAT497) Incoming 30" Line FO060550 05/02/06	Catch Basin ANB502 Adj. to PGE- FP (Drains to AAT498) FO060552 05/02/06	Catch Basin AMZ188 Adj. to Brazil FO060551 05/02/06	Catch Basin AMZ192 Adj. to Greenway FO070815 06/22/07	Catch Basin ANF207 Adj. to Greenway FO070816 06/22/07	Catch Basin AAT525 SE of Greenway FO070817 06/22/07	Toxicity	Bioaccumulation
Total Organic Carbon[2]																			
	TOC	%	0.667	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.64	6.4	5.42	--	--
Total Solids (EPA 160.3M or SM 2540G)																			
	TS	%	76	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49 (43.2)	68.8 (68.4)	34.6 (40.1)	--	--
Metals (EPA 6010/6020)																			
	Aluminum	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	Antimony	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56.7	3.84	3.68	64	--
	Arsenic	mg/Kg	**8.08**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.92	5.44	3.95	33	7
	Barium	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	Cadmium	mg/Kg	0.77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.57**	0.47	0.72	4.98	1
	Chromium	mg/Kg	63.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52.1	60.8	71.6	111	--
	Copper	mg/Kg	64.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	60.9	114	158	149	--
	Lead	mg/Kg	**27**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**111**	**128**	**140**	128	17
	Mercury[3]	mg/Kg	0.033	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.156**	**0.085**	**0.169**	1.06	0.07
	Nickel	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.1	31.8	31.9	48.6	--
	Selenium	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	2
	Silver	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.22	1.79	0.8	5	--
	Zinc	mg/Kg	208	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	438	307	458	459	--
Organochlorine Pesticides (EPA 8081A or 8082)																			
	2,4'-DDD	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	2,4'-DDE	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	2,4'-DDT	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	4,4'-DDD	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	4,4'-DDE	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	4,4'-DDT	ug/Kg	22.6 U	89.3 U	426 U	418 U	463 U	457 U	500 U	89.8 U	85.4 U	80.9 U	718 U	336 U	NA	NA	NA	--	--
	DDD[4]	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	31.3	0.33
	DDE[4]	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	28	0.33
	DDT[4]	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	62.9	0.33
	Estimated Total DDx[5]	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	--	0.33
	Aldrin	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	70.2	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	40	--
	alpha-Endosulfan	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	alpha-Hexachlorocyclohexane	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	beta-Endosulfan	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	beta-Hexachlorocyclohexane	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	alpha-Chlordane[6]	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	beta-Chlordane[6]	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	Total Chlordane[7]	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	17.6	0.37
	Chlordane (tech)	ug/Kg	U	2000 U	1910 U	1870 U	2070 U	2050 U	3210 U	2010 U	1910 U	1810 U	3210 U	1500 U	NA	NA	NA		
	cis-Nonachlor	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	delta-Hexachlorocyclohexane	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	Dieldrin	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	61.8	0.0081
	Endosulfan sulfate	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	--	--
	Endrin	ug/Kg	22.6 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	207	--
	Endrin aldehyde	ug/Kg	22.6 U	89.3 U	426 U	418 U	426 U	457 U	500 U	89.8 U	85.4 U	80.9 U	718 U	336 U	NA	NA	NA	--	--
	Endrin ketone	ug/Kg	22.6 U	89.3 U	426 U	418 U	426 U	457 U	500 U	89.8 U	85.4 U	80.9 U	718 U	336 U	NA	NA	NA	--	--
	gamma-Hexachlorocyclohexane	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	4.99	--
	Heptachlor	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	10	--
	Heptachlor epoxide	ug/Kg	11.3 U	89.3 U	85.3 U	83.7 U	92.6 U	91.3 U	100 U	89.8 U	85.4 U	80.9 U	144 U	67.2 U	NA	NA	NA	16	--
	Methoxychlor	ug/Kg	113 U	89.3 U	426 U	418 U	463 U	457 U	500 U	89.8 U	85.4 U	80.9 U	718 U	336 U	NA	NA	NA	--	--
	Mirex	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	oxy-Chlordane	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	Toxaphene	ug/Kg	1130 U	2670 U	2550 U	2500 U	2760 U	2730 U	2990 U	2680 U	2550 U	2410 U	4280 U	2000 U	NA	NA	NA	--	--
	trans-Nonachlor	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
Polychlorinated Biphenyls (PCBs) (EPA 8082)																			
	Aroclor 1016	ug/Kg	117 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15 U	530	--
	Aroclor 1221	ug/Kg	234 U	100 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	30 U	--	--
	Aroclor 1232	ug/Kg	117 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15 U	--	--
	Aroclor 1242	ug/Kg	117 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	21	15 U	--	--
	Aroclor 1248	ug/Kg	117 U	50 U	10 U	10 U	47	22	10 U	10 U	10 U	10 U	20	24	10 U	10 U	15 U	1500	--
	Aroclor 1254	ug/Kg	117 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15 U	300	--
	Aroclor 1260	ug/Kg	117 U	137	15	11	40	25	10 U	10 U	10 U	10 U	**29**	67	10 U	11	15 U	200	--
	Aroclor 1262	ug/Kg	NA	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15 U	--	--
	Aroclor 1268	ug/Kg	NA	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	15 U	--	--
	Total PCBs[8]	ug/Kg	ND	**137**	15	**11**	**87**	**47**	ND	ND	ND	ND	**49**	**91**	ND	**32**	ND	676	0.39

Table 5
Basin 19 Inline Solids Sample Results:
Eastern Branch - Active Lines in NW St. Helens

Class	Analyte	Units	Manhole AAT496 From Manhole FO031022 10/8/03	Manhole AAT427 From Manhole (Drains to AAT496) FO060544 05/02/06	Manhole AAT496 Incoming 30" Line from St Helens FO060543 05/02/06	Manhole AAT496 Incoming 30" Line from St Helens FO060553 (duplicate sample) 05/02/06	Catch Basin AMZ147 NW of PGE-FP (Drains to AAT496) FO060545 05/02/06	Catch Basin ANB320 NW of PGE-FP (Drains to AAT496) FO060546 05/02/06	Manhole AAT497 (Drains to AAT496) Outgoing 30" Line FO060547 05/02/06	Manhole AAT497 (Drains to AAT496) Incoming 30" Line FO060548 05/02/06	Manhole AAT498 (Drains to AAT497) Outgoing 30" Line FO060549 05/02/06	Manhole AAT498 (Drains to AAT497) Incoming 30" Line FO060550 05/02/06	Catch Basin ANB502 Adj. to PGE- FP (Drains to AAT498) FO060552 05/02/06	Catch Basin AMZ188 Adj. to Brazil FO060551 05/02/06	Catch Basin AMZ192 Adj. to Greenway FO070815 06/22/07	Catch Basin ANF207 Adj. to Greenway FO070816 06/22/07	Catch Basin AAT525 SE of Greenway FO070817 06/22/07	JSCS [1] Screening Level Values Toxicity	JSCS [1] Screening Level Values Bioaccumulation
			Downstream ---------->												**Upstream**				
Polynuclear Aromatic Hydrocarbons (EPA 8270C or 8270-SIM)																			
	2-Methylnaphthalene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	12	9.9	200	--
	Acenaphthene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	15	9.1	300	--
	Acenaphthylene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.8	10	4.4	200	--
	Anthracene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29	46	30	845	--
	Benzo(a)anthracene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	180	91	1050	--
	Benzo(a)pyrene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95	180	92	1450	--
	Benzo(b)fluoranthene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	250	130	--	--
	Benzo(g,h,i)perylene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	110	190	110	300	--
	Benzo(k)fluoranthene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39	93	37	13000	--
	Benzofluoranthenes[9]	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
	Chrysene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	280	130	1290	--
	Dibenzo(a,h)anthracene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22	36	24	1300	--
	Fluoranthene	ug/Kg	78.5 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	290	500	320	2230	37000
	Fluorene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	17	12	536	--
	Indeno(1,2,3-cd)pyrene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98	200	100	100	--
	Naphthalene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	87	24	17	561	--
	Phenanthrene	ug/Kg	79.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160	240	160	1170	--
	Pyrene	ug/Kg	111	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	280	390	230	1520	1900
	Total PAHs[8]	ug/Kg	189.5 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1680	2663	1506	--	--
Phthalates (EPA 8270C or 8270-SIM)																			
	Bis(2-ethylhexyl) phthalate (BEHP	ug/Kg	**549**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2500**	**2100**	**3800**	800	330
	Butylbenzyl phthalate	ug/Kg	399 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3900	1100	4600	--	--
	Dibutyl phthalate	ug/Kg	319 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	100	60
	Diethyl phthalate	ug/Kg	319 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	600	--
	Dimethyl phthalate	ug/Kg	319 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	250 J	200 U	410	--	--
	Di-n-octyl phthalate	ug/Kg	319 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	--	--
Semivolatile Organic Compounds (EPA 8081A or 8270-SIM)[10]																			
	Dibenzofuran (EPA 8270 SIM)	ug/Kg	319 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22	36	8.2	--	--
	Hexachlorobenzene	ug/Kg	120 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	100	19
	Hexachlorobutadiene	ug/Kg	120 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	600	--
	Hexachloroethane	ug/Kg	120 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	120 U	100 U	130 U	--	--

Notes:

J = Estimated value

U = The analyte was not detected above the reported sample quantification limit

NA = Not analyzed

ND = Not detected

-- = No JSCS screening level available.

ug/Kg = Micrograms per kilogram

mg/Kg = Milligrams per kilogram

[1] JSCS = Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007)

[2] TOC analyzed using Puget Sound Estuary Program (PSEP), Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound; ASTM D4129-82M; EPA 415.1; or EPA 9060.

[3] Mercury analysis by EPA 7471A or WPCL SOP-M-10.01

[4] The toxicity SLV represents the sum of the 2,4' and 4,4' isomers

[5] Estimated Total DDx is the sum of DDE, DDD and DDT

[6] Alpha-Chlordane also is known as cis-Chlordane. Beta-Chlordane also is known as trans-Chlordane.

[7] Total Chlordane is the sum of alpha-, and beta-isomers.

[8] Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.

[9] Benzofluoranthenes include benzo(b)fluoranthene and benzo(k)fluoranthene.

[10] Additional SVOCs and VOCs that were analyzed in samples collected in 2003 are not listed; all results were ND.

= concentration exceeds JSCS Toxicity Screening Level Value.

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value.

Table 6
Basin 19 Inline Solids Sample Results:
Eastern Branch - Abandoned Lines in NW St. Helens

Downstream ---------- Upstream

Class	Analyte	Units	From abandoned 6" line IL-19-6IN-1006-1 FO061296 10/11/06	From abandoned 6" line IL-19-6IN-1006-2 FO061297 10/11/06	From abandoned 6" line IL-19-6IN-1006-3 FO061298 10/11/06	From abandoned 12" line IL-19-12IN-1006-4 FO061299 10/11/06	JSCS[1] Screening Level Values Toxicity	JSCS[1] Screening Level Values Bioaccumulation
Organochlorine Pesticides (EPA 8081A)								
	2,4'-DDD	µg/Kg	NA	NA	NA	NA	--	--
	2,4'-DDE	µg/Kg	NA	NA	NA	NA	--	--
	2,4'-DDT	µg/Kg	NA	NA	NA	NA	--	--
	4,4'-DDD	µg/Kg	21	2.6 U	3.7	2.1 U	--	--
	4,4'-DDE	µg/Kg	49	5.2	8.4	2.1 U	--	--
	4,4'-DDT	µg/Kg	290	34	62	41	--	--
	DDD[2]	µg/Kg	**21**	ND	**3.7**	ND	31.3	0.33
	DDE[2]	µg/Kg	**49**	**5.2**	**8.4**	ND	28	0.33
	DDT[2]	µg/Kg	**290**	**34**	**62**	**41**	62.9	0.33
	Estimated Total DDx[3]	µg/Kg	**360**	**39.2**	**74.1**	**41**	--	0.33
	Aldrin	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	40	--
	alpha-Endosulfan	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	--	--
	alpha-Hexachlorocyclohexane	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	--	--
	beta-Endosulfan	µg/Kg	12 U	2.6 U	2.8 U	2.1 U	--	--
	beta-Hexachlorocyclohexane	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	--	--
	alpha-Chlordane[4]	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	--	--
	beta-Chlordane[4]	µg/Kg	5.8 U	1.3 U	1.4 U	2.8	--	--
	Total Chlordane[5]	µg/Kg	ND	ND	ND	**2.8**	17.6	0.37
	Chlordane (tech)	µg/Kg	NA	NA	NA	NA		
	cis-Nonachlor	µg/Kg	NA	NA	NA	NA	--	--
	delta-Hexachlorocyclohexane	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	--	--
	Dieldrin	µg/Kg	12 U	2.6 U	**9.2**	**12**	61.8	0.0081
	Endosulfan sulfate	µg/Kg	12 U	2.6 U	2.8 U	1.1 U	--	--
	Endrin	µg/Kg	12 U	2.6 U	2.8 U	2.1 U	207	--
	Endrin aldehyde	µg/Kg	28 U	2.6 U	2.8 U	9.6	--	--
	Endrin ketone	µg/Kg	48 U	2.6 U	2.8 U	27	--	--
	gamma-Hexachlorocyclohexane	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	4.99	--
	Heptachlor	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	10	--
	Heptachlor epoxide	µg/Kg	5.8 U	1.3 U	1.4 U	1.1 U	16	--
	Methoxychlor	µg/Kg	58 U	13 U	14 U	11 U	--	--
	Mirex	µg/Kg	NA	NA	NA	NA	--	--
	oxy-Chlordane	µg/Kg	NA	NA	NA	NA	--	--
	Toxaphene	µg/Kg	580 U	130 U	140 U	110 U	--	--
	trans-Nonachlor	µg/Kg	NA	NA	NA	NA	--	--
Polychlorinated Biphenyls (PCBs) (EPA 8082)								
	Aroclor 1016	µg/Kg	50 U	10 U	50 U	50 U	530	--
	Aroclor 1221	µg/Kg	100 U	20 U	100 U	100 U	--	--
	Aroclor 1232	µg/Kg	50 U	10 U	50 U	50 U	--	--
	Aroclor 1242	µg/Kg	50 U	10 U	50 U	50 U	--	--
	Aroclor 1248	µg/Kg	50 U	10 U	50 U	50 U	1500	--
	Aroclor 1254	µg/Kg	50 U	10 U	50 U	50 U	300	--
	Aroclor 1260	µg/Kg	515	187	771	679	200	--
	Aroclor 1262	µg/Kg	50 U	10 U	50 U	50 U	--	--
	Aroclor 1268	µg/Kg	50 U	10 U	50 U	50 U	--	--
	Total PCBs[6]	µg/Kg	**515**	**187**	**771**	**679**	676	0.39

Table 6
Basin 19 Inline Solids Sample Results:
Eastern Branch - Abandoned Lines in NW St. Helens

			Downstream ---------- **Upstream**					
			From abandoned 6" line IL-19-6IN-1006-1 FO061296 10/11/06	From abandoned 6" line IL-19-6IN-1006-2 FO061297 10/11/06	From abandoned 6" line IL-19-6IN-1006-3 FO061298 10/11/06	From abandoned 12" line IL-19-12IN-1006-4 FO061299 10/11/06	**JSCS[1] Screening Level Values**	
Class	**Analyte**	**Units**					**Toxicity**	**Bioaccumulation**

Notes:

U = The analyte was not detected above the reported sample quantification limit

NA = Not analyzed

ND = Not detected

-- = No JSCS screening level available.

µg/Kg = Micrograms per kilogram

[1] JSCS = Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007)

[2] The toxicity SLV represents the sum of the 2,4' and 4,4' isomers

[3] Estimated Total DDx is the sum of DDE, DDD and DDT

[4] Alpha-Chlordane also is known as cis-Chlordane. Beta-Chlordane is also known as trans-Chlordane.

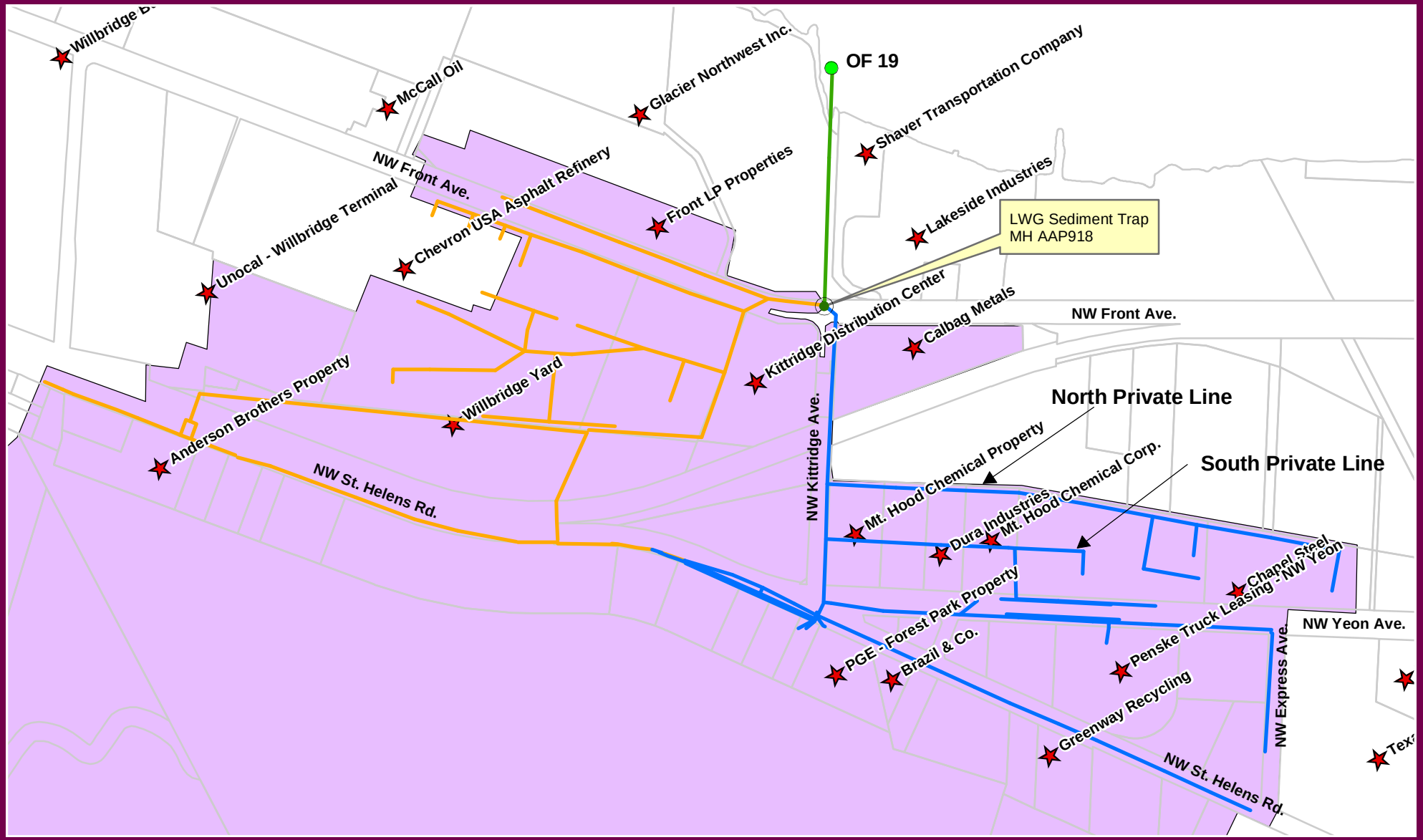
[5] Total Chlordane is the sum of alpha-, and beta-isomers.

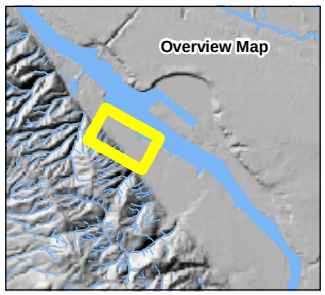
[6] Total PCBs are calculated by assigning "0" to undetected constituents.

= concentration exceeds JSCS Toxicity Screening Level Value.

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value.

Figures





Legend

- Basin 19
- To Outfall 19
- Eastern Branch
- Western Branch
- Taxlots
- DEQ Environmental Cleanup Sites
- City Outfall
- Manhole

0 250 500 1,000 Feet

N E S W

Figure 1
Outfall 19 Drainage Basin Overview

Source: City of Portland BES	Environmental Services, City of Portland, 1120 SW Fifth Avenue, Room 1000, Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 Overview	**Program Manager:** Dawn Sanders, Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 05/10/10 **Prepared by:** Corey Treacy

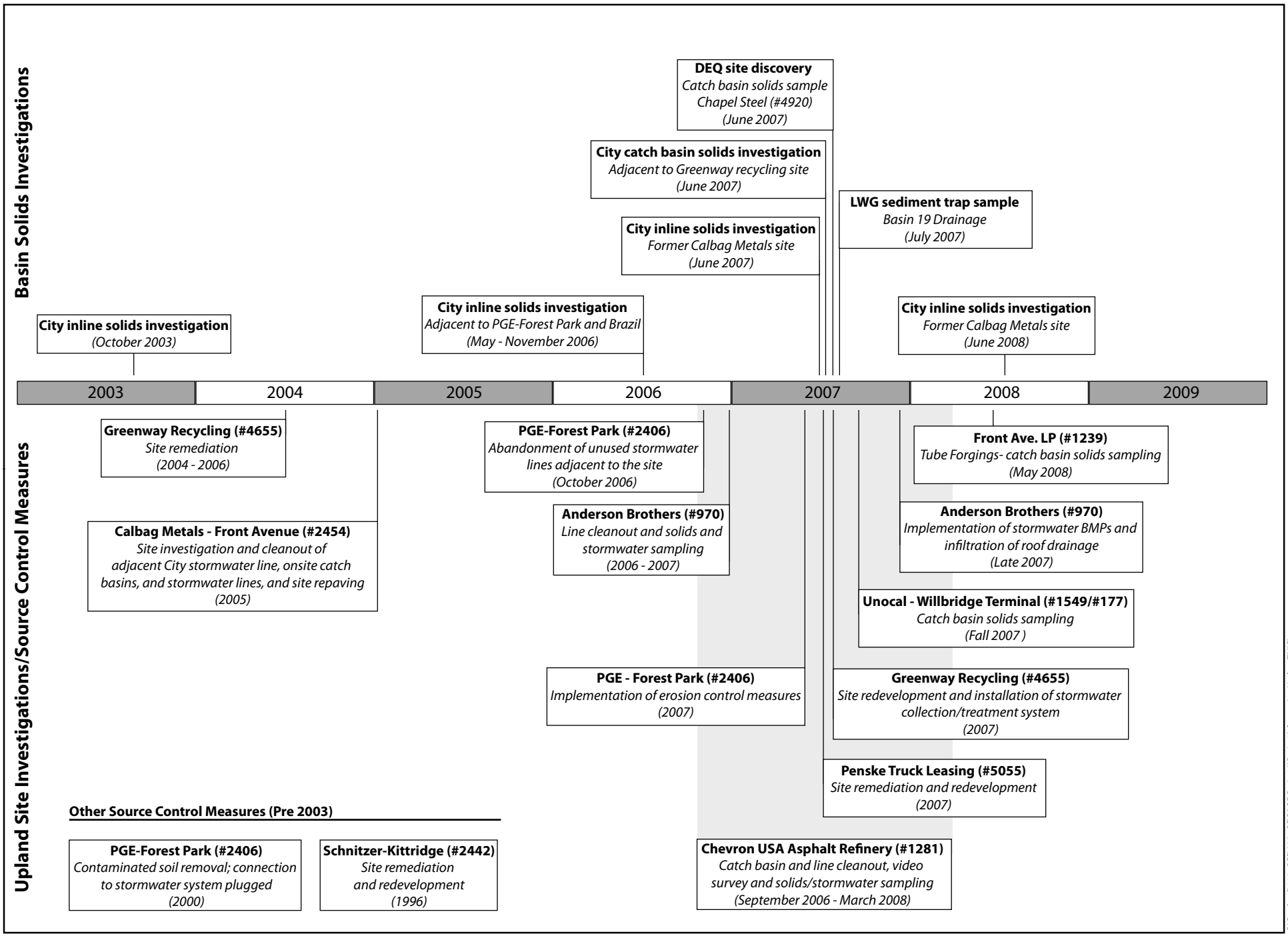
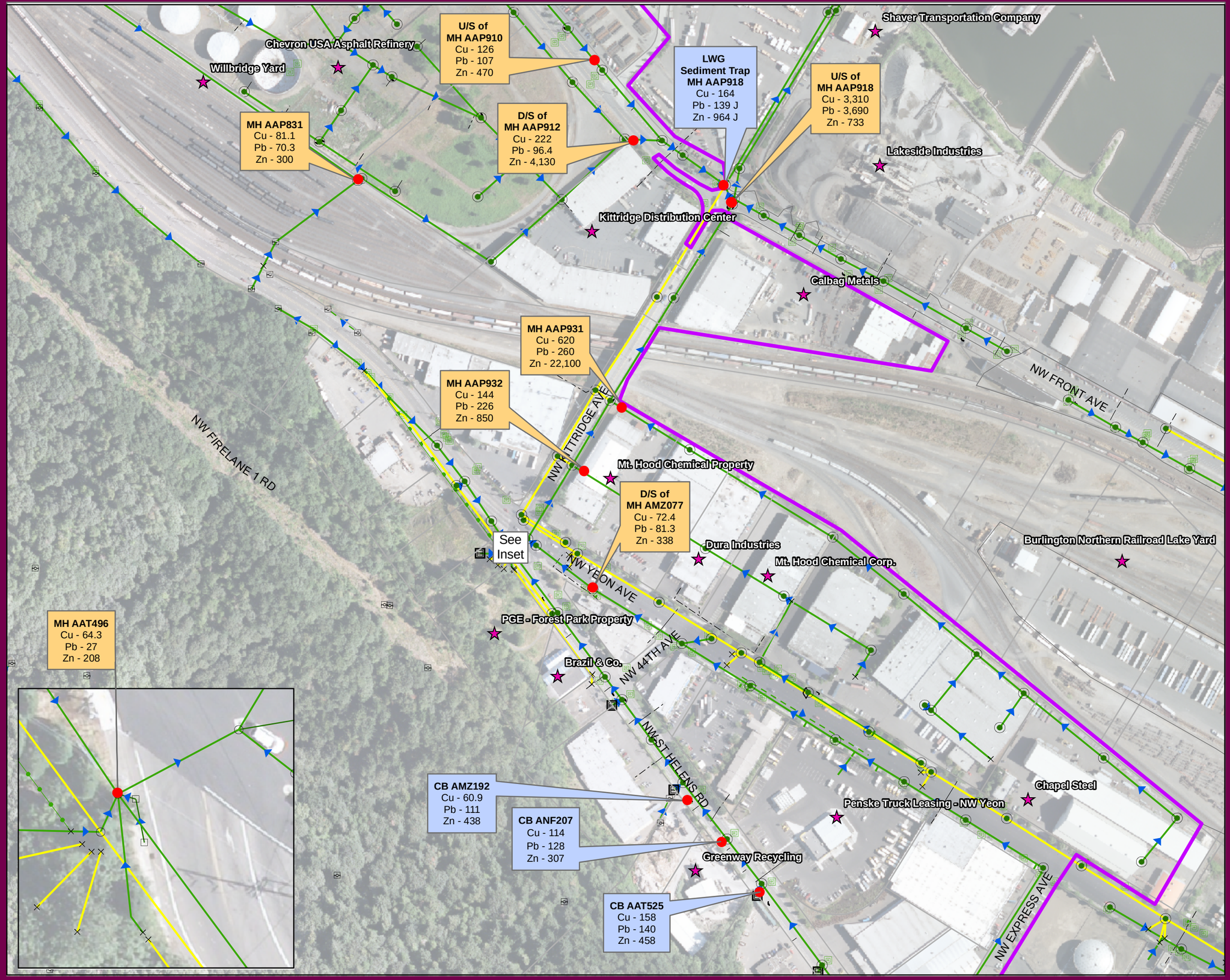


Figure 2. Timeline of Basin 19 Source Investigation/Control Measures



Legend

- Storm Line
- Manhole (MH)
- Lateral Line
- Storm Inlet (CB)
- Abandoned Line
- Trash Rack
- DEQ Environmental Cleanup Sites
- Sample Location
- Basin 19 Boundary
- Sampled 2003
- Sampled 2007

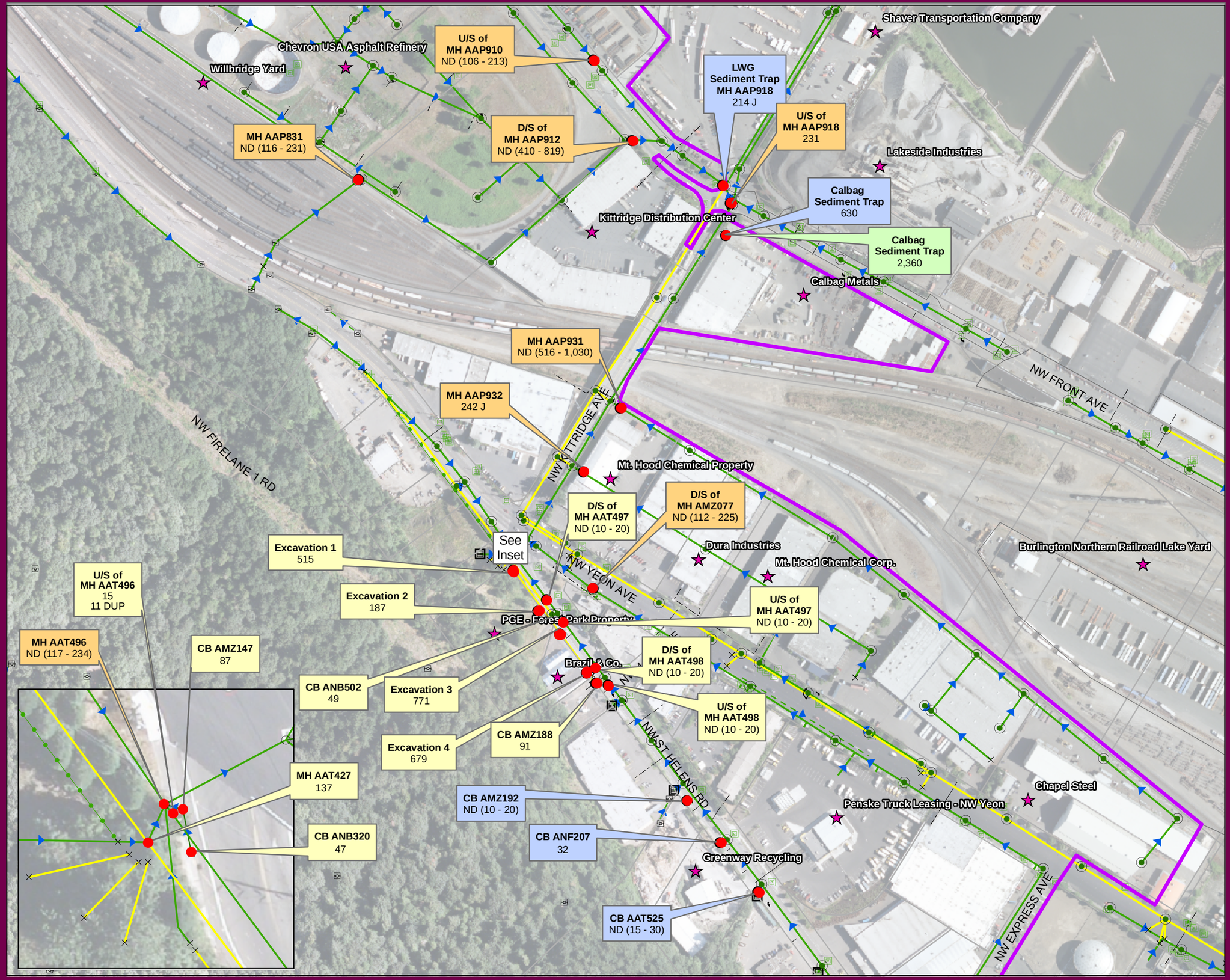
Notes: Results are shown in mg/Kg
ND = Non-detect
J = Estimated Value
U/S = Upstream
D/S = Downstream

N W E S

0 2,500 5,000 10,000 Feet

Figure 3
Basin 19 Inline Solids Metals (Cu, Pb, Zn)

Source: City of Portland 2009 Aerial	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 Metals.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 of 1	**Date Printed:** 06/14/10



Legend

- Storm Line
- Manhole (MH)
- Lateral Line
- Storm Inlet (CB)
- Abandoned Line
- Trash Rack
- DEQ Environmental Cleanup Sites
- Sample Location
- Basin 19 Boundary
- Sampled 2003
- Sampled 2006
- Sampled 2007
- Sampled 2008

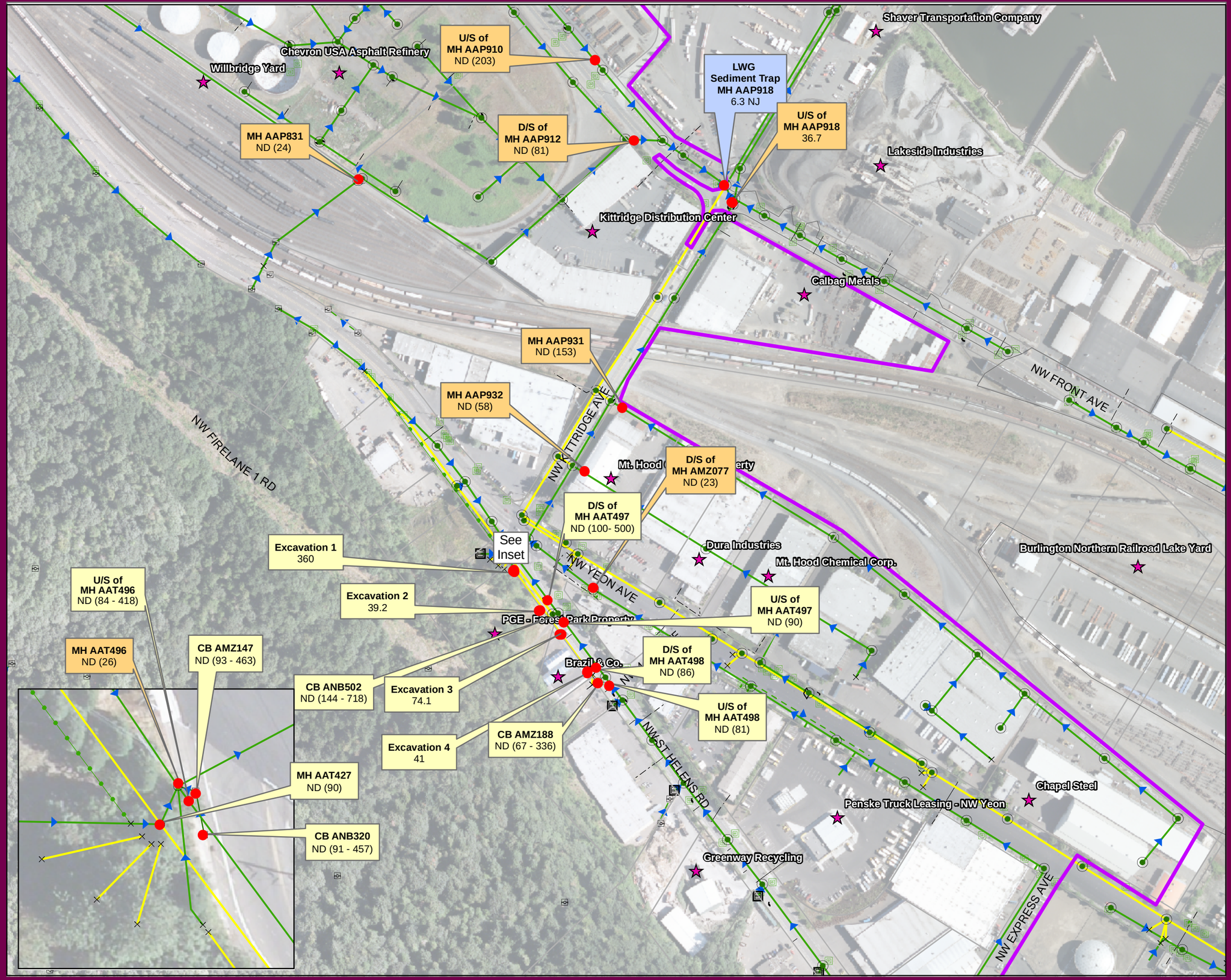
Notes: Results are shown in ug/Kg
ND = Non-detect
J = Estimated Value
U/S = Upstream
D/S = Downstream

N W E S

0 2,500 5,000 10,000 Feet

Figure 4
Basin 19 Inline Solids Total PCBs

Source: City of Portland 2009 Aerial	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 PCBs.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 of 1	**Date Printed:** 06/15/2010



Legend

- Storm Line
- Manhole (MH)
- Lateral Line
- Storm Inlet (CB)
- Abandoned Line
- Trash Rack
- DEQ Environmental Cleanup Sites
- Sample Location
- Basin 19 Boundary
- Sampled 2003
- Sampled 2006
- Sampled 2007

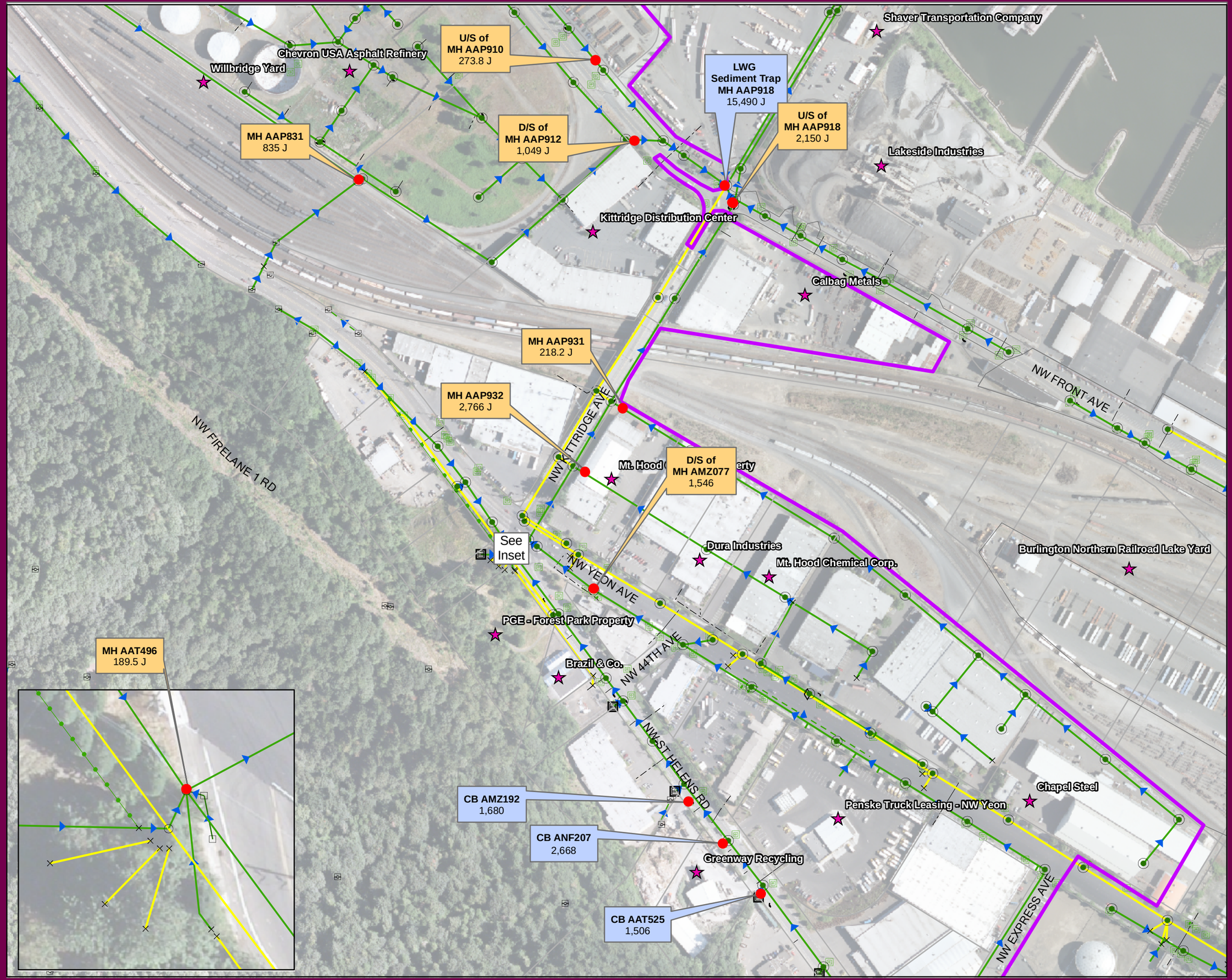
Notes: Results are shown in ug/Kg
ND = Non-detect
N = Presumptive evidence of a compound
J = Estimated Value
U/S = Upstream
D/S = Downstream

N W E S

0 2,500 5,000 10,000 Feet

Figure 5
Basin 19 Inline Solids Total DDx

Source: City of Portland 2009 Aerial	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 DDx.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 of 1	**Date Printed:** 06/14/2010



Legend

- Storm Line
- Manhole (MH)
- Lateral Line
- Storm Inlet (CB)
- Abandoned Line
- Trash Rack
- DEQ Environmental Cleanup Sites
- Sample Location
- Basin 19 Boundary
- Sampled 2003
- Sampled 2007

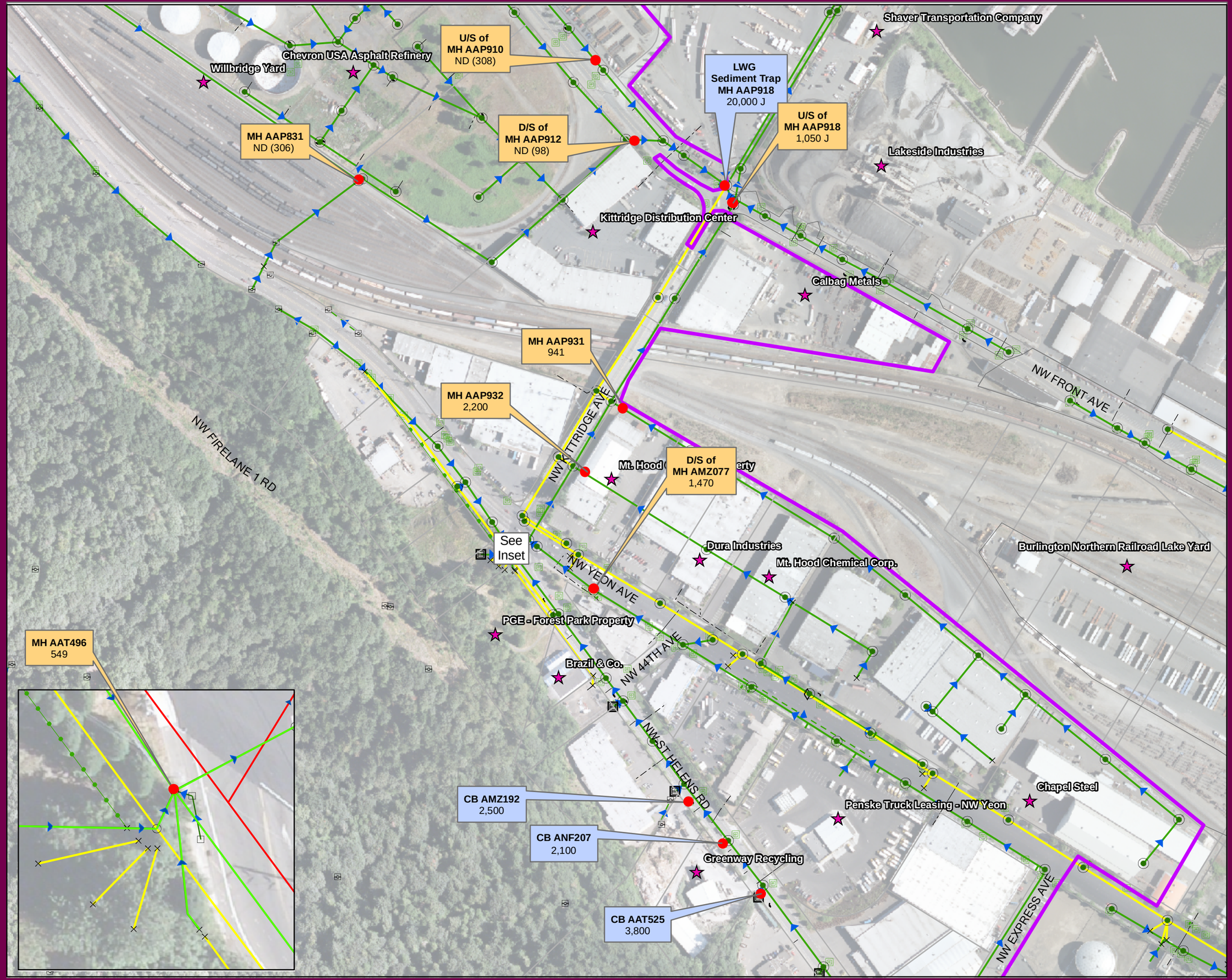
Notes: Results are shown in ug/Kg
ND = Non-detect
J = Estimated Value
U/S = Upstream
D/S = Downstream

N W E S

0 2,500 5,000 10,000 Feet

Figure 6
Basin 19 Inline Solids Total PAHs

Source: City of Portland 2009 Aerial	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 PAHs.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 of 1	**Date Printed:** 06/14/2010



Legend

- Storm Line
- Manhole (MH)
- Lateral Line
- Storm Inlet (CB)
- Abandoned Line
- Trash Rack
- DEQ Environmental Cleanup Sites
- Sample Location
- Basin 19 Boundary
- Sampled 2003
- Sampled 2007

Notes: Results are shown in ug/Kg
ND = Non-detect
J = Estimated Value
U/S = Upstream
D/S = Downstream

N W E S

0 2,500 5,000 10,000 Feet

Figure 7
Basin 19 Inline Solids Total BEHP

Source: City of Portland 2009 Aerial	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\GIS\Corey Maps\OF 19 BEHPs.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 of 1	**Date Printed:** 06/14/2010

APPENDIX A

Outfall 19 Inline Sediment Investigation Data Report

Outfall 19 Inline Sediment Investigation Data Report

PREPARED FOR: Dawn Sanders/City of Portland

PREPARED BY: CH2M HILL

DATE: July 30, 2004

1.0 Introduction

This memo presents a summary of field activities, field observations, and analytical data associated with the October 2003 inline solids investigation conducted by the City of Portland (City) Bureau of Environmental Services (BES) in stormwater drainage basin 19. Pursuant to the September 18, 2003, verbal approval given by the Oregon Department of Environmental Quality (DEQ) (personal communication between Rod Struck of DEQ and Dawn Sanders of BES, October 6, 2003), the City collected inline solids samples in Basin 19 between October 7 and October 9, 2003.

The inline solids investigation in Basin 19 was intended to evaluate the nature and extent of environmental contamination that may enter or has entered the City's stormwater conveyance system, and thus potentially affect sediment quality in the Willamette River. The purpose of the investigation was to identify subbasins with substantially higher concentrations of chemicals that indicate further investigation of upland sources is warranted within that subbasin.

Sampling was conducted in accordance with the *Sampling and Analysis Plan – Inline Solids in Basins M-1 and 18* (SAP) (CH2M HILL, August 2003). Sampling locations were selected to characterize subbasins that may require additional source investigation. Figure A-1 shows the locations that were chosen. Inline solids samples were collected during no-flow or low-flow conditions, and sampling was not conducted in areas where standing river water (resulting from high river stages) had backed up the stormwater line. Samples were collected from eight locations and analyzed for total metals (arsenic, cadmium, chromium, copper, lead, mercury, and zinc), polynuclear aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPHs), pesticides, and total organic carbon (TOC). The City of Portland Water Pollution Control Laboratory analyzed samples for metals, PAHs, and TPHs and contracted all other analyses to Severn Trent Laboratories (STL). Laboratory methods and target detection limits were presented in the SAP.

2.0 Inline Solids Investigation

This section presents field observations noted during inline solids sampling and data results of inline solids samples collected by the City in Basin 19 between October 7, 2003, and October 9, 2003.

2.1 Field Observations

Field observations for Basin 19 are presented in Table A-1. The table includes the sample identification (ID) number and entrance node (manhole) location, upstream subbasin, solids description, and comments. Observations for each sample were recorded by a representative of CH2M HILL in a field notebook (Attachment A) and by a representative of the City on field data sheets (Attachment B). Photographs of sample locations are shown in Attachment C.

2.2 Data Results

Data results are summarized in Table A-2 of this memorandum. Corresponding laboratory data sheets and a data validation report are presented in Attachments D and E, respectively. Samples were analyzed according to the SAP with the following exceptions:

- Results were reported for more metals than originally requested in four of the samples collected because the City metals analyst noticed detections of barium, selenium, and silver in the samples.
- Targeted detection limits were not achieved for PAHs, pesticides, PCBs, SVOCs, and TPH. Laboratory narratives indicate detection limits were not achieved because of matrix interferences and/or nonhomogeneity. Some pesticide samples required dilutions of 100 times.

TABLE A-1
Basin 19 Inline Solids Sampling Observations

Sample ID/ Location	Upstream Subbasin	Solids Description	Comments
IL-19-AAP910-1003 5200 NW Front Avenue	1	WELL-GRADED SAND WITH GRAVEL, dark gray, little or no silt, 10 percent rounded gravel up to ½ inch in diameter	Sample collected 0 to 2 feet upstream of AAP910. No standing or flowing water at sample location. Light sheen observed on sample. Minor (<< 1 percent) anthropomorphic debris observed (green and white paint chips).
IL-19-AAP0912-1003 2100 NW Front Avenue	2	SILT, brown, cohesive-silt formed 1/8-inch balls when scraped from stormwater line	Sample collected 0 to 14 feet downstream of node. Groundwater observed entering stormwater inline 15 feet downstream of node. Black slime observed around line juncture where groundwater was entering the line. The sample was collected upstream of where the groundwater was entering.
IL-19-AAP831-1003 Chevron Asphalt	2B	WELL-GRADED SAND AND GRAVEL, brown, 50 percent angular gravel up to 2 inches in diameter, < 5 percent silt	Sample collected at node. The node is a 5-foot-by-5-foot-square catch basin. Minor (<< 1 percent) amount of anthropomorphic debris (metal screw, metal flakes, glass pieces). Minor (< 1 percent) amount of organic debris (leaves, twigs, small pieces of wood). No sheen or odor observed.
IL-19-AAP918-1003 NW Kittridge and Front Avenue	3	GRAVEL WITH SAND, brown, 1/8- to 2-inch_diameter, angular, 50 percent sand, no silt	Sample collected 20 to 22 feet upstream of AAP918. Water flowing in channels between sediment. A flow rate could not be determined. Minor (<< 1 percent) anthropomorphic debris observed (metal shavings up to ½ inch long, small glass pieces). Minor (< 1 percent) organic debris observed (twigs).
IL-19-AAP931-1003 4488 NW Yeon Avenue	3A	Groundwater precipitate, orange-brown	Sample collected in an 18-inch-diameter private line that enters node AAP931 from the south. Solids approximately 1/8 inch thick at sample location. Small volume recovered (approximately 8 ounces). Two full jars and one half-full jar submitted to laboratory for analysis for metals, semivolatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). No debris or sheen observed in sample.
IL-19-AAP932-1003 4488 NW Yeon Avenue	3B	80 percent root matter, 20 percent silt	Sample collected in an 18-inch-diameter private line that enters node AAP932 from the south. A thick mat of living roots approximately 2 inches thick covered the bottom of the 18-inch-diameter line and trapped silt in the line. No odor or sheen observed. Removed larger root debris from sample. ½ inch of standing water at sample location.
IL-19-AAZ077-1003 4465 NW Yeon Avenue	3C	WELL-GRADED SAND, gray with white grains, medium grain	Sample collected 0 to 2 feet downstream of node. No odor or debris observed. Light sheen observed on sample.
IL-19-AAT496-1003 NW St. Helens Road and Yeon Avenue	3D	SAND WITH GRAVEL, brown, 50 percent gravel up to 1 inch in diameter, < 5 percent silt	Sample collected 0 to 2 feet upstream of node in 36-inch-diameter line. No odor, debris, or sheen observed.

TABLE A-2
Analytical Results from Outfall 19 Inline Solids Samples Taken October 8, 2003

Class/Analyte	Units	IL-19-AAP831-1003	IL-19-AAP910-1003	IL-19-AAP912-1003	IL-19-AAP918-1003	IL-19-AAP931-1003	IL-19-AAP932-1003	IL-19-AAT496-1003	IL-19-AMZ077-1003
General Chemistry:									
Total Organic Carbon	mg/kg	5,760	10,300	25,900	3,930	36,900	82,700	6,670	8,660
Total Metals:									
Arsenic	mg/kg	29	6.0	465	12	137	67	8.1	4.4
Barium	mg/kg	--	--	2,740	228	3,950	324	--	--
Cadmium	mg/kg	1.1	1.2	18	1.2	95	2.6	0.77	0.75
Chromium	mg/kg	36	52	49	262	97	73	63	66
Copper	mg/kg	81	126	222	3,310	620	144	64	72
Lead	mg/kg	70	107	96	3,690	260	226	27	81
Mercury	mg/kg	0.050	0.046	0.38	0.92	0.35	0.28	0.033	0.047
Selenium	mg/kg	--	--	2.2	1.0 U	4.4	1.0	--	--
Silver	mg/kg	--	--	0.21	35	77	145	--	--
Zinc	mg/kg	300	470	4,130	733	22,100	850	208	338
PCBs:									
Aroclor-1016	µg/kg	116 U	106 U	410 U	110 U	516 U	329 U	117 U	112 U
Aroclor-1221	µg/kg	231 U	213 U	819 U	220 U	1,030 U	657 U	234 U	225 U
Aroclor-1232	µg/kg	116 U	106 U	410 U	110 U	516 U	329 U	117 U	112 U
Aroclor-1242	µg/kg	116 U	106 U	410 U	110 U	516 U	329 U	117 U	112 U
Aroclor-1248	µg/kg	116 U	106 U	410 U	110 U	516 U	329 U	117 U	112 U
Aroclor-1254	µg/kg	116 U	106 U	410 U	110 U	516 U	329 U	117 U	112 U
Aroclor-1260	µg/kg	116 U	106 U	410 U	231	516 U	242 J	117 U	112 U
Estimated Total PCBs[1,5]	µg/kg	--	--	--	231	--	242	--	--
Pesticides:									
4,4'-DDD	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
4,4'-DDE	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
4,4'-DDT	µg/kg	24 U	203 UJ	81 U	37	153 U	58 U	23 U	23 U
Estimated Total DDTs[1,6]	µg/kg	--	--	--	37	--	--	--	--
4,4'-Methoxychlor	µg/kg	119 U	1,020 UJ	406 U	112 U	766 U	288 U	113 U	114 U
Aldrin	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Alpha-BHC	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
beta-BHC	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Chlordane	µg/kg	12 U	102 UJ	41 U	11 U	77 U	38	11 U	11 U
cis-Chlordane	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
delta-BHC	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Dieldrin	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Endosulfan I	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Endosulfan II	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Endosulfan Sulfate	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Endrin	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Endrin Aldehyde	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Endrin Ketone	µg/kg	24 U	203 UJ	81 U	22 U	153 U	58 U	23 U	23 U
Heptachlor	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Heptachlor Epoxide	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Lindane	µg/kg	12 U	102 UJ	41 U	11 U	77 U	29 U	11 U	11 U
Toxaphene	µg/kg	1,190 U	10,200 UJ	4,060 U	1,120 U	7,660 U	2,880 U	1,130 U	1,140 U

TABLE A-2
Analytical Results from Outfall 19 Inline Solids Samples Taken October 8, 2003

Class/Analyte	Units	IL-19-AAP831-1003		IL-19-AAP910-1003		IL-19-AAP912-1003		IL-19-AAP918-1003		IL-19-AAP931-1003		IL-19-AAP932-1003		IL-19-AAT496-1003		IL-19-AMZ077-1003	
Semivolatile Organic Compounds:																	
1,2,4-Trichlorobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
1,2-Dichlorobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
1,3-Dichlorobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
1,4-Dichlorobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,4,5-Trichlorophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,4,6-Trichlorophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,4-Dichlorophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,4-Dimethylphenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,4-Dinitrophenol	µg/kg	1,530	U	1,540	U	488	U	1,510	UJ	686	U	4,150	U	1,600	U	1,460	U
2,4-Dinitrotoluene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2,6-Dinitrotoluene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2-Chloronaphthalene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
2-Chlorophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2-Methylphenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2-Nitroaniline	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
2-Nitrophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
3&4-Methylphenol	µg/kg	612	U	615	U	195	U	603	UJ	274	U	1,660	U	638	U	585	U
3,3'-Dichlorobenzidine	µg/kg	612	U	615	U	195	U	603	UJ	274	U	1,660	U	638	U	585	U
3-Nitroaniline	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4,6-Dinitro-2-Methylphenol	µg/kg	1,530	U	1,540	U	488	U	1,510	UJ	686	U	4,150	U	1,600	U	1,460	U
4-Bromophenyl Phenyl Ether	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4-Chloro-3-Methylphenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4-Chloroaniline	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4-Chlorophenyl Phenyl Ether	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4-Nitroaniline	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
4-Nitrophenol	µg/kg	764	U	769	U	244	U	754	UJ	343	U	2,080	U	798	U	732	U
Benzoic Acid	µg/kg	1,530	U	1,540	U	488	U	1,510	UJ	686	U	4,150	U	1,600	U	1,460	U
Benzyl Alcohol	µg/kg	382	U	385	U	122	U	377	UJ	172	U	1,040	U	399	U	366	U
Bis(2-Chloroethoxy) Methane	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Bis(2-Chloroethyl) Ether	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Bis(2-Chloroisopropyl) Ether	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Bis(2-Ethylhexyl) Phthalate	µg/kg	306	U	308	U	98	U	1,050	J	941		2,200		549		1,470	
Butyl Benzyl Phthalate	µg/kg	382	U	385	U	122	U	377	UJ	172	U	1,040	U	399	U	366	U
Di-n-Butyl Phthalate	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Di-n-Octyl Phthalate	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Dibenzofuran	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Diethyl Phthalate	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Dimethyl Phthalate	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Hexachlorobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Hexachlorobutadiene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Hexachlorocyclopentadiene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Hexachloroethane	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Isophorone	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
n-Nitrosodi-n-Propylamine	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
n-Nitrosodiphenylamine	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Nitrobenzene	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Pentachlorophenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U
Phenol	µg/kg	306	U	308	U	98	U	302	UJ	137	U	831	U	319	U	293	U

TABLE A-2
Analytical Results from Outfall 19 Inline Solids Samples Taken October 8, 2003

Class/Analyte	Units	IL-19-AAP831-1003		IL-19-AAP910-1003		IL-19-AAP912-1003		IL-19-AAP918-1003		IL-19-AAP931-1003		IL-19-AAP932-1003		IL-19-AAT496-1003		IL-19-AMZ077-1003	
LPAHs:																	
2-Methylnaphthalene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
Acenaphthene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
Acenaphthylene	µg/kg	76	U	77	U	14	J	96	J	34	U	208	U	80	U	73	U
Anthracene	µg/kg	40	J	77	U	13	J	74	UJ	34	U	208	U	80	U	73	U
Fluorene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
Naphthalene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
Phenanthrene	µg/kg	76	U	64	J	27		135	J	27	J	139	J	80	U	110	
HPAHs:																	
Benzo (a) anthracene	µg/kg	76	U	77	U	91		280	J	18	J	208	U	80	U	73	U
Benzo (a) pyrene	µg/kg	76	U	77	U	62		75	UJ	34	U	893		80	U	73	U
Benzo (g,h,i) perylene	µg/kg	76	U	77	U	188		75	UJ	34	U	208	U	80	U	73	U
Benzofluoranthenes	µg/kg	539		77	U	271		350	J	74		790		80	U	553	
Chrysene	µg/kg	76	U	77	U	67		292	J	34	U	208	U	80	U	73	U
Dibenzo (a,h) anthracene	µg/kg	76	U	77	U	24	U	75	UJ	34	U	208	U	80	U	73	U
Fluoranthene	µg/kg	131		86		88		372	J	48		412		79	J	234	
Indeno (1,2,3-cd) pyrene	µg/kg	76	U	77	U	146		75	UJ	34	U	208	U	80	U	73	U
Pyrene	µg/kg	125		124		82		552	UJ	52		532		111		649	
Estimated Total LPAHs[1,2]	µg/kg	40		64		54		304		27		139		--		110	
Estimated Total HPAHs[1,3]	µg/kg	795		210		995		1846		192		2627		190		1436	
Estimated Total PAHs[1,4]	µg/kg	835		274		1049		2150		218		2766		190		1546	
TPH - Dx:																	
Diesel by Dx	mg/kg	25	U	250	U	125	U	25	U	150	U	100	U	25	U	50	U
Fuel Oil, #6	mg/kg	50	U	500	U	250	U	50	U	300	U	396		231		100	U
Kerosene	mg/kg	25	U	250	U	125	U	25	U	150	U	100	U	25	U	50	U
Motor Oil	mg/kg	207		1,260		608		641		1,560		1,930		980		1,010	

Notes:

[1] Total parameters (LPAHs, HPAHs, PAHs, PCBs, and DDTs) were calculated based on detections only. Qualifiers are not included on total parameters as it is implied that these are estimated quantities.

[2] Total LPAHs: Includes naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, and 2-methylnaphthalene.

[3] Total HPAHs: Includes fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzofluoranthenes, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[ghi]perylene.

[4] Total PAHs: Represents the sum of Total LPAHs and HPAHs.

[5] Total PCBs: Includes all aroclors.

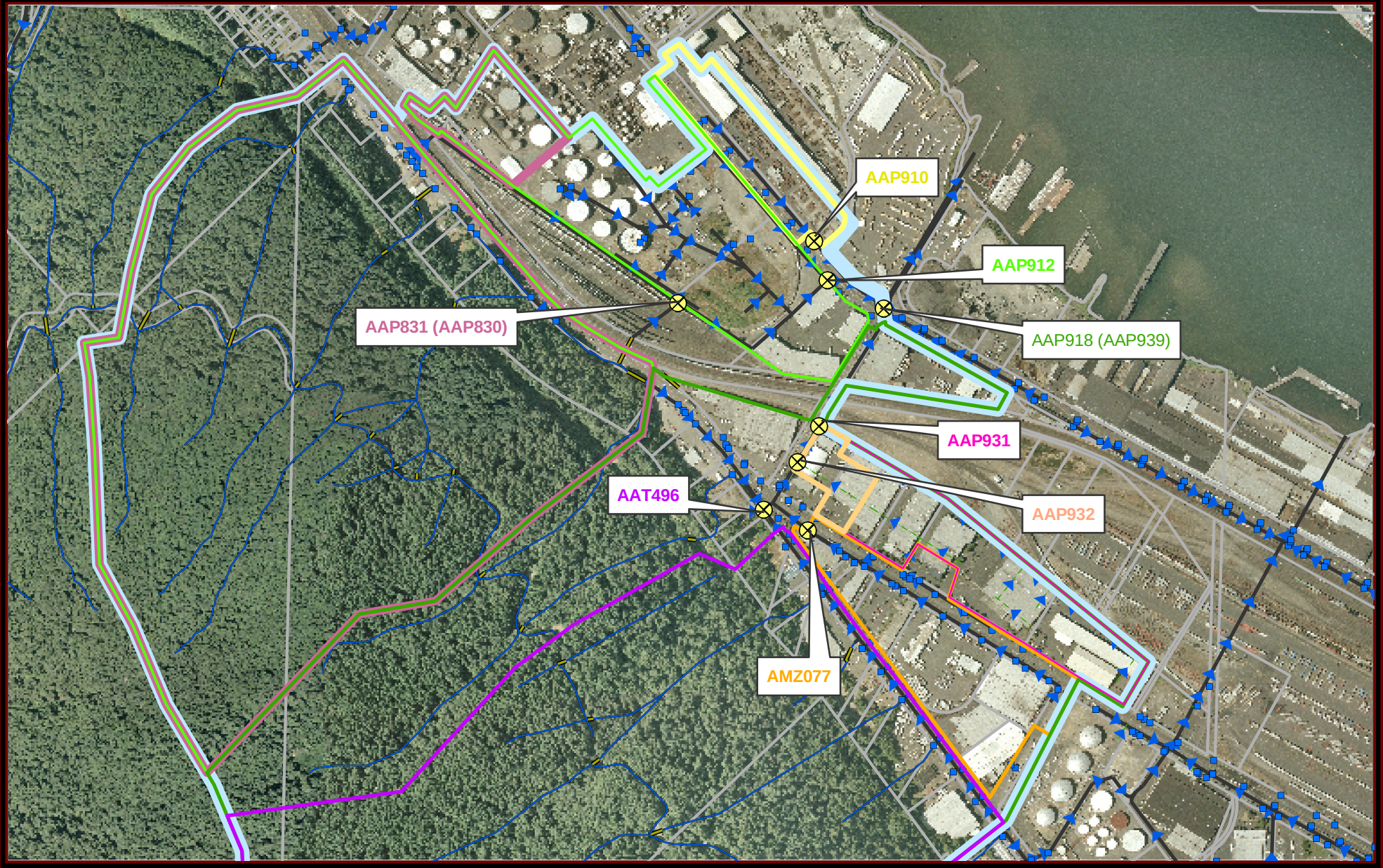
[6] Total DDTs: Sum of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.

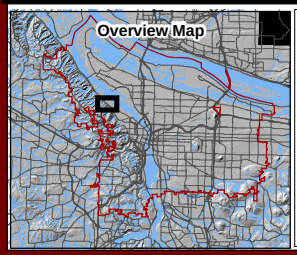
Abbreviations/Definitions:

--	Not available or applicable
HPAH	high molecular weight polycyclic aromatic hydrocarbons
LPAH	low molecular weight polycyclic aromatic hydrocarbons
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
NA	Not analyzed
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
TPH	total petroleum hydrocarbon

Qualifiers:

J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but the analyte was not detected above the reported sample quantitation limit.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.





Legend

- Sample Points
- Subbasin 1
- Subbasin 2
- Subbasin 2A
- Subbasin 3
- Subbasin 3A
- Subbasin 3B
- Subbasin 3C
- Subbasin 3D
- Storm Pipe
- Storm Inlets
- Ditch
- 19 Basin Area

Figure A-1

Outfall 19 Drainage Basin
In-line Sampling Locations

0 250 500 1,000 Feet

N W E S

City of Portland
Program Manager:
Dawn Sanders, Portland Harbor Superfund

Source: s:\gis\phase1_report\figureA1.mxd

Sheet No. 1 OF 1

Date Printed: 05/06/04

PDX/042100013.PDF

ATTACHMENT A

Field Notes

182032. SC. 15

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

LEVEL

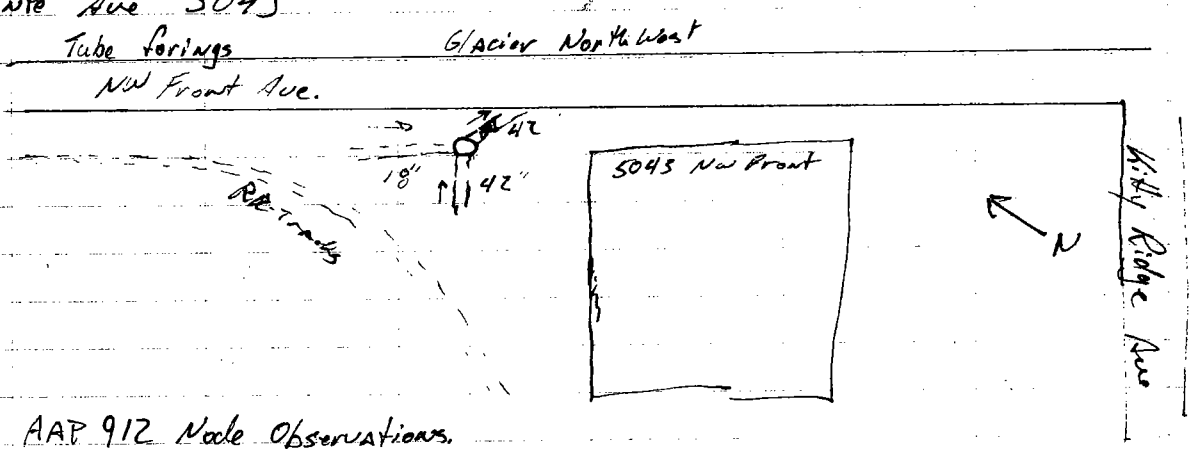
All-Weather Maxi-Spiral
No. 313-MX

Portland BES - Source Control
Portland OR
CH2M HILL (503) 235-5000
August 12, 2003 —

10-7-2003
BES Source Control In line Solids Sampling Basin 19

9:00 On Site: D. Lacey/CH2M Michael Hauser/BES Craig/BES
Weather: Sunny 60°F.
Note: Heavy rain on 10-6-03 P.M.
Objective: Collect inline solids samples from Basin 19.
Starting at AAP 912

910 Mobilize to AAP 912
Fronte Ave 5043



AAP 912 Node Observations.

- Two lines enter 18" from NW
  42" from ~~SE~~ SW
- One line exits 42" to the ~~West~~ East
- 5" Standing water at pooled at the node, Solids at Node
- 1/8" solids in 42" downstream line. 1/2" deep water, flowing at 1 ft/sec ≈ 5 gpm. Solids extend at least 60 feet. Minor solid in SW line
- Minor Iron Oxide staining in lines.

Grab Collect Sample IL-19-AAP912-1003
- Sample collected 0 to 15-ft from node
- No sheen on water, no odor
- Silt, Brown, <1% SAND, 50% water, Silt cohesive, small 1/8" balls.

Photographs 1, 2 from downstream 42" line.

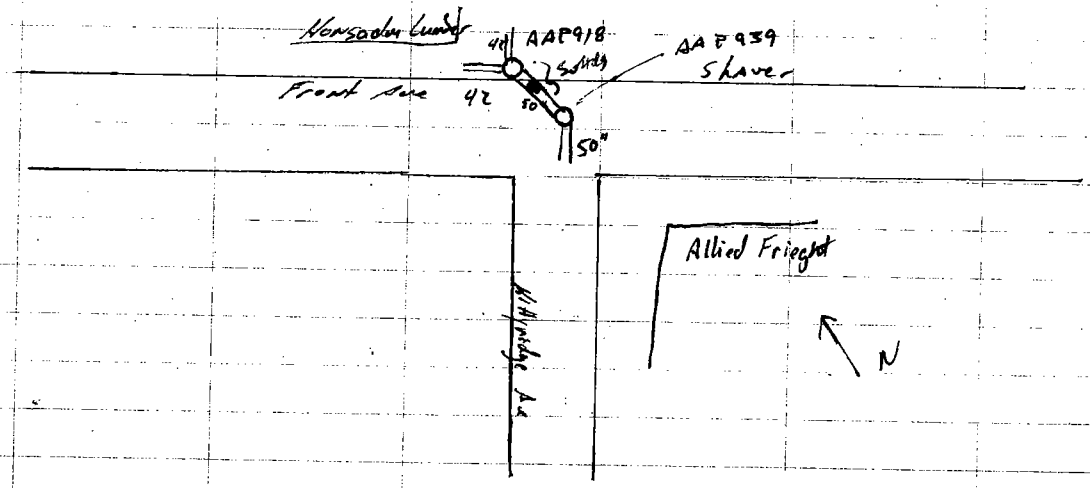
Note: Groundwater entering line 15-ft downstream of node.
sample collected upstream of groundwater intrusion. A black slime was observed around the groundwater intrusion at a pipe seam.

10-7-2003

BES - Source Control Inline Sampling Basin 19

1010 Mobilize to Node AAP 939

Flow meter and stormwater sampler at this Node location. - BES



AAP 939 Observations

- Entered at AAP 918 to avoid street closer.
- Sediment observed in South line
- Sample collected
- 2" of flowing water above sediment

Sample AAP 918

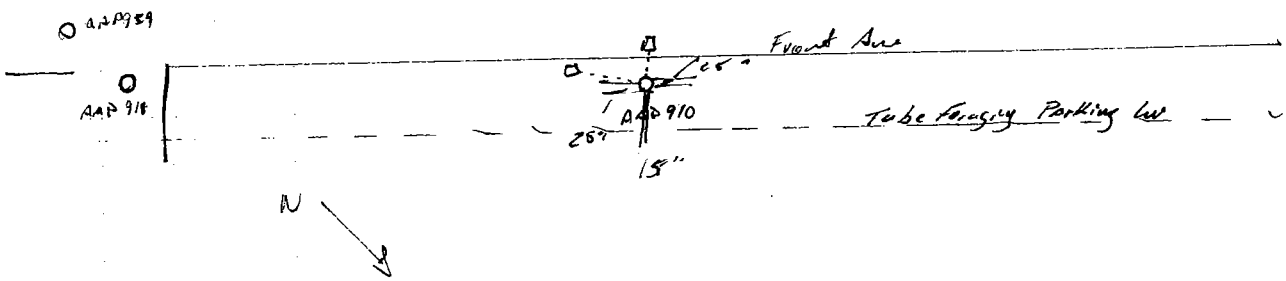
- Sediment extend 0 to at least 20-feet
- Sample collected from 20 to 22-feet
- Water flowing in channel through sediment, can not determine flow rate.
- Gravel with sand, Brown, 1/8" to 2". Angular
  50% sand, No silt.
- No sheen or odor
- Debris metal shavings up to 1/2 diameter, broken glass <1%
- Organic debris - twigs, <1%

- No solids in 42" upstream pipe
- Solids do not appear to be from 42" downstream line.
  Sample crew (Mike) said that under flood storm flow conditions a significantly larger amount of water comes from the 50" line.

1105 Investigate line layout and solids at node AAP 959.

- One 50" line enters from the southwest. Ten inches of standing water at node and southwest line. The solids extent approximately 60 feet from AAP 918. Water is dammed behind the solids. At the start of the solids are finer i.e. more sand. A sample could not be collected because of the depth of standing water. No other sampling equipment other than stainless steel scoop available.

1130 Kirkpatrick Mobilize to ~~AAP 918~~ AAP 910



AAP 910 Node Observations

- One line enters from the northwest - 25"
- One line exist to the southeast - 25"
- No flow at node. Bottom of line moist, no ~~ox~~ iron oxid staining
- 2nd line enters from the northeast 15"
- Band of solids in 25" upstream line. No solids in downstream or 15" lines.
- Solids - sand, gravel 3/4" deep 0 to 5 feet upstream

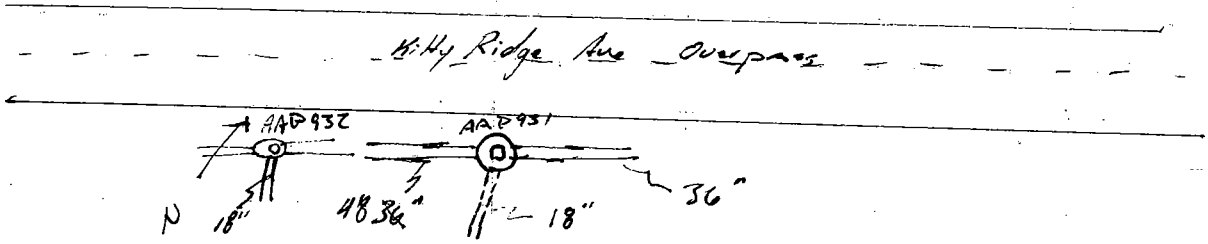
Sample IL-19-AAP910-1003

- & Well Graded SAND with Gravel, little or no silt. Gravel 10% up to 1/2" diameter. Rounded
- No standing water
- Sample collected 0 to 2-ft upstream
- No iron oxide staining.
- ~~No debris~~, light sheen. Minor amount of paint chips <<1%, green and white

10-7-03

RES - Source Control Inline Solids Sampling BASIN 19

1305 Mobilize to AAP 931



AAP 931 Node Observations

- Two line enter one from the south and one from the southwest.
- Approximately 5 gpm flow from south line. Water clean. line stained orange.
- Solids in 18" line. Orange brown color
- ½" flowing water

Sample IL-19-AAP931-1003

- Orange Brown ppt precipitate on bottom of line ⅛" thick
- Scraped pipe only small amount of solids in line
- Sample volume adiquate for metals, SVOCs, PCBs only.
- Sample collected from 0 to 2-ft upstream of node in 18" line.

1350 Mobilize to AAP 932

See above

AAP932 Node Observations

- Two lines enter one from the south and one from the southwest.
- No solids in main line
- 1 gpm from southwest line
- No ½" standing water in south line
- Root matter and solids in south line.

Sample IL-19-AAP932-1003

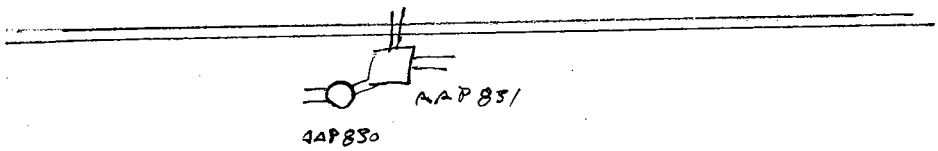
- Sample collected 0 to 2-ft upstream in 18" line
- 90% Root matter 10% Silt.
- Removed large root matter from sample. Sample 80% Root matter 20% silt.
- Collect 1 for sample.

10-8-2005

BES Source Control Inline solids sampling Basin 19

850 Onsite D. LACEY/CH2M HILL, Maggin, Denik/BES
Weather: 60°F, Rain, 10mph South wind
Objective: Collect inline solids samples from basin 19.
(AAP850, AMZ077, and AAT496)

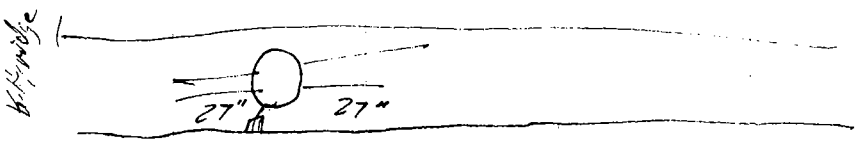
910 Mobilize to AAP 830



- AAP 830 Node Observations
- No solids
- Mobilize to AAP831
- 2" of solids in node. 4" of water in node. 10 gpm of free flow from NW line. No flow
- Solids mostly gravel and sand with minor silt.
- ½" solids in southwest line, No solids in NW line

Sample IL-19-AAP831
- Sand with Gravel, Brown, 50% gravel ⅛" to 2" diameter, Angular <5% silt. Well graded
- No sheen or odor, <1% metal debris (screw, glass pieces) metal flakes, 1% Organic matter (leaves, twigs, small pieces of wood).

1135 Mobilize to AMZ077



4465 Abandon fire hours.

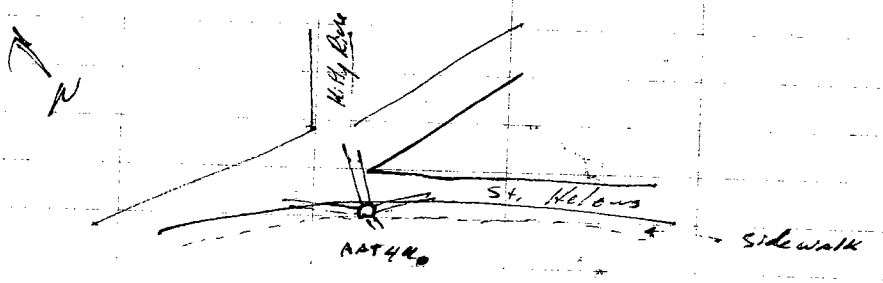
AMZ077 Node Observation
- Flow 1 gpm
- ½" sands in upstream line.

10-8-03
BES- Source Control Inline Solids Basin 19

Node AMZ077 Observations continued
- ½ band of sand in downstream line extended 0 to 5-ft

Sample 12-19-AMZ077-1003
- Well Graded Sand, Gray with white grains. Medium grain.
- No odor or debris
- Light sheen.

1230 Mobilize to AAT 496



AAT 496 Node Observations
- Three lines enter at this node
  - A 36" from the South east from St Helens which ½" of flow and 4½" solids
  - A 32" from the Northwest
  - Solids extend from the manhole to >10-feet
  - 18" line from South does not ~~appear~~ appear to be abandon. bottom of line moist

~~AAT~~ Sample ~~AAT 496~~ 12-19-AAT496-1003
- ~~Time from~~ Sample collect 0 to 2-ft
- Sand with Gravel, Brown, 50% Gravel up to 1". 5% silt
- No sheen or odor.
- No debris.

ATTACHMENT B

Field Data Sheets

City of Portland
Environmental Services

DAILY FIELD REPORT

Project: LOWER HARBOR OF SED SAMP   Project No. 10[illegible]
Location: BASIN OF 19   Date: 10/7/03
Subject: SED SAMP - DAY 1   By: MSH

900 MEET DAVE LANEY OF CH2MHILL (MSH/CJD)
910 PROCEED TO APP912 - FIRST NODE SAMPLING LOCATION
SUCCESS. SEDIMENTS IN THE LINE
0941 SAMPLE COLLECTED
1007 APP 912 FINISHED
1010 PROCEED TO AAP 939/AAP918
COLLECT SAMPLE 20' UP FROM AAP 918
1103 CJD PROCEEDS UP PIPE FROM AAP918 TO AAP 939
1130 PROCEED TO AAP 910
1153 CJD COLLECTS SAMPLE FROM AAP 910
1220 - LUNCH
1310 - AT AAP 931 TO COLLECT SAMPLE
BARELY ENOUGH SAMPLE
1400 TO AAP 932
LOTS OF ROOTS. GOOD SAMPLE
1500 BACK TO WPCL
WILL HOLD SAMPLES AT LAB AND SUBMIT WITH
TOMORROW'S, ALL ON ONE COC.

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of 2

Project LOWER HARBOR SED SAMP
Location BASIN OF 19
Subject SED SAMP - DAY 2

Project No. 1020.001
Date 10/8/03
By DJH

~~DJH~~

~~0900~~ - DJH | MKS | ~~DEV~~ DAC MEET DAVE LACEY OF CH2M HILL FOR SECOND DAY OF SEDIMENT SAMPLING.

WEATHER - LIGHT RAIN NOW. 0.33" PREDICTED FROM 1000-1500. COULD HAMPER FIELDWORK.

AAP830 (831) (CHEVRON ASPHALT)

* ARRIVE @ 0920 TO MEET CHRISTOPHER WADE FOR ACCESS. AFTER A HUGE SIGN-IN DELAY, WE ARE ALLOWED ACCESS TO MH AAP830 AT 1020.

NO SEDIMENT IN } AAP830 (4' x 4' VAULT)
SEDIMENT IN SQUARE A CHAMBER AT AAP831
SEE F.D.S. FOR COMPLETE DETAILS

1120 - LEAVE SITE

AMZ077 (4465 NW YEON) ARRIVE @ 1125
27" pipe both up/dwnstrm
- Barely any sediment in the. DJH could collect ~~2 oz at the most~~ something though.

Attachments 1150 Sampled sediment dwnstrm.
PDX/042100009.PDF
1225 Leave site.

City of Portland
Environmental Services

DAILY FIELD REPORT

Project Lower Harbor OF Sed Samp
Location Basin OF 19
Subject Sed Samp – Day 2

Project No.
Date 10/8/03
By MKS

1230 Move to node AATU496.
- The 18" line coming off of the West Hills appears to have had flow recently (~~as~~ from this morning's rain) → not abandoned.
- Sampled the abundant sediment in 30" line upstream of MH, coming down St. Helens Rd.

1240 Sampled sediment

1255 Leave site.

Attachments

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

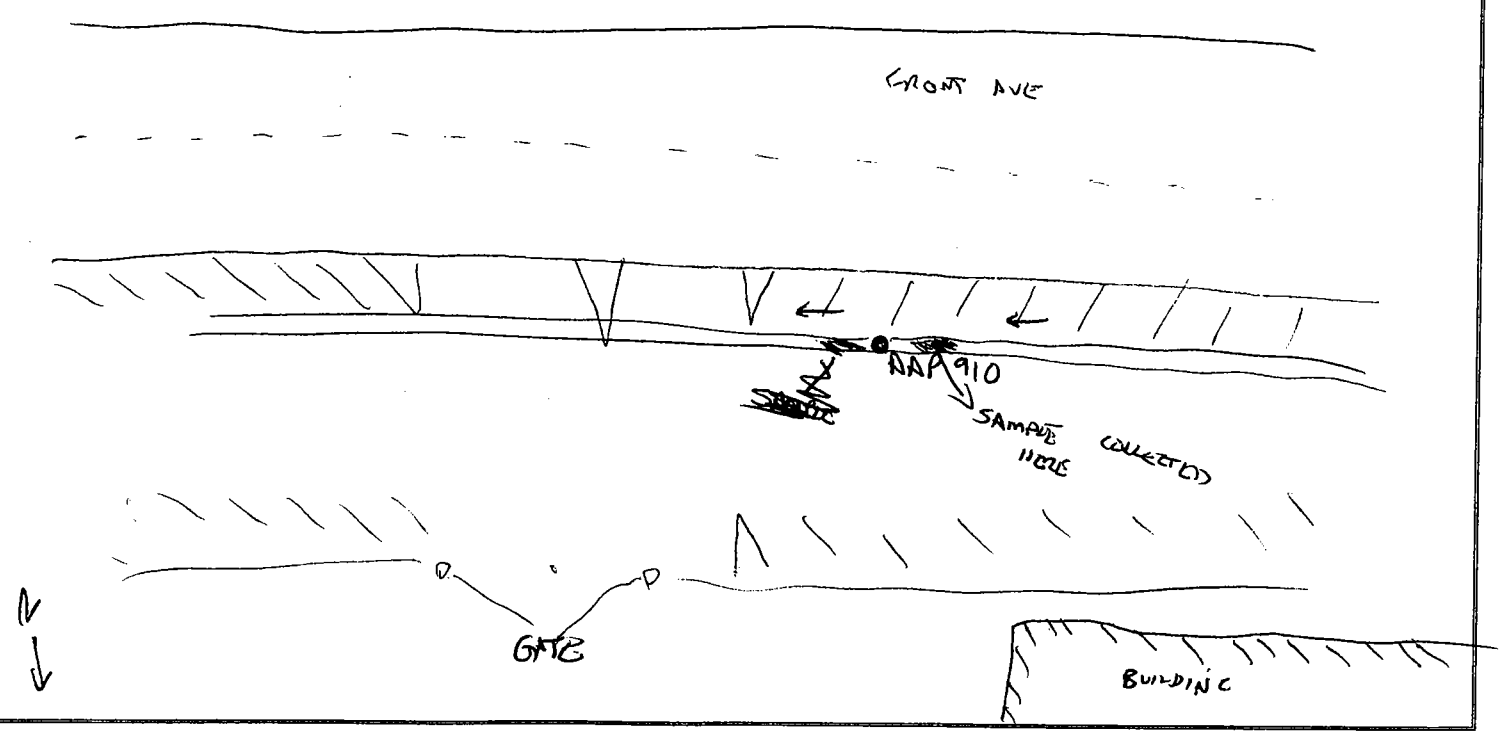
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10-7-03	Time: 1134	Current Weather conditions:	OVERCAST
Sampling Team Present:	MIKE HOUSER/ CRAIG WEINBUCHLER		
Basin: 19	Node: AAP 910	Subbasin:	
Address:	TUBE FORGINGS P-LOT - FRONT AVE		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	NO
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	FROM NODE EXTENDING 5' UP. NONE DOWNSTREAM

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAP 910

Sampling Equipment:	SS SPOON / BOWL
Equipment Decontamination process:	SOP 7.01a
Sample date: 10-7-03	Sample time: 1153
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAP910-1003
Sample location: (number of feet from node of entry)	3' UP FROM NODE
Sample collection technique:	SS SPOON USED TO FILL BOWL. BOWL BROUGHT TO SURFACE. SAMPLE COMPOSITED
Color of sample:	BLACK
Texture/Particle size:	SANDY GRAVEL
Visual or olfactory evidence of contamination:	YES. SHEEN OBSERVED ON WATER.
Depth of solids in area where sample collected:	3/4"
Amount and type of debris:	SANDY GRAVEL
Compositing notes:	

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals	One 4oz glass jar		
	PAHs/SVOCs	One 4oz glass jar		
	PCBs	One 4oz glass jar		
	TPH (two jars)	Two 4oz glass jars		
	TOC	One 4oz glass jar		

Duplicate sample collected?		
Duplicate sample fictitious identification # on COC:		
Samples placed in chilled cooler? Y/N		
Samples delivered to lab? Y/N	Lab ID Number:	FO 031017
Describe any deviations from standard procedures:		

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

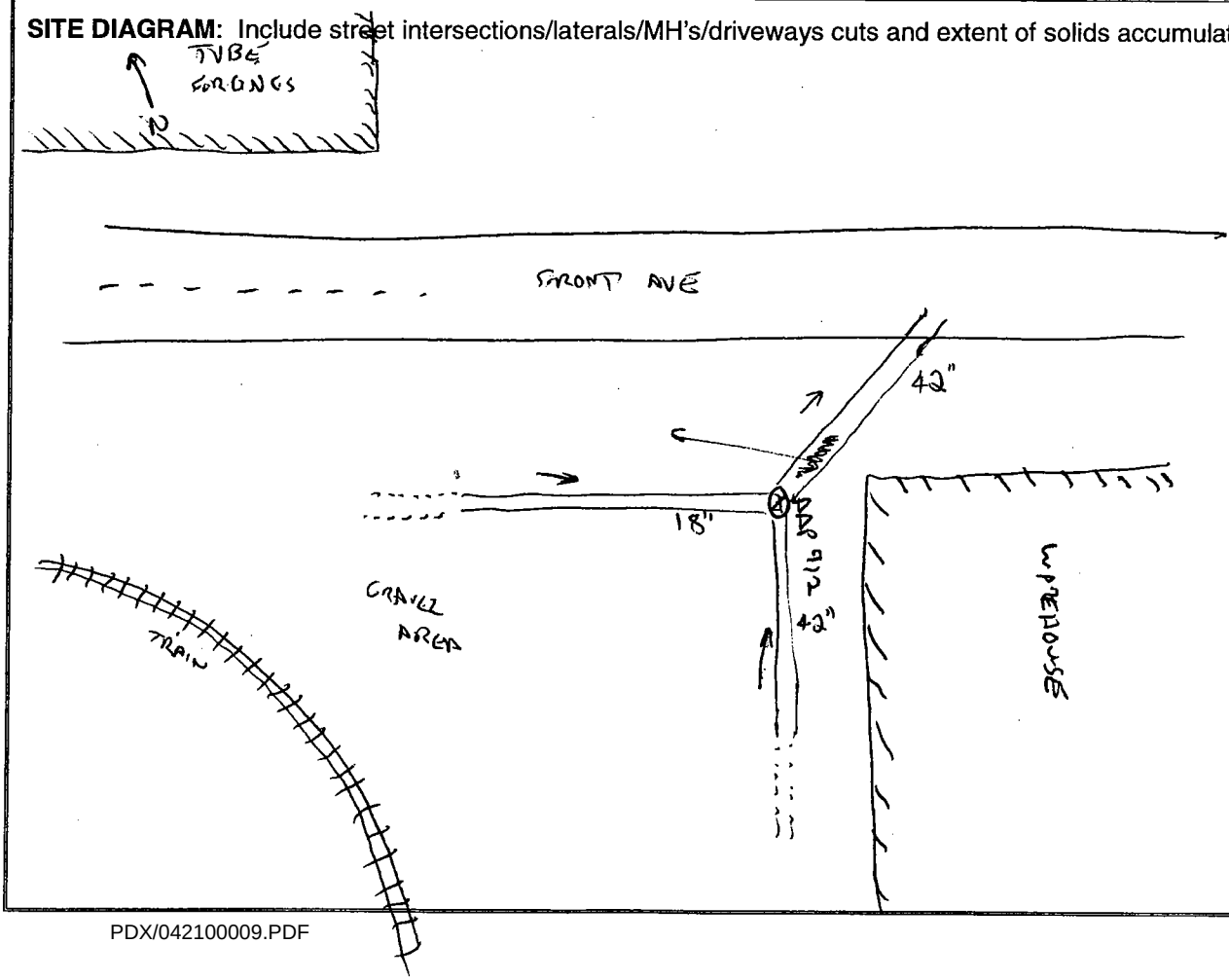
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10-7-03	Time: 0921	Current Weather conditions: SUNNY / PARTLY CLOUDY	
Sampling Team Present: MIKE HAUSER	CRAIG HEIMBUCHER		
Basin: 19	Node: RAP 912	Subbasin:	
Address: 5100 NW FRONT AVE			

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	STANDING WATER IN MH. 5" DEEP. RUNS OUT OF 42" LINE 1/4" DEEP
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES 1/8" DEEP
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	APPROX 30' SWEET

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAP 912

Sampling Equipment:	STAINLESS STEEL SPOON + STAINLESS STEEL BOWL
Equipment Decontamination process:	SOP 7.01a
Sample date: 10-7-03	Sample time: 0941
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAP912-1003
Sample location: (number of feet from node of entry)	AT NODE TO 15 FEET DOWN
Sample collection technique:	SAMPLE COLLECTED FROM 42" DOWNSTREAM LINE INTO SS BOWL, SAMPLE BROUGHT TO SURFACE, COMPOSITED + PUT INTO SAMPLE JARS
Color of sample:	DARK BROWN
Texture/Particle size:	SILTY SAND MIX.
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1/4" DEEP
Amount and type of debris:	SILTY SAND,
Compositing notes:	—

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:	Metals	One 4oz glass jar	✓	
	PAHs/SVOCs	One 4oz glass jar	✓	
	PCBs	One 4oz glass jar	✓	
	TPH (two jars)	Two 4oz glass jars	✓	
	TOC	One 4oz glass jar	✓	

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	—
Samples placed in chilled cooler? (Y)/N	YES
Samples delivered to lab? Y/N	Lab ID Number: FO 031018
Describe any deviations from standard procedures:	NONE

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

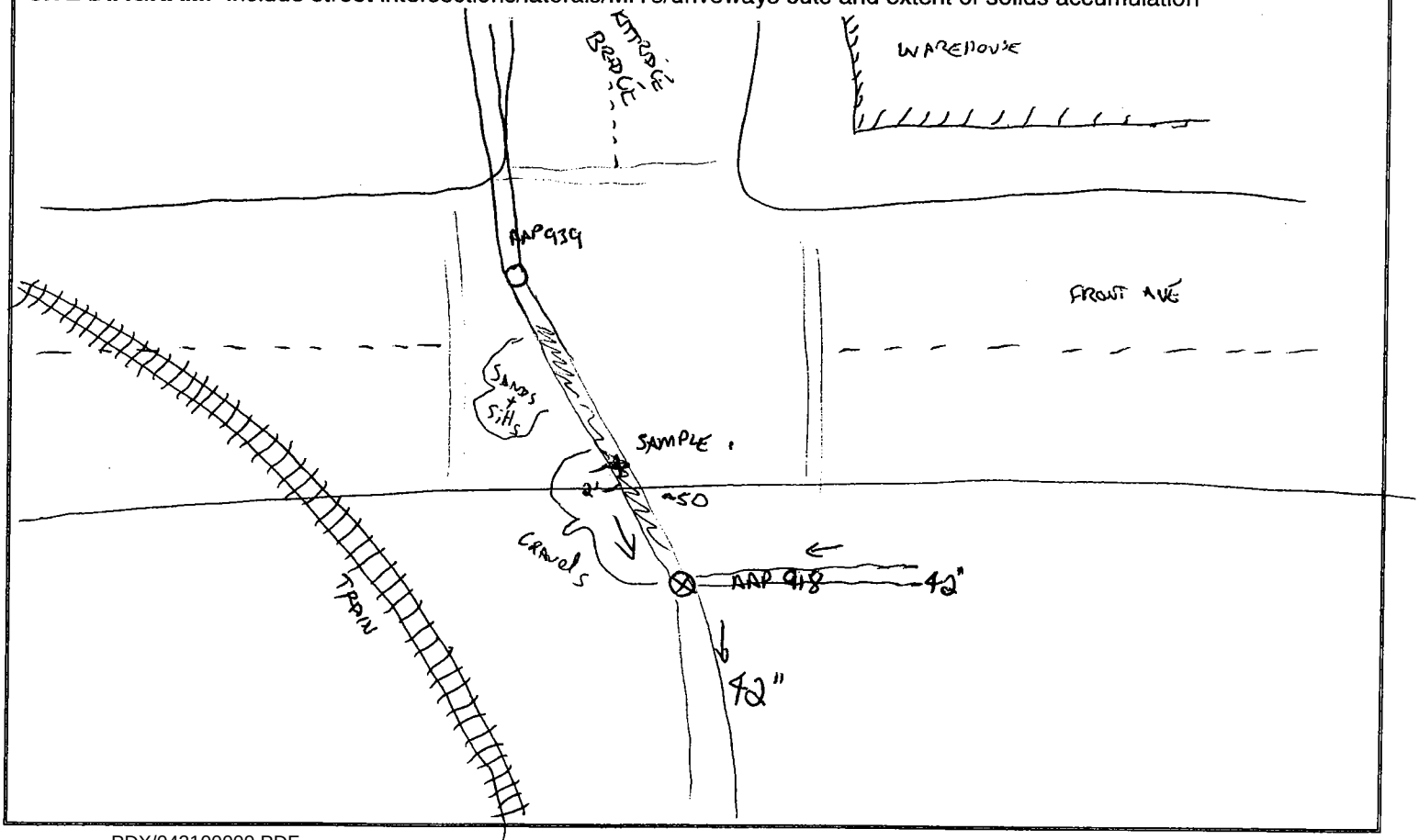
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10-7-03	Time: 1034	Current Weather conditions: PARTIALLY CLOUDY
Sampling Team Present: MIKE HAUSER / CRAIG NED		
Basin: 19	Node: ~~AAP 434~~ AAP 918	Subbasin:
Address: NW KITTRIDGE + FRONT.		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	2" OF FLOWING WATER
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	AT LEAST 20' UP FROM AAP 918

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAP918

Sampling Equipment:	STAINLESS STEEL SPOON + BOWL
Equipment Decontamination process:	SOP 7.01a
Sample date: 10-7-03	Sample time: 1049
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAP918-1003
Sample location: (number of feet from node of entry)	20' UP FROM AAP 918
Sample collection technique:	SAMPLE COLLECTED INTO SS BOWL USING SPOON. SAMPLE BROUGHT TO THE SURFACE, HOMOGENIZED AND PUT INTO 6 LAB SUPPLIED JARS
Color of sample:	BLACK
Texture/Particle size:	POORLY SORTED SANDY GRAVEL
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	6"-8"
Amount and type of debris:	GRAVELS + SANDS
Compositing notes:	—

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals	One 4oz glass jar	1	
	PAHs/SVOCs	One 4oz glass jar	1	
	PCBs	One 4oz glass jar	1	
	TPH (two jars)	Two 4oz glass jars	2	
	TOC	One 4oz glass jar	1	

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	—
Samples placed in chilled cooler? Y/N	YES
Samples delivered to lab? Y/N	Lab ID Number: FO 031019
Describe any deviations from standard procedures:	—

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

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6543 N. Burlington Ave.,
Portland, OR 97203-5452

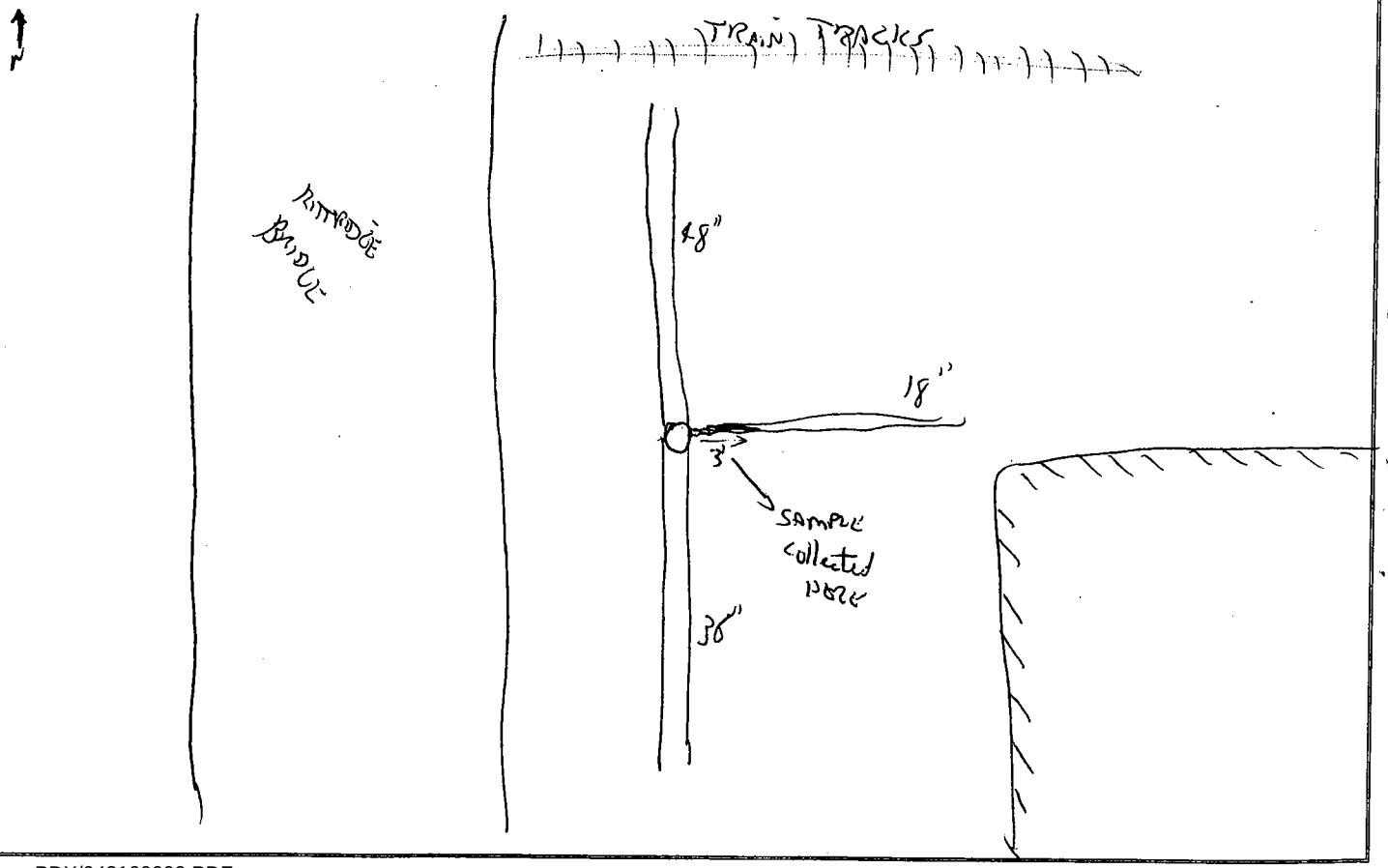
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10-7-03	Time: 1322	Current Weather conditions:	OVERCAST
Sampling Team Present:	MIKE JOHNSON / CRAIG [illegible]		
Basin: 19	Node: AAP93	Subbasin:	
Address:			

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	½" OF FLOWING WATER
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES
Are sample-able quantities of sediments present in the line?	MAYBE .. (SEE OVER) →
Describe lateral extent of sample-able sediments present in the line:	15-20 feet

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: NAP 931

Sampling Equipment:	SS SPOON + BOWL
Equipment Decontamination process:	SOP 7.01a
Sample date: 10-7-03	Sample time: 1340
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-NAP931-1003
Sample location: (number of feet from node of entry)	03' UP 18" LINE FROM NODE
Sample collection technique:	SS SPOON INTO BUCKET. BUCKET BROUGHT TO SURFACE. SAMPLE COMPOSITED + PUT INTO SAMPLE CONTAINERS
Color of sample:	DK BROWN
Texture/Particle size:	SILTY
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1/2"
Amount and type of debris:	—
Compositing notes:	— PER SAP

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals	One 4oz glass jar	✓	1/4 FULL
	PAHs/SVOCs	One 4oz glass jar	✓	3/4 FULL
	PCBs	One 4oz glass jar	✓	3/4 FULL
	TPH (two jars)	Two 4oz glass jars		
	TOC	One 4oz glass jar		

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	— FO 031020
Samples placed in chilled cooler? Y/N	YES
Samples delivered to lab? Y/N	Lab ID Number:
Describe any deviations from standard procedures:	NOT ENOUGH SAMPLE VOLUME FOR ALL CONTAINERS, DESPITE BEST EFFORTS. FILLED CONTAINERS WITH PARTIAL VOLUME PER SAP.

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

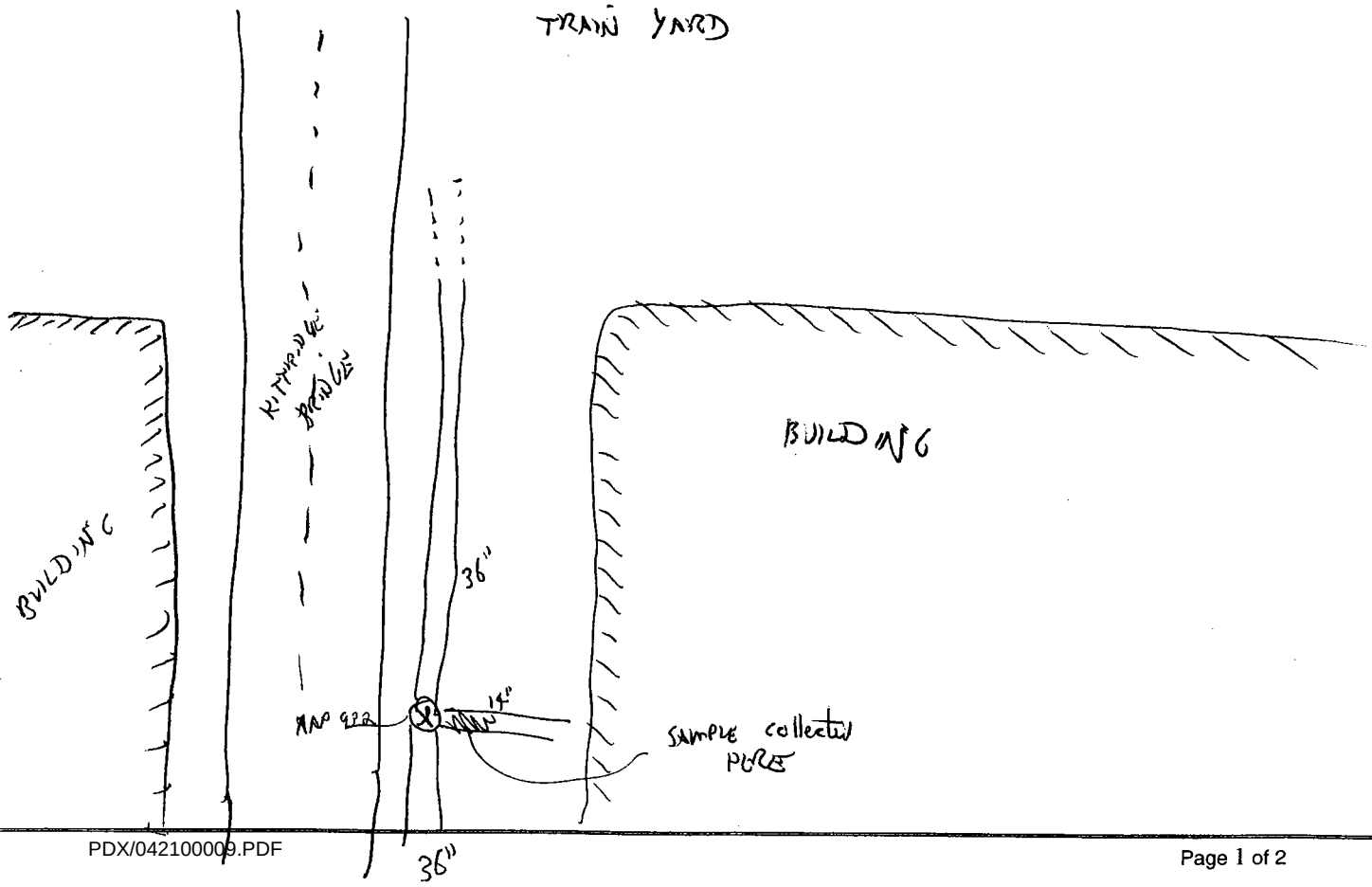
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10-7-03	Time: 1410	Current Weather conditions:	OVERCAST
Sampling Team Present:	MIKE HARSEM / CRAIG ISEMINGER		
Basin: 19	Node: AAP 93a	Subbasin:	
Address:	JUST EAST OF S END OF KITTRIDGE BRIDGE		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	NO
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES - ROCKS + SEDIMENT
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	ALMOST 10' UP

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAP 932

Sampling Equipment:	SS SPOON + BUCKET
Equipment Decontamination process:	SOP 7.01a
Sample date: 10-7-03	Sample time: 1420
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAP932-1003
Sample location: (number of feet from node of entry)	1' UP FROM NODE IN 14" LINE
Sample collection technique:	SAMPLE COLLECTED IN BUCKET. BUCKET BROUGHT TO SURFACE. SAMPLE COMPOSITED → PUT INTO SAMPLE JARS
Color of sample:	BROWN
Texture/Particle size:	ROOTS + SILT
Visual or olfactory evidence of contamination:	DARK BROWN color
Depth of solids in area where sample collected:	~~N~~ ROOTS
Amount and type of debris:	ROOTS
Compositing notes:	

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:	Metals	One 4oz glass jar	1	
	PAHs/SVOCs	One 4oz glass jar	1	
	PCBs	One 4oz glass jar	1	
	TPH (two jars)	Two 4oz glass jars	2	
	TOC	One 4oz glass jar	1	

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	
Samples placed in chilled cooler? Y/N	YES
Samples delivered to lab? Y/N	Lab ID Number: FO 031021
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

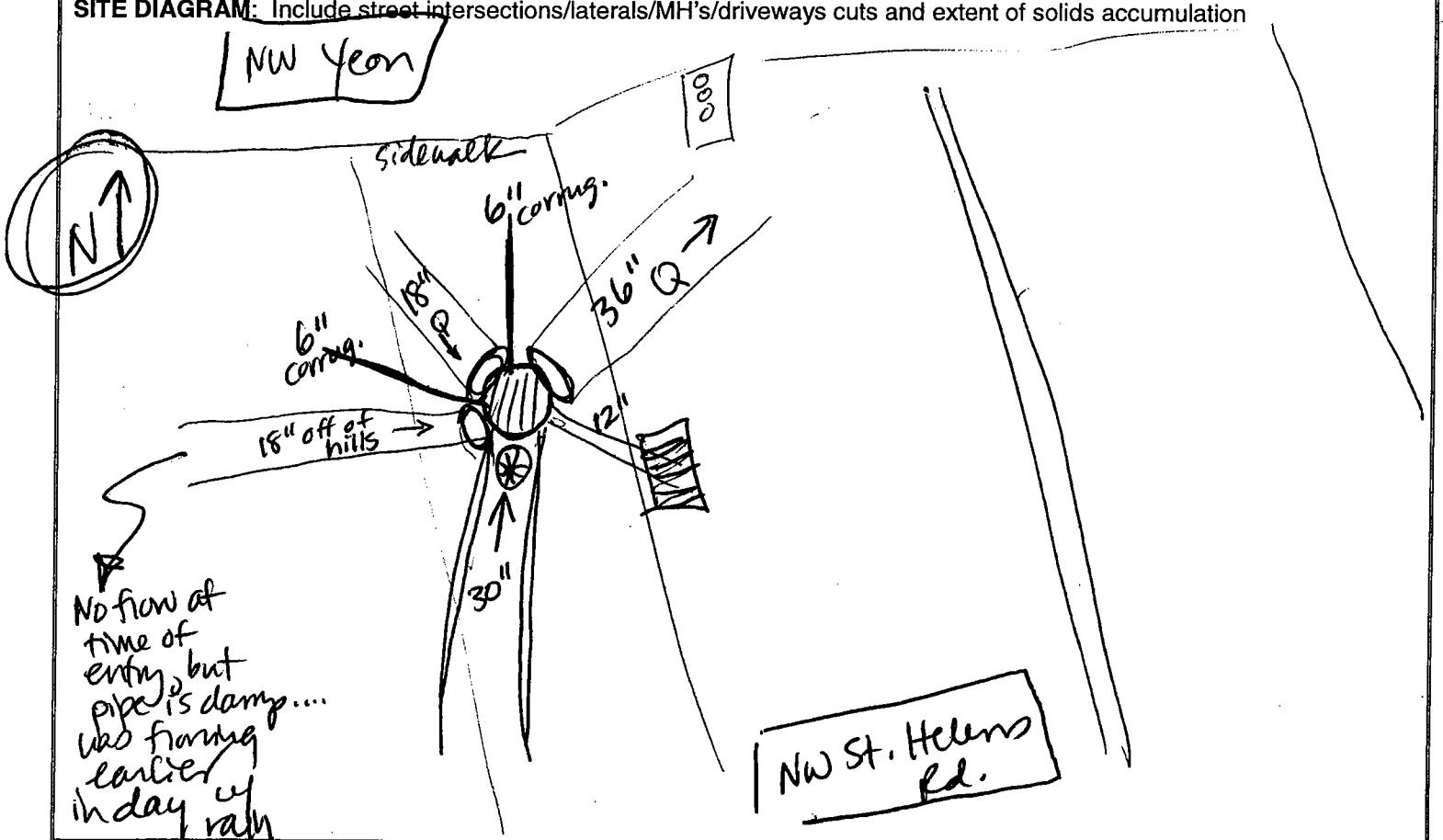
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10/8/03	Time: 1235	Current Weather conditions: Partly Cloudy 60°F
Sampling Team Present: MKS/DJH/DAE		
Basin: OF 19	Node: AAT496	Subbasin: —
Address: NW St. Helens Rd & Yeon		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	0.8" flowing water
Does river appear to back up to this location? Describe rate/color/odor of flow:	No
Are sediments observed in the line?	yes
Are sample-able quantities of sediments present in the line?	yes... lots, ~~downs~~ upstream in 30" line
Describe lateral extent of sample-able sediments present in the line:	From MH to as far up as eye can see

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT496

Sampling Equipment:	S.S. Spoon & Bowl
Equipment Decontamination process:	SOP 7.01a
Sample date: 10/8/03	Sample time: 1240
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAT496-1003
Sample location: (number of feet from node of entry)	0-2 ft. upstream from mH in 30" line coming down St Helens
Sample collection technique:	S.S. Spoon into bowl
Color of sample:	Brown
Texture/Particle size:	Sandy gravel w rocks up to 2"
Visual or olfactory evidence of contamination:	Nothing noticeable
Depth of solids in area where sample collected:	4"
Amount and type of debris:	no....
Compositing notes:	Tried to exclude larger rocks from sample

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals	One 4oz glass jar	✓	
	PAHs/SVOCs	One 4oz glass jar	✓	
	PCBs	One 4oz glass jar	✓	
	TPH (two jars)	Two 4oz glass jars	✓	
	TOC	One 4oz glass jar	✓	

Duplicate sample collected?	No
Duplicate sample fictitious identification # on COC:	
Samples placed in chilled cooler? Y/N	
Samples delivered to lab? Y/N	Lab ID Number: FO 031022
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

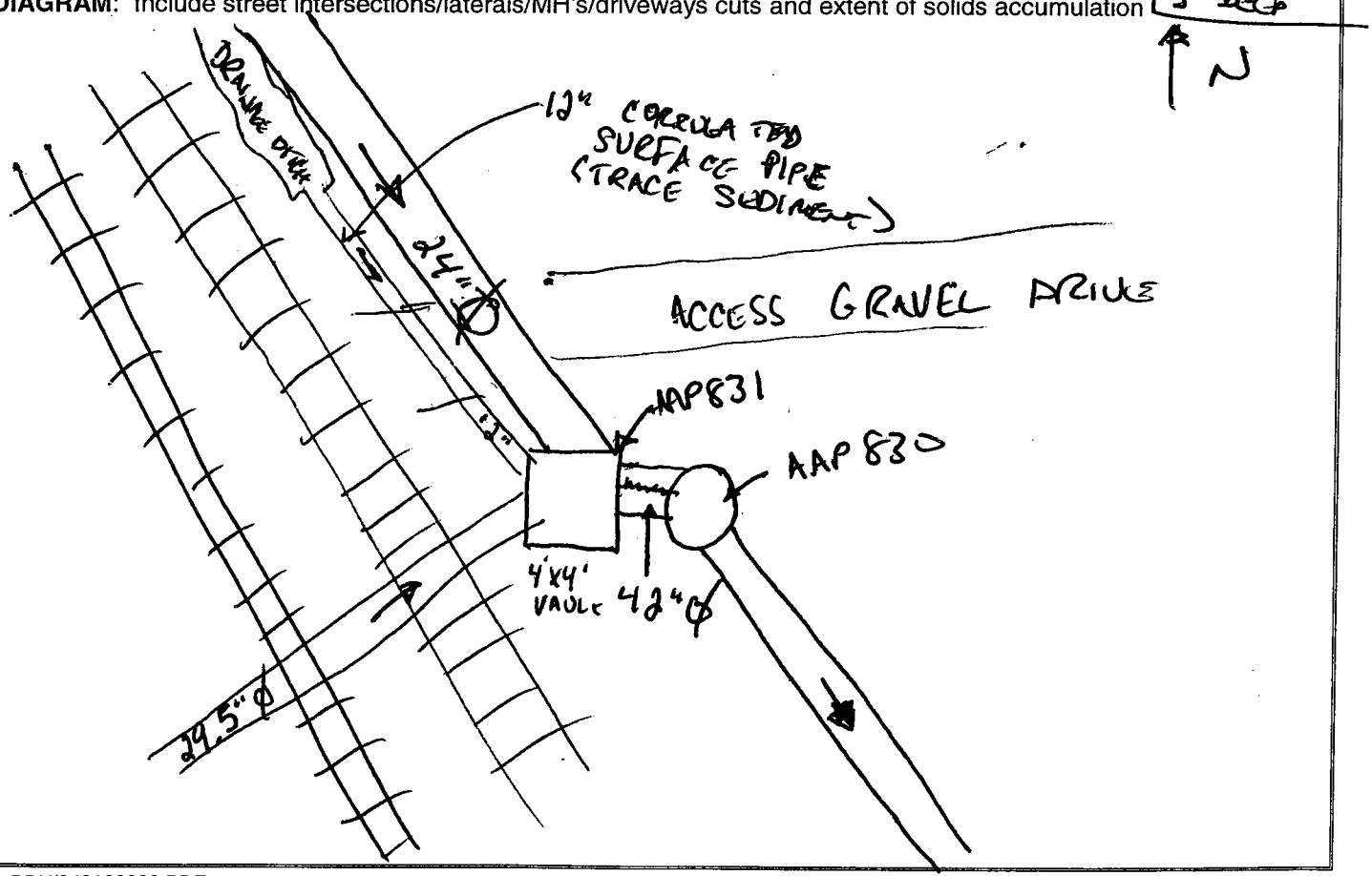
Date: 10/8/03	Time: 1020	Current Weather conditions: SHOWERS, ↳ 55°F
Sampling Team Present: DAC / MKS / DJH		
Basin: OF19	Node: AAP831	Subbasin: —
Address: CHEVRON ASPHALT		

*NO SEDIMENT IN AAP830!

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	1/4" H2O IN 24" LINE FROM NW 0.1" H2O IN 29.5" LINE FROM SW 2" H2O IN 4'x4' VAULT (WOOD FLOOR)
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO / SEE ABOVE FOR FLOW INFO
Are sediments observed in the line?	IN 4'x4' VAULT ☒ AND 6' UP 29.5" LINE FROM S.W.
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	IN VAULT, UP TO 1/4" MOSTLY IN CORNERS IN 29.5" LINE, UP 6' ON EAST SIDE OF TO

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAP831

Sampling Equipment:	SS. BOWL + SPOON
Equipment Decontamination process:	SOP 7.01A
Sample date: 10/8/03	Sample time: 1035
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AAP831-1003
Sample location: (number of feet from node of entry)	ENTIRELY IN SQUARE VAULT AT NODE AAP831
Sample collection technique:	SS. SPOON INTO BOWL
Color of sample:	BROWN
Texture/Particle size:	SANDY GRAVEL
Visual or olfactory evidence of contamination:	NONE
Depth of solids in area where sample collected:	UP TO 1/4" IN CORNERS OF VAULT SAMPLE COLLECTED FROM W/I VAULT ONLY
Amount and type of debris: TRACE WOOD + METAL	MOSTLY GRAVEL + COBBLES IN VAULT, SCREED SAMPLE TO EXCLUDE 2" AND LARGER
Compositing notes:	ATTEMPTED TO EXCLUDE GRAVEL > 1" Ø

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals	One 4oz glass jar	✓	
	PAHs/SVOCs	One 4oz glass jar	✓	
	PCBs	One 4oz glass jar	✓	
	TPH (two jars)	Two 4oz glass jars	✓	
	TOC	One 4oz glass jar	✓	

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	N/A
Samples placed in chilled cooler? (Y)/N	
Samples delivered to lab? (Y)/N	Lab ID Number: FO 031023
Describe any deviations from standard procedures:	NONE

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	FROM DOWN + UP
	Homogenized sample	YES

OVERVIEW PHOTO

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

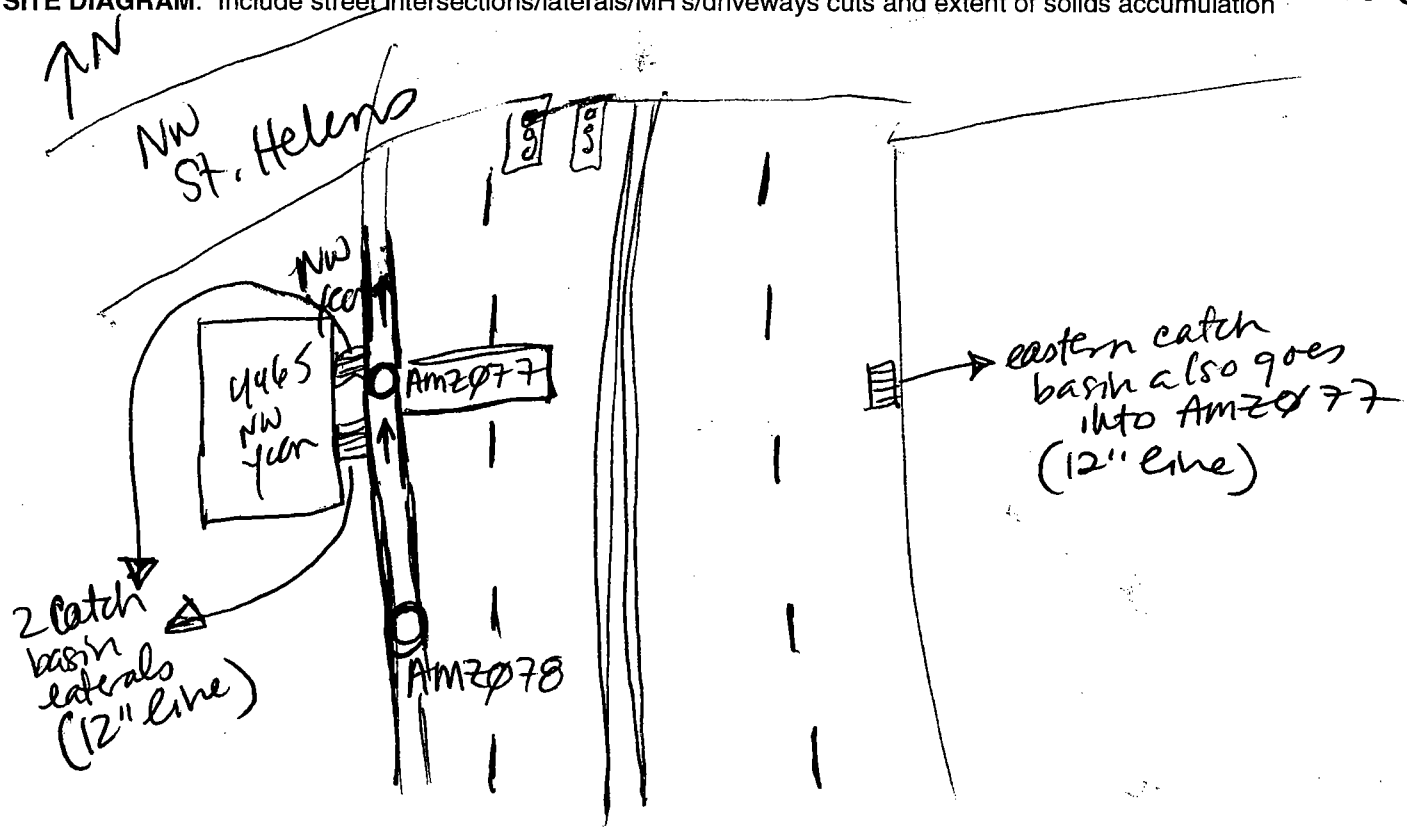
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 10/8/03	Time: 1135	Current Weather conditions: Partly cloudy ~60°F	
Sampling Team Present: MKS/DJH/DAC			
Basin: OF19	Node: AMZ0077	Subbasin: —	
Address: 4465 NW Yeon			

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	0.5" Flowing water (flows to the north)
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	Yes. Trace upstream, more downstream.
Are sample-able quantities of sediments present in the line?	Yes.
Describe lateral extent of sample-able sediments present in the line:	Trace of sediment upstream. more sed. downstream → 3'-10" downstrm of node

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AMZ077

Sampling Equipment:	S.S. Bowl & Spoon
Equipment Decontamination process:	SOP 7.01A
Sample date: 10/8/03	Sample time: 1150
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-19-AMZ077-1003
Sample location: (number of feet from node of entry)	3-10 ft downstrm of node ⇒ sampled all sediment
Sample collection technique:	S.S. spoon into bowl
Color of sample:	Dark brown
Texture/Particle size:	Medium-grained sand w/ fines interspersed
Visual or olfactory evidence of contamination:	No.... not unless sample mixed & then there's some oily sheen
Depth of solids in area where sample collected:	Up to 0.3"
Amount and type of debris:	Some woody debris, paint flecks.
Compositing notes:	

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:	Metals	One 4oz glass jar	✓	
	PAHs/SVOCs	One 4oz glass jar	✓	
	PCBs	One 4oz glass jar	✓	
	TPH (two jars)	Two 4oz glass jars	✓	
	TOC	One 4oz glass jar	✓	

Duplicate sample collected?	No
Duplicate sample fictitious identification # on COC:	N/A
Samples placed in chilled cooler? (Y/N)	
Samples delivered to lab? (Y/N)	Lab ID Number: FO 031024
Describe any deviations from standard procedures:	None

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	From dam & up
	Homogenized sample	Yes

Overview pic

ATTACHMENT C
Site Photographs

Photo 1— Basin 19: Sample IL-19-AA910-1003

Photo 2— Basin 19: Sample IL-19-AA910-1003

Photo 1 — Basin 19: Sample IL-19-AAP0912-1003

Photo 2 — Basin 19: Sample IL-19-AAP0912-1003

Photo 1 — Basin 19: Sample IL-19-AAP831-1003

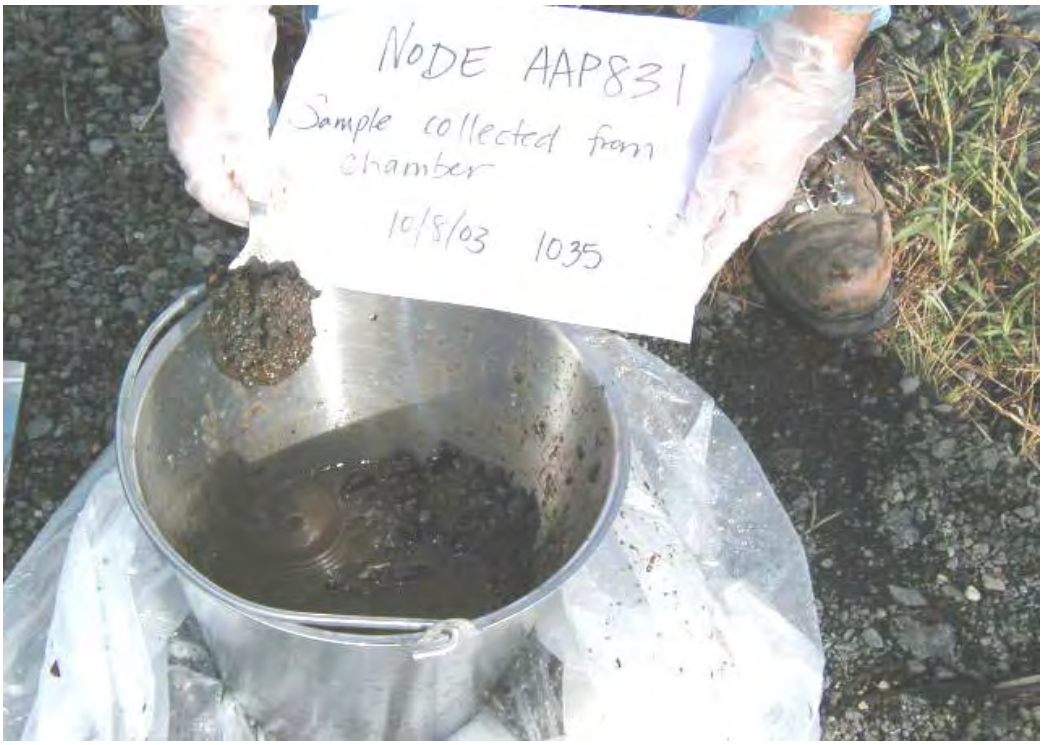


Photo 2 — Basin 19: Sample IL-19-AAP831-1003

Photo 1—Basin 19: Sample IL-19-AAP918-1003

Photo 2—Basin 19: Sample IL-19-AAP918-1003

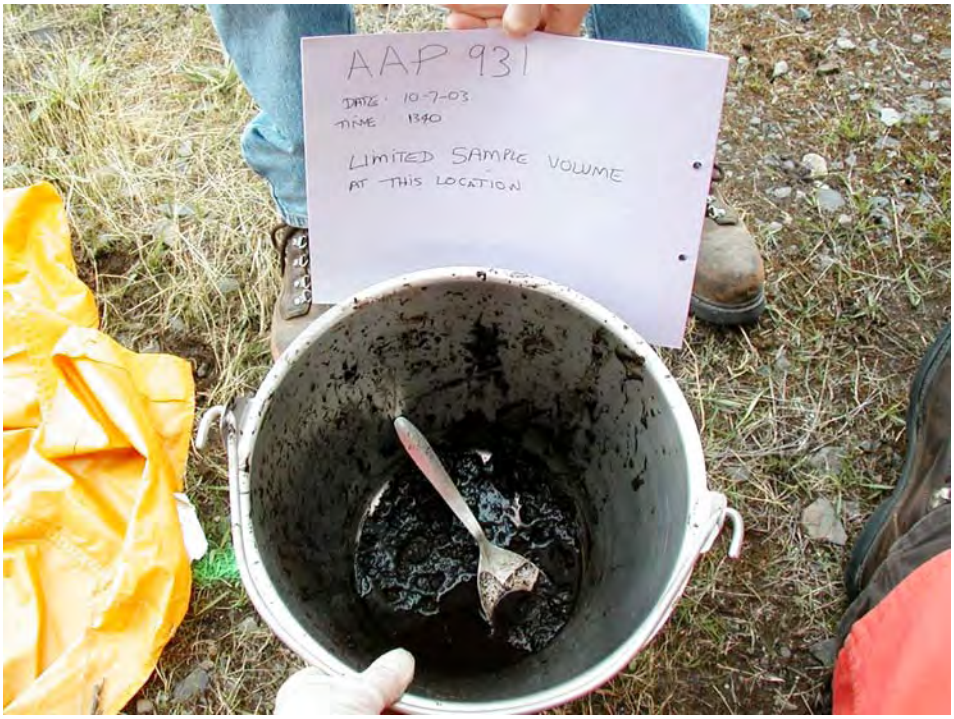


Photo 1 — Basin 19: Sample IL-19-AP931-1003

Photo 2 — Basin 19: Sample IL-19-AAP931-1003

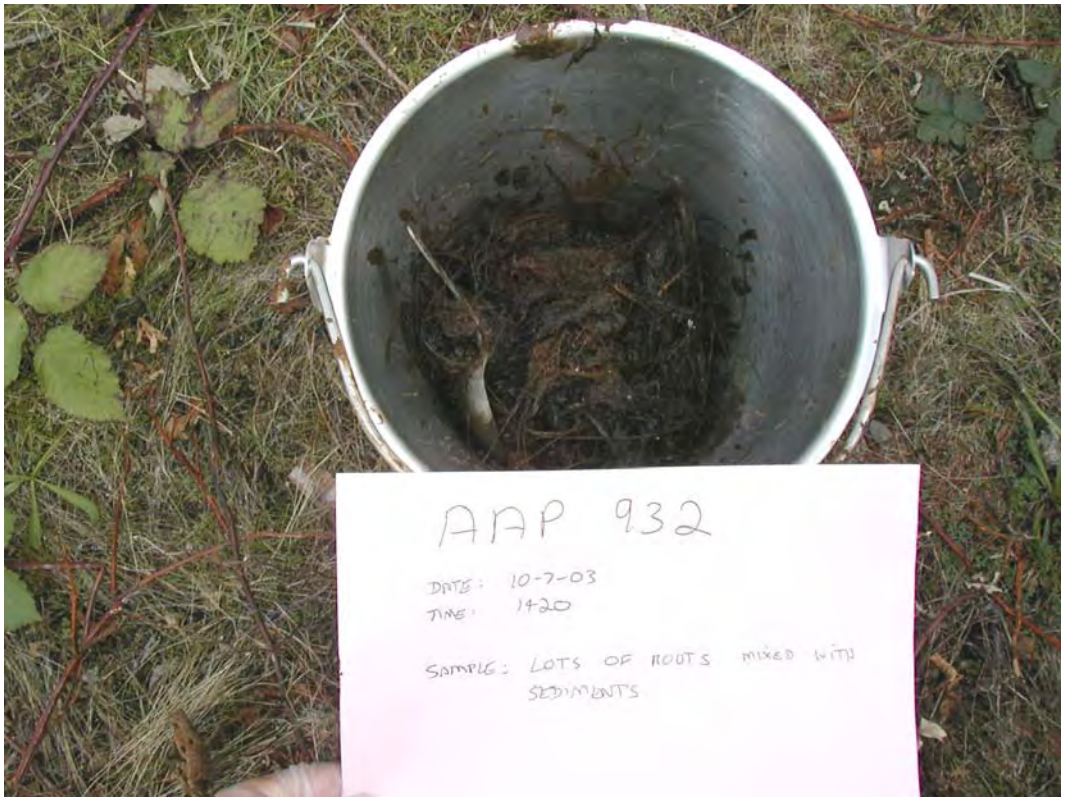


Photo 1—Basin 19: Sample IL-19-AAP932-1002

Photo 2—Basin 19: Sample IL-19-AAP932-1002

Photo 1 — Basin 19: Sample IL-19-AAZ077-1003

Photo 2 — Basin 19: Sample IL-19-AAZ077-1003

Photo 1—Basin 19: Sample IL-19-AAT496-1003

Photo 2—Basin 19: Sample IL-19-AAT496-1003

ATTACHMENT D

Laboratory Data Sheets

Part I: City of Portland Water Pollution Control Laboratory Data Analysis Report

PDX/042100011.PDF

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
(503) 823-5696

City of Portland Chain-of-Custody

Bureau of Environmental Services

Date: 10/7-8/03

Page: 1 of 1

Collected By: MJH/CSH/DAC/MKS/DSH

Project Name: LOWER HARBOR OF SED SAMP

File Number: 1020.001 Matrix: SEDIMENT

*PCB/Pesticide, Semi-volatiles, and TOC analyses will be perforemd by Severn Trent Laboratory, routed through Northcreek.
DUE TO SMALL VOLUME FOR SAMPLE 19_4, PRIORITIZE ANALYTES ACCORDING TO S.A.P.

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: Pesticides/PCBs*	General: Semi-Volatiles (full list, low-le	General: TOC*	General: NWTPH-Dx	Metals: Total Metals - EPA 6020 (As, Cu, Cd, Cr, Hg, Pb, Zn)	Field Comments
FO 031017	IL-19-AAP910-1003 5200 NW FRONT AVE	19_1	10/7/03	1153	C	●	●	●	●	●	
FO 031018	IL-19-AAP912-1003 5100 NW FRONT AVE	19_2		0941	C	●	●	●	●	●	
FO 031019	IL-19-AAP918-1003 NW KITTRIDGE & FRONT	19_3		1044	C	●	●	●	●	●	
FO 031020	IL-19-AAP931-1003 4488 NW YEON	19_4		1340	C	PCBs only	●			●	LIMITED SAMPLE VOLUME. PRIORITIZE ACCORDING TO SAP S.A.P.
FO 031021	IL-19-AAP932-1003 4488 NW YEON	19_5		1420	C	●	●	●	●	●	
FO 031022	IL-19-AAT496-1003 NW ST HELENS & YEON	19_6	10/8/03	1240	C	●	●	●	●	●	
FO 031023	IL-19-AAP831-1003 CHEVRON ASPHALT	19_7		1035	C	●	●	●	●	●	
FO 031024	IL-19-AMZ077-1003 4465 NW YEON AVE	19_8		1150	C	●	●	●	●	●	
9											
10											

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: Time: 1422	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: DAVE HUTCHINS Date: 10/8/03	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature: Time:	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

s:\eid\1000\1020.001\Sampdoc\Lower Harbor Sed COC.xls

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 11:53 **System ID** AH08395 **Sample ID** **FO031017**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP910-1003

5200 NW FRONT AVE

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_1
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 10 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. Surrogates were not recoverable for Pesticide analysis due to required dilution (100x).

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	82.4	% W/W	0.01	SM 2540 G
METALS				
COPPER	126	mg/Kg dry wt	0.25	EPA 6020
ZINC	470	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	6.02	mg/Kg dry wt	0.50	EPA 6020
CADMIUM	1.16	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	52.4	mg/Kg dry wt	0.50	EPA 6020
LEAD	107	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.046	mg/Kg dry wt	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<500	mg/Kg dry wt	500	NWTPH-Dx
DIESEL	<250	mg/Kg dry wt	250	NWTPH-Dx
KEROSENE	<250	mg/Kg dry wt	250	NWTPH-Dx
MOTOR OIL	1260	mg/Kg dry wt	500	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	10300	mg/Kg dry wt	39.5	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<203	µg/Kg dry wt	203	EPA 8081
4,4'-DDE	<203	µg/Kg dry wt	203	EPA 8081
4,4'-DDT	<203	µg/Kg dry wt	203	EPA 8081
Aldrin	<102	µg/Kg dry wt	102	EPA 8081
Alpha-BHC	<102	µg/Kg dry wt	102	EPA 8081
Alpha-Chlordane	<102	µg/Kg dry wt	102	EPA 8081
Beta-BHC	<102	µg/Kg dry wt	102	EPA 8081
Delta-BHC	<102	µg/Kg dry wt	102	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 11:53 **System ID** AH08395 **Sample ID** **FO031017**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP910-1003

5200 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_1
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 10 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. Surrogates were not recoverable for Pesticide analysis due to required dilution (100x).

Test Parameter	Result	Units	MRL	Method
Dieldrin	<203	µg/Kg dry wt	203	EPA 8081
Endosulfan I	<102	µg/Kg dry wt	102	EPA 8081
Endosulfan II	<203	µg/Kg dry wt	203	EPA 8081
Endosulfan Sulfate	<203	µg/Kg dry wt	203	EPA 8081
Endrin	<203	µg/Kg dry wt	203	EPA 8081
Endrin Aldehyde	<203	µg/Kg dry wt	203	EPA 8081
Endrin Ketone	<203	µg/Kg dry wt	203	EPA 8081
Gamma-BHC(Lindane)	<102	µg/Kg dry wt	102	EPA 8081
Gamma-Chlordane	<102	µg/Kg dry wt	102	EPA 8081
Heptachlor	<102	µg/Kg dry wt	102	EPA 8081
Heptachlor Epoxide	<102	µg/Kg dry wt	102	EPA 8081
Methoxychlor	<1020	µg/Kg dry wt	1020	EPA 8081
PCB 1016	<106	µg/Kg dry wt	106	EPA 8081
PCB 1221	<213	µg/Kg dry wt	213	EPA 8081
PCB 1232	<106	µg/Kg dry wt	106	EPA 8081
PCB 1242	<106	µg/Kg dry wt	106	EPA 8081
PCB 1248	<106	µg/Kg dry wt	106	EPA 8081
PCB 1254	<106	µg/Kg dry wt	106	EPA 8081
PCB 1260	<106	µg/Kg dry wt	106	EPA 8081
Toxaphene	<10200	µg/Kg dry wt	10200	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
1,2-Dichlorobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
1,3-Dichlorobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
1,4-Dichlorobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
2,4,5-Trichlorophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
2,4,6-Trichlorophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
2,4-Dichlorophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
2,4-Dimethylphenol	<308	µg/Kg dry wt	308	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 11:53 **System ID** AH08395 **Sample ID** **FO031017**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP910-1003

5200 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_1
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 10 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. Surrogates were not recoverable for Pesticide analysis due to required dilution (100x).

Test Parameter	Result	Units	MRL	Method
2,4-Dinitrophenol	<1540	µg/Kg dry wt	1540	EPA 8270 - S
2,4-Dinitrotoluene	<308	µg/Kg dry wt	308	EPA 8270 - S
2,6-Dinitrotoluene	<308	µg/Kg dry wt	308	EPA 8270 - S
2-Chloronaphthalene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
2-Chlorophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
2-Methylnaphthalene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
2-Methylphenol	<308	µg/Kg dry wt	308	EPA 8270 - S
2-Nitroaniline	<308	µg/Kg dry wt	308	EPA 8270 - S
2-Nitrophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
3,3'-Dichlorobenzidine	<615	µg/Kg dry wt	615	EPA 8270 - S
3- & 4-Methylphenol	<615	µg/Kg dry wt	615	EPA 8270 - S
3-Nitroaniline	<308	µg/Kg dry wt	308	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1540	µg/Kg dry wt	1540	EPA 8270 - S
4-Bromophenylphenyl ether	<308	µg/Kg dry wt	308	EPA 8270 - S
4-Chloro-3-methylphenol	<308	µg/Kg dry wt	308	EPA 8270 - S
4-Chloroaniline	<308	µg/Kg dry wt	308	EPA 8270 - S
4-Chlorophenylphenyl ether	<308	µg/Kg dry wt	308	EPA 8270 - S
4-Nitroaniline	<308	µg/Kg dry wt	308	EPA 8270 - S
4-Nitrophenol	<769	µg/Kg dry wt	769	EPA 8270 - S
Acenaphthene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Acenaphthylene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Anthracene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Benzo(a)anthracene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Benzo(a)pyrene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Benzo(g,h,i)perylene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Benzofluoranthenes	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Benzoic acid	<1540	µg/Kg dry wt	1540	EPA 8270 - S
Benzyl alcohol	<385	µg/Kg dry wt	385	EPA 8270 - S
Benzyl butyl phthalate	<385	µg/Kg dry wt	385	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 11:53 **System ID** AH08395 **Sample ID** **FO031017**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP910-1003

5200 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_1
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 10 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. Surrogates were not recoverable for Pesticide analysis due to required dilution (100x).

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroethoxy) methane	<308	µg/Kg dry wt	308	EPA 8270 - S
Bis(2-chloroethyl) ether	<308	µg/Kg dry wt	308	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<308	µg/Kg dry wt	308	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<308	µg/Kg dry wt	308	EPA 8270 - S
Chrysene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Di-n-butyl phthalate	<308	µg/Kg dry wt	308	EPA 8270 - S
Di-n-octyl phthalate	<308	µg/Kg dry wt	308	EPA 8270 - S
Dibenzo(a,h)anthracene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Dibenzofuran	<308	µg/Kg dry wt	308	EPA 8270 - S
Diethyl phthalate	<308	µg/Kg dry wt	308	EPA 8270 - S
Dimethyl phthalate	<308	µg/Kg dry wt	308	EPA 8270 - S
Fluoranthene	85.9	µg/Kg dry wt	76.9	EPA 8270 - S
Fluorene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Hexachlorobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
Hexachlorobutadiene	<308	µg/Kg dry wt	308	EPA 8270 - S
Hexachlorocyclopentadiene	<308	µg/Kg dry wt	308	EPA 8270 - S
Hexachloroethane	<308	µg/Kg dry wt	308	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Isophorone	<308	µg/Kg dry wt	308	EPA 8270 - S
N-Nitrosodi-n-propylamine	<308	µg/Kg dry wt	308	EPA 8270 - S
N-Nitrosodiphenylamine	<308	µg/Kg dry wt	308	EPA 8270 - S
Naphthalene	<76.9	µg/Kg dry wt	76.9	EPA 8270 - S
Nitrobenzene	<308	µg/Kg dry wt	308	EPA 8270 - S
Pentachlorophenol	<308	µg/Kg dry wt	308	EPA 8270 - S
Phenanthrene	EST 63.9	µg/Kg dry wt	76.9	EPA 8270 - S
Phenol	<308	µg/Kg dry wt	308	EPA 8270 - S
Pyrene	124	µg/Kg dry wt	76.9	EPA 8270 - S

End of Report for Sample ID: FO031017

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 9:41 **System ID** AH08396 **Sample ID** **FO031018**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP912-1003

5100 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_2
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	21.2	% W/W	0.01	SM 2540 G
METALS				
COPPER	222	mg/Kg dry wt	0.25	EPA 6020
ZINC	4130	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (8) BY EPA 6020				
ARSENIC	465	mg/Kg dry wt	0.50	EPA 6020
BARIUM	2740	mg/Kg dry wt	0.10	EPA 6020
CADMIUM	18.3	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	48.7	mg/Kg dry wt	0.50	EPA 6020
LEAD	96.4	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.380	mg/Kg dry wt	0.010	EPA 6020
SELENIUM	2.22	mg/Kg dry wt	1.00	EPA 6020
SILVER	0.21	mg/Kg dry wt	0.10	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<250	mg/Kg dry wt	250	NWTPH-Dx
DIESEL	<125	mg/Kg dry wt	125	NWTPH-Dx
KEROSENE	<125	mg/Kg dry wt	125	NWTPH-Dx
MOTOR OIL	608	mg/Kg dry wt	250	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	25900	mg/Kg dry wt	226	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<81.1	µg/Kg dry wt	81.1	EPA 8081
4,4'-DDE	<81.1	µg/Kg dry wt	81.1	EPA 8081
4,4'-DDT	<81.1	µg/Kg dry wt	81.1	EPA 8081
Aldrin	<40.6	µg/Kg dry wt	40.6	EPA 8081
Alpha-BHC	<40.6	µg/Kg dry wt	40.6	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 9:41 **System ID** AH08396 **Sample ID** **FO031018**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP912-1003

5100 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_2
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Alpha-Chlordane	<40.6	µg/Kg dry wt	40.6	EPA 8081
Beta-BHC	<40.6	µg/Kg dry wt	40.6	EPA 8081
Delta-BHC	<40.6	µg/Kg dry wt	40.6	EPA 8081
Dieldrin	<81.1	µg/Kg dry wt	81.1	EPA 8081
Endosulfan I	<40.6	µg/Kg dry wt	40.6	EPA 8081
Endosulfan II	<81.1	µg/Kg dry wt	81.1	EPA 8081
Endosulfan Sulfate	<81.1	µg/Kg dry wt	81.1	EPA 8081
Endrin	<81.1	µg/Kg dry wt	81.1	EPA 8081
Endrin Aldehyde	<81.1	µg/Kg dry wt	81.1	EPA 8081
Endrin Ketone	<81.1	µg/Kg dry wt	81.1	EPA 8081
Gamma-BHC(Lindane)	<40.6	µg/Kg dry wt	40.6	EPA 8081
Gamma-Chlordane	<40.6	µg/Kg dry wt	40.6	EPA 8081
Heptachlor	<40.6	µg/Kg dry wt	40.6	EPA 8081
Heptachlor Epoxide	<40.6	µg/Kg dry wt	40.6	EPA 8081
Methoxychlor	<406	µg/Kg dry wt	406	EPA 8081
PCB 1016	<410	µg/Kg dry wt	410	EPA 8081
PCB 1221	<819	µg/Kg dry wt	819	EPA 8081
PCB 1232	<410	µg/Kg dry wt	410	EPA 8081
PCB 1242	<410	µg/Kg dry wt	410	EPA 8081
PCB 1248	<410	µg/Kg dry wt	410	EPA 8081
PCB 1254	<410	µg/Kg dry wt	410	EPA 8081
PCB 1260	<410	µg/Kg dry wt	410	EPA 8081
Toxaphene	<4060	µg/Kg dry wt	4060	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
1,2-Dichlorobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
1,3-Dichlorobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
1,4-Dichlorobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2,4,5-Trichlorophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 9:41 **System ID** AH08396 **Sample ID** **FO031018**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP912-1003

5100 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_2
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
2,4,6-Trichlorophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2,4-Dichlorophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2,4-Dimethylphenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2,4-Dinitrophenol	<488	µg/Kg dry wt	488	EPA 8270 - S
2,4-Dinitrotoluene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2,6-Dinitrotoluene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2-Chloronaphthalene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
2-Chlorophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2-Methylnaphthalene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
2-Methylphenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2-Nitroaniline	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
2-Nitrophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
3,3'-Dichlorobenzidine	<195	µg/Kg dry wt	195	EPA 8270 - S
3- & 4-Methylphenol	<195	µg/Kg dry wt	195	EPA 8270 - S
3-Nitroaniline	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<488	µg/Kg dry wt	488	EPA 8270 - S
4-Bromophenylphenyl ether	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4-Chloro-3-methylphenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4-Chloroaniline	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4-Chlorophenylphenyl ether	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4-Nitroaniline	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
4-Nitrophenol	<244	µg/Kg dry wt	244	EPA 8270 - S
Acenaphthene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
Acenaphthylene	EST 13.8	µg/Kg dry wt	24.4	EPA 8270 - S
Anthracene	EST 13.1	µg/Kg dry wt	24.4	EPA 8270 - S
Benzo(a)anthracene	91.4	µg/Kg dry wt	24.4	EPA 8270 - S
Benzo(a)pyrene	62.1	µg/Kg dry wt	24.4	EPA 8270 - S
Benzo(g,h,i)perylene	188	µg/Kg dry wt	24.4	EPA 8270 - S
Benzofluoranthenes	271	µg/Kg dry wt	24.4	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 9:41 **System ID** AH08396 **Sample ID** **FO031018**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP912-1003

5100 NW FRONT AVE

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_2
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Benzoic acid	<488	µg/Kg dry wt	488	EPA 8270 - S
Benzyl alcohol	<122	µg/Kg dry wt	122	EPA 8270 - S
Benzyl butyl phthalate	<122	µg/Kg dry wt	122	EPA 8270 - S
Bis(2-chloroethoxy) methane	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Bis(2-chloroethyl) ether	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Chrysene	66.7	µg/Kg dry wt	24.4	EPA 8270 - S
Di-n-butyl phthalate	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Di-n-octyl phthalate	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Dibenzo(a,h)anthracene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
Dibenzofuran	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Diethyl phthalate	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Dimethyl phthalate	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Fluoranthene	87.6	µg/Kg dry wt	24.4	EPA 8270 - S
Fluorene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
Hexachlorobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Hexachlorobutadiene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Hexachlorocyclopentadiene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Hexachloroethane	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	146	µg/Kg dry wt	24.4	EPA 8270 - S
Isophorone	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
N-Nitrosodi-n-propylamine	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
N-Nitrosodiphenylamine	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Naphthalene	<24.4	µg/Kg dry wt	24.4	EPA 8270 - S
Nitrobenzene	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Pentachlorophenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S
Phenanthrene	27.3	µg/Kg dry wt	24.4	EPA 8270 - S
Phenol	<97.5	µg/Kg dry wt	97.5	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 9:41 **System ID** AH08396 **Sample ID** **FO031018**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP912-1003

5100 NW FRONT AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_2
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Pyrene	82	µg/Kg dry wt	24.4	EPA 8270 - S

End of Report for Sample ID: FO031018

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 10:44 **System ID** AH08397 **Sample ID** **FO031019**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP918-1003
NW KITTRIDGE AND FRONT

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_3
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL. For Method 8270, 1 of 6 surrogate recoveries was low, and 5 of 22 MS/MSD recoveries were low or high due to matrix interference and/or non-homogeneity.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	81.2	% W/W	0.01	SM 2540 G
METALS				
COPPER	3310	mg/Kg dry wt	0.25	EPA 6020
ZINC	733	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (8) BY EPA 6020				
ARSENIC	12.2	mg/Kg dry wt	0.50	EPA 6020
BARIUM	228	mg/Kg dry wt	0.10	EPA 6020
CADMIUM	1.23	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	262	mg/Kg dry wt	0.50	EPA 6020
LEAD	3690	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.917	mg/Kg dry wt	0.010	EPA 6020
SELENIUM	<1.00	mg/Kg dry wt	1.00	EPA 6020
SILVER	34.9	mg/Kg dry wt	0.10	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<50	mg/Kg dry wt	50	NWTPH-Dx
DIESEL	<25	mg/Kg dry wt	25	NWTPH-Dx
KEROSENE	<25	mg/Kg dry wt	25	NWTPH-Dx
MOTOR OIL	641	mg/Kg dry wt	50	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	3930	mg/Kg dry wt	40.5	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<22.4	µg/Kg dry wt	22.4	EPA 8081
4,4'-DDE	<22.4	µg/Kg dry wt	22.4	EPA 8081
4,4'-DDT	36.7	µg/Kg dry wt	22.4	EPA 8081
Aldrin	<11.2	µg/Kg dry wt	11.2	EPA 8081
Alpha-BHC	<11.2	µg/Kg dry wt	11.2	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 10:44 **System ID** AH08397 **Sample ID** **FO031019**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP918-1003
NW KITTRIDGE AND FRONT

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_3
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL. For Method 8270, 1 of 6 surrogate recoveries was low, and 5 of 22 MS/MSD recoveries were low or high due to matrix interference and/or non-homogeneity.

Test Parameter	Result	Units	MRL	Method
Alpha-Chlordane	<11.2	µg/Kg dry wt	11.2	EPA 8081
Beta-BHC	<11.2	µg/Kg dry wt	11.2	EPA 8081
Delta-BHC	<11.2	µg/Kg dry wt	11.2	EPA 8081
Dieldrin	<22.4	µg/Kg dry wt	22.4	EPA 8081
Endosulfan I	<11.2	µg/Kg dry wt	11.2	EPA 8081
Endosulfan II	<22.4	µg/Kg dry wt	22.4	EPA 8081
Endosulfan Sulfate	<22.4	µg/Kg dry wt	22.4	EPA 8081
Endrin	<22.4	µg/Kg dry wt	22.4	EPA 8081
Endrin Aldehyde	<22.4	µg/Kg dry wt	22.4	EPA 8081
Endrin Ketone	<22.4	µg/Kg dry wt	22.4	EPA 8081
Gamma-BHC(Lindane)	<11.2	µg/Kg dry wt	11.2	EPA 8081
Gamma-Chlordane	<11.2	µg/Kg dry wt	11.2	EPA 8081
Heptachlor	<11.2	µg/Kg dry wt	11.2	EPA 8081
Heptachlor Epoxide	<11.2	µg/Kg dry wt	11.2	EPA 8081
Methoxychlor	<112	µg/Kg dry wt	112	EPA 8081
PCB 1016	<110	µg/Kg dry wt	110	EPA 8081
PCB 1221	<220	µg/Kg dry wt	220	EPA 8081
PCB 1232	<110	µg/Kg dry wt	110	EPA 8081
PCB 1242	<110	µg/Kg dry wt	110	EPA 8081
PCB 1248	<110	µg/Kg dry wt	110	EPA 8081
PCB 1254	<110	µg/Kg dry wt	110	EPA 8081
PCB 1260	231	µg/Kg dry wt	110	EPA 8081
Toxaphene	<1120	µg/Kg dry wt	1120	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
1,2-Dichlorobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
1,3-Dichlorobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
1,4-Dichlorobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
2,4,5-Trichlorophenol	<302	µg/Kg dry wt	302	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 10:44 **System ID** AH08397 **Sample ID** **FO031019**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP918-1003

NW KITTRIDGE AND FRONT

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_3
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL. For Method 8270, 1 of 6 surrogate recoveries was low, and 5 of 22 MS/MSD recoveries were low or high due to matrix interference and/or non-homogeneity.

Test Parameter	Result	Units	MRL	Method
2,4,6-Trichlorophenol	<302	µg/Kg dry wt	302	EPA 8270 - S
2,4-Dichlorophenol	<302	µg/Kg dry wt	302	EPA 8270 - S
2,4-Dimethylphenol	<302	µg/Kg dry wt	302	EPA 8270 - S
2,4-Dinitrophenol	<1510	µg/Kg dry wt	1510	EPA 8270 - S
2,4-Dinitrotoluene	<302	µg/Kg dry wt	302	EPA 8270 - S
2,6-Dinitrotoluene	<302	µg/Kg dry wt	302	EPA 8270 - S
2-Chloronaphthalene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
2-Chlorophenol	<302	µg/Kg dry wt	302	EPA 8270 - S
2-Methylnaphthalene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
2-Methylphenol	<302	µg/Kg dry wt	302	EPA 8270 - S
2-Nitroaniline	<302	µg/Kg dry wt	302	EPA 8270 - S
2-Nitrophenol	<302	µg/Kg dry wt	302	EPA 8270 - S
3,3'-Dichlorobenzidine	<603	µg/Kg dry wt	603	EPA 8270 - S
3- & 4-Methylphenol	<603	µg/Kg dry wt	603	EPA 8270 - S
3-Nitroaniline	<302	µg/Kg dry wt	302	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1510	µg/Kg dry wt	1510	EPA 8270 - S
4-Bromophenylphenyl ether	<302	µg/Kg dry wt	302	EPA 8270 - S
4-Chloro-3-methylphenol	<302	µg/Kg dry wt	302	EPA 8270 - S
4-Chloroaniline	<302	µg/Kg dry wt	302	EPA 8270 - S
4-Chlorophenylphenyl ether	<302	µg/Kg dry wt	302	EPA 8270 - S
4-Nitroaniline	<302	µg/Kg dry wt	302	EPA 8270 - S
4-Nitrophenol	<754	µg/Kg dry wt	754	EPA 8270 - S
Acenaphthene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Acenaphthylene	95.8	µg/Kg dry wt	75.4	EPA 8270 - S
Anthracene	EST 73.6	µg/Kg dry wt	75.4	EPA 8270 - S
Benzo(a)anthracene	280	µg/Kg dry wt	75.4	EPA 8270 - S
Benzo(a)pyrene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Benzo(g,h,i)perylene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Benzofluoranthenes	350	µg/Kg dry wt	75.4	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 10:44 **System ID** AH08397 **Sample ID** **FO031019**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP918-1003

NW KITTRIDGE AND FRONT

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_3
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL. For Method 8270, 1 of 6 surrogate recoveries was low, and 5 of 22 MS/MSD recoveries were low or high due to matrix interference and/or non-homogeneity.

Test Parameter	Result	Units	MRL	Method
Benzoic acid	<1510	µg/Kg dry wt	1510	EPA 8270 - S
Benzyl alcohol	<377	µg/Kg dry wt	377	EPA 8270 - S
Benzyl butyl phthalate	<377	µg/Kg dry wt	377	EPA 8270 - S
Bis(2-chloroethoxy) methane	<302	µg/Kg dry wt	302	EPA 8270 - S
Bis(2-chloroethyl) ether	<302	µg/Kg dry wt	302	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<302	µg/Kg dry wt	302	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1050	µg/Kg dry wt	302	EPA 8270 - S
Chrysene	292	µg/Kg dry wt	75.4	EPA 8270 - S
Di-n-butyl phthalate	<302	µg/Kg dry wt	302	EPA 8270 - S
Di-n-octyl phthalate	<302	µg/Kg dry wt	302	EPA 8270 - S
Dibenzo(a,h)anthracene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Dibenzofuran	<302	µg/Kg dry wt	302	EPA 8270 - S
Diethyl phthalate	<302	µg/Kg dry wt	302	EPA 8270 - S
Dimethyl phthalate	<302	µg/Kg dry wt	302	EPA 8270 - S
Fluoranthene	372	µg/Kg dry wt	75.4	EPA 8270 - S
Fluorene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Hexachlorobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
Hexachlorobutadiene	<302	µg/Kg dry wt	302	EPA 8270 - S
Hexachlorocyclopentadiene	<302	µg/Kg dry wt	302	EPA 8270 - S
Hexachloroethane	<302	µg/Kg dry wt	302	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Isophorone	<302	µg/Kg dry wt	302	EPA 8270 - S
N-Nitrosodi-n-propylamine	<302	µg/Kg dry wt	302	EPA 8270 - S
N-Nitrosodiphenylamine	<302	µg/Kg dry wt	302	EPA 8270 - S
Naphthalene	<75.4	µg/Kg dry wt	75.4	EPA 8270 - S
Nitrobenzene	<302	µg/Kg dry wt	302	EPA 8270 - S
Pentachlorophenol	<302	µg/Kg dry wt	302	EPA 8270 - S
Phenanthrene	135	µg/Kg dry wt	75.4	EPA 8270 - S
Phenol	<302	µg/Kg dry wt	302	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 10:44 **System ID** AH08397 **Sample ID** **FO031019**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP918-1003
NW KITTRIDGE AND FRONT

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_3
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL. For Method 8270, 1 of 6 surrogate recoveries was low, and 5 of 22 MS/MSD recoveries were low or high due to matrix interference and/or non-homogeneity.

Test Parameter	Result	Units	MRL	Method
Pyrene	552	µg/Kg dry wt	75.4	EPA 8270 - S

End of Report for Sample ID: FO031019

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 13:40 **System ID** AH08398 **Sample ID** **FO031020**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP931-1003

4488 NW YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_4
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	15.6	% W/W	0.01	SM 2540 G
METALS				
COPPER	620	mg/Kg dry wt	0.25	EPA 6020
ZINC	22100	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (8) BY EPA 6020				
ARSENIC	137	mg/Kg dry wt	0.50	EPA 6020
BARIUM	3950	mg/Kg dry wt	0.10	EPA 6020
CADMIUM	94.5	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	96.6	mg/Kg dry wt	0.50	EPA 6020
LEAD	260	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.347	mg/Kg dry wt	0.010	EPA 6020
SELENIUM	4.36	mg/Kg dry wt	1.00	EPA 6020
SILVER	76.9	mg/Kg dry wt	0.10	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<300	mg/Kg dry wt	300	NWTPH-Dx
DIESEL	<150	mg/Kg dry wt	150	NWTPH-Dx
KEROSENE	<150	mg/Kg dry wt	150	NWTPH-Dx
MOTOR OIL	1560	mg/Kg dry wt	300	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	36900	mg/Kg dry wt	472	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<153	µg/Kg dry wt	153	EPA 8081
4,4'-DDE	<153	µg/Kg dry wt	153	EPA 8081
4,4'-DDT	<153	µg/Kg dry wt	153	EPA 8081
Aldrin	<76.6	µg/Kg dry wt	76.6	EPA 8081
Alpha-BHC	<76.6	µg/Kg dry wt	76.6	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 13:40 **System ID** AH08398 **Sample ID** **FO031020**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP931-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_4
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Alpha-Chlordane	<76.6	µg/Kg dry wt	76.6	EPA 8081
Beta-BHC	<76.6	µg/Kg dry wt	76.6	EPA 8081
Delta-BHC	<76.6	µg/Kg dry wt	76.6	EPA 8081
Dieldrin	<153	µg/Kg dry wt	153	EPA 8081
Endosulfan I	<76.6	µg/Kg dry wt	76.6	EPA 8081
Endosulfan II	<153	µg/Kg dry wt	153	EPA 8081
Endosulfan Sulfate	<153	µg/Kg dry wt	153	EPA 8081
Endrin	<153	µg/Kg dry wt	153	EPA 8081
Endrin Aldehyde	<153	µg/Kg dry wt	153	EPA 8081
Endrin Ketone	<153	µg/Kg dry wt	153	EPA 8081
Gamma-BHC(Lindane)	<76.6	µg/Kg dry wt	76.6	EPA 8081
Gamma-Chlordane	<76.6	µg/Kg dry wt	76.6	EPA 8081
Heptachlor	<76.6	µg/Kg dry wt	76.6	EPA 8081
Heptachlor Epoxide	<76.6	µg/Kg dry wt	76.6	EPA 8081
Methoxychlor	<766	µg/Kg dry wt	766	EPA 8081
PCB 1016	<516	µg/Kg dry wt	516	EPA 8081
PCB 1221	<1030	µg/Kg dry wt	1030	EPA 8081
PCB 1232	<516	µg/Kg dry wt	516	EPA 8081
PCB 1242	<516	µg/Kg dry wt	516	EPA 8081
PCB 1248	<516	µg/Kg dry wt	516	EPA 8081
PCB 1254	<516	µg/Kg dry wt	516	EPA 8081
PCB 1260	<516	µg/Kg dry wt	516	EPA 8081
Toxaphene	<7660	µg/Kg dry wt	7660	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
1,2-Dichlorobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
1,3-Dichlorobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
1,4-Dichlorobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
2,4,5-Trichlorophenol	<137	µg/Kg dry wt	137	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 13:40 **System ID** AH08398 **Sample ID** **FO031020**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP931-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_4
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
2,4,6-Trichlorophenol	<137	µg/Kg dry wt	137	EPA 8270 - S
2,4-Dichlorophenol	<137	µg/Kg dry wt	137	EPA 8270 - S
2,4-Dimethylphenol	<137	µg/Kg dry wt	137	EPA 8270 - S
2,4-Dinitrophenol	<686	µg/Kg dry wt	686	EPA 8270 - S
2,4-Dinitrotoluene	<137	µg/Kg dry wt	137	EPA 8270 - S
2,6-Dinitrotoluene	<137	µg/Kg dry wt	137	EPA 8270 - S
2-Chloronaphthalene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
2-Chlorophenol	<137	µg/Kg dry wt	137	EPA 8270 - S
2-Methylnaphthalene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
2-Methylphenol	<137	µg/Kg dry wt	137	EPA 8270 - S
2-Nitroaniline	<137	µg/Kg dry wt	137	EPA 8270 - S
2-Nitrophenol	<137	µg/Kg dry wt	137	EPA 8270 - S
3,3'-Dichlorobenzidine	<274	µg/Kg dry wt	274	EPA 8270 - S
3- & 4-Methylphenol	<274	µg/Kg dry wt	274	EPA 8270 - S
3-Nitroaniline	<137	µg/Kg dry wt	137	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<686	µg/Kg dry wt	686	EPA 8270 - S
4-Bromophenylphenyl ether	<137	µg/Kg dry wt	137	EPA 8270 - S
4-Chloro-3-methylphenol	<137	µg/Kg dry wt	137	EPA 8270 - S
4-Chloroaniline	<137	µg/Kg dry wt	137	EPA 8270 - S
4-Chlorophenylphenyl ether	<137	µg/Kg dry wt	137	EPA 8270 - S
4-Nitroaniline	<137	µg/Kg dry wt	137	EPA 8270 - S
4-Nitrophenol	<343	µg/Kg dry wt	343	EPA 8270 - S
Acenaphthene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Acenaphthylene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Anthracene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Benzo(a)anthracene	EST 17.6	µg/Kg dry wt	34.3	EPA 8270 - S
Benzo(a)pyrene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Benzo(g,h,i)perylene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Benzofluoranthenes	73.8	µg/Kg dry wt	34.3	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 13:40 **System ID** AH08398 **Sample ID** **FO031020**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP931-1003

4488 NW YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_4
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Benzoic acid	<686	µg/Kg dry wt	686	EPA 8270 - S
Benzyl alcohol	<172	µg/Kg dry wt	172	EPA 8270 - S
Benzyl butyl phthalate	<172	µg/Kg dry wt	172	EPA 8270 - S
Bis(2-chloroethoxy) methane	<137	µg/Kg dry wt	137	EPA 8270 - S
Bis(2-chloroethyl) ether	<137	µg/Kg dry wt	137	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<137	µg/Kg dry wt	137	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	941	µg/Kg dry wt	137	EPA 8270 - S
Chrysene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Di-n-butyl phthalate	<137	µg/Kg dry wt	137	EPA 8270 - S
Di-n-octyl phthalate	<137	µg/Kg dry wt	137	EPA 8270 - S
Dibenzo(a,h)anthracene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Dibenzofuran	<137	µg/Kg dry wt	137	EPA 8270 - S
Diethyl phthalate	<137	µg/Kg dry wt	137	EPA 8270 - S
Dimethyl phthalate	<137	µg/Kg dry wt	137	EPA 8270 - S
Fluoranthene	48.1	µg/Kg dry wt	34.3	EPA 8270 - S
Fluorene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Hexachlorobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
Hexachlorobutadiene	<137	µg/Kg dry wt	137	EPA 8270 - S
Hexachlorocyclopentadiene	<137	µg/Kg dry wt	137	EPA 8270 - S
Hexachloroethane	<137	µg/Kg dry wt	137	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Isophorone	<137	µg/Kg dry wt	137	EPA 8270 - S
N-Nitrosodi-n-propylamine	<137	µg/Kg dry wt	137	EPA 8270 - S
N-Nitrosodiphenylamine	<137	µg/Kg dry wt	137	EPA 8270 - S
Naphthalene	<34.3	µg/Kg dry wt	34.3	EPA 8270 - S
Nitrobenzene	<137	µg/Kg dry wt	137	EPA 8270 - S
Pentachlorophenol	<137	µg/Kg dry wt	137	EPA 8270 - S
Phenanthrene	EST 26.7	µg/Kg dry wt	34.3	EPA 8270 - S
Phenol	<137	µg/Kg dry wt	137	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 13:40 **System ID** AH08398 **Sample ID** **FO031020**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP931-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_4
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Pyrene	52	µg/Kg dry wt	34.3	EPA 8270 - S

End of Report for Sample ID: FO031020

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 14:20 **System ID** AH08399 **Sample ID** **FO031021**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP932-1003

4488 NW YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_5
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	25.0	% W/W	0.01	SM 2540 G
METALS				
COPPER	144	mg/Kg dry wt	0.25	EPA 6020
ZINC	850	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (8) BY EPA 6020				
ARSENIC	67.3	mg/Kg dry wt	0.50	EPA 6020
BARIUM	324	mg/Kg dry wt	0.10	EPA 6020
CADMIUM	2.55	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	72.8	mg/Kg dry wt	0.50	EPA 6020
LEAD	226	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.277	mg/Kg dry wt	0.010	EPA 6020
SELENIUM	1.02	mg/Kg dry wt	1.00	EPA 6020
SILVER	145	mg/Kg dry wt	0.10	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	396	mg/Kg dry wt	200	NWTPH-Dx
DIESEL	<100	mg/Kg dry wt	100	NWTPH-Dx
KEROSENE	<100	mg/Kg dry wt	100	NWTPH-Dx
MOTOR OIL	1930	mg/Kg dry wt	200	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	82700	mg/Kg dry wt	216	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<57.6	µg/Kg dry wt	57.6	EPA 8081
4,4'-DDE	<57.6	µg/Kg dry wt	57.6	EPA 8081
4,4'-DDT	<57.6	µg/Kg dry wt	57.6	EPA 8081
Aldrin	<28.8	µg/Kg dry wt	28.8	EPA 8081
Alpha-BHC	<28.8	µg/Kg dry wt	28.8	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 14:20 **System ID** AH08399 **Sample ID** **FO031021**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP932-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_5
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Alpha-Chlordane	<28.8	µg/Kg dry wt	28.8	EPA 8081
Beta-BHC	<28.8	µg/Kg dry wt	28.8	EPA 8081
Delta-BHC	<28.8	µg/Kg dry wt	28.8	EPA 8081
Dieldrin	<57.6	µg/Kg dry wt	57.6	EPA 8081
Endosulfan I	<28.8	µg/Kg dry wt	28.8	EPA 8081
Endosulfan II	<57.6	µg/Kg dry wt	57.6	EPA 8081
Endosulfan Sulfate	<57.6	µg/Kg dry wt	57.6	EPA 8081
Endrin	<57.6	µg/Kg dry wt	57.6	EPA 8081
Endrin Aldehyde	<57.6	µg/Kg dry wt	57.6	EPA 8081
Endrin Ketone	<57.6	µg/Kg dry wt	57.6	EPA 8081
Gamma-BHC(Lindane)	<28.8	µg/Kg dry wt	28.8	EPA 8081
Gamma-Chlordane	38.3	µg/Kg dry wt	28.8	EPA 8081
Heptachlor	<28.8	µg/Kg dry wt	28.8	EPA 8081
Heptachlor Epoxide	<28.8	µg/Kg dry wt	28.8	EPA 8081
Methoxychlor	<288	µg/Kg dry wt	288	EPA 8081
PCB 1016	<329	µg/Kg dry wt	329	EPA 8081
PCB 1221	<657	µg/Kg dry wt	657	EPA 8081
PCB 1232	<329	µg/Kg dry wt	329	EPA 8081
PCB 1242	<329	µg/Kg dry wt	329	EPA 8081
PCB 1248	<329	µg/Kg dry wt	329	EPA 8081
PCB 1254	<329	µg/Kg dry wt	329	EPA 8081
PCB 1260	EST 242	µg/Kg dry wt	329	EPA 8081
Toxaphene	<2880	µg/Kg dry wt	2880	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
1,2-Dichlorobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
1,3-Dichlorobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
1,4-Dichlorobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
2,4,5-Trichlorophenol	<831	µg/Kg dry wt	831	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 14:20 **System ID** AH08399 **Sample ID** **FO031021**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP932-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_5
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
2,4,6-Trichlorophenol	<831	µg/Kg dry wt	831	EPA 8270 - S
2,4-Dichlorophenol	<831	µg/Kg dry wt	831	EPA 8270 - S
2,4-Dimethylphenol	<831	µg/Kg dry wt	831	EPA 8270 - S
2,4-Dinitrophenol	<4150	µg/Kg dry wt	4150	EPA 8270 - S
2,4-Dinitrotoluene	<831	µg/Kg dry wt	831	EPA 8270 - S
2,6-Dinitrotoluene	<831	µg/Kg dry wt	831	EPA 8270 - S
2-Chloronaphthalene	<208	µg/Kg dry wt	208	EPA 8270 - S
2-Chlorophenol	<831	µg/Kg dry wt	831	EPA 8270 - S
2-Methylnaphthalene	<208	µg/Kg dry wt	208	EPA 8270 - S
2-Methylphenol	<831	µg/Kg dry wt	831	EPA 8270 - S
2-Nitroaniline	<831	µg/Kg dry wt	831	EPA 8270 - S
2-Nitrophenol	<831	µg/Kg dry wt	831	EPA 8270 - S
3,3'-Dichlorobenzidine	<1660	µg/Kg dry wt	1660	EPA 8270 - S
3- & 4-Methylphenol	<1660	µg/Kg dry wt	1660	EPA 8270 - S
3-Nitroaniline	<831	µg/Kg dry wt	831	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<4150	µg/Kg dry wt	4150	EPA 8270 - S
4-Bromophenylphenyl ether	<831	µg/Kg dry wt	831	EPA 8270 - S
4-Chloro-3-methylphenol	<831	µg/Kg dry wt	831	EPA 8270 - S
4-Chloroaniline	<831	µg/Kg dry wt	831	EPA 8270 - S
4-Chlorophenylphenyl ether	<831	µg/Kg dry wt	831	EPA 8270 - S
4-Nitroaniline	<831	µg/Kg dry wt	831	EPA 8270 - S
4-Nitrophenol	<2080	µg/Kg dry wt	2080	EPA 8270 - S
Acenaphthene	<208	µg/Kg dry wt	208	EPA 8270 - S
Acenaphthylene	<208	µg/Kg dry wt	208	EPA 8270 - S
Anthracene	<208	µg/Kg dry wt	208	EPA 8270 - S
Benzo(a)anthracene	<208	µg/Kg dry wt	208	EPA 8270 - S
Benzo(a)pyrene	893	µg/Kg dry wt	208	EPA 8270 - S
Benzo(g,h,i)perylene	<208	µg/Kg dry wt	208	EPA 8270 - S
Benzofluoranthenes	790	µg/Kg dry wt	208	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 14:20 **System ID** AH08399 **Sample ID** **FO031021**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP932-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_5
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Benzoic acid	<4150	µg/Kg dry wt	4150	EPA 8270 - S
Benzyl alcohol	<1040	µg/Kg dry wt	1040	EPA 8270 - S
Benzyl butyl phthalate	<1040	µg/Kg dry wt	1040	EPA 8270 - S
Bis(2-chloroethoxy) methane	<831	µg/Kg dry wt	831	EPA 8270 - S
Bis(2-chloroethyl) ether	<831	µg/Kg dry wt	831	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<831	µg/Kg dry wt	831	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	2200	µg/Kg dry wt	831	EPA 8270 - S
Chrysene	<208	µg/Kg dry wt	208	EPA 8270 - S
Di-n-butyl phthalate	<831	µg/Kg dry wt	831	EPA 8270 - S
Di-n-octyl phthalate	<831	µg/Kg dry wt	831	EPA 8270 - S
Dibenzo(a,h)anthracene	<208	µg/Kg dry wt	208	EPA 8270 - S
Dibenzofuran	<831	µg/Kg dry wt	831	EPA 8270 - S
Diethyl phthalate	<831	µg/Kg dry wt	831	EPA 8270 - S
Dimethyl phthalate	<831	µg/Kg dry wt	831	EPA 8270 - S
Fluoranthene	412	µg/Kg dry wt	208	EPA 8270 - S
Fluorene	<208	µg/Kg dry wt	208	EPA 8270 - S
Hexachlorobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
Hexachlorobutadiene	<831	µg/Kg dry wt	831	EPA 8270 - S
Hexachlorocyclopentadiene	<831	µg/Kg dry wt	831	EPA 8270 - S
Hexachloroethane	<831	µg/Kg dry wt	831	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<208	µg/Kg dry wt	208	EPA 8270 - S
Isophorone	<831	µg/Kg dry wt	831	EPA 8270 - S
N-Nitrosodi-n-propylamine	<831	µg/Kg dry wt	831	EPA 8270 - S
N-Nitrosodiphenylamine	<831	µg/Kg dry wt	831	EPA 8270 - S
Naphthalene	<208	µg/Kg dry wt	208	EPA 8270 - S
Nitrobenzene	<831	µg/Kg dry wt	831	EPA 8270 - S
Pentachlorophenol	<831	µg/Kg dry wt	831	EPA 8270 - S
Phenanthrene	EST 139	µg/Kg dry wt	208	EPA 8270 - S
Phenol	<831	µg/Kg dry wt	831	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/7/2003 14:20 **System ID** AH08399 **Sample ID** **FO031021**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP932-1003

4488 NW YEON

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_5
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Reporting limits are raised for NWTPH-Dx analysis due to the low %solids in the sample. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Pyrene	532	µg/Kg dry wt	208	EPA 8270 - S

End of Report for Sample ID: FO031021

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 12:40 **System ID** AH08400 **Sample ID** **FO031022**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAT496-1003
NW ST HELENS & YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_6
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	76.0	% W/W	0.01	SM 2540 G
METALS				
COPPER	64.3	mg/Kg dry wt	0.25	EPA 6020
ZINC	208	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	8.08	mg/Kg dry wt	0.50	EPA 6020
CADMIUM	0.77	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	63.1	mg/Kg dry wt	0.50	EPA 6020
LEAD	27.0	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.033	mg/Kg dry wt	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	231	mg/Kg dry wt	50	NWTPH-Dx
DIESEL	<25	mg/Kg dry wt	25	NWTPH-Dx
KEROSENE	<25	mg/Kg dry wt	25	NWTPH-Dx
MOTOR OIL	980	mg/Kg dry wt	50	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	6670	mg/Kg dry wt	45.1	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<22.6	µg/Kg dry wt	22.6	EPA 8081
4,4'-DDE	<22.6	µg/Kg dry wt	22.6	EPA 8081
4,4'-DDT	<22.6	µg/Kg dry wt	22.6	EPA 8081
Aldrin	<11.3	µg/Kg dry wt	11.3	EPA 8081
Alpha-BHC	<11.3	µg/Kg dry wt	11.3	EPA 8081
Alpha-Chlordane	<11.3	µg/Kg dry wt	11.3	EPA 8081
Beta-BHC	<11.3	µg/Kg dry wt	11.3	EPA 8081
Delta-BHC	<11.3	µg/Kg dry wt	11.3	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 12:40 **System ID** AH08400 **Sample ID** **FO031022**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAT496-1003
NW ST HELENS & YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_6
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Dieldrin	<22.6	µg/Kg dry wt	22.6	EPA 8081
Endosulfan I	<11.3	µg/Kg dry wt	11.3	EPA 8081
Endosulfan II	<22.6	µg/Kg dry wt	22.6	EPA 8081
Endosulfan Sulfate	<22.6	µg/Kg dry wt	22.6	EPA 8081
Endrin	<22.6	µg/Kg dry wt	22.6	EPA 8081
Endrin Aldehyde	<22.6	µg/Kg dry wt	22.6	EPA 8081
Endrin Ketone	<22.6	µg/Kg dry wt	22.6	EPA 8081
Gamma-BHC(Lindane)	<11.3	µg/Kg dry wt	11.3	EPA 8081
Gamma-Chlordane	<11.3	µg/Kg dry wt	11.3	EPA 8081
Heptachlor	<11.3	µg/Kg dry wt	11.3	EPA 8081
Heptachlor Epoxide	<11.3	µg/Kg dry wt	11.3	EPA 8081
Methoxychlor	<113	µg/Kg dry wt	113	EPA 8081
PCB 1016	<117	µg/Kg dry wt	117	EPA 8081
PCB 1221	<234	µg/Kg dry wt	234	EPA 8081
PCB 1232	<117	µg/Kg dry wt	117	EPA 8081
PCB 1242	<117	µg/Kg dry wt	117	EPA 8081
PCB 1248	<117	µg/Kg dry wt	117	EPA 8081
PCB 1254	<117	µg/Kg dry wt	117	EPA 8081
PCB 1260	<117	µg/Kg dry wt	117	EPA 8081
Toxaphene	<1130	µg/Kg dry wt	1130	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
1,2-Dichlorobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
1,3-Dichlorobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
1,4-Dichlorobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
2,4,5-Trichlorophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
2,4,6-Trichlorophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
2,4-Dichlorophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
2,4-Dimethylphenol	<319	µg/Kg dry wt	319	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 12:40 **System ID** AH08400 **Sample ID** **FO031022**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAT496-1003

NW ST HELENS & YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_6
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
2,4-Dinitrophenol	<1600	µg/Kg dry wt	1600	EPA 8270 - S
2,4-Dinitrotoluene	<319	µg/Kg dry wt	319	EPA 8270 - S
2,6-Dinitrotoluene	<319	µg/Kg dry wt	319	EPA 8270 - S
2-Chloronaphthalene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
2-Chlorophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
2-Methylnaphthalene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
2-Methylphenol	<319	µg/Kg dry wt	319	EPA 8270 - S
2-Nitroaniline	<319	µg/Kg dry wt	319	EPA 8270 - S
2-Nitrophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
3,3'-Dichlorobenzidine	<638	µg/Kg dry wt	638	EPA 8270 - S
3- & 4-Methylphenol	<638	µg/Kg dry wt	638	EPA 8270 - S
3-Nitroaniline	<319	µg/Kg dry wt	319	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1600	µg/Kg dry wt	1600	EPA 8270 - S
4-Bromophenylphenyl ether	<319	µg/Kg dry wt	319	EPA 8270 - S
4-Chloro-3-methylphenol	<319	µg/Kg dry wt	319	EPA 8270 - S
4-Chloroaniline	<319	µg/Kg dry wt	319	EPA 8270 - S
4-Chlorophenylphenyl ether	<319	µg/Kg dry wt	319	EPA 8270 - S
4-Nitroaniline	<319	µg/Kg dry wt	319	EPA 8270 - S
4-Nitrophenol	<798	µg/Kg dry wt	798	EPA 8270 - S
Acenaphthene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Acenaphthylene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Anthracene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Benzo(a)anthracene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Benzo(a)pyrene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Benzo(g,h,i)perylene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Benzofluoranthenes	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Benzoic acid	<1600	µg/Kg dry wt	1600	EPA 8270 - S
Benzyl alcohol	<399	µg/Kg dry wt	399	EPA 8270 - S
Benzyl butyl phthalate	<399	µg/Kg dry wt	399	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 12:40 **System ID** AH08400 **Sample ID** **FO031022**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAT496-1003

NW ST HELENS & YEON

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_6
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Contamination quantified as Fuel Oil most closely resembles the hydrocarbon pattern of JP-7 fuel. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroethoxy) methane	<319	µg/Kg dry wt	319	EPA 8270 - S
Bis(2-chloroethyl) ether	<319	µg/Kg dry wt	319	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<319	µg/Kg dry wt	319	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	549	µg/Kg dry wt	319	EPA 8270 - S
Chrysene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Di-n-butyl phthalate	<319	µg/Kg dry wt	319	EPA 8270 - S
Di-n-octyl phthalate	<319	µg/Kg dry wt	319	EPA 8270 - S
Dibenzo(a,h)anthracene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Dibenzofuran	<319	µg/Kg dry wt	319	EPA 8270 - S
Diethyl phthalate	<319	µg/Kg dry wt	319	EPA 8270 - S
Dimethyl phthalate	<319	µg/Kg dry wt	319	EPA 8270 - S
Fluoranthene	EST 78.5	µg/Kg dry wt	79.8	EPA 8270 - S
Fluorene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Hexachlorobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
Hexachlorobutadiene	<319	µg/Kg dry wt	319	EPA 8270 - S
Hexachlorocyclopentadiene	<319	µg/Kg dry wt	319	EPA 8270 - S
Hexachloroethane	<319	µg/Kg dry wt	319	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Isophorone	<319	µg/Kg dry wt	319	EPA 8270 - S
N-Nitrosodi-n-propylamine	<319	µg/Kg dry wt	319	EPA 8270 - S
N-Nitrosodiphenylamine	<319	µg/Kg dry wt	319	EPA 8270 - S
Naphthalene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Nitrobenzene	<319	µg/Kg dry wt	319	EPA 8270 - S
Pentachlorophenol	<319	µg/Kg dry wt	319	EPA 8270 - S
Phenanthrene	<79.8	µg/Kg dry wt	79.8	EPA 8270 - S
Phenol	<319	µg/Kg dry wt	319	EPA 8270 - S
Pyrene	111	µg/Kg dry wt	79.8	EPA 8270 - S

End of Report for Sample ID: FO031022

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 10:35 **System ID** AH08401 **Sample ID** **FO031023**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP831-1003
CHEVRON ASPHALT

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_7
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	73.7	% W/W	0.01	SM 2540 G
METALS				
COPPER	81.1	mg/Kg dry wt	0.25	EPA 6020
ZINC	300	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	28.8	mg/Kg dry wt	0.50	EPA 6020
CADMIUM	1.12	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	36.4	mg/Kg dry wt	0.50	EPA 6020
LEAD	70.3	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.050	mg/Kg dry wt	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<50	mg/Kg dry wt	50	NWTPH-Dx
DIESEL	<25	mg/Kg dry wt	25	NWTPH-Dx
KEROSENE	<25	mg/Kg dry wt	25	NWTPH-Dx
MOTOR OIL	207	mg/Kg dry wt	50	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	5760	mg/Kg dry wt	39.5	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<23.7	µg/Kg dry wt	23.7	EPA 8081
4,4'-DDE	<23.7	µg/Kg dry wt	23.7	EPA 8081
4,4'-DDT	<23.7	µg/Kg dry wt	23.7	EPA 8081
Aldrin	<11.9	µg/Kg dry wt	11.9	EPA 8081
Alpha-BHC	<11.9	µg/Kg dry wt	11.9	EPA 8081
Alpha-Chlordane	<11.9	µg/Kg dry wt	11.9	EPA 8081
Beta-BHC	<11.9	µg/Kg dry wt	11.9	EPA 8081
Delta-BHC	<11.9	µg/Kg dry wt	11.9	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 10:35 **System ID** AH08401 **Sample ID** **FO031023**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP831-1003

CHEVRON ASPHALT

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_7
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Dieldrin	<23.7	µg/Kg dry wt	23.7	EPA 8081
Endosulfan I	<11.9	µg/Kg dry wt	11.9	EPA 8081
Endosulfan II	<23.7	µg/Kg dry wt	23.7	EPA 8081
Endosulfan Sulfate	<23.7	µg/Kg dry wt	23.7	EPA 8081
Endrin	<23.7	µg/Kg dry wt	23.7	EPA 8081
Endrin Aldehyde	<23.7	µg/Kg dry wt	23.7	EPA 8081
Endrin Ketone	<23.7	µg/Kg dry wt	23.7	EPA 8081
Gamma-BHC(Lindane)	<11.9	µg/Kg dry wt	11.9	EPA 8081
Gamma-Chlordane	<11.9	µg/Kg dry wt	11.9	EPA 8081
Heptachlor	<11.9	µg/Kg dry wt	11.9	EPA 8081
Heptachlor Epoxide	<11.9	µg/Kg dry wt	11.9	EPA 8081
Methoxychlor	<119	µg/Kg dry wt	119	EPA 8081
PCB 1016	<116	µg/Kg dry wt	116	EPA 8081
PCB 1221	<231	µg/Kg dry wt	231	EPA 8081
PCB 1232	<116	µg/Kg dry wt	116	EPA 8081
PCB 1242	<116	µg/Kg dry wt	116	EPA 8081
PCB 1248	<116	µg/Kg dry wt	116	EPA 8081
PCB 1254	<116	µg/Kg dry wt	116	EPA 8081
PCB 1260	<116	µg/Kg dry wt	116	EPA 8081
Toxaphene	<1190	µg/Kg dry wt	1190	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
1,2-Dichlorobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
1,3-Dichlorobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
1,4-Dichlorobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
2,4,5-Trichlorophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
2,4,6-Trichlorophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
2,4-Dichlorophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
2,4-Dimethylphenol	<306	µg/Kg dry wt	306	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 10:35 **System ID** AH08401 **Sample ID** **FO031023**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP831-1003

CHEVRON ASPHALT

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_7
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
2,4-Dinitrophenol	<1530	µg/Kg dry wt	1530	EPA 8270 - S
2,4-Dinitrotoluene	<306	µg/Kg dry wt	306	EPA 8270 - S
2,6-Dinitrotoluene	<306	µg/Kg dry wt	306	EPA 8270 - S
2-Chloronaphthalene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
2-Chlorophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
2-Methylnaphthalene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
2-Methylphenol	<306	µg/Kg dry wt	306	EPA 8270 - S
2-Nitroaniline	<306	µg/Kg dry wt	306	EPA 8270 - S
2-Nitrophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
3,3'-Dichlorobenzidine	<612	µg/Kg dry wt	612	EPA 8270 - S
3- & 4-Methylphenol	<612	µg/Kg dry wt	612	EPA 8270 - S
3-Nitroaniline	<306	µg/Kg dry wt	306	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1530	µg/Kg dry wt	1530	EPA 8270 - S
4-Bromophenylphenyl ether	<306	µg/Kg dry wt	306	EPA 8270 - S
4-Chloro-3-methylphenol	<306	µg/Kg dry wt	306	EPA 8270 - S
4-Chloroaniline	<306	µg/Kg dry wt	306	EPA 8270 - S
4-Chlorophenylphenyl ether	<306	µg/Kg dry wt	306	EPA 8270 - S
4-Nitroaniline	<306	µg/Kg dry wt	306	EPA 8270 - S
4-Nitrophenol	<764	µg/Kg dry wt	764	EPA 8270 - S
Acenaphthene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Acenaphthylene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Anthracene	EST 40	µg/Kg dry wt	76.4	EPA 8270 - S
Benzo(a)anthracene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Benzo(a)pyrene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Benzo(g,h,i)perylene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Benzofluoranthenes	539	µg/Kg dry wt	76.4	EPA 8270 - S
Benzoic acid	<1530	µg/Kg dry wt	1530	EPA 8270 - S
Benzyl alcohol	<382	µg/Kg dry wt	382	EPA 8270 - S
Benzyl butyl phthalate	<382	µg/Kg dry wt	382	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 10:35 **System ID** AH08401 **Sample ID** **FO031023**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AAP831-1003

CHEVRON ASPHALT

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_7
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Results flagged as estimates are less than the PQL but detectable above the MDL.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroethoxy) methane	<306	µg/Kg dry wt	306	EPA 8270 - S
Bis(2-chloroethyl) ether	<306	µg/Kg dry wt	306	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<306	µg/Kg dry wt	306	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<306	µg/Kg dry wt	306	EPA 8270 - S
Chrysene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Di-n-butyl phthalate	<306	µg/Kg dry wt	306	EPA 8270 - S
Di-n-octyl phthalate	<306	µg/Kg dry wt	306	EPA 8270 - S
Dibenzo(a,h)anthracene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Dibenzofuran	<306	µg/Kg dry wt	306	EPA 8270 - S
Diethyl phthalate	<306	µg/Kg dry wt	306	EPA 8270 - S
Dimethyl phthalate	<306	µg/Kg dry wt	306	EPA 8270 - S
Fluoranthene	131	µg/Kg dry wt	76.4	EPA 8270 - S
Fluorene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Hexachlorobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
Hexachlorobutadiene	<306	µg/Kg dry wt	306	EPA 8270 - S
Hexachlorocyclopentadiene	<306	µg/Kg dry wt	306	EPA 8270 - S
Hexachloroethane	<306	µg/Kg dry wt	306	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Isophorone	<306	µg/Kg dry wt	306	EPA 8270 - S
N-Nitrosodi-n-propylamine	<306	µg/Kg dry wt	306	EPA 8270 - S
N-Nitrosodiphenylamine	<306	µg/Kg dry wt	306	EPA 8270 - S
Naphthalene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Nitrobenzene	<306	µg/Kg dry wt	306	EPA 8270 - S
Pentachlorophenol	<306	µg/Kg dry wt	306	EPA 8270 - S
Phenanthrene	<76.4	µg/Kg dry wt	76.4	EPA 8270 - S
Phenol	<306	µg/Kg dry wt	306	EPA 8270 - S
Pyrene	125	µg/Kg dry wt	76.4	EPA 8270 - S

End of Report for Sample ID: FO031023

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 11:50 **System ID** AH08402 **Sample ID** **FO031024**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AMZ077-1003

4465 NW YEON AVE

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_8
IMS File/Invoice #: 1020.001

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 2 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. One of 2 surrogates for Pesticide analysis had low recovery due to matrix interference.

Test Parameter	Result	Units	MRL	Method
GENERAL				
TOTAL SOLIDS - NOT REPORTED	79.8	% W/W	0.01	SM 2540 G
METALS				
COPPER	72.4	mg/Kg dry wt	0.25	EPA 6020
ZINC	338	mg/Kg dry wt	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	4.36	mg/Kg dry wt	0.50	EPA 6020
CADMIUM	0.75	mg/Kg dry wt	0.10	EPA 6020
CHROMIUM	65.9	mg/Kg dry wt	0.50	EPA 6020
LEAD	81.3	mg/Kg dry wt	0.10	EPA 6020
MERCURY	0.047	mg/Kg dry wt	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<100	mg/Kg dry wt	100	NWTPH-Dx
DIESEL	<50	mg/Kg dry wt	50.0	NWTPH-Dx
KEROSENE	<50	mg/Kg dry wt	50.0	NWTPH-Dx
MOTOR OIL	1010	mg/Kg dry wt	100	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	8660	mg/Kg dry wt	31.1	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<22.7	µg/Kg dry wt	22.7	EPA 8081
4,4'-DDE	<22.7	µg/Kg dry wt	22.7	EPA 8081
4,4'-DDT	<22.7	µg/Kg dry wt	22.7	EPA 8081
Aldrin	<11.4	µg/Kg dry wt	11.4	EPA 8081
Alpha-BHC	<11.4	µg/Kg dry wt	11.4	EPA 8081
Alpha-Chlordane	<11.4	µg/Kg dry wt	11.4	EPA 8081
Beta-BHC	<11.4	µg/Kg dry wt	11.4	EPA 8081
Delta-BHC	<11.4	µg/Kg dry wt	11.4	EPA 8081

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 11:50 **System ID** AH08402 **Sample ID** **FO031024**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AMZ077-1003

4465 NW YEON AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_8
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 2 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. One of 2 surrogates for Pesticide analysis had low recovery due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Dieldrin	<22.7	µg/Kg dry wt	22.7	EPA 8081
Endosulfan I	<11.4	µg/Kg dry wt	11.4	EPA 8081
Endosulfan II	<22.7	µg/Kg dry wt	22.7	EPA 8081
Endosulfan Sulfate	<22.7	µg/Kg dry wt	22.7	EPA 8081
Endrin	<22.7	µg/Kg dry wt	22.7	EPA 8081
Endrin Aldehyde	<22.7	µg/Kg dry wt	22.7	EPA 8081
Endrin Ketone	<22.7	µg/Kg dry wt	22.7	EPA 8081
Gamma-BHC(Lindane)	<11.4	µg/Kg dry wt	11.4	EPA 8081
Gamma-Chlordane	<11.4	µg/Kg dry wt	11.4	EPA 8081
Heptachlor	<11.4	µg/Kg dry wt	11.4	EPA 8081
Heptachlor Epoxide	<11.4	µg/Kg dry wt	11.4	EPA 8081
Methoxychlor	<114	µg/Kg dry wt	114	EPA 8081
PCB 1016	<112	µg/Kg dry wt	112	EPA 8081
PCB 1221	<225	µg/Kg dry wt	225	EPA 8081
PCB 1232	<112	µg/Kg dry wt	112	EPA 8081
PCB 1242	<112	µg/Kg dry wt	112	EPA 8081
PCB 1248	<112	µg/Kg dry wt	112	EPA 8081
PCB 1254	<112	µg/Kg dry wt	112	EPA 8081
PCB 1260	<112	µg/Kg dry wt	112	EPA 8081
Toxaphene	<1140	µg/Kg dry wt	1140	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
1,2-Dichlorobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
1,3-Dichlorobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
1,4-Dichlorobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
2,4,5-Trichlorophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
2,4,6-Trichlorophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
2,4-Dichlorophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
2,4-Dimethylphenol	<293	µg/Kg dry wt	293	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 11:50 **System ID** AH08402 **Sample ID** **FO031024**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AMZ077-1003

4465 NW YEON AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_8
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 2 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. One of 2 surrogates for Pesticide analysis had low recovery due to matrix interference.

Test Parameter	Result	Units	MRL	Method
2,4-Dinitrophenol	<1460	µg/Kg dry wt	1460	EPA 8270 - S
2,4-Dinitrotoluene	<293	µg/Kg dry wt	293	EPA 8270 - S
2,6-Dinitrotoluene	<293	µg/Kg dry wt	293	EPA 8270 - S
2-Chloronaphthalene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
2-Chlorophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
2-Methylnaphthalene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
2-Methylphenol	<293	µg/Kg dry wt	293	EPA 8270 - S
2-Nitroaniline	<293	µg/Kg dry wt	293	EPA 8270 - S
2-Nitrophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
3,3'-Dichlorobenzidine	<585	µg/Kg dry wt	585	EPA 8270 - S
3- & 4-Methylphenol	<585	µg/Kg dry wt	585	EPA 8270 - S
3-Nitroaniline	<293	µg/Kg dry wt	293	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1460	µg/Kg dry wt	1460	EPA 8270 - S
4-Bromophenylphenyl ether	<293	µg/Kg dry wt	293	EPA 8270 - S
4-Chloro-3-methylphenol	<293	µg/Kg dry wt	293	EPA 8270 - S
4-Chloroaniline	<293	µg/Kg dry wt	293	EPA 8270 - S
4-Chlorophenylphenyl ether	<293	µg/Kg dry wt	293	EPA 8270 - S
4-Nitroaniline	<293	µg/Kg dry wt	293	EPA 8270 - S
4-Nitrophenol	<732	µg/Kg dry wt	732	EPA 8270 - S
Acenaphthene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Acenaphthylene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Anthracene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Benzo(a)anthracene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Benzo(a)pyrene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Benzo(g,h,i)perylene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Benzofluoranthenes	553	µg/Kg dry wt	73.2	EPA 8270 - S
Benzoic acid	<1460	µg/Kg dry wt	1460	EPA 8270 - S
Benzyl alcohol	<366	µg/Kg dry wt	366	EPA 8270 - S
Benzyl butyl phthalate	<366	µg/Kg dry wt	366	EPA 8270 - S

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 10/8/2003 11:50 **System ID** AH08402 **Sample ID** **FO031024**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-19-AMZ077-1003

4465 NW YEON AVE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 19_8
IMS File/Invoice #: 1020.001

Date Received: 10/8/2003
Sample Status: COMPLETE AND VALIDATED

Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/CJH

Comments: QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. The sample required dilution by a factor of 2 for NWTPH-Dx analysis due to the high concentration of petroleum hydrocarbons. Results flagged as estimates are less than the PQL but detectable above the MDL. One of 2 surrogates for Pesticide analysis had low recovery due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroethoxy) methane	<293	µg/Kg dry wt	293	EPA 8270 - S
Bis(2-chloroethyl) ether	<293	µg/Kg dry wt	293	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<293	µg/Kg dry wt	293	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1470	µg/Kg dry wt	293	EPA 8270 - S
Chrysene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Di-n-butyl phthalate	<293	µg/Kg dry wt	293	EPA 8270 - S
Di-n-octyl phthalate	<293	µg/Kg dry wt	293	EPA 8270 - S
Dibenzo(a,h)anthracene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Dibenzofuran	<293	µg/Kg dry wt	293	EPA 8270 - S
Diethyl phthalate	<293	µg/Kg dry wt	293	EPA 8270 - S
Dimethyl phthalate	<293	µg/Kg dry wt	293	EPA 8270 - S
Fluoranthene	234	µg/Kg dry wt	73.2	EPA 8270 - S
Fluorene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Hexachlorobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
Hexachlorobutadiene	<293	µg/Kg dry wt	293	EPA 8270 - S
Hexachlorocyclopentadiene	<293	µg/Kg dry wt	293	EPA 8270 - S
Hexachloroethane	<293	µg/Kg dry wt	293	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Isophorone	<293	µg/Kg dry wt	293	EPA 8270 - S
N-Nitrosodi-n-propylamine	<293	µg/Kg dry wt	293	EPA 8270 - S
N-Nitrosodiphenylamine	<293	µg/Kg dry wt	293	EPA 8270 - S
Naphthalene	<73.2	µg/Kg dry wt	73.2	EPA 8270 - S
Nitrobenzene	<293	µg/Kg dry wt	293	EPA 8270 - S
Pentachlorophenol	<293	µg/Kg dry wt	293	EPA 8270 - S
Phenanthrene	110	µg/Kg dry wt	73.2	EPA 8270 - S
Phenol	<293	µg/Kg dry wt	293	EPA 8270 - S
Pyrene	649	µg/Kg dry wt	73.2	EPA 8270 - S

End of Report for Sample ID: FO031024

Part II: Severn Trent Laboratory Data Analysis Report

116855

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

TRANSMITTAL MEMORANDUM

DATE: October 31, 2003

TO: Howard Holmes
North Creek Analytical
9405 S. W. Nimbus Ave.
Beaverton, OR 97008

PROJECT: City of Portland Lower Harbor

REPORT NUMBER: 116855

TOTAL NUMBER OF PAGES: 59

Enclosed are the test results for eight samples received at STL Seattle on October 13, 2003.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Tom Watson
Project Manager

STL Seattle

ANALYTICAL NARRATIVE

Client: North Creek Analytical

Date: February 25, 2004

Project: City of Portland Lower Harbor

Lab No.: 116855

Organchlorine Pesticides 8081A

The QC Blank Spike Duplicate recovery for Eldrin Aldehyde failed high. Corrective action was not taken all samples were ND for Endrin Aldehyde.

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
116855-1	FO 031017	10-07-03 11:53	solid
116855-2	FO 031018	10-07-03 09:41	solid
116855-3	FO 031019	10-07-03 10:44	solid
116855-4	FO 031020	10-07-03 13:40	solid
116855-5	FO 031021	10-07-03 14:20	solid
116855-6	FO 031022	10-08-03 12:40	solid
116855-7	FO 031023	10-08-03 10:35	solid
116855-8	FO 031024	10-08-03 11:50	solid

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031017
Lab ID:	116855-01
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	85.22
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	10300	98.7	39.5	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031018
Lab ID:	116855-02
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	24.35
Dilution Factor	5

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	25900	564	226	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031019
Lab ID:	116855-03
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	83.46
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	3930	101	40.5	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031020
Lab ID:	116855-04
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	18.66
Dilution Factor	.10

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	36900	1180	472	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031021
Lab ID:	116855-05
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	30.09
Dilution Factor	5

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	82700	540	216	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031022
Lab ID:	116855-06
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	80.52
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	6670	113	45.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031023
Lab ID:	116855-07
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	78.53
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	5760	98.7	39.5	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031024
Lab ID:	116855-08
Date Received:	10/13/03
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	82.91
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	8660	77.7	31.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031017
Lab ID:	116855-01
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	85.22
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	105		35	144
Phenol - d5	131		39	140
Nitrobenzene - d5	147		37	156
2 - Fluorobiphenyl	101		39	145
2,4,6 - Tribromophenol	100		25	148
p - Terphenyl - d14	115		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	308	154	
bis(2-Chloroethyl)ether	ND	308	154	
2-Chlorophenol	ND	308	154	
1,3-Dichlorobenzene	ND	308	154	
1,4-Dichlorobenzene	ND	308	154	
Benzyl Alcohol	ND	385	192	
1,2-Dichlorobenzene	ND	308	154	
2-Methylphenol	ND	308	154	
bis(2-Chloroisopropyl)ether	ND	308	154	
3-&4-Methylphenol	ND	615	308	
N-nitroso-di-n-propylamine	ND	308	154	
Hexachloroethane	ND	308	154	
Nitrobenzene	ND	308	154	
Isophorone	ND	308	154	
2-Nitrophenol	ND	308	154	
2,4-Dimethylphenol	ND	308	154	
Benzoic Acid	ND	1540	769	
bis(2-Chloroethoxy)methane	ND	308	154	
2,4-Dichlorophenol	ND	308	154	
1,2,4-Trichlorobenzene	ND	308	154	
Naphthalene	ND	76.9	38.5	
4-Chloroaniline	ND	308	154	
Hexachlorobutadiene	ND	308	154	
4-Chloro-3-methylphenol	ND	308	154	
2-Methylnaphthalene	ND	76.9	38.5	
Hexachlorocyclopentadiene	ND	308	154	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-01 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		308	154	
2,4,5-Trichlorophenol	ND		308	154	
2-Chloronaphthalene	ND		76.9	38.5	
2-Nitroaniline	ND		308	154	
Dimethylphthalate	ND		308	154	
Acenaphthylene	ND		76.9	38.5	
2,6-Dinitrotoluene	ND		308	154	
3-Nitroaniline	ND		308	154	
Acenaphthene	ND		76.9	38.5	
2,4-Dinitrophenol	ND		1540	769	
4-Nitrophenol	ND		769	385	
Dibenzofuran	ND		308	154	
2,4-Dinitrotoluene	ND		308	154	
Diethylphthalate	ND		308	154	
4-Chlorophenylphenylether	ND		308	154	
Fluorene	ND		76.9	38.5	
4-Nitroaniline	ND		308	154	
4,6-Dinitro-2-methylphenol	ND		1540	769	
N-Nitrosodiphenylamine	ND		308	154	
4-Bromophenylphenylether	ND		308	154	
Hexachlorobenzene	ND		308	154	
Pentachlorophenol	ND		308	154	
Phenanthrene		63.9	76.9	38.5	J
Anthracene	ND		76.9	38.5	
Di-n-butylphthalate	ND		308	154	
Fluoranthene		85.9	76.9	38.5	
Pyrene		124	76.9	38.5	
Butylbenzylphthalate	ND		385	192	
3,3'-Dichlorobenzidine	ND		615	308	
Benzo(a)anthracene	ND		76.9	38.5	
Chrysene	ND		76.9	38.5	
bis(2-Ethylhexyl)phthalate	ND		308	154	
Di-n-octylphthalate	ND		308	154	
Benzofluoranthenes	ND		76.9	38.5	
Benzo(a)pyrene	ND		76.9	38.5	
Indeno(1,2,3-cd)pyrene	ND		76.9	38.5	
Dibenz(a,h)anthracene	ND		76.9	38.5	
Benzo(g,h,i)perylene	ND		76.9	38.5	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031018
Lab ID:	116855-02
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	24.35
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	79.1		35	144
Phenol - d5	95.6		39	140
Nitrobenzene - d5	104		37	156
2 - Fluorobiphenyl	97.1		39	145
2,4,6 - Tribromophenol	107		25	148
p - Terphenyl - d14	115		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	97.5	48.8	
bis(2-Chloroethyl)ether	ND	97.5	48.8	
2-Chlorophenol	ND	97.5	48.8	
1,3-Dichlorobenzene	ND	97.5	48.8	
1,4-Dichlorobenzene	ND	97.5	48.8	
Benzyl Alcohol	ND	122	61	
1,2-Dichlorobenzene	ND	97.5	48.8	
2-Methylphenol	ND	97.5	48.8	
bis(2-Chloroisopropyl)ether	ND	97.5	48.8	
3-&4-Methylphenol	ND	195	97.5	
N-nitroso-di-n-propylamine	ND	97.5	48.8	
Hexachloroethane	ND	97.5	48.8	
Nitrobenzene	ND	97.5	48.8	
Isophorone	ND	97.5	48.8	
2-Nitrophenol	ND	97.5	48.8	
2,4-Dimethylphenol	ND	97.5	48.8	
Benzoic Acid	ND	488	244	
bis(2-Chloroethoxy)methane	ND	97.5	48.8	
2,4-Dichlorophenol	ND	97.5	48.8	
1,2,4-Trichlorobenzene	ND	97.5	48.8	
Naphthalene	ND	24.4	12.2	
4-Chloroaniline	ND	97.5	48.8	
Hexachlorobutadiene	ND	97.5	48.8	
4-Chloro-3-methylphenol	ND	97.5	48.8	
2-Methylnaphthalene	ND	24.4	12.2	
Hexachlorocyclopentadiene	ND	97.5	48.8	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-02 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		97.5	48.8	
2,4,5-Trichlorophenol	ND		97.5	48.8	
2-Chloronaphthalene	ND		24.4	12.2	
2-Nitroaniline	ND		97.5	48.8	
Dimethylphthalate	ND		97.5	48.8	
Acenaphthylene		13.8	24.4	12.2	J
2,6-Dinitrotoluene	ND		97.5	48.8	
3-Nitroaniline	ND		97.5	48.8	
Acenaphthene	ND		24.4	12.2	
2,4-Dinitrophenol	ND		488	244	
4-Nitrophenol	ND		244	122	
Dibenzofuran	ND		97.5	48.8	
2,4-Dinitrotoluene	ND		97.5	48.8	
Diethylphthalate	ND		97.5	48.8	
4-Chlorophenylphenylether	ND		97.5	48.8	
Fluorene	ND		24.4	12.2	
4-Nitroaniline	ND		97.5	48.8	
4,6-Dinitro-2-methylphenol	ND		488	244	
N-Nitrosodiphenylamine	ND		97.5	48.8	
4-Bromophenylphenylether	ND		97.5	48.8	
Hexachlorobenzene	ND		97.5	48.8	
Pentachlorophenol	ND		97.5	48.8	
Phenanthrene		27.3	24.4	12.2	
Anthracene		13.1	24.4	12.2	J
Di-n-butylphthalate	ND		97.5	48.8	
Fluoranthene		87.6	24.4	12.2	
Pyrene		82	24.4	12.2	
Butylbenzylphthalate	ND		122	61	
3,3'-Dichlorobenzidine	ND		195	97.5	
Benzo(a)anthracene		91.4	24.4	12.2	
Chrysene		66.7	24.4	12.2	
bis(2-Ethylhexyl)phthalate	ND		97.5	48.8	
Di-n-octylphthalate	ND		97.5	48.8	
Benzofluoranthenes		271	24.4	12.2	
Benzo(a)pyrene		62.1	24.4	12.2	
Indeno(1,2,3-cd)pyrene		146	24.4	12.2	
Dibenz(a,h)anthracene	ND		24.4	12.2	
Benzo(g,h,i)perylene		188	24.4	12.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031019
Lab ID:	116855-03
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	83.46
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	High
2 - Fluorophenol	111		35	144
Phenol - d5	112		39	140
Nitrobenzene - d5	101		37	156
2 - Fluorobiphenyl	91.4		39	145
2,4,6 - Tribromophenol	130		25	148
p - Terphenyl - d14	21.5	X9	39	158

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MRL	Flags
Phenol	ND	302	151	
bis(2-Chloroethyl)ether	ND	302	151	
2-Chlorophenol	ND	302	151	
1,3-Dichlorobenzene	ND	302	151	
1,4-Dichlorobenzene	ND	302	151	
Benzyl Alcohol	ND	377	189	
1,2-Dichlorobenzene	ND	302	151	
2-Methylphenol	ND	302	151	
bis(2-Chloroisopropyl)ether	ND	302	151	
3-&4-Methylphenol	ND	603	302	
N-nitroso-di-n-propylamine	ND	302	151	
Hexachloroethane	ND	302	151	
Nitrobenzene	ND	302	151	
Isophorone	ND	302	151	
2-Nitrophenol	ND	302	151	
2,4-Dimethylphenol	ND	302	151	
Benzoic Acid	ND	1510	754	
bis(2-Chloroethoxy)methane	ND	302	151	
2,4-Dichlorophenol	ND	302	151	
1,2,4-Trichlorobenzene	ND	302	151	
Naphthalene	ND	75.4	37.7	
4-Chloroaniline	ND	302	151	
Hexachlorobutadiene	ND	302	151	
4-Chloro-3-methylphenol	ND	302	151	
2-Methylnaphthalene	ND	75.4	37.7	
Hexachlorocyclopentadiene	ND	302	151	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-03 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		302	151	
2,4,5-Trichlorophenol	ND		302	151	
2-Chloronaphthalene	ND		75.4	37.7	
2-Nitroaniline	ND		302	151	
Dimethylphthalate	ND		302	151	
Acenaphthylene		95.8	75.4	37.7	
2,6-Dinitrotoluene	ND		302	151	
3-Nitroaniline	ND		302	151	
Acenaphthene	ND		75.4	37.7	
2,4-Dinitrophenol	ND		1510	754	
4-Nitrophenol	ND		754	377	
Dibenzofuran	ND		302	151	
2,4-Dinitrotoluene	ND		302	151	
Diethylphthalate	ND		302	151	
4-Chlorophenylphenylether	ND		302	151	
Fluorene	ND		75.4	37.7	
4-Nitroaniline	ND		302	151	
4,6-Dinitro-2-methylphenol	ND		1510	754	
N-Nitrosodiphenylamine	ND		302	151	
4-Bromophenylphenylether	ND		302	151	
Hexachlorobenzene	ND		302	151	
Pentachlorophenol	ND		302	151	
Phenanthrene		135	75.4	37.7	
Anthracene		73.6	75.4	37.7	J
Di-n-butylphthalate	ND		302	151	
Fluoranthene		372	75.4	37.7	
Pyrene		552	75.4	37.7	
Butylbenzylphthalate	ND		377	189	
3,3'-Dichlorobenzidine	ND		603	302	
Benzo(a)anthracene		280	75.4	37.7	
Chrysene		292	75.4	37.7	
bis(2-Ethylhexyl)phthalate		1050	302	151	B1
Di-n-octylphthalate	ND		302	151	
Benzofluoranthenes		350	75.4	37.7	
Benzo(a)pyrene	ND		75.4	37.7	
Indeno(1,2,3-cd)pyrene	ND		75.4	37.7	
Dibenz(a,h)anthracene	ND		75.4	37.7	
Benzo(g,h,i)perylene	ND		75.4	37.7	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031020
Lab ID:	116855-04
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	18.66
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	79.1		35	144
Phenol - d5	85.8		39	140
Nitrobenzene - d5	91.6		37	156
2 - Fluorobiphenyl	83.3		39	145
2,4,6 - Tribromophenol	112		25	148
p - Terphenyl - d14	101		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		137	68.6	
bis(2-Chloroethyl)ether	ND		137	68.6	
2-Chlorophenol	ND		137	68.6	
1,3-Dichlorobenzene	ND		137	68.6	
1,4-Dichlorobenzene	ND		137	68.6	
Benzyl Alcohol	ND		172	85.8	
1,2-Dichlorobenzene	ND		137	68.6	
2-Methylphenol	ND		137	68.6	
bis(2-Chloroisopropyl)ether	ND		137	68.6	
3-&4-Methylphenol	ND		274	137	
N-nitroso-di-n-propylamine	ND		137	68.6	
Hexachloroethane	ND		137	68.6	
Nitrobenzene	ND		137	68.6	
Isophorone	ND		137	68.6	
2-Nitrophenol	ND		137	68.6	
2,4-Dimethylphenol	ND		137	68.6	
Benzoic Acid	ND		686	343	
bis(2-Chloroethoxy)methane	ND		137	68.6	
2,4-Dichlorophenol	ND		137	68.6	
1,2,4-Trichlorobenzene	ND		137	68.6	
Naphthalene	ND		34.3	17.2	
4-Chloroaniline	ND		137	68.6	
Hexachlorobutadiene	ND		137	68.6	
4-Chloro-3-methylphenol	ND		137	68.6	
2-Methylnaphthalene	ND		34.3	17.2	
Hexachlorocyclopentadiene	ND		137	68.6	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-04 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		137	68.6	
2,4,5-Trichlorophenol	ND		137	68.6	
2-Chloronaphthalene	ND		34.3	17.2	
2-Nitroaniline	ND		137	68.6	
Dimethylphthalate	ND		137	68.6	
Acenaphthylene	ND		34.3	17.2	
2,6-Dinitrotoluene	ND		137	68.6	
3-Nitroaniline	ND		137	68.6	
Acenaphthene	ND		34.3	17.2	
2,4-Dinitrophenol	ND		686	343	
4-Nitrophenol	ND		343	172	
Dibenzofuran	ND		137	68.6	
2,4-Dinitrotoluene	ND		137	68.6	
Diethylphthalate	ND		137	68.6	
4-Chlorophenylphenylether	ND		137	68.6	
Fluorene	ND		34.3	17.2	
4-Nitroaniline	ND		137	68.6	
4,6-Dinitro-2-methylphenol	ND		686	343	
N-Nitrosodiphenylamine	ND		137	68.6	
4-Bromophenylphenylether	ND		137	68.6	
Hexachlorobenzene	ND		137	68.6	
Pentachlorophenol	ND		137	68.6	
Phenanthrene		26.7	34.3	17.2	J
Anthracene	ND		34.3	17.2	
Di-n-butylphthalate	ND		137	68.6	
Fluoranthene		48.1	34.3	17.2	
Pyrene		52	34.3	17.2	
Butylbenzylphthalate	ND		172	85.8	
3,3'-Dichlorobenzidine	ND		274	137	
Benzo(a)anthracene		17.6	34.3	17.2	J
Chrysene	ND		34.3	17.2	
bis(2-Ethylhexyl)phthalate		941	137	68.6	B1
Di-n-octylphthalate	ND		137	68.6	
Benzofluoranthenes		73.8	34.3	17.2	
Benzo(a)pyrene	ND		34.3	17.2	
Indeno(1,2,3-cd)pyrene	ND		34.3	17.2	
Dibenz(a,h)anthracene	ND		34.3	17.2	
Benzo(g,h,i)perylene	ND		34.3	17.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031021
Lab ID:	116855-05
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	30.09
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	79.5		35	144
Phenol - d5	109		39	140
Nitrobenzene - d5	99.9		37	156
2 - Fluorobiphenyl	78		39	145
2,4,6 - Tribromophenol	100		25	148
p - Terphenyl - d14	124		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		831	415	
bis(2-Chloroethyl)ether	ND		831	415	
2-Chlorophenol	ND		831	415	
1,3-Dichlorobenzene	ND		831	415	
1,4-Dichlorobenzene	ND		831	415	
Benzyl Alcohol	ND		1040	519	
1,2-Dichlorobenzene	ND		831	415	
2-Methylphenol	ND		831	415	
bis(2-Chloroisopropyl)ether	ND		831	415	
3-&4-Methylphenol	ND		1660	831	
N-nitroso-di-n-propylamine	ND		831	415	
Hexachloroethane	ND		831	415	
Nitrobenzene	ND		831	415	
Isophorone	ND		831	415	
2-Nitrophenol	ND		831	415	
2,4-Dimethylphenol	ND		831	415	
Benzoic Acid	ND		4150	2080	
bis(2-Chloroethoxy)methane	ND		831	415	
2,4-Dichlorophenol	ND		831	415	
1,2,4-Trichlorobenzene	ND		831	415	
Naphthalene	ND		208	104	
4-Chloroaniline	ND		831	415	
Hexachlorobutadiene	ND		831	415	
4-Chloro-3-methylphenol	ND		831	415	
2-Methylnaphthalene	ND		208	104	
Hexachlorocyclopentadiene	ND		831	415	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-05 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		831	415	
2,4,5-Trichlorophenol	ND		831	415	
2-Chloronaphthalene	ND		208	104	
2-Nitroaniline	ND		831	415	
Dimethylphthalate	ND		831	415	
Acenaphthylene	ND		208	104	
2,6-Dinitrotoluene	ND		831	415	
3-Nitroaniline	ND		831	415	
Acenaphthene	ND		208	104	
2,4-Dinitrophenol	ND		4150	2080	
4-Nitrophenol	ND		2080	1040	
Dibenzofuran	ND		831	415	
2,4-Dinitrotoluene	ND		831	415	
Diethylphthalate	ND		831	415	
4-Chlorophenylphenylether	ND		831	415	
Fluorene	ND		208	104	
4-Nitroaniline	ND		831	415	
4,6-Dinitro-2-methylphenol	ND		4150	2080	
N-Nitrosodiphenylamine	ND		831	415	
4-Bromophenylphenylether	ND		831	415	
Hexachlorobenzene	ND		831	415	
Pentachlorophenol	ND		831	415	
Phenanthrene		139	208	104	J
Anthracene	ND		208	104	
Di-n-butylphthalate	ND		831	415	
Fluoranthene		412	208	104	
Pyrene		532	208	104	
Butylbenzylphthalate	ND		1040	519	
3,3'-Dichlorobenzidine	ND		1660	831	
Benzo(a)anthracene	ND		208	104	
Chrysene	ND		208	104	
bis(2-Ethylhexyl)phthalate		2200	831	415	B1
Di-n-octylphthalate	ND		831	415	
Benzofluoranthenes		790	208	104	
Benzo(a)pyrene		893	208	104	
Indeno(1,2,3-cd)pyrene	ND		208	104	
Dibenz(a,h)anthracene	ND		208	104	
Benzo(g,h,i)perylene	ND		208	104	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031022
Lab ID:	116855-06
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	80.52
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	91.3		35	144
Phenol - d5	123		39	140
Nitrobenzene - d5	109		37	156
2 - Fluorobiphenyl	112		39	145
2,4,6 - Tribromophenol	94.9		25	148
p - Terphenyl - d14	146		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	319	160	
bis(2-Chloroethyl)ether	ND	319	160	
2-Chlorophenol	ND	319	160	
1,3-Dichlorobenzene	ND	319	160	
1,4-Dichlorobenzene	ND	319	160	
Benzyl Alcohol	ND	399	200	
1,2-Dichlorobenzene	ND	319	160	
2-Methylphenol	ND	319	160	
bis(2-Chloroisopropyl)ether	ND	319	160	
3-&4-Methylphenol	ND	638	319	
N-nitroso-di-n-propylamine	ND	319	160	
Hexachloroethane	ND	319	160	
Nitrobenzene	ND	319	160	
Isophorone	ND	319	160	
2-Nitrophenol	ND	319	160	
2,4-Dimethylphenol	ND	319	160	
Benzoic Acid	ND	1600	798	
bis(2-Chloroethoxy)methane	ND	319	160	
2,4-Dichlorophenol	ND	319	160	
1,2,4-Trichlorobenzene	ND	319	160	
Naphthalene	ND	79.8	39.9	
4-Chloroaniline	ND	319	160	
Hexachlorobutadiene	ND	319	160	
4-Chloro-3-methylphenol	ND	319	160	
2-Methylnaphthalene	ND	79.8	39.9	
Hexachlorocyclopentadiene	ND	319	160	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-06 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		319	160	
2,4,5-Trichlorophenol	ND		319	160	
2-Chloronaphthalene	ND		79.8	39.9	
2-Nitroaniline	ND		319	160	
Dimethylphthalate	ND		319	160	
Acenaphthylene	ND		79.8	39.9	
2,6-Dinitrotoluene	ND		319	160	
3-Nitroaniline	ND		319	160	
Acenaphthene	ND		79.8	39.9	
2,4-Dinitrophenol	ND		1600	798	
4-Nitrophenol	ND		798	399	
Dibenzofuran	ND		319	160	
2,4-Dinitrotoluene	ND		319	160	
Diethylphthalate	ND		319	160	
4-Chlorophenylphenylether	ND		319	160	
Fluorene	ND		79.8	39.9	
4-Nitroaniline	ND		319	160	
4,6-Dinitro-2-methylphenol	ND		1600	798	
N-Nitrosodiphenylamine	ND		319	160	
4-Bromophenylphenylether	ND		319	160	
Hexachlorobenzene	ND		319	160	
Pentachlorophenol	ND		319	160	
Phenanthrene	ND		79.8	39.9	
Anthracene	ND		79.8	39.9	
Di-n-butylphthalate	ND		319	160	
Fluoranthene		78.5	79.8	39.9	J
Pyrene		111	79.8	39.9	
Butylbenzylphthalate	ND		399	200	
3,3'-Dichlorobenzidine	ND		638	319	
Benzo(a)anthracene	ND		79.8	39.9	
Chrysene	ND		79.8	39.9	
bis(2-Ethylhexyl)phthalate		549	319	160	B1
Di-n-octylphthalate	ND		319	160	
Benzofluoranthenes	ND		79.8	39.9	
Benzo(a)pyrene	ND		79.8	39.9	
Indeno(1,2,3-cd)pyrene	ND		79.8	39.9	
Dibenz(a,h)anthracene	ND		79.8	39.9	
Benzo(g,h,i)perylene	ND		79.8	39.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031023
Lab ID:	116855-07
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	78.53
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	68		35	144
Phenol - d5	111		39	140
Nitrobenzene - d5	120		37	156
2 - Fluorobiphenyl	106		39	145
2,4,6 - Tribromophenol	98.1		25	148
p - Terphenyl - d14	94.6		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		306	153	
bis(2-Chloroethyl)ether	ND		306	153	
2-Chlorophenol	ND		306	153	
1,3-Dichlorobenzene	ND		306	153	
1,4-Dichlorobenzene	ND		306	153	
Benzyl Alcohol	ND		382	191	
1,2-Dichlorobenzene	ND		306	153	
2-Methylphenol	ND		306	153	
bis(2-Chloroisopropyl)ether	ND		306	153	
3-&4-Methylphenol	ND		612	306	
N-nitroso-di-n-propylamine	ND		306	153	
Hexachloroethane	ND		306	153	
Nitrobenzene	ND		306	153	
Isophorone	ND		306	153	
2-Nitrophenol	ND		306	153	
2,4-Dimethylphenol	ND		306	153	
Benzoic Acid	ND		1530	764	
bis(2-Chloroethoxy)methane	ND		306	153	
2,4-Dichlorophenol	ND		306	153	
1,2,4-Trichlorobenzene	ND		306	153	
Naphthalene	ND		76.4	38.2	
4-Chloroaniline	ND		306	153	
Hexachlorobutadiene	ND		306	153	
4-Chloro-3-methylphenol	ND		306	153	
2-Methylnaphthalene	ND		76.4	38.2	
Hexachlorocyclopentadiene	ND		306	153	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-07 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		306	153	
2,4,5-Trichlorophenol	ND		306	153	
2-Chloronaphthalene	ND		76.4	38.2	
2-Nitroaniline	ND		306	153	
Dimethylphthalate	ND		306	153	
Acenaphthylene	ND		76.4	38.2	
2,6-Dinitrotoluene	ND		306	153	
3-Nitroaniline	ND		306	153	
Acenaphthene	ND		76.4	38.2	
2,4-Dinitrophenol	ND		1530	764	
4-Nitrophenol	ND		764	382	
Dibenzofuran	ND		306	153	
2,4-Dinitrotoluene	ND		306	153	
Diethylphthalate	ND		306	153	
4-Chlorophenylphenylether	ND		306	153	
Fluorene	ND		76.4	38.2	
4-Nitroaniline	ND		306	153	
4,6-Dinitro-2-methylphenol	ND		1530	764	
N-Nitrosodiphenylamine	ND		306	153	
4-Bromophenylphenylether	ND		306	153	
Hexachlorobenzene	ND		306	153	
Pentachlorophenol	ND		306	153	
Phenanthrene	ND		76.4	38.2	
Anthracene		40	76.4	38.2	J
Di-n-butylphthalate	ND		306	153	
Fluoranthene		131	76.4	38.2	
Pyrene		125	76.4	38.2	
Butylbenzylphthalate	ND		382	191	
3,3'-Dichlorobenzidine	ND		612	306	
Benzo(a)anthracene	ND		76.4	38.2	
Chrysene	ND		76.4	38.2	
bis(2-Ethylhexyl)phthalate	ND		306	153	
Di-n-octylphthalate	ND		306	153	
Benzofluoranthenes		539	76.4	38.2	
Benzo(a)pyrene	ND		76.4	38.2	
Indeno(1,2,3-cd)pyrene	ND		76.4	38.2	
Dibenz(a,h)anthracene	ND		76.4	38.2	
Benzo(g,h,i)perylene	ND		76.4	38.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031024
Lab ID:	116855-08
Date Received:	10/13/2003
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	82.91
Dilution Factor	10

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	82.8		35	144
Phenol - d5	112		39	140
Nitrobenzene - d5	94		37	156
2 - Fluorobiphenyl	109		39	145
2,4,6 - Tribromophenol	126		25	148
p - Terphenyl - d14	80.9		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	293	146	
bis(2-Chloroethyl)ether	ND	293	146	
2-Chlorophenol	ND	293	146	
1,3-Dichlorobenzene	ND	293	146	
1,4-Dichlorobenzene	ND	293	146	
Benzyl Alcohol	ND	366	183	
1,2-Dichlorobenzene	ND	293	146	
2-Methylphenol	ND	293	146	
bis(2-Chloroisopropyl)ether	ND	293	146	
3-&4-Methylphenol	ND	585	293	
N-nitroso-di-n-propylamine	ND	293	146	
Hexachloroethane	ND	293	146	
Nitrobenzene	ND	293	146	
Isophorone	ND	293	146	
2-Nitrophenol	ND	293	146	
2,4-Dimethylphenol	ND	293	146	
Benzoic Acid	ND	1460	732	
bis(2-Chloroethoxy)methane	ND	293	146	
2,4-Dichlorophenol	ND	293	146	
1,2,4-Trichlorobenzene	ND	293	146	
Naphthalene	ND	73.2	36.6	
4-Chloroaniline	ND	293	146	
Hexachlorobutadiene	ND	293	146	
4-Chloro-3-methylphenol	ND	293	146	
2-Methylnaphthalene	ND	73.2	36.6	
Hexachlorocyclopentadiene	ND	293	146	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 116855-08 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		293	146	
2,4,5-Trichlorophenol	ND		293	146	
2-Chloronaphthalene	ND		73.2	36.6	
2-Nitroaniline	ND		293	146	
Dimethylphthalate	ND		293	146	
Acenaphthylene	ND		73.2	36.6	
2,6-Dinitrotoluene	ND		293	146	
3-Nitroaniline	ND		293	146	
Acenaphthene	ND		73.2	36.6	
2,4-Dinitrophenol	ND		1460	732	
4-Nitrophenol	ND		732	366	
Dibenzofuran	ND		293	146	
2,4-Dinitrotoluene	ND		293	146	
Diethylphthalate	ND		293	146	
4-Chlorophenylphenylether	ND		293	146	
Fluorene	ND		73.2	36.6	
4-Nitroaniline	ND		293	146	
4,6-Dinitro-2-methylphenol	ND		1460	732	
N-Nitrosodiphenylamine	ND		293	146	
4-Bromophenylphenylether	ND		293	146	
Hexachlorobenzene	ND		293	146	
Pentachlorophenol	ND		293	146	
Phenanthrene		110	73.2	36.6	
Anthracene	ND		73.2	36.6	
Di-n-butylphthalate	ND		293	146	
Fluoranthene		234	73.2	36.6	
Pyrene		649	73.2	36.6	
Butylbenzylphthalate	ND		366	183	
3,3'-Dichlorobenzidine	ND		585	293	
Benzo(a)anthracene	ND		73.2	36.6	
Chrysene	ND		73.2	36.6	
bis(2-Ethylhexyl)phthalate		1470	293	146	B1
Di-n-octylphthalate	ND		293	146	
Benzofluoranthenes		553	73.2	36.6	
Benzo(a)pyrene	ND		73.2	36.6	
Indeno(1,2,3-cd)pyrene	ND		73.2	36.6	
Dibenz(a,h)anthracene	ND		73.2	36.6	
Benzo(g,h,i)perylene	ND		73.2	36.6	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031017
Lab ID:	116855-01
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	85.22
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	78.1		57	125
Decachlorobiphenyl	82.3		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.106	0.0532	
Aroclor 1221	ND		0.213	0.106	
Aroclor 1232	ND		0.106	0.0532	
Aroclor 1242	ND		0.106	0.0532	
Aroclor 1248	ND		0.106	0.0532	
Aroclor 1254	ND		0.106	0.0532	
Aroclor 1260	ND		0.106	0.0532	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031018
Lab ID:	116855-02
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	24.35
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	108		57	125
Decachlorobiphenyl	115		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.41	0.205	
Aroclor 1221	ND		0.819	0.41	
Aroclor 1232	ND		0.41	0.205	
Aroclor 1242	ND		0.41	0.205	
Aroclor 1248	ND		0.41	0.205	
Aroclor 1254	ND		0.41	0.205	
Aroclor 1260	ND		0.41	0.205	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031019
Lab ID:	116855-03
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	83.46
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	80.6		57	125
Decachlorobiphenyl	83.4		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.11	0.055	
Aroclor 1221	ND		0.22	0.11	
Aroclor 1232	ND		0.11	0.055	
Aroclor 1242	ND		0.11	0.055	
Aroclor 1248	ND		0.11	0.055	
Aroclor 1254	ND		0.11	0.055	
Aroclor 1260		0.231	0.11	0.055	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031020
Lab ID:	116855-04
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	18.66
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	106		57	125
Decachlorobiphenyl	111		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.516	0.258	
Aroclor 1221	ND		1.03	0.516	
Aroclor 1232	ND		0.516	0.258	
Aroclor 1242	ND		0.516	0.258	
Aroclor 1248	ND		0.516	0.258	
Aroclor 1254	ND		0.516	0.258	
Aroclor 1260	ND		0.516	0.258	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031021
Lab ID:	116855-05
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	30.09
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	108		57	125
Decachlorobiphenyl	111		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.329	0.164	
Aroclor 1221	ND		0.657	0.329	
Aroclor 1232	ND		0.329	0.164	
Aroclor 1242	ND		0.329	0.164	
Aroclor 1248	ND		0.329	0.164	
Aroclor 1254	ND		0.329	0.164	
Aroclor 1260		0.242	0.329	0.164	J

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031022
Lab ID:	116855-06
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	80.52
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	83.3		57	125
Decachlorobiphenyl	86.8		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.117	0.0584	
Aroclor 1221	ND		0.234	0.117	
Aroclor 1232	ND		0.117	0.0584	
Aroclor 1242	ND		0.117	0.0584	
Aroclor 1248	ND		0.117	0.0584	
Aroclor 1254	ND		0.117	0.0584	
Aroclor 1260	ND		0.117	0.0584	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031023
Lab ID:	116855-07
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	78.53
Dilution Factor	5

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	82.6		57	125
Decachlorobiphenyl	85.3		63	126

Sample results are on a dry weight basis.

Analyte		Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND		0.116	0.0578	
Aroclor 1221	ND		0.231	0.116	
Aroclor 1232	ND		0.116	0.0578	
Aroclor 1242	ND		0.116	0.0578	
Aroclor 1248	ND		0.116	0.0578	
Aroclor 1254	ND		0.116	0.0578	
Aroclor 1260	ND		0.116	0.0578	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031024
Lab ID:	116855-08
Date Received:	10/13/03
Date Prepared:	10/17/03
Date Analyzed:	10/18/03
% Solids	82.91
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	85		57	125
Decachlorobiphenyl	84.1		63	126

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.112	0.0562	
Aroclor 1221	ND		0.225	0.112	
Aroclor 1232	ND		0.112	0.0562	
Aroclor 1242	ND		0.112	0.0562	
Aroclor 1248	ND		0.112	0.0562	
Aroclor 1254	ND		0.112	0.0562	
Aroclor 1260	ND		0.112	0.0562	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031017
Lab ID:	116855-01
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/30/2003
% Solids	85.22
Dilution Factor	100

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	-	X8	57	153
Decachlorobiphenyl	-	X8	57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	102	
alpha-BHC	ND	102	
beta-BHC	ND	102	
delta-BHC	ND	102	
gamma-BHC (Lindane)	ND	102	
4,4'-DDD	ND	203	
4,4'-DDE	ND	203	
4,4'-DDT	ND	203	
Dieldrin	ND	203	
Endosulfan I	ND	102	
Endosulfan II	ND	203	
Endosulfan sulfate	ND	203	
Endrin	ND	203	
Endrin aldehyde	ND	203	
Heptachlor	ND	102	
Heptachlor epoxide	ND	102	
Methoxychlor	ND	1020	
Endrin ketone	ND	203	
Toxaphene	ND	10200	
alpha-Chlordane	ND	102	
gamma-Chlordane	ND	102	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031018
Lab ID:	116855-02
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/28/2003
% Solids	24.35
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	109		57	153
Decachlorobiphenyl	111		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	40.6	
alpha-BHC	ND	40.6	
beta-BHC	ND	40.6	
delta-BHC	ND	40.6	
gamma-BHC (Lindane)	ND	40.6	
4,4'-DDD	ND	81.1	
4,4'-DDE	ND	81.1	
4,4'-DDT	ND	81.1	
Dieldrin	ND	81.1	
Endosulfan I	ND	40.6	
Endosulfan II	ND	81.1	
Endosulfan sulfate	ND	81.1	
Endrin	ND	81.1	
Endrin aldehyde	ND	81.1	
Heptachlor	ND	40.6	
Heptachlor epoxide	ND	40.6	
Methoxychlor	ND	406	
Endrin ketone	ND	81.1	
Toxaphene	ND	4060	
alpha-Chlordane	ND	40.6	
gamma-Chlordane	ND	40.6	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031019
Lab ID:	116855-03
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/28/2003
% Solids	83.46
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	74.8		57	153
Decachlorobiphenyl	85.3		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	11.2	
alpha-BHC	ND	11.2	
beta-BHC	ND	11.2	
delta-BHC	ND	11.2	
gamma-BHC (Lindane)	ND	11.2	
4,4'-DDD	ND	22.4	
4,4'-DDE	ND	22.4	
4,4'-DDT	36.7	22.4	C1
Dieldrin	ND	22.4	
Endosulfan I	ND	11.2	
Endosulfan II	ND	22.4	
Endosulfan sulfate	ND	22.4	
Endrin	ND	22.4	
Endrin aldehyde	ND	22.4	
Heptachlor	ND	11.2	
Heptachlor epoxide	ND	11.2	
Methoxychlor	ND	112	
Endrin ketone	ND	22.4	
Toxaphene	ND	1120	
alpha-Chlordane	ND	11.2	
gamma-Chlordane	ND	11.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031020
Lab ID:	116855-04
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/28/2003
% Solids	18.66
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	91.2		57	153
Decachlorobiphenyl	111		57	145

Sample results are on a dry weight basis.

Analyte		Result (ug/kg)	PQL	Flags
Aldrin	ND		76.6	
alpha-BHC	ND		76.6	
beta-BHC	ND		76.6	
delta-BHC	ND		76.6	
gamma-BHC (Lindane)	ND		76.6	
4,4'-DDD	ND		153	
4,4'-DDE	ND		153	
4,4'-DDT	ND		153	
Dieldrin	ND		153	
Endosulfan I	ND		76.6	
Endosulfan II	ND		153	
Endosulfan sulfate	ND		153	
Endrin	ND		153	
Endrin aldehyde	ND		153	
Heptachlor	ND		76.6	
Heptachlor epoxide	ND		76.6	
Methoxychlor	ND		766	
Endrin ketone	ND		153	
Toxaphene	ND		7660	
alpha-Chlordane	ND		76.6	
gamma-Chlordane	ND		76.6	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031021
Lab ID:	116855-05
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/28/2003
% Solids	30.09
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

Surrogate	% Recovery	Flags	Recovery Limits Low	High
Tetrachloro-m-xylene	91.9		57	153
Decachlorobiphenyl	79.2		57	145

Sample results are on a dry weight basis.

Analyte		Result (ug/kg)	PQL	Flags
Aldrin	ND		28.8	
alpha-BHC	ND		28.8	
beta-BHC	ND		28.8	
delta-BHC	ND		28.8	
gamma-BHC (Lindane)	ND		28.8	
4,4'-DDD	ND		57.6	
4,4'-DDE	ND		57.6	
4,4'-DDT	ND		57.6	
Dieldrin	ND		57.6	
Endosulfan I	ND		28.8	
Endosulfan II	ND		57.6	
Endosulfan sulfate	ND		57.6	
Endrin	ND		57.6	
Endrin aldehyde	ND		57.6	
Heptachlor	ND		28.8	
Heptachlor epoxide	ND		28.8	
Methoxychlor	ND		288	
Endrin ketone	ND		57.6	
Toxaphene	ND		2880	
alpha-Chlordane	ND		28.8	
gamma-Chlordane		38.3	28.8	C2

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031022
Lab ID:	116855-06
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/29/2003
% Solids	80.52
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	90		57	153
Decachlorobiphenyl	79.8		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	11.3	
alpha-BHC	ND	11.3	
beta-BHC	ND	11.3	
delta-BHC	ND	11.3	
gamma-BHC (Lindane)	ND	11.3	
4,4'-DDD	ND	22.6	
4,4'-DDE	ND	22.6	
4,4'-DDT	ND	22.6	
Dieldrin	ND	22.6	
Endosulfan I	ND	11.3	
Endosulfan II	ND	22.6	
Endosulfan sulfate	ND	22.6	
Endrin	ND	22.6	
Endrin aldehyde	ND	22.6	
Heptachlor	ND	11.3	
Heptachlor epoxide	ND	11.3	
Methoxychlor	ND	113	
Endrin ketone	ND	22.6	
Toxaphene	ND	1130	
alpha-Chlordane	ND	11.3	
gamma-Chlordane	ND	11.3	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031023
Lab ID:	116855-07
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/29/2003
% Solids	78.53
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	77.3		57	153
Decachlorobiphenyl	116		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	11.9	
alpha-BHC	ND	11.9	
beta-BHC	ND	11.9	
delta-BHC	ND	11.9	
gamma-BHC (Lindane)	ND	11.9	
4,4'-DDD	ND	23.7	
4,4'-DDE	ND	23.7	
4,4'-DDT	ND	23.7	
Dieldrin	ND	23.7	
Endosulfan I	ND	11.9	
Endosulfan II	ND	23.7	
Endosulfan sulfate	ND	23.7	
Endrin	ND	23.7	
Endrin aldehyde	ND	23.7	
Heptachlor	ND	11.9	
Heptachlor epoxide	ND	11.9	
Methoxychlor	ND	119	
Endrin ketone	ND	23.7	
Toxaphene	ND	1190	
alpha-Chlordane	ND	11.9	
gamma-Chlordane	ND	11.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 031024
Lab ID:	116855-08
Date Received:	10/13/2003
Date Prepared:	10/17/2003
Date Analyzed:	10/30/2003
% Solids	82.91
Dilution Factor	10

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	92.4		57	153
Decachlorobiphenyl	7.55	X9	57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**Flags**
Aldrin	ND	11.4	
alpha-BHC	ND	11.4	
beta-BHC	ND	11.4	
delta-BHC	ND	11.4	
gamma-BHC (Lindane)	ND	11.4	
4,4'-DDD	ND	22.7	
4,4'-DDE	ND	22.7	
4,4'-DDT	ND	22.7	
Dieldrin	ND	22.7	
Endosulfan I	ND	11.4	
Endosulfan II	ND	22.7	
Endosulfan sulfate	ND	22.7	
Endrin	ND	22.7	
Endrin aldehyde	ND	22.7	
Heptachlor	ND	11.4	
Heptachlor epoxide	ND	11.4	
Methoxychlor	ND	114	
Endrin ketone	ND	22.7	
Toxaphene	ND	1140	
alpha-Chlordane	ND	11.4	
gamma-Chlordane	ND	11.4	

STL Seattle

Lab ID:	Method Blank - TOC1085
Date Received:	-
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
% Solids	
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	ND	100	40	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 031017
Lab ID:	116855-01
Date Prepared:	10/20/03
Date Analyzed:	10/20/03
QC Batch ID:	TOC1085

Total Organic Carbon by USEPA Method 9060

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
TOC	10000	19700	29200	95.9	30100	98.3	2.5	

STL Seattle

Lab ID:	Method Blank - SS0963
Date Received:	-
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
% Solids	
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	High
2 - Fluorophenol	113		35	144
Phenol - d5	106		39	140
Nitrobenzene - d5	101		37	156
2 - Fluorobiphenyl	98.7		39	145
2,4,6 - Tribromophenol	87.8		25	148
p - Terphenyl - d14	127		39	158

Sample results are on an as received basis.

Analyte		Result (ug/kg)	PQL	MRL	Flags
Phenol	ND		26.7	13.3	
bis(2-Chloroethyl)ether	ND		26.7	13.3	
2-Chlorophenol	ND		26.7	13.3	
1,3-Dichlorobenzene	ND		26.7	13.3	
1,4-Dichlorobenzene	ND		26.7	13.3	
Benzyl Alcohol	ND		33.3	16.7	
1,2-Dichlorobenzene	ND		26.7	13.3	
2-Methylphenol	ND		26.7	13.3	
bis(2-Chloroisopropyl)ether	ND		26.7	13.3	
3-&4-Methylphenol	ND		53.3	26.7	
N-nitroso-di-n-propylamine	ND		26.7	13.3	
Hexachloroethane	ND		26.7	13.3	
Nitrobenzene	ND		26.7	13.3	
Isophorone	ND		26.7	13.3	
2-Nitrophenol	ND		26.7	13.3	
2,4-Dimethylphenol	ND		26.7	13.3	
Benzoic Acid	ND		133	66.7	
bis(2-Chloroethoxy)methane	ND		26.7	13.3	
2,4-Dichlorophenol	ND		26.7	13.3	
1,2,4-Trichlorobenzene	ND		26.7	13.3	
Naphthalene	ND		6.67	3.33	
4-Chloroaniline	ND		26.7	13.3	
Hexachlorobutadiene	ND		26.7	13.3	
4-Chloro-3-methylphenol	ND		26.7	13.3	
2-Methylnaphthalene	ND		6.67	3.33	
Hexachlorocyclopentadiene	ND		26.7	13.3	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for SS0963 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		26.7	13.3
2,4,5-Trichlorophenol	ND		26.7	13.3
2-Chloronaphthalene	ND		6.67	3.33
2-Nitroaniline	ND		26.7	13.3
Dimethylphthalate	ND		26.7	13.3
Acenaphthylene	ND		6.67	3.33
2,6-Dinitrotoluene	ND		26.7	13.3
3-Nitroaniline	ND		26.7	13.3
Acenaphthene	ND		6.67	3.33
2,4-Dinitrophenol	ND		133	66.7
4-Nitrophenol	ND		66.7	33.3
Dibenzofuran	ND		26.7	13.3
2,4-Dinitrotoluene	ND		26.7	13.3
Diethylphthalate	ND		26.7	13.3
4-Chlorophenylphenylether	ND		26.7	13.3
Fluorene	ND		6.67	3.33
4-Nitroaniline	ND		26.7	13.3
4,6-Dinitro-2-methylphenol	ND		133	66.7
N-Nitrosodiphenylamine	ND		26.7	13.3
4-Bromophenylphenylether	ND		26.7	13.3
Hexachlorobenzene	ND		26.7	13.3
Pentachlorophenol	ND		26.7	13.3
Phenanthrene	ND		6.67	3.33
Anthracene	ND		6.67	3.33
Di-n-butylphthalate	ND		26.7	13.3
Fluoranthene	ND		6.67	3.33
Pyrene	ND		6.67	3.33
Butylbenzylphthalate	ND		33.3	16.7
3,3'-Dichlorobenzidine	ND		53.3	26.7
Benzo(a)anthracene	ND		6.67	3.33
Chrysene	ND		6.67	3.33
bis(2-Ethylhexyl)phthalate		60.4	26.7	13.3
Di-n-octylphthalate	ND		26.7	13.3
Benzofluoranthenes	ND		6.67	3.33
Benzo(a)pyrene	ND		6.67	3.33
Indeno(1,2,3-cd)pyrene	ND		6.67	3.33
Dibenz(a,h)anthracene	ND		6.67	3.33
Benzo(g,h,i)perylene	ND		6.67	3.33

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	SS0963
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
QC Batch ID:	SS0963

Semivolatile Organics by USEPA Method 8270

Compound Name	Blank Result (ug/kg)	Spike Amount (ug/kg)	BS Result (ug/kg)	BS % Rec.	BSD Result (ug/kg)	BSD % Rec.	RPD	Flag
Phenol	0	100	97	97	104	104	7	
2-Chlorophenol	0	100	99.7	99.7	115	115	14	
1,4-Dichlorobenzene	0	66.7	69.2	104	70.3	105	0.96	
N-nitroso-di-n-propylamine	0	66.7	65.9	98.8	70.8	106	7	
1,2,4-Trichlorobenzene	0	66.7	65	97.5	85.6	128	27	
4-Chloro-3-methylphenol	0	100	116	116	125	125	7.5	
Acenaphthene	0	66.7	75.6	113	81	122	7.7	
4-Nitrophenol	0	100	136	136	143	143	5	
2,4-Dinitrotoluene	0	66.7	57.8	86.7	71.1	107	21	
Pentachlorophenol	0	100	47.6	47.6	54.1	54.1	13	
Pyrene	0	66.7	84.9	127	80.3	120	-5.7	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 031019
Lab ID:	116855-03
Date Prepared:	10/15/2003
Date Analyzed:	10/15/2003
QC Batch ID:	SS0963

Semivolatile Organics by USEPA Method 8270

Compound Name	Sample Result (ug/kg)	Spike Amount (ug/kg)	MS Result (ug/kg)	MS % Rec.	MSD Result (ug/kg)	MSD % Rec.	RPD	Flag
Phenol	0	111	107	96.3	107	97.4	1.1	
2-Chlorophenol	0	111	110	99.2	118	108	8.5	
1,4-Dichlorobenzene	0	74.2	1.98	2.67	52.7	72.1	190	X7
N-nitroso-di-n-propylamine	0	74.2	5.64	7.61	70.5	96.5	170	X7
1,2,4-Trichlorobenzene	0	74.2	71.4	96.2	74	101	4.9	
4-Chloro-3-methylphenol	0	111	145	130	151	138	6	
Acenaphthene	0	74.2	76.2	103	90.5	124	19	
4-Nitrophenol	0	111	238	214	149	136	-45	X7
2,4-Dinitrotoluene	0	74.2	61.1	82.3	53.2	72.8	-12	
Pentachlorophenol	0	111	137	123	99.2	90.6	-30	
Pyrene	550	74.2	192	0	757	281	200	X7a

STL Seattle

Lab ID:	Method Blank - PB0621
Date Received:	-
Date Prepared:	10/17/03
Date Analyzed:	10/17/03
% Solids	
Dilution Factor	5

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	86.1		57	125
Decachlorobiphenyl	88.1		63	126

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.1	0.05	
Aroclor 1221	ND	0.2	0.1	
Aroclor 1232	ND	0.1	0.05	
Aroclor 1242	ND	0.1	0.05	
Aroclor 1248	ND	0.1	0.05	
Aroclor 1254	ND	0.1	0.05	
Aroclor 1260	ND	0.1	0.05	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PB0621
Date Prepared:	10/17/03
Date Analyzed:	10/17/03
QC Batch ID:	PB0621

PCBs by USEPA Method 8082

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Aroclor 1242	0	1	0.92	92	0.899	89.9	-2.3	
Aroclor 1260	0	1	1.02	102	0.99	99	-3	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	MW-23-1-CUTTINGS
Lab ID:	116961-10
Date Prepared:	10/17/03
Date Analyzed:	10/17/03
QC Batch ID:	PB0621

PCBs by USEPA Method 8082

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Aroclor 1242	0	1.03	0.997	96.5	1.02	97.4	0.93	
Aroclor 1260	0.22	1.03	1.25	100	1.25	98.5	-1.5	

STL Seattle

Lab ID:	Method Blank - PE1651
Date Received:	-
Date Prepared:	10/17/2003
Date Analyzed:	10/24/2003
% Solids	
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	119		57	153
Decachlorobiphenyl	122		57	145

Sample results are on an as received basis.

Analyte	Result (ug/kg)	PQL	Flags
Aldrin	ND	1	
alpha-BHC	ND	1	
beta-BHC	ND	1	
delta-BHC	ND	1	
gamma-BHC (Lindane)	ND	1	
4,4'-DDD	ND	2	
4,4'-DDE	ND	2	
4,4'-DDT	ND	2	
Dieldrin	ND	2	
Endosulfan I	ND	1	
Endosulfan II	ND	2	
Endosulfan sulfate	ND	2	
Endrin	ND	2	
Endrin aldehyde	ND	2	
Heptachlor	ND	1	
Heptachlor epoxide	ND	1	
Methoxychlor	ND	10	
Endrin ketone	ND	2	
Toxaphene	ND	100	
alpha-Chlordane	ND	1	
gamma-Chlordane	ND	1	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PE1651
Date Prepared:	10/17/2003
Date Analyzed:	10/24/2003
QC Batch ID:	PE1651

Organochlorine Pesticides by USEPA Methods 8081A

Compound Name	Blank Result (ug/kg)	Spike Amount (ug/kg)	BS Result (ug/kg)	BS % Rec.	BSD Result (ug/kg)	BSD % Rec.	RPD	Flag
Aldrin	0	40	41.9	105	44.6	112	6.5	
alpha-BHC	0	40	44.6	112	47.8	120	6.9	
beta-BHC	0	40	39.1	97.8	42	105	7.1	
delta-BHC	0	40	36.9	92.2	40.3	101	9.1	
gamma-BHC (Lindane)	0	40	45	113	48.4	121	6.8	
4,4'-DDD	0	40	45.5	114	48.9	122	6.8	
4,4'-DDE	0	40	39	97.5	42.5	106	8.4	
4,4'-DDT	0	40	38.1	95.2	46.1	115	19	
Dieldrin	0	40	43.6	109	47.2	118	7.9	
Endosulfan I	0	40	41.8	105	44.7	112	6.5	
Endosulfan II	0	40	38.4	95.9	42.6	106	10	
Endosulfan sulfate	0	40	36.5	91.2	40.9	102	11	
Endrin	0	40	41.5	104	45.6	114	9.2	
Endrin aldehyde	0	40	49.1	123	53.8	134	8.6	N
Heptachlor	0	40	40.1	100	43.3	108	7.7	
Heptachlor epoxide	0	40	40.7	102	43.6	109	6.6	
Methoxychlor	0	40	41.2	103	42.7	107	3.8	
Endrin ketone	0	40	40.3	101	44.5	111	9.4	
alpha-Chlordane	0	40	40	100	43	107	6.8	
gamma-Chlordane	0	40	42.9	107	45.9	115	7.2	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 031022
Lab ID:	116855-06
Date Prepared:	10/17/2003
Date Analyzed:	10/29/2003
QC Batch ID:	PE1651

Organochlorine Pesticides by USEPA Methods 8081A

Compound Name	Sample Result (ug/kg)	Spike Amount (ug/kg)	MS Result (ug/kg)	MS % Rec.	MSD Result (ug/kg)	MSD % Rec.	RPD	Flag
Aldrin	0	45.7	40.3	88.3	41.4	88.4	0.11	
alpha-BHC	0	45.7	41.5	90.8	42.2	90.1	-0.77	
beta-BHC	0	45.7	43.9	96.1	44.5	95.1	-1	
delta-BHC	0	45.7	35.1	76.8	36.8	78.6	2.3	
gamma-BHC (Lindane)	0	45.7	43.8	95.9	44.1	94.3	-1.7	
4,4'-DDD	0	45.7	43.4	95	45.9	98.1	3.2	
4,4'-DDE	0	45.7	40.8	89.2	42.1	89.9	0.78	
4,4'-DDT	0	45.7	65.6	143	55.3	118	-19	
Dieldrin	0	45.7	43	94	44.8	95.7	1.8	
Endosulfan I	0	45.7	40.5	88.6	43	91.9	3.7	
Endosulfan II	0	45.7	41.1	89.8	42.2	90.2	0.44	
Endosulfan sulfate	0	45.7	39.9	87.3	40.1	85.6	-2	
Endrin	0	45.7	47.7	104	49.2	105	0.96	
Endrin aldehyde	0	45.7	46.7	102	45.8	97.9	-4.1	
Heptachlor	0	45.7	45.6	99.8	45.4	97	-2.8	
Heptachlor epoxide	0	45.7	40.7	89	41.8	89.3	0.34	
Methoxychlor	0	45.7	48.5	106	48	102	-3.8	
Endrin ketone	0	45.7	40.4	88.5	45.5	97.3	9.5	
alpha-Chlordane	0	45.7	41.8	91.4	44.1	94.3	3.1	
gamma-Chlordane	0	45.7	48.5	106	49.8	106	0	

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DATA QUALIFIERS AND ABBREVIATIONS

B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be < 40%.

C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.

C3: Second analysis confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be ≤ 30%.

C4: Second analysis confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 30%. The original analysis was reported unless anomalies were noted.

M: GC/MS confirmation was performed. The result derived from the original analysis was reported.

D: The reported result for this analyte was calculated based on a secondary dilution factor.

E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

MRL: Method Reporting Limit

N: See analytical narrative

ND: Not Detected

PQL: Practical Quantitation Limit

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product.

X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.

X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.

X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike recovery was not determined due to the required dilution.

X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was re-analyzed with similar results.

X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.

X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.

X8: Surrogate recovery was not determined due to the required dilution.

X9: Surrogate recovery outside advisory QC limits due to matrix interference.

SUBCONTRACT ORDER

North Creek Analytical - Portland

P3J0346

11685

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: P3J0346-08	**Soil**	**Sampled: 10/08/03 11:50**		
8081A/8082 Pest/PCB	10/23/03 17:00	10/22/03 11:50		
8270C Semivolatiles	10/23/03 17:00	10/22/03 11:50		low level analysis
Solids, Dry Weight	10/16/03 17:00	11/05/03 11:50		
Subcontract Outside	10/23/03 17:00	04/05/04 11:50		City of Portland-Lower Harbor
TOC-9060 mod	10/23/03 17:00	11/05/03 11:50		

Containers Supplied:

4 oz. jar (A) 4 oz. jar (B) 4 oz. jar (C) 4 oz. jar (D)

Erica Dahan 10/10/03 — Released By / Date

[illegible] — Received By

10/10/03 15:56 — Date

Released By — Date

Received By

10/13/03 10 — Date

ATTACHMENT E

Data Validation Report

Review of Quality Assurance/Quality Control (QA/QC) Data for Portland Harbor Sediment Sampling, October 2003

TO: David Lacey/PDX
Tina Rice/PDX

COPIES: Project File

FROM: Wendi Gale/CVO

DATE: February 2, 2004

Summary

The majority of the data have met the QA/QC acceptance criteria outlined for the Portland Harbor Sediment Sampling study. Nonconformances with QA/QC criteria are discussed, identified, and qualified in this report. The following is a brief summary of the overall quality of the sample results.

All polychlorinated biphenyls (PCBs), pesticides, semivolatile petroleum products (NWTPH-Dx), metals, mercury, and total organic carbon (TOC) results for all samples met all QA/QC criteria for the selected QC parameters. A completeness objective of 95 percent was achieved for all samples analyzed for all parameters based on precision and accuracy.

The majority of semivolatile organic compound (SVOC-SIM) results for all samples met all QA/QC criteria for the selected QC parameters. A completeness objective of 95 percent was achieved for all samples analyzed for all parameters based on precision and accuracy. Nonconformances with the QA/QC criteria were observed as follows:

- SVOC-SIM results for one sediment sample were qualified as estimates and flagged with a “J” for positive results or with a "UJ" for nondetected results due to surrogate recoveries reported below the lower QC acceptance criteria.
- Pesticide results for one sediment sample were qualified as estimates and flagged with a “UJ” for nondetect results because surrogate recoveries were not reported due to dilution.

Introduction

Eight sediment samples were collected between October 7 and 8, 2003. Samples submitted for metals, mercury, and NWTPH-Dx analyses were performed by City of Portland Water Pollution Control Laboratory (CITY), located in Portland, Oregon. Samples submitted for SVOC-SIM, pesticides, PCBs, and TOC analyses were performed by Severn Trent Laboratory (STL), located in Tacoma, Washington.

Data Review Criteria

U.S. EPA Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review* (October 1999) and *National Functional Guidelines for Inorganic Data Review* (July 2002) provided guidelines for data qualification, where applicable. Only summary QA/QC information were reviewed for each analytical parameter.

This QA review focuses on criteria for the following QA/QC parameters and their overall effect on the data:

- Sample custody, handling, and preservation
- Holding time compliance
- Summary initial and continuing calibration data
- Method blanks
- Surrogate spike recovery
- Precision and Accuracy (laboratory control samples, spike/spike duplicates, and laboratory duplicates)

Analytical Methods

All samples were analyzed by and QA/QC criteria were taken from one of the following sources:

- U.S. EPA. Test Methods for Evaluating Solid Waste (SW 846), April 1998.
- Oregon D.E.Q. Northwest Total Petroleum Hydrocarbon-Dx Method (NWTPH-Dx) is based on Oregon's Department of Environmental Quality TPH and Washington's Department of Ecology WTPH methods.

Table 1 lists the analytical method used for each parameter and the number and type of samples analyzed.

Table 1
Summary of Analyses

Parameter	Method	No. of Field Samples
SVOC-SIM	EPA 8270-SIM	8 sediment
Pesticides	SW 8081A	8 sediment
PCBs	SW 8082	8 sediment
TPH-#6 Fuel Oil, Diesel, Kerosene, Motor Oil	NWTPH-D	8 sediment
Metals and Mercury	EPA 6020	8 sediment
TOC	SW 9060	8 sediment

Qualifiers

The following definitions provide brief explanations of the data qualifiers that may be assigned to results in the data review process.

U - The analyte was analyzed for, but the analyte was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

The laboratory may have assigned additional data qualifiers. Laboratory data qualifiers are defined in each laboratory report.

Sample Custody, Handling, and Preservation

Chain-of-custody (COC) forms and the laboratory sample receiving checklists were reviewed to determine if any sample handling procedures might affect the integrity or the quality of the sample results.

According to the case narrative, all coolers were received by the laboratory at a temperature of 4 °C ± 2 °C, as recommended by EPA. All sample containers were received intact. All sediment samples were extracted and/or analyzed within their respective holding time requirements.

GC/MS Tune Criteria

Instrument tuning must be performed at the beginning of each twelve-hour instrument sequence, prior to standard and sample analyses. Analysis frequency criteria and ion abundance criteria for each instrument sequence were met.

Initial Calibration

Initial calibration criteria monitor analytical performance and proper compound identification at the start of analysis.

All acceptance criteria were met according to the case narrative. Initial calibration data were not provided by the laboratory, therefore compliance with QC criteria could not be verified.

Continuing Calibration

Continuing calibration criteria monitor analytical performance and proper compound identification on a daily or more frequent basis.

All acceptance criteria were met according to the case narrative. Continuing calibration data were not provided by the laboratory, therefore compliance with QC criteria could not be verified.

Method Blanks

Method blanks monitor contamination that may be introduced during analysis.

Method blanks were provided for all analyses by the STL laboratory. Except for the instance noted below, all method blanks were contamination-free, therefore meeting QC acceptance criteria.

- The SVOC-SIM method blank analyzed on October 15, 2003 (SDG 116855) was reported with detectable concentrations of bis(2-ethylhexyl)phthalate (60.4 µg/kg). Bis(2-ethylhexyl)phthalate was not detected in any associated samples or was greater than five times the amount detected in the method blank, therefore sample results were considered unaffected and were not qualified.

Method blanks were not provided by the CITY laboratory, therefore compliance with QC criteria could not be verified. Method blanks were contamination-free according to the case narrative.

Surrogate Spike Recovery

Surrogate compounds are organic compounds which are similar to the analytes of interest in chemical composition, extraction, and chromatography, but are not likely to be found in environmental samples. Every sample and blank analyzed for organic parameters is spiked prior to extraction or analysis with surrogate compounds that are representative of the analysis.

All surrogate spike recoveries should be within the laboratory-established control limits to meet QC acceptance criteria.

EPA Method 8270-SIM (SVOC-SIM)

Surrogate recoveries should be within the QC control limits of 37 to 156 percent for nitrobenzene-d5, 39 to 145 percent for 2-fluorobiphenyl, 39 to 158 percent for p-terphenyl-d14, 39 to 140 percent for phenol-d5, 35 to 144 percent for 2-fluorophenol, and 25 to 148 percent for 2,4,6-tribromophenol for sediment samples. Except for the instances noted below, all surrogate recoveries were within the specified QC control limits for sediment samples.

- The surrogate recovery for p-terphenyl-d14 was reported below the lower QC control limit for sample IL-19-AAP918-1003 (21.5%). SVOC-SIM results for sample IL-19-AAP918-1003 were qualified as estimates and flagged with a “J” for positive results or with a "UJ" for nondetected results.

NWTPH-Dx Method (NWTPH-Dx Hydrocarbons)

All acceptance criteria were met according to the case narrative. Surrogate compounds and QC control limits were not provided by the laboratory, therefore compliance with QC criteria could not be verified.

EPA Method SW 8081A (Pesticides)

Surrogate recoveries should be within the QC control limits of 57 to 153 percent for tetrachloro-m-xylene and 57 to 145 percent for decachlorobiphenyl in sediment samples. Pesticide results are not qualified based on surrogate results.

Except for the instance noted below, all surrogate recoveries were within the specified QC control limits.

- The surrogate recoveries for tetrachloro-m-xylene and dechlorobiphenyl were not reported as a result of sample dilution for sediment sample IL-19-AAP910-1003. Pesticide results for sample IL-19-AAP910-1003 were qualified as estimates and flagged with a "UJ" for nondetected results.
- The surrogate recovery for dechlorobiphenyl was reported below the lower QC control limit for sample IL-19-AMZ077-1003 (7.55%). The surrogate recovery for tetra-m-chloroxylene was acceptable and the low recovery of decachlorobiphenyl was due to a matrix interference; no sample results required qualification.

EPA Method SW 8082 (PCBs)

Surrogate recoveries should be within the QC control limits of 57 to 125 percent for tetrachloro-m-xylene and 63 to 126 percent for decachlorobiphenyl in sediment samples. PCB results are not qualified based on surrogate results.

All surrogate recoveries were within the specified QC control limits.

Laboratory Control Samples, Matrix Spike/Matrix Spike Duplicates, and Laboratory Duplicates

Precision and accuracy of laboratory performance are evaluated by the analysis of laboratory control samples (LCS), matrix spike (MS), matrix spike duplicates (MSDs), and laboratory duplicates. LCSs, MS/MSDs, and laboratory duplicates should be performed at a frequency of five percent or once per analytical batch, whichever is more frequent. LCS, MS/MSD, and laboratory duplicate recoveries and relative percent difference (%RPD) results should be within laboratory established control limits to meet precision and accuracy QC acceptance criteria.

LCS, MS/MSD, and laboratory duplicate data were not provided by the CITY laboratory, therefore compliance with QC criteria could not be verified. All acceptance criteria were met according to the case narrative.

LCS, MS/MSD, and laboratory duplicate data were provided by the STL laboratory. Frequency criteria were met for all analytical methods. Except for the instance noted below, all LCS, MS/MSD, and laboratory duplicate recoveries and %RPD results were within the

laboratory established QC control limits for all samples analyzed. Therefore, the majority of the samples met precision and accuracy QC acceptance criteria.

- Several MS/MSD recoveries and RPD results were reported outside the laboratory-established QC control limits for SVOC-SIM analysis. Organic sample results cannot be qualified using MS/MSD data alone, but can be used in conjunction with other QC criteria to determine the precision and accuracy of individual samples. Sample results did not require qualification based on precision or accuracy criteria, therefore SVOC-SIM results were not qualified based on MS/MSD results.

APPENDIX B

Basin 19 Catch Basin Solids Sampling Adjacent to Greenway Recycling

Appendix B: Basin 19 Catch Basin Solids Sampling Adjacent to Greenway Recycling

Introduction

This appendix summarizes the results of the City of Portland BES source investigation of catch basin solids near the Greenway Recycling facility. The facility also is known as the Armstrong Disposal Company on DEQ's Environmental Cleanup Site Information (ECSI) database (ECSI Site No. 4655). The Greenway site is located within Outfall Basin 19.

In 2004 and 2005, the City received complaints about erosion from the site onto NW St. Helens Road. Free petroleum product was observed draining from the Greenway site "out of soil and onto St. Helens Road after a rainstorm in early 2006" (DEQ, 2009a). The City collected solids samples from stormwater catch basins in the roadway adjacent to the site in June 2007 and submitted the samples for laboratory analyses. The purpose of this investigation was to evaluate whether possible overland discharges from the Greenway site are a current source of contaminants to the City conveyance system.

The investigation results indicate the presence of PCBs and other constituents in the catch basin solids; however, based on the detected concentrations, the Greenway facility does not appear to be a significant ongoing source of contaminants to the Basin 19 stormwater conveyance system.

Background

The Greenway site began site redevelopment, including grading, in 2004 without City permits or erosion control. Numerous complaints were received in 2004 and 2005 of mud from the site covering the road, sidewalks, and reaching the street catch basins. Offsite tracking of soils was also reported. The City required the site to apply for the appropriate permits and worked with the site to install onsite stormwater treatment (implemented in 2007), pursuant to the City's Stormwater Manual. Areas with higher soil contamination were also paved in 2007. Additional stormwater controls, such as construction of a cover for the woodchipper, have been added to the site since 2007.

Based on the site history and potential for contamination, the City collected catch basin solids samples on NW St. Helens Road, adjacent to the site, to help determine the appropriate onsite treatment and to evaluate current offsite migration of site contaminants. These catch basins discharge to the 30-inch-diameter stormwater conveyance line in NW St. Helens Road.

The Greenway site submitted an independent cleanup report and risk assessment summarizing soil and groundwater remedial activities conducted at the site between 2003 and 2006; these activities were not conducted under DEQ oversight. Analytical data presented in the report includes data for a soil sample collected near an onsite stormwater catch basin with a PCB Aroclor 1016 concentration of 560 µg/Kg (Evren Northwest, 2007). The soil represented by this sample subsequently was excavated and disposed. DEQ issued a Conditional No Further Action

determination stating that "DEQ does not believe that stormwater from the site is contributing contaminants to the Willamette River at levels warranting DEQ oversight" (DEQ, 2009b).

Sampling Activities and Analytical Approach

Solids samples were collected on June 22, 2007 from three catch basins located in the site vicinity, which are shown on Figure B1. All three catch basins receive flows from the site, based on field observations of wood debris (see Attachment B1, similar to those at the Greenway site. Also, during the catch basin sampling event, BES sampling personnel observed water seeping from the ground surface at the properties on the west side of NW St. Helens Road, including the Greenway facility (see photograph 4 in Attachment B2). The seepage was observed to run along the west curb line draining to all three catch basins sampled.

The solids samples were collected from the bottom of each catch basin using a stainless steel trowel/spoon and bowl in accordance with BES Field Operations Standard Operating Procedures. Field notes recorded during sampling activities are provided in Attachment B1. Photographs of the sampling locations and inline solids are included in Attachment B2.

The three catch basin solids samples were homogenized and submitted to the City's Water Pollution Control Laboratory for analysis of metals, PCBs, polycyclic aromatic hydrocarbons (PAHs), phthalates, semi-volatile organic compounds (SVOCs), total organic carbon and total solids.

Summary of Results

Table B1 summarizes the laboratory analytical results for the City samples relative to the Portland Harbor Joint Source Control Strategy (JSCS) screening level values (SLVs) for bioaccumulation and toxicity (DEQ/EPA, 2005, as amended 2007). The laboratory reports and data review memorandum for the City samples are provided in Attachment B3.

- **Metals:** The results indicate that copper and lead are being discharged to the system at concentrations exceeding JSCS Toxicity SLVs (see Table B1).
- **PCBs:** PCBs were detected in the sample from catch basin ANF207 (the middle catch basin). Concentrations of the individual Aroclors do not exceed the SLVs; the total PCB concentration in this sample exceeds the Bioaccumulation SLV but is an order-of-magnitude less than the Toxicity SLV.
- **PAHs:** With the exception of indeno(1,2,3-cd)pyrene in the sample from catch basin ANF207, PAH concentrations in the samples were not elevated above SLVs.
- **Phthalates:** Bis(2-ethylhexyl)phthalate (BEHP) and/or di-n-butyl phthalate were detected in the samples. The detected concentrations were less than an order-of-magnitude greater than the SLVs.
- **SVOCs:** With the exception of phenol in the sample from catch basin AMZ192, detected SVOC concentrations in the samples were not elevated above SLVs.

Conclusions

The results of this source investigation indicate that indeno(1,2,3-cd)pyrene, BEHP and/or phenol are present in solids in catch basins that receive stormwater runoff from the Greenway facility at concentrations greater than (but within an order-of-magnitude of) the JSCS Toxicity SLVs. Total PCBs were detected in one catch basin sample adjacent to the site which exceeded the Bioaccumulation SLV; this detection may be related to PCBs that were documented in near-surface soil prior to site remedial activities (Evren Northwest, 2007) or may indicate the presence of an ongoing minor source of PCBs at the site or in the site vicinity. Based on these findings, the Greenway facility does not appear to be a significant ongoing source of contaminants to the Basin 19 stormwater conveyance system. The site also has an NPDES stormwater general permit (issued in 2007) and the City continues to work with the site to implement stormwater best management practices.

The sampling conducted adjacent to the Greenway facility was conducted after much of the site contamination had been removed and pavement placed in the areas of higher concentrations. Therefore, these results are not reflective of what may have historically discharged to the City system from this facility, especially when significant erosion was occurring during site grading.

References

DEQ. 2009a. DEQ Site Summary Report – Details for ECSI Site No. 4655. DEQ Environmental Cleanup Site Information (ECSI) Database.
http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=4655

DEQ. 2009b. Conditional No Further Action Determination, Greenway Recycling, 4135 NW Saint Helens Road, Portland, Oregon 97208, ECSI Site ID No. 4655. Letter to T. Garrett (Greenway) from K. Johnson (DEQ). February 23, 2009.

DEQ and EPA. 2005. Portland Harbor Joint Source Control Strategy, Final, dated December 2005 (updated July 2007).

Evren Northwest. 2007. Independent Cleanup Report, Greenway Recycling Facility, 4135 NW St. Helens Road, Portland, Oregon. Prepared for Greenway Recycling. December 4, 2007.

Table

Table B1 – *Catch Basin Solids Samples Results Adjacent to Greenway Recycling, Outfall Basin 19*

Figure

Figure B1 – *Catch Basin Solids Sampling Locations*

Attachments

Attachment B1 – *Field Data Sheets*
Attachment B2 – *Field Photographs*
Attachment B3 – *Laboratory Results*

Table B1
Catch Basin Solids Sample Results Adjacent to Greenway Recycling
Outfall Basin 19

Class	Analyte	Units	Upstream ----------> Downstream Catch Basin AAT525 6/22/2007	Catch Basin ANF207 6/22/2007	Catch Basin AMZ192 FO 070815 6/22/2007	JSCS[1] Screening Level Value Toxicity	 Bioaccumulation
Total Organic Carbon (EPA 9060 MOD)							
	TOC	mg/Kg	54200	64000	76400	--	--
Total Solids (SM 2540 G)							
	TS	%W/W	34.6	68.8	49	--	--
Metals (EPA 6020)							
	Antimony	mg/Kg	3.68	3.84	56.7	64	--
	Arsenic	mg/Kg	3.95	5.44	3.92	33	7
	Cadmium	mg/Kg	0.72	0.47	**1.57**	4.98	1
	Chromium	mg/Kg	71.6	60.8	52.1	111	--
	Copper	mg/Kg	158	114	60.9	149	--
	Lead	mg/Kg	**140**	**128**	**111**	128	17
	Mercury	mg/Kg	**0.169**	**0.085**	**0.156**	1.06	0.07
	Nickel	mg/Kg	31.9	31.8	25.1	48.6	--
	Silver	mg/Kg	0.8	1.79	0.22	5	--
	Zinc	mg/Kg	458	307	438	459	--
Polychlorinated Biphenyls(PCBs) (EPA 8082)							
	Aroclor 1016	µg/Kg	15 U	10 U	10 U	530	--
	Aroclor 1221	µg/Kg	30 U	20 U	20 U	--	--
	Aroclor 1232	µg/Kg	15 U	10 U	10 U	--	--
	Aroclor 1242	µg/Kg	15 U	21	10 U	--	--
	Aroclor 1248	µg/Kg	15 U	10 U	10 U	1500	--
	Aroclor 1254	µg/Kg	15 U	10 U	10 U	300	--
	Aroclor 1260	µg/Kg	15 U	11	10 U	200	--
	Aroclor 1262	µg/Kg	15 U	10 U	10 U	--	--
	Aroclor 1268	µg/Kg	15 U	10 U	10 U	--	--
	Total PCBs[2]	µg/Kg	ND	**32**	ND	676	0.39
Polynuclear Aromatic Hydrocarbons(PAH) (EPA 8270C-SIM)							
	2-Methylnaphthalene	µg/Kg	9.9	12	80	200	--
	Acenaphthene	µg/Kg	9.1	15	12	300	--
	Acenaphthylene	µg/Kg	4.4	10	5.8	200	--
	Anthracene	µg/Kg	30	46	29	845	--
	Benzo(a)anthracene	µg/Kg	91	180	100	1050	--
	Benzo(a)pyrene	µg/Kg	92	180	95	1450	--
	Benzo(b)fluoranthene	µg/Kg	130	250	130	--	--
	Benzo(g,h,i)perylene	µg/Kg	110	190	110	300	--
	Benzo(k)fluoranthene	µg/Kg	37	93	39	13000	--
	Chrysene	µg/Kg	130	280	130	1290	--
	Dibenzo(a,h)anthracene	µg/Kg	24	36	22	1300	--
	Dibenzofuran	µg/Kg	8.2	13	8.1	--	--
	Fluoranthene	µg/Kg	320	500	290	2230	37000
	Fluorene	µg/Kg	12	17	12	536	--
	Indeno(1,2,3-cd)pyrene	µg/Kg	100	200	98	100	--
	Naphthalene	µg/Kg	17	24	87	561	--
	Phenanthrene	µg/Kg	160	240	160	1170	--
	Pyrene	µg/Kg	230	390	280	1520	1900
	Total PAHs[2]	µg/Kg	1515	2676	1688	--	--
Phthalates (EPA8270C)							
	Bis(2-ethylhexyl) phthalate (BEHP)	µg/Kg	**3800**	**2100**	**2500**	800	330
	Butyl Benzyl Phthalate	µg/Kg	4600	1100	3900	--	--
	Diethyl phthalate	µg/Kg	130 U	100 U	120 U	600	--
	Dimethyl phthalate	µg/Kg	130 U	100 U	120 U	--	--
	Di-n-butyl phthalate	µg/Kg	**410**	200 U	**250** J	100	60
	Di-n-octyl phthalate	µg/Kg	130 U	100 U	120 U	--	--
Semivolatile Organic Compounds (SVOC) (EPA8270C)							
	1,2,4-Trichlorobenzene	µg/Kg	130 U	100 U	120 U	9200	--
	1,2-Dichlorobenzene	µg/Kg	130 U	100 U	120 U	1700	--
	1,3-Dichlorobenzene	µg/Kg	130 U	100 U	120 U	300	--
	1,4-Dichlorobenzene	µg/Kg	130 U	100 U	120 U	300	--
	2,4,5-Trichlorophenol	µg/Kg	130 U	100 U	120 U	--	--
	2,4,6-Trichlorophenol	µg/Kg	130 U	100 U	120 U	--	--
	2,4-Dichlorophenol	µg/Kg	130 U	100 U	120 U	--	--
	2,4-Dimethylphenol	µg/Kg	620 U	500 U	580 U	--	--
	2,4-Dinitrophenol	µg/Kg	2500 U	2000 U	2300 U	--	--
	2,4-Dinitrotoluene	µg/Kg	130 U	100 U	120 U	--	--
	2,6-Dinitrotoluene	µg/Kg	130 U	100 U	120 U	--	--
	2-Chloronaphthalene	µg/Kg	130 U	100 U	120 U	--	--
	2-Chlorophenol	µg/Kg	130 U	100 U	120 U	--	--
	2-Methyl-4,6-dinitrophenol	µg/Kg	1300 U	1000 U	1200 U	--	--

Table B1
Catch Basin Solids Sample Results Adjacent to Greenway Recycling
Outfall Basin 19

Class	Analyte	Units	Upstream ----------> Downstream Catch Basin AAT525 6/22/2007	Catch Basin ANF207 6/22/2007	Catch Basin AMZ192 FO 070815 6/22/2007	JSCS[1] Screening Level Value Toxicity	 Bioaccumulation
	2-Methylphenol	µg/Kg	130 U	100 U	120 U	--	--
	2-Nitroaniline	µg/Kg	250 U	200 U	230 U	--	--
	2-Nitrophenol	µg/Kg	130 U	100 U	120 U	--	--
	3,3'-Dichlorobenzidine	µg/Kg	1300 U	1000 U	1200 U	--	--
	3-Nitroaniline	µg/Kg	250 U	200 U	230 U	--	--
	4-Bromophenylphenyl ether	µg/Kg	130 U	100 U	120 U	--	--
	4-Chloro-3-methylphenol	µg/Kg	130 U	100 U	120 U	--	--
	4-Chloroaniline	µg/Kg	130 U	100 U	120 U	--	--
	4-Chlorophenyl phenyl ether	µg/Kg	130 U	100 U	120 U	--	--
	4-Methylphenol[3]	µg/Kg	910	100 U	1400	--	--
	4-Nitroaniline	µg/Kg	250 U	200 U	230 U	--	--
	4-Nitrophenol	µg/Kg	1300 U	1000 U	1200 U	--	--
	Benzoic acid	µg/Kg	2500 U	2000 U	2300 U	--	--
	Benzyl alcohol	µg/Kg	330	200 U	230	--	--
	Bis(2-chloroethoxy) methane	µg/Kg	130 U	100 U	120 U	--	--
	Bis(2-chloroethyl) ether	µg/Kg	130 U	100 U	120 U	--	--
	Bis(2-chloroisopropyl) ether	µg/Kg	130 U	100 U	120 U	--	--
	Hexachlorobenzene	µg/Kg	130 U	100 U	120 U	100	19
	Hexachlorobutadiene	µg/Kg	130 U	100 U	120 U	600	--
	Hexachlorocyclopentadiene	µg/Kg	730 U	500 U	680 U	400	--
	Hexachloroethane	µg/Kg	130 U	100 U	120 U	--	--
	Isophorone	µg/Kg	130 U	100 U	120 U	--	--
	Nitrobenzene	µg/Kg	130 U	100 U	120 U	--	--
	N-Nitrosodi-n-propylamine	µg/Kg	130 U	100 U	120 U	--	--
	N-Nitrosodiphenylamine	µg/Kg	130 U	100 U	120 U	--	--
	Pentachlorophenol	µg/Kg	1300 U	1000 U	1200 U	1000	250
	Phenol	µg/Kg	380 U	300 U	400	50	--

Notes:

B = The analyte was found in the associated method blank at a level that is significant relative to the sample result. Sample results less than twenty times the level found in the blank are flagged as estimated.

U = The analyte was not detected above the reported sample quantification limit.

ND = Not detected

J = The analyte was detected in the method blank at a concentration greater than twenty times the level found in the sample; therefore, the results is qualified as estimated.

-- No JSCS screening level has been established.

µg/Kg = Micrograms per kilogram.

mg/Kg = Milligrams per kilogram.

[1]JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007).

[3] Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.

[3]This analyte cannot be separated from 3-Methylphenol.

= concentration exceeds JSCS Toxicity Screening Level Value

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value

Legend

- Manhole
- Sample Location
- Inlet
- Trash Rack
- Storm Line
- DEQ Environmental Cleanup Sites
- Taxlots

0 62.5 125 250 Feet

2

Figure B1
Catch Basin Solids Sampling Locations

Source: City of Portland BES

Environmental Services
City of Portland
1120 SW Fifth Avenue, Room 1000
Portland Oregon, 97204-1912

File Name: s:\Corey Maps\OF19

Program Manager: Dawn Sanders
Portland Harbor Superfund

Sheet No. 1 OF 1

Date Printed: 04/21/10

Prepared by: Corey Treacy

Attachment B1
Field Data Sheets

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution Control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

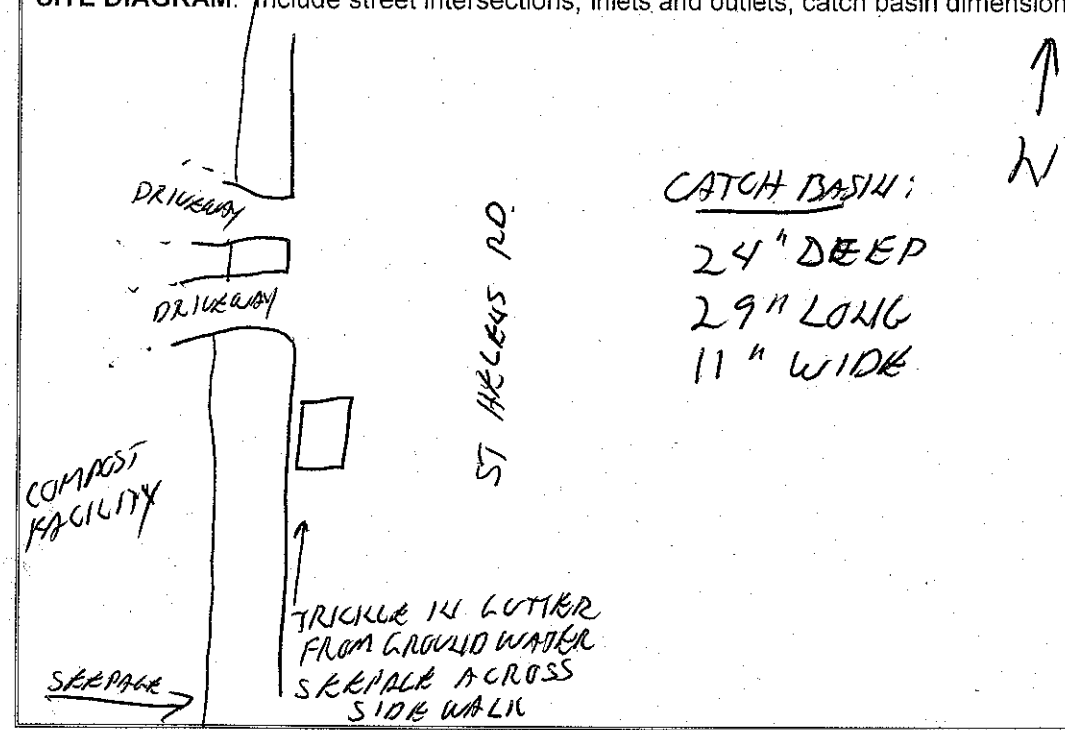
CATCH BASIN SOLIDS SAMPLING
FIELD DATA SHEET

Project Name: PORTLAND HARBOR WILLIE SAMP		Project Number: 1020.001
Sampling Team: WOR/JSM	Date: 6/22/07	Arrival Time: 0936
Basin: 19	Node: AMZ-192	Address: 4135 NW ST HELENS RD
Current weather and last known rainfall: CLEAR, DRY, COOL		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe potential solids or contaminant sources that could impact catch basin (const. activities, erosion, vehicles, material storage, onsite processes, etc.):	COMPOSTING/RECYCLING FACILITY
Describe debris and/or clogging around, or in catch basin grate/cover:	SEDIMENTS IN GUTTER, GRATE, & CATCH BASIN
Is there standing water in catch basin?	NO
Describe visual or olfactory observations of contamination at catch basin if any (odor, sheen, discoloration, etc.)	ORGANIC, MUDDY DEBRIS (STICKS/TWIGS
Describe depth of sediments present in catch basin and the total depth of the catch basin or sump:	1/4" OF SEDIMENTS. CB IS 24" DEEP

SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, etc.



Date: 6/22/07	SECTION 2 - SAMPLE COLLECTION REPORT	Node: AMZ-192

Sampling Equipment:	☐Stainless steel spoon & stainless steel bucket ☑OTHER (DESCRIBE) STAINLESS TROWEL & BOWL
Equipment decontamination procedure:	☑Per SOP7.01a ☐ OTHER (DESCRIBE)
Sample date: 6/22/07	Sample time: 0936
Sample Identification Code: 19_11 IL-19-AMZ192-0607	Sample collection technique and if/how overlying water was removed: PULLED SAMPLE W/ TROWEL; WATER TRICKLE FLOWING OVER SEDS
Subsample number and location:	TOOK ALL SEDIMENT OUT
Color of sample: DARK BROWN	
Texture/particle size: FINE SEDIMENTS TO COARSE CHUNKS	
Visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.) NONE	
Amount and type of debris in bulk sample:	WOOD DEBRIS + TWIGS, + STYROFOAM ~ 2-3 QUARTS
Amount and type of debris removed from final sample:	8 4-OZ JARS
Compositing notes: MIXED IT UP, PULLED OUT LARGE CHUNKS OF BARK MULCH	
Sample jars collected (number, size, full or partial)? 8 - 4 OZ., FULL	

If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).				

FO 070815

Duplicate sample collected? Y (N) Dupe ID

Duplicate sample identification # on COC:

Any deviations from standard procedures:

SECTION 3 - PHOTOGRAPH LOG

Overview of CB showing drainage area ✓	
Catch basin plan view prior to sampling showing solids NO	
Lateral connections to/from CB YES, 2 PHOTOS	
Homogenized sample (sediment in bowl) ✓	

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

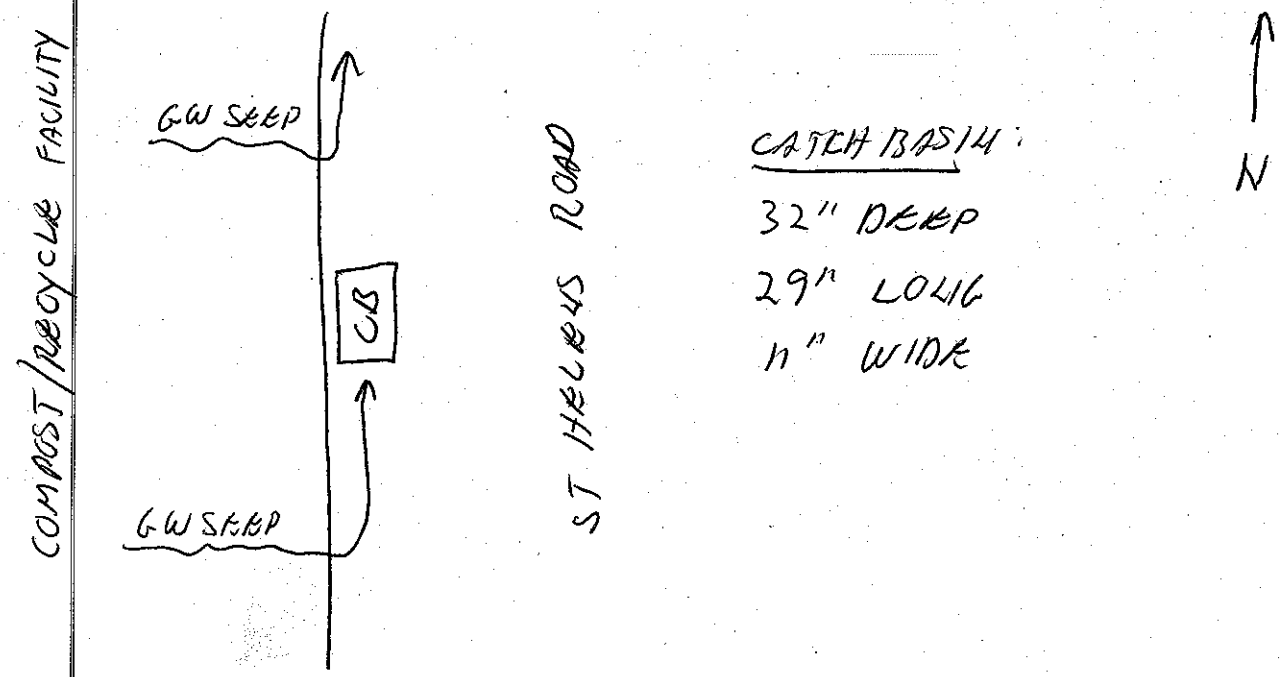
CATCH BASIN SOLIDS SAMPLING
FIELD DATA SHEET

Project Name: PORTLAND HARBOR ILLWR SAMP		Project Number: 1020.001
Sampling Team: WCR/JJM	Date: 6/22/07	Arrival Time: 1006
Basin: 19	Node: ALK207	Address: 4135 NW ST HELENS RD
Current weather and last known rainfall: CLEAR, DRY, COOL		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe potential solids or contaminant sources that could impact catch basin (const. activities, erosion, vehicles, material storage, onsite processes, etc.):	COMPOSTING/RECYCLING FACILITY, GROUNDWATER SEEPAGE
Describe debris and/or clogging around, or in catch basin grate/cover:	WOOD DEBRIS, STRAW, STYROFOAM
Is there standing water in catch basin?	N
Describe visual or olfactory observations of contamination at catch basin if any (odor, sheen, discoloration, etc.)	LOAM
Describe depth of sediments present in catch basin and the total depth of the catch basin or sump:	1"-2" DEEP SEDIMENTS 32" DEEP CATCH BASIN

SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, etc.



Date: 6/22/07	SECTION 2 - SAMPLE COLLECTION REPORT	Node: AHF 207

Sampling Equipment:	☐Stainless steel spoon & stainless steel bucket, TROWEL ☐ OTHER (DESCRIBE)
Equipment decontamination procedure:	☑ Per SOP7.01a ☐ OTHER (DESCRIBE)
Sample date: 6/22/07	Sample time: 1006
Sample Identification Code: 19-12 IL-19-AHF207-0607	Sample collection technique and if/how overlying water was removed: SCRAPED IT UP, TRICKLE OF FLOW OVER THE SIDES
Subsample number and location:	
Color of sample: DARK BROWN	
Texture/particle size: FINE SEDS TO LARGE WOOD CHUNKS	
Visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.)	NONE
Amount and type of debris in bulk sample:	MOSTLY ORGANIC DEBRIS, (N 1GALLON) STYROFOAM
Amount and type of debris removed from final sample:	AA BATTERY, LARGE WOOD CHUNKS, STRAW, METAL PIECES, BAND-AID, LARGE PIECES STYROFOAM
Compositing notes:	
Sample jars collected (number, size, full or partial)?	8, 4-OZ, FULL
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	
FO 070816	Duplicate sample collected? Y (N) Dupe ID
Duplicate sample identification # on COC:	
Any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Overview of CB showing drainage area ✓	
Catch basin plan view prior to sampling showing solids ✓	
Lateral connections to/from CB ✓	
Homogenized sample (sediment in bowl) ✓	

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution Control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

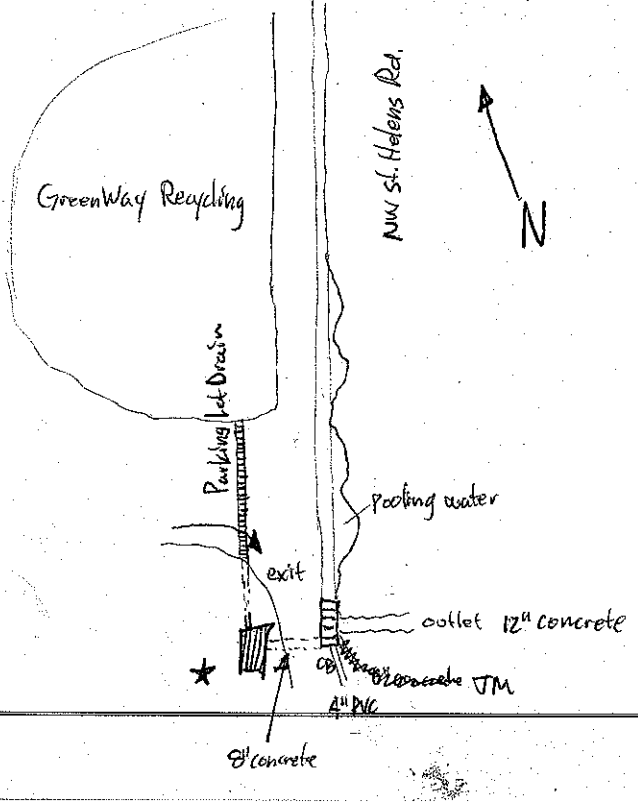
CATCH BASIN SOLIDS SAMPLING
FIELD DATA SHEET

Project Name: Portland Harbor Inline Sed. Samp. OF19 Basin		Project Number: 1020.001
Sampling Team: JTM, WCR	Date: 6/22/07	Arrival Time: ~~0933~~ JTM 1031
Basin: OF19	Node: IL-19-AAT525-0607	Address: 4135 NW St. Helens CB-5
Current weather and last known rainfall: overcast, warm. last rain on		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe potential solids or contaminant sources that could impact catch basin (const. activities, erosion, vehicles, material storage, onsite processes, etc.):	composting/waste transfer station, heavy traffic and industrial transport via St. Helens, construction site across street, grating/CB draining transfer station lot
Describe debris and/or clogging around, or in catch basin grate/cover:	CB cover partially plugged w/ organics and styrofoam
Is there standing water in catch basin?	flowing water
Describe visual or olfactory observations of contamination at catch basin if any (odor, sheen, discoloration, etc.)	pooling sheen present on water adjacent to CB which is flowing into CB
Describe depth of sediments present in catch basin and the total depth of the catch basin or sump:	~~0.25~~ JTM 1/8" - 1/2" deep CB depth =

SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, etc.



Inlets
- 8" concrete from grating adjacent to CB opposite sidewalk
- 4" PVC from the south

Outlets
- 12" outlet from CB

★ oily sheen observed in grating/CB draining transfer station lot
★★ sed. observed in grating/CB

Date: 6/22/07	SECTION 2 - SAMPLE COLLECTION REPORT	Node: IL-19-AAT525-0607

Sampling Equipment: stainless steel spoon, bowl decond per SOP	☑ Stainless steel spoon & stainless steel bucket ☐ OTHER (DESCRIBE)
Equipment decontamination procedure: per SOP	☑ Per SOP7.01a ☐ OTHER (DESCRIBE)
Sample date: 6/22/07	Sample time: ~~0958~~ 1055 1058
Sample Identification Code: 19_13	Sample collection technique and if/how overlying water was removed: all sed. in CB composited in bowl; organics, styro, PVC, plastics removed
Subsample number and location:	
Color of sample: brownish	dark brown peppered w/ styro balls
Texture/particle size: fine to sand w/ ample organics/bark mulch	
Visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.)	smells like dirt, organic
Amount and type of debris in bulk sample:	fines, sandy w/ bark mulch, styro balls
Amount and type of debris removed from final sample:	PVC chunks, bulk styro, bulk organics
Compositing notes: all sed. in CB composited in bowl, mixed vigoreously	
Sample jars collected (number, size, full or partial)?	3 full, 1 95% full — 4 sample

If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).				

FO 070817	Duplicate sample collected? Y (N) Dupe ID
Duplicate sample identification # on COC:	
Any deviations from standard procedures: limited sample volume	

SECTION 3 - PHOTOGRAPH LOG

Overview of CB showing drainage area	
Catch basin plan view prior to sampling showing solids	
Lateral connections to/from CB	
Homogenized sample (sediment in bowl)	

Took photos of grading/CB/drain adjacent to IL-19-AAT525-0607 which appears to be draining ~~from~~ transfer station lot into sample CB.

Attachment B2
Field Photographs

Catch Basin Solids Investigation: June 2007

Photo 1. Location of catch basin AAT525. The Greenway Recycling facility is shown in the background.

Photo 2. Looking inside catch basin AAT525. These solids were collected for analysis.

Photo 3. Solids collected from catch basin AAT525.

Photo 4. Sampling at catch basin ANF207. Greenway Recycling is shown in the background. Note the seepage from the site into the right-of-way.

Photo 5. Looking inside catch basin ANF207.

Photo 6. Solids collected from catch basin ANF207.

Photo 7. Location of catch basin AMZ192.

Photo 8. Catch basin AMZ192.

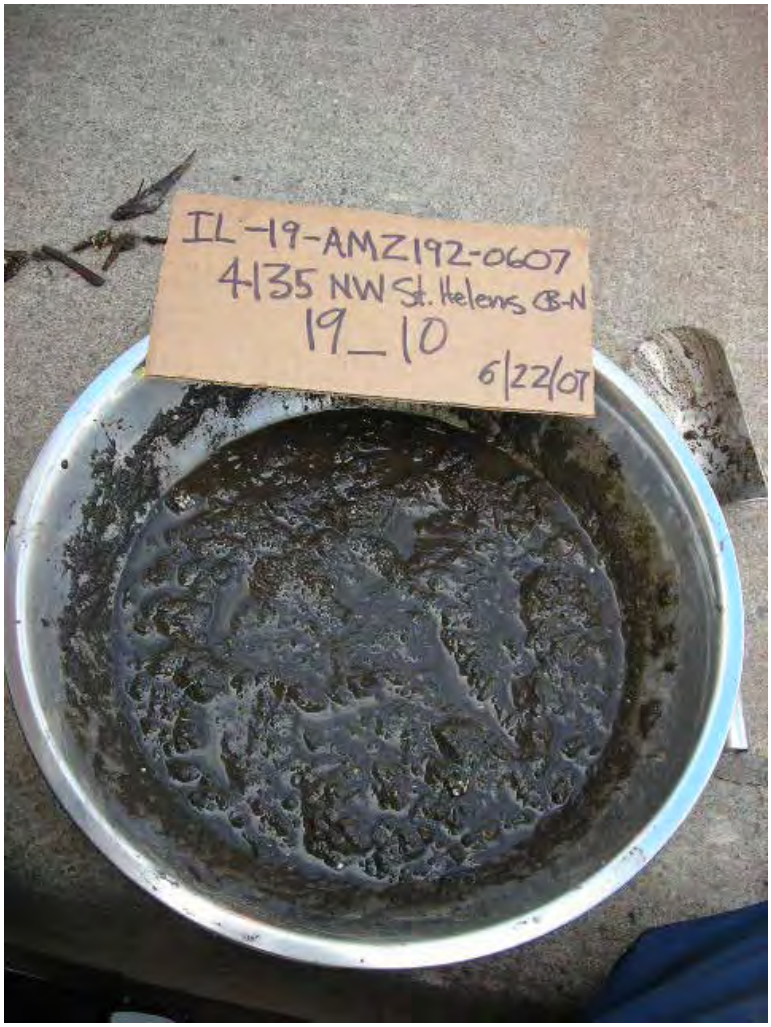


Photo 9. Solids collected from catch basin AMZ192.

Attachment B3
Laboratory Results

Laboratory Data QA/QC Review
Inline Solids Investigation
City Outfall Basin 19

To: File

From: Andrew Davidson, GSI

Date: February 24, 2010

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during source control investigation sampling and analyses conducted by the City of Portland (City) in Outfall Basin 19 on June 22, 2007. Three catch basin solids samples were collected in the immediate vicinity of the Greenway Recycling facility (a.k.a. Armstrong Disposal Company, ECSI #4655) and submitted for laboratory analyses.

The laboratory analyses were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontract laboratory, as follows:

- BES WPCL
    - Total Organic Carbon (EPA 9060 MOD)
    - Total Solids (SM 2540 G)
    - Metals (EPA 6020)
    - Polychlorinated Biphenyls (PCBs) (EPA 8082).
- Columbia Analytical Services (CAS)
    - Total Solids (EPA 160.3)
    - Polynuclear Aromatic Hydrocarbons (PAHs) (EPA 8270C-SIM)
    - Phthalates and other Semi-volatile Organic Compounds (SVOCs) (EPA 8270C).

Sample results for these analyses are summarized in Table 1.

This QA/QC review is based upon the available documentation supplied from WPCL and CAS. The QA/QC review of laboratory data included the following checks:

- Chain-of-custody record (complete and correct)

- Analytical holding times
- Chemicals of interest in method blanks
- Surrogate recoveries within accuracy control limits
- Laboratory duplicates within accuracy control limits
- Laboratory control sample recoveries within accuracy control limits
- Laboratory control sample duplicate results within precision control limits

The results of the QA/QC review are presented below.

Chain-of-Custody

The chain-of-custody (COC) forms indicate tracking of sample custody from BES field personnel to the WPCL, and from WPCL to the contract laboratory (CAS). While the COC forms transferring samples from WPCL to CAS appear complete, the form showing initial transfer (relinquishing) from BES field staff to WPCL was unsigned by the WPCL receiving personnel. Excluding this deviation, the chain-of-custody procedures appear adequate.

Analysis Holding Times

The samples were extracted and analyzed within the required method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of PAHs, phthalates and SVOCs. Di-n-butyl phthalate was detected in the method blank and in samples IL-19-AMZ192-0607 and IL-19-AAT525-0607. Because the detected concentration in sample IL-19-AMZ192-0607 is less than 20 times the method blank concentration, the result was qualified ("B") by CAS in accordance with its QA/QC policy. The presence of di-n-butyl phthalate in this sample is likely a result of laboratory contamination.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analysis of PAHs, phthalates and SVOCs. Low recoveries for some SVOC surrogates in samples IL-19-AMZ192-0607 and IL-19-AAT525-0607, and in the method blank, prompted re-extraction of the entire batch. The results for the field samples were comparable for both determinations which indicated that the problems were restricted to the surrogate recovery or method blank; results of the re-extractions were comparable to the original data, and the original results were reported. All other surrogate recoveries were within laboratory control limits.

Laboratory Control/ Duplicate Laboratory Control Samples

Laboratory duplicates were processed during the laboratory analysis of total solids. The relative percent differences (RPDs) between the sample and the laboratory duplicate was within quality control limits.

Laboratory control sample recoveries were reported by WPCL to be within quality control limits.

Laboratory blank spike duplicate recoveries were reported by WPCL to be within quality control limits.

Other

The reporting limits were elevated for all samples analyzed for SVOCs by EPA 8270C. The sample extracts were diluted prior to instrumental analysis due to relatively high levels of non-target background components. Clean-up of the extract did not eliminate enough of the background components to prevent dilution.

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
(503) 823-5696

City of Portland Chain-of-Custody

Bureau of Environmental Services

Date: 6/22/07

Page: 1 of 1

Collected By: JJM, WCR

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001 Matrix: SEDIMENT

OUTFALL 19 CHAIN-OF-CUSTODY

If insufficient sample volume, analyses should be performed by priority list below:

PCBs, SVOCs, PAH-SIM, Metals, TOC, TS

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: SVOCs	PAH-SIM	PCBs	TOC	Total Solids			Metals: Total Metals (Ag, As, Cd, Cr, Cu, Hg, Pb, Sb, Ni, Zn)				Field Comments
FO 070815	IL-19-AMZ192-0607 4135 NW St Helens CB-N	19_11	6/22/07	0936	G	●	●	●	●	●			●				
FO 070816	IL-19-ANF207-0607 4135 NW St Helens CB-M	19_12	6/22/07	1006	G	●	●	●	●	●			●				
FO 070817	IL-19-AAT525-0607 4135 NW St Helens CB-S	19_13	6/22/07	1058	G	●	●	●	●	●			●				
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: Jordan McCann Time: 1151	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Jordan McCann Date: 6/22/07	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By: 2.**	**Received By: 3.**	**Received By: 4.**
Signature: Time:	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070815** **Sample Collected:** 6/22/2007 09:36 **Sample Received:** 06/22/07 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AMZ192-0607
4135 NW ST HELENS RD - NORTH CB
Sample Point Code: 19_11
Sample Type: GRAB
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3
System ID: AL05908
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Low recoveries for some Semivolatile Organic surrogates in both this sample and the Method Blank prompted re-extraction of the entire batch. Results of the re-extractions were comparable to the original data, and the original results are reported. LAB: Trace levels of Aroclors 1242 and 1260 were detected (<10 ug/Kg each).

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	49.0	% W/W	0.01	SM 2540 G	06/25/07
METALS					
ANTIMONY	56.7	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ARSENIC	3.92	mg/Kg dry wt	0.50	EPA 6020	06/27/07
CADMIUM	1.57	mg/Kg dry wt	0.10	EPA 6020	06/27/07
CHROMIUM	52.1	mg/Kg dry wt	0.50	EPA 6020	06/27/07
COPPER	60.9	mg/Kg dry wt	0.25	EPA 6020	06/27/07
LEAD	111	mg/Kg dry wt	0.10	EPA 6020	06/27/07
MERCURY	0.156	mg/Kg dry wt	0.010	EPA 6020	06/27/07
NICKEL	25.1	mg/Kg dry wt	0.25	EPA 6020	06/27/07
SILVER	0.22	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ZINC	438	mg/Kg dry wt	0.50	EPA 6020	06/27/07
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/25/07
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1242	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1260	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	76400	mg/Kg dry wt	100	EPA 9060 MOD	07/05/07
POLYNUCLEAR AROMATICS - CAS					
2-Methylnaphthalene	80	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Acenaphthene	12	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Acenaphthylene	5.8	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Anthracene	29	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Benzo(a)anthracene	100	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070815** **Sample Collected:** 6/22/2007 09:36 **Sample Received:** 06/22/07 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AMZ192-0607
4135 NW ST HELENS RD - NORTH CB
Sample Point Code: 19_11
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05908
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Low recoveries for some Semivolatile Organic surrogates in both this sample and the Method Blank prompted re-extraction of the entire batch. Results of the re-extractions were comparable to the original data, and the original results are reported. LAB: Trace levels of Aroclors 1242 and 1260 were detected (<10 ug/Kg each).

Test Parameter	Result	Units	MRL	Method	Analysis Date
Benzo(a)pyrene	95	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Benzo(b)fluoranthene	130	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Benzo(ghi)perylene	110	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Benzo(k)fluoranthene	39	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Chrysene	130	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Dibenzo(a,h)anthracene	22	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Dibenzofuran	8.1	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Fluoranthene	290	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Fluorene	12	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Indeno(1,2,3-cd)pyrene	98	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Naphthalene	87	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Phenanthrene	160	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
Pyrene	280	µg/Kg dry wt	2.9	EPA 8270M-SIM	07/05/07
SEMI-VOLATILE ORGANICS - CAS					
1,2,4-Trichlorobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
1,2-Dichlorobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
1,3-Dichlorobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
1,4-Dichlorobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2,4,5-Trichlorophenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2,4,6-Trichlorophenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2,4-Dichlorophenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2,4-Dimethylphenol	<580	µg/Kg dry wt	580	EPA 8270 LV	07/05/07
2,4-Dinitrophenol	<2300	µg/Kg dry wt	2300	EPA 8270 LV	07/05/07
2,4-Dinitrotoluene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2,6-Dinitrotoluene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2-Chloronaphthalene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2-Chlorophenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2-Methylphenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
2-Nitroaniline	<230	µg/Kg dry wt	230	EPA 8270 LV	07/05/07
2-Nitrophenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
3,3'-Dichlorobenzidine	<1200	µg/Kg dry wt	1200	EPA 8270 LV	07/05/07
3-Nitroaniline	<230	µg/Kg dry wt	230	EPA 8270 LV	07/05/07
4,6-Dinitro-2-methylphenol	<1200	µg/Kg dry wt	1200	EPA 8270 LV	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070815** **Sample Collected:** 6/22/2007 09:36 **Sample Received:** 06/22/07 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AMZ192-0607
4135 NW ST HELENS RD - NORTH CB
Sample Point Code: 19_11
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05908
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Low recoveries for some Semivolatile Organic surrogates in both this sample and the Method Blank prompted re-extraction of the entire batch. Results of the re-extractions were comparable to the original data, and the original results are reported. LAB: Trace levels of Aroclors 1242 and 1260 were detected (<10 ug/Kg each).

Test Parameter	Result	Units	MRL	Method	Analysis Date
4-Bromophenylphenyl ether	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
4-Chloro-3-methylphenol	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
4-Chloroaniline	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
4-Chlorophenylphenyl ether	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
4-Methylphenol	1400	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
4-Nitroaniline	<230	µg/Kg dry wt	230	EPA 8270 LV	07/05/07
4-Nitrophenol	<1200	µg/Kg dry wt	1200	EPA 8270 LV	07/05/07
Benzoic acid	<2300	µg/Kg dry wt	2300	EPA 8270 LV	07/05/07
Benzyl alcohol	230	µg/Kg dry wt	230	EPA 8270 LV	07/05/07
Bis(2-chloroethoxy) methane	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Bis(2-chloroethyl) ether	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Bis(2-chloroisopropyl) ether	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Bis(2-ethylhexyl) phthalate	2500	µg/Kg dry wt	1200	EPA 8270 LV	07/05/07
Butyl benzyl phthalate	3900	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Diethyl phthalate	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Dimethyl phthalate	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Di-n-butyl phthalate	250	µg/Kg dry wt	230	EPA 8270 LV	07/05/07
Di-n-octyl phthalate	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Hexachlorobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Hexachlorobutadiene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Hexachlorocyclopentadiene	<680	µg/Kg dry wt	680	EPA 8270 LV	07/05/07
Hexachloroethane	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Isophorone	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Nitrobenzene	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
N-Nitrosodi-n-propylamine	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
N-Nitrosodiphenylamine	<120	µg/Kg dry wt	120	EPA 8270 LV	07/05/07
Pentachlorophenol	<1200	µg/Kg dry wt	1200	EPA 8270 LV	07/05/07
Phenol	400	µg/Kg dry wt	350	EPA 8270 LV	07/05/07

End of Report for Sample ID: FO070815

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070816** **Sample Collected:** 6/22/2007 10:06 **Sample Received:** 06/22/07 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-ANF207-0607
4135 NW ST HELENS RD - MIDDLE CB
Sample Point Code: 19_12
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05909
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	68.8	% W/W	0.01	SM 2540 G	06/25/07
METALS					
ANTIMONY	3.84	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ARSENIC	5.44	mg/Kg dry wt	0.50	EPA 6020	06/27/07
CADMIUM	0.47	mg/Kg dry wt	0.10	EPA 6020	06/27/07
CHROMIUM	60.8	mg/Kg dry wt	0.50	EPA 6020	06/27/07
COPPER	114	mg/Kg dry wt	0.25	EPA 6020	06/27/07
LEAD	128	mg/Kg dry wt	0.10	EPA 6020	06/27/07
MERCURY	0.085	mg/Kg dry wt	0.010	EPA 6020	06/27/07
NICKEL	31.8	mg/Kg dry wt	0.25	EPA 6020	06/27/07
SILVER	1.79	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ZINC	307	mg/Kg dry wt	0.50	EPA 6020	06/27/07
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/25/07
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1242	21	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1260	11	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/25/07
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	64000	mg/Kg dry wt	100	EPA 9060 MOD	07/05/07
POLYNUCLEAR AROMATICS - CAS					
2-Methylnaphthalene	12	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Acenaphthene	15	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Acenaphthylene	10	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Anthracene	46	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Benzo(a)anthracene	180	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Benzo(a)pyrene	180	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Benzo(b)fluoranthene	250	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070816** **Sample Collected:** 6/22/2007 10:06 **Sample Received:** 06/22/07 **Sample Status:** **COMPLETE AND VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-ANF207-0607
4135 NW ST HELENS RD - MIDDLE CB
Sample Point Code: 19_12
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05909
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Benzo(ghi)perylene	190	µg/Kg dry wt	5.0	EPA 8270M-SIM	07/05/07
Benzo(k)fluoranthene	93	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Chrysene	280	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Dibenzo(a,h)anthracene	36	µg/Kg dry wt	5.0	EPA 8270M-SIM	07/05/07
Dibenzofuran	13	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Fluoranthene	500	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Fluorene	17	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Indeno(1,2,3-cd)pyrene	200	µg/Kg dry wt	5.0	EPA 8270M-SIM	07/05/07
Naphthalene	24	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Phenanthrene	240	µg/Kg dry wt	2.5	EPA 8270M-SIM	07/05/07
Pyrene	390	µg/Kg dry wt	5.0	EPA 8270M-SIM	07/05/07
SEMI-VOLATILE ORGANICS - CAS					
1,2,4-Trichlorobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
1,2-Dichlorobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
1,3-Dichlorobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
1,4-Dichlorobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2,4,5-Trichlorophenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2,4,6-Trichlorophenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2,4-Dichlorophenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2,4-Dimethylphenol	<500	µg/Kg dry wt	500	EPA 8270 LV	07/05/07
2,4-Dinitrophenol	<2000	µg/Kg dry wt	2000	EPA 8270 LV	07/05/07
2,4-Dinitrotoluene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2,6-Dinitrotoluene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2-Chloronaphthalene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2-Chlorophenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2-Methylphenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
2-Nitroaniline	<200	µg/Kg dry wt	200	EPA 8270 LV	07/05/07
2-Nitrophenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
3,3'-Dichlorobenzidine	<1000	µg/Kg dry wt	1000	EPA 8270 LV	07/05/07
3-Nitroaniline	<200	µg/Kg dry wt	200	EPA 8270 LV	07/05/07
4,6-Dinitro-2-methylphenol	<1000	µg/Kg dry wt	1000	EPA 8270 LV	07/05/07
4-Bromophenylphenyl ether	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
4-Chloro-3-methylphenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
4-Chloroaniline	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
4-Chlorophenylphenyl ether	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070816** **Sample Collected:** 6/22/2007 10:06 **Sample Received:** 06/22/07 **Sample Status:** **COMPLETE AND VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-ANF207-0607
4135 NW ST HELENS RD - MIDDLE CB
Sample Point Code: 19_12
Sample Type: GRAB
Sample Matrix: SEDIMENT

Report Page: Page 3 of 3
System ID: AL05909
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
4-Methylphenol	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
4-Nitroaniline	<200	µg/Kg dry wt	200	EPA 8270 LV	07/05/07
4-Nitrophenol	<1000	µg/Kg dry wt	1000	EPA 8270 LV	07/05/07
Benzoic acid	<2000	µg/Kg dry wt	2000	EPA 8270 LV	07/05/07
Benzyl alcohol	<200	µg/Kg dry wt	200	EPA 8270 LV	07/05/07
Bis(2-chloroethoxy) methane	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Bis(2-chloroethyl) ether	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Bis(2-chloroisopropyl) ether	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Bis(2-ethylhexyl) phthalate	2100	µg/Kg dry wt	1000	EPA 8270 LV	07/05/07
Butyl benzyl phthalate	1100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Diethyl phthalate	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Dimethyl phthalate	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Di-n-butyl phthalate	<200	µg/Kg dry wt	200	EPA 8270 LV	07/05/07
Di-n-octyl phthalate	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Hexachlorobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Hexachlorobutadiene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Hexachlorocyclopentadiene	<500	µg/Kg dry wt	500	EPA 8270 LV	07/05/07
Hexachloroethane	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Isophorone	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Nitrobenzene	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
N-Nitrosodi-n-propylamine	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
N-Nitrosodiphenylamine	<100	µg/Kg dry wt	100	EPA 8270 LV	07/05/07
Pentachlorophenol	<1000	µg/Kg dry wt	1000	EPA 8270 LV	07/05/07
Phenol	<300	µg/Kg dry wt	300	EPA 8270 LV	07/05/07

End of Report for Sample ID: FO070816

Report Date: 09/06/07 **Validated By: Signature on File**

City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

LABORATORY ANALYSIS REPORT

Sample ID: **FO070817** **Sample Collected:** 6/22/2007 10:58 **Sample Received:** 06/22/07 **Sample Status:** **COMPLETE AND VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AAT525-0607
4135 NW ST HELENS RD - SOUTH CB
Sample Point Code: 19_13
Sample Type: GRAB
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3
System ID: AL05910
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Low recoveries for some Semivolatile Organic surrogates in both this sample and the Method Blank prompted re-extraction of the entire batch. Results of the re-extractions were comparable to the original data, and the original results are reported. LAB: Trace level of Aroclor 1242 was detected (<15 ug/Kg).

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	34.6	% W/W	0.01	SM 2540 G	06/25/07
METALS					
ANTIMONY	3.68	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ARSENIC	3.95	mg/Kg dry wt	0.50	EPA 6020	06/27/07
CADMIUM	0.72	mg/Kg dry wt	0.10	EPA 6020	06/27/07
CHROMIUM	71.6	mg/Kg dry wt	0.50	EPA 6020	06/27/07
COPPER	158	mg/Kg dry wt	0.25	EPA 6020	06/27/07
LEAD	140	mg/Kg dry wt	0.10	EPA 6020	06/27/07
MERCURY	0.169	mg/Kg dry wt	0.010	EPA 6020	06/27/07
NICKEL	31.9	mg/Kg dry wt	0.25	EPA 6020	06/27/07
SILVER	0.80	mg/Kg dry wt	0.10	EPA 6020	06/27/07
ZINC	458	mg/Kg dry wt	0.50	EPA 6020	06/27/07
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1221	<30	µg/Kg dry wt	30	EPA 8082	06/25/07
Aroclor 1232	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1242	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1248	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1254	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1260	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1262	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
Aroclor 1268	<15	µg/Kg dry wt	15	EPA 8082	06/25/07
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	54200	mg/Kg dry wt	100	EPA 9060 MOD	07/05/07
POLYNUCLEAR AROMATICS - CAS					
2-Methylnaphthalene	9.9	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Acenaphthene	9.1	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Acenaphthylene	4.4	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Anthracene	30	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Benzo(a)anthracene	91	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

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LABORATORY ANALYSIS REPORT

Sample ID: FO070817 **Sample Collected:** 6/22/2007 10:58 **Sample Received:** 06/22/07 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AAT525-0607
4135 NW ST HELENS RD - SOUTH CB
Sample Point Code: 19_13
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05910
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
QA/QC: Except as follows, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Low recoveries for some Semivolatile Organic surrogates in both this sample and the Method Blank prompted re-extraction of the entire batch. Results of the re-extractions were comparable to the original data, and the original results are reported. LAB: Trace level of Aroclor 1242 was detected (<15 ug/Kg).

Test Parameter	Result	Units	MRL	Method	Analysis Date
Benzo(a)pyrene	92	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Benzo(b)fluoranthene	130	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Benzo(ghi)perylene	110	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Benzo(k)fluoranthene	37	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Chrysene	130	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Dibenzo(a,h)anthracene	24	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Dibenzofuran	8.2	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Fluoranthene	320	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Fluorene	12	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Indeno(1,2,3-cd)pyrene	100	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Naphthalene	17	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Phenanthrene	160	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
Pyrene	230	µg/Kg dry wt	3.1	EPA 8270M-SIM	07/05/07
SEMI-VOLATILE ORGANICS - CAS					
1,2,4-Trichlorobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
1,2-Dichlorobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
1,3-Dichlorobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
1,4-Dichlorobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2,4,5-Trichlorophenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2,4,6-Trichlorophenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2,4-Dichlorophenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2,4-Dimethylphenol	<620	µg/Kg dry wt	620	EPA 8270 LV	07/05/07
2,4-Dinitrophenol	<2500	µg/Kg dry wt	2500	EPA 8270 LV	07/05/07
2,4-Dinitrotoluene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2,6-Dinitrotoluene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2-Chloronaphthalene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2-Chlorophenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2-Methylphenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
2-Nitroaniline	<250	µg/Kg dry wt	250	EPA 8270 LV	07/05/07
2-Nitrophenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
3,3'-Dichlorobenzidine	<1300	µg/Kg dry wt	1300	EPA 8270 LV	07/05/07
3-Nitroaniline	<250	µg/Kg dry wt	250	EPA 8270 LV	07/05/07
4,6-Dinitro-2-methylphenol	<1300	µg/Kg dry wt	1300	EPA 8270 LV	07/05/07

Report Date: 09/06/07 **Validated By: Signature on File**

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LABORATORY ANALYSIS REPORT

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Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-19-AAT525-0607
4135 NW ST HELENS RD - SOUTH CB
Sample Point Code: 19_13
Sample Type: GRAB
Sample Matrix: SEDIMENT

System ID: AL05910
EID File # : 1020.001
LocCode: PORTHARI
Collected By: JJM

Comments:
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Test Parameter	Result	Units	MRL	Method	Analysis Date
4-Bromophenylphenyl ether	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
4-Chloro-3-methylphenol	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
4-Chloroaniline	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
4-Chlorophenylphenyl ether	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
4-Methylphenol	910	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
4-Nitroaniline	<250	µg/Kg dry wt	250	EPA 8270 LV	07/05/07
4-Nitrophenol	<1300	µg/Kg dry wt	1300	EPA 8270 LV	07/05/07
Benzoic acid	<2500	µg/Kg dry wt	2500	EPA 8270 LV	07/05/07
Benzyl alcohol	330	µg/Kg dry wt	250	EPA 8270 LV	07/05/07
Bis(2-chloroethoxy) methane	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Bis(2-chloroethyl) ether	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Bis(2-chloroisopropyl) ether	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Bis(2-ethylhexyl) phthalate	3800	µg/Kg dry wt	1300	EPA 8270 LV	07/05/07
Butyl benzyl phthalate	4600	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Diethyl phthalate	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Dimethyl phthalate	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Di-n-butyl phthalate	410	µg/Kg dry wt	250	EPA 8270 LV	07/05/07
Di-n-octyl phthalate	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Hexachlorobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Hexachlorobutadiene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Hexachlorocyclopentadiene	<730	µg/Kg dry wt	730	EPA 8270 LV	07/05/07
Hexachloroethane	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Isophorone	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Nitrobenzene	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
N-Nitrosodi-n-propylamine	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
N-Nitrosodiphenylamine	<130	µg/Kg dry wt	130	EPA 8270 LV	07/05/07
Pentachlorophenol	<1300	µg/Kg dry wt	1300	EPA 8270 LV	07/05/07
Phenol	<380	µg/Kg dry wt	380	EPA 8270 LV	07/05/07

End of Report for Sample ID: FO070817

1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 (360) 636-1068 fax

Columbia Analytical Services INC.
An Employee - Owned Company

August 13, 2007 Analytical Report for Service Request No: K0705445

Jennifer Shackelford
Portland, City of
1120 SW Fifth Avenue # 600
Portland, OR 97204

RE: Portland Harbor Inline Samp

Dear Jennifer:

Enclosed are the results of the sample(s) submitted to our laboratory on June 25, 2007. For your reference, these analyses have been assigned our service request number K0705445.

All analyses were performed according to our laboratory's quality assurance program. Where applicable, the methods cited conform to the Methods Update Rule (effective 4/11/2007), which relates to the use of analytical methods for the drinking water and waste water programs. The test results meet requirements of the NELAC standards. Exceptions are noted in the case narrative report where applicable. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at LVo@kelso.caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Loan Vo, Ph.D.
Project Chemist

LV/lb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inli
Sample Matrix: Sludge, solid

Service Request: K0705445

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
FO 070815	K0705445-001	06/22/2007	06/25/2007	06/26/2007	43.2	
FO 070816	K0705445-002	06/22/2007	06/25/2007	06/26/2007	68.4	
FO 070817	K0705445-003	06/22/2007	06/25/2007	06/26/2007	40.1	

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inli	**Date Collected:**	06/22/2007
Sample Matrix:	Sludge, solid	**Date Received:**	06/25/2007
		Date Analyzed:	06/26/2007

Duplicate Sample Summary
Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	Wet
Test Notes:			

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
FO 070815	K0705445-001	43.2	43.1	43.2	<1	

00006

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	FO 070815	**Units:**	ug/Kg
Lab Code:	K0705445-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Phenol	**400**	D	350	10	07/05/07	07/17/07	KWG0707428	
2-Chlorophenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
1,3-Dichlorobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
1,4-Dichlorobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
1,2-Dichlorobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Benzyl Alcohol	**230**	D	230	10	07/05/07	07/17/07	KWG0707428	
Bis(2-chloroisopropyl) Ether	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2-Methylphenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Hexachloroethane	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
N-Nitrosodi-n-propylamine	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Methylphenol†	**1400**	D	120	10	07/05/07	07/17/07	KWG0707428	
Nitrobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Isophorone	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2-Nitrophenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2,4-Dimethylphenol	ND	U	580	10	07/05/07	07/17/07	KWG0707428	
Bis(2-chloroethoxy)methane	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2,4-Dichlorophenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Benzoic Acid	ND	U	2300	10	07/05/07	07/17/07	KWG0707428	
1,2,4-Trichlorobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Chloroaniline	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Hexachlorobutadiene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Chloro-3-methylphenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Hexachlorocyclopentadiene	ND	U	680	10	07/05/07	07/17/07	KWG0707428	
2,4,6-Trichlorophenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2,4,5-Trichlorophenol	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2-Chloronaphthalene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2-Nitroaniline	ND	U	230	10	07/05/07	07/17/07	KWG0707428	
Dimethyl Phthalate	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
2,6-Dinitrotoluene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
3-Nitroaniline	ND	U	230	10	07/05/07	07/17/07	KWG0707428	
2,4-Dinitrophenol	ND	U	2300	10	07/05/07	07/17/07	KWG0707428	
4-Nitrophenol	ND	U	1200	10	07/05/07	07/17/07	KWG0707428	

Comments:

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705445
Date Collected: 06/22/2007
Date Received: 06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070815
Lab Code: K0705445-001

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4-Dinitrotoluene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Chlorophenyl Phenyl Ether	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Diethyl Phthalate	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Nitroaniline	ND	U	230	10	07/05/07	07/17/07	KWG0707428	
2-Methyl-4,6-dinitrophenol	ND	U	1200	10	07/05/07	07/17/07	KWG0707428	
N-Nitrosodiphenylamine	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
4-Bromophenyl Phenyl Ether	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Hexachlorobenzene	ND	U	120	10	07/05/07	07/17/07	KWG0707428	
Pentachlorophenol	ND	U	1200	10	07/05/07	07/17/07	KWG0707428	
Di-n-butyl Phthalate	**250**	BD	230	10	07/05/07	07/17/07	KWG0707428	
Butyl Benzyl Phthalate	**3900**	D	120	10	07/05/07	07/17/07	KWG0707428	
3,3'-Dichlorobenzidine	ND	U	1200	10	07/05/07	07/17/07	KWG0707428	
Bis(2-ethylhexyl) Phthalate	**2500**	D	1200	10	07/05/07	07/17/07	KWG0707428	
Di-n-octyl Phthalate	ND	U	120	10	07/05/07	07/17/07	KWG0707428	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	11	10-86	07/17/07	Acceptable
Phenol-d6	15	17-101	07/17/07	Outside Control Limits
Nitrobenzene-d5	9	10-108	07/17/07	Outside Control Limits
2-Fluorobiphenyl	13	10-108	07/17/07	Acceptable
2,4,6-Tribromophenol	51	21-110	07/17/07	Acceptable
Terphenyl-d14	76	26-122	07/17/07	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	FO 070816	**Units:**	ug/Kg
Lab Code:	K0705445-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Phenol	ND	U	300	10	07/05/07	07/12/07	KWG0707428	
2-Chlorophenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
1,3-Dichlorobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
1,4-Dichlorobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
1,2-Dichlorobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Benzyl Alcohol	ND	U	200	10	07/05/07	07/12/07	KWG0707428	
Bis(2-chloroisopropyl) Ether	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2-Methylphenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Hexachloroethane	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
N-Nitrosodi-n-propylamine	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Methylphenol†	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Nitrobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Isophorone	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2-Nitrophenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2,4-Dimethylphenol	ND	U	500	10	07/05/07	07/12/07	KWG0707428	
Bis(2-chloroethoxy)methane	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2,4-Dichlorophenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Benzoic Acid	ND	U	2000	10	07/05/07	07/12/07	KWG0707428	
1,2,4-Trichlorobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Chloroaniline	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Hexachlorobutadiene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Chloro-3-methylphenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Hexachlorocyclopentadiene	ND	U	500	10	07/05/07	07/12/07	KWG0707428	
2,4,6-Trichlorophenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2,4,5-Trichlorophenol	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2-Chloronaphthalene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2-Nitroaniline	ND	U	200	10	07/05/07	07/12/07	KWG0707428	
Dimethyl Phthalate	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
2,6-Dinitrotoluene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
3-Nitroaniline	ND	U	200	10	07/05/07	07/12/07	KWG0707428	
2,4-Dinitrophenol	ND	U	2000	10	07/05/07	07/12/07	KWG0707428	
4-Nitrophenol	ND	U	1000	10	07/05/07	07/12/07	KWG0707428	

Comments:

00009

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705445
Date Collected: 06/22/2007
Date Received: 06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070816
Lab Code: K0705445-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 3541
Analysis Method: 8270C

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4-Dinitrotoluene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Chlorophenyl Phenyl Ether	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Diethyl Phthalate	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Nitroaniline	ND	U	200	10	07/05/07	07/12/07	KWG0707428	
2-Methyl-4,6-dinitrophenol	ND	U	1000	10	07/05/07	07/12/07	KWG0707428	
N-Nitrosodiphenylamine	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
4-Bromophenyl Phenyl Ether	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Hexachlorobenzene	ND	U	100	10	07/05/07	07/12/07	KWG0707428	
Pentachlorophenol	ND	U	1000	10	07/05/07	07/12/07	KWG0707428	
Di-n-butyl Phthalate	ND	U	200	10	07/05/07	07/12/07	KWG0707428	
Butyl Benzyl Phthalate	**1100**	D	100	10	07/05/07	07/12/07	KWG0707428	
3,3'-Dichlorobenzidine	ND	U	1000	10	07/05/07	07/12/07	KWG0707428	
Bis(2-ethylhexyl) Phthalate	**2100**	D	1000	10	07/05/07	07/12/07	KWG0707428	
Di-n-octyl Phthalate	ND	U	100	10	07/05/07	07/12/07	KWG0707428	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	36	10-86	07/12/07	Acceptable
Phenol-d6	52	17-101	07/12/07	Acceptable
Nitrobenzene-d5	37	10-108	07/12/07	Acceptable
2-Fluorobiphenyl	54	10-108	07/12/07	Acceptable
2,4,6-Tribromophenol	65	21-110	07/12/07	Acceptable
Terphenyl-d14	63	26-122	07/12/07	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	FO 070817	**Units:**	ug/Kg
Lab Code:	K0705445-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Phenol	ND	U	380	10	07/05/07	07/17/07	KWG0707428	
2-Chlorophenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
1,3-Dichlorobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
1,4-Dichlorobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
1,2-Dichlorobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Benzyl Alcohol	**330**	D	250	10	07/05/07	07/17/07	KWG0707428	
Bis(2-chloroisopropyl) Ether	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2-Methylphenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Hexachloroethane	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
N-Nitrosodi-n-propylamine	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Methylphenol†	**910**	D	130	10	07/05/07	07/17/07	KWG0707428	
Nitrobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Isophorone	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2-Nitrophenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2,4-Dimethylphenol	ND	U	620	10	07/05/07	07/17/07	KWG0707428	
Bis(2-chloroethoxy)methane	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2,4-Dichlorophenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Benzoic Acid	ND	U	2500	10	07/05/07	07/17/07	KWG0707428	
1,2,4-Trichlorobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Chloroaniline	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Hexachlorobutadiene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Chloro-3-methylphenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Hexachlorocyclopentadiene	ND	U	730	10	07/05/07	07/17/07	KWG0707428	
2,4,6-Trichlorophenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2,4,5-Trichlorophenol	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2-Chloronaphthalene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2-Nitroaniline	ND	U	250	10	07/05/07	07/17/07	KWG0707428	
Dimethyl Phthalate	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
2,6-Dinitrotoluene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
3-Nitroaniline	ND	U	250	10	07/05/07	07/17/07	KWG0707428	
2,4-Dinitrophenol	ND	U	2500	10	07/05/07	07/17/07	KWG0707428	
4-Nitrophenol	ND	U	1300	10	07/05/07	07/17/07	KWG0707428	

Comments:

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	FO 070817	**Units:**	ug/Kg
Lab Code:	K0705445-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4-Dinitrotoluene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Chlorophenyl Phenyl Ether	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Diethyl Phthalate	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Nitroaniline	ND	U	250	10	07/05/07	07/17/07	KWG0707428	
2-Methyl-4,6-dinitrophenol	ND	U	1300	10	07/05/07	07/17/07	KWG0707428	
N-Nitrosodiphenylamine	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
4-Bromophenyl Phenyl Ether	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Hexachlorobenzene	ND	U	130	10	07/05/07	07/17/07	KWG0707428	
Pentachlorophenol	ND	U	1300	10	07/05/07	07/17/07	KWG0707428	
Di-n-butyl Phthalate	**410**	D	250	10	07/05/07	07/17/07	KWG0707428	
Butyl Benzyl Phthalate	**4600**	D	130	10	07/05/07	07/17/07	KWG0707428	
3,3'-Dichlorobenzidine	ND	U	1300	10	07/05/07	07/17/07	KWG0707428	
Bis(2-ethylhexyl) Phthalate	**3800**	D	1300	10	07/05/07	07/17/07	KWG0707428	
Di-n-octyl Phthalate	ND	U	130	10	07/05/07	07/17/07	KWG0707428	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	9	10-86	07/17/07	Outside Control Limits
Phenol-d6	14	17-101	07/17/07	Outside Control Limits
Nitrobenzene-d5	9	10-108	07/17/07	Outside Control Limits
2-Fluorobiphenyl	11	10-108	07/17/07	Acceptable
2,4,6-Tribromophenol	52	21-110	07/17/07	Acceptable
Terphenyl-d14	74	26-122	07/17/07	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

00012

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0707428-5	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Phenol	ND	U	15	1	07/05/07	07/12/07	KWG0707428	
2-Chlorophenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
1,3-Dichlorobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
1,4-Dichlorobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
1,2-Dichlorobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Benzyl Alcohol	ND	U	10	1	07/05/07	07/12/07	KWG0707428	
Bis(2-chloroisopropyl) Ether	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2-Methylphenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Hexachloroethane	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
N-Nitrosodi-n-propylamine	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Methylphenol†	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Nitrobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Isophorone	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2-Nitrophenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2,4-Dimethylphenol	ND	U	25	1	07/05/07	07/12/07	KWG0707428	
Bis(2-chloroethoxy)methane	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2,4-Dichlorophenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Benzoic Acid	ND	U	100	1	07/05/07	07/12/07	KWG0707428	
1,2,4-Trichlorobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Chloroaniline	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Hexachlorobutadiene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Chloro-3-methylphenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Hexachlorocyclopentadiene	ND	U	29	1	07/05/07	07/12/07	KWG0707428	
2,4,6-Trichlorophenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2,4,5-Trichlorophenol	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2-Chloronaphthalene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2-Nitroaniline	ND	U	10	1	07/05/07	07/12/07	KWG0707428	
Dimethyl Phthalate	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
2,6-Dinitrotoluene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
3-Nitroaniline	ND	U	10	1	07/05/07	07/12/07	KWG0707428	
2,4-Dinitrophenol	ND	U	100	1	07/05/07	07/12/07	KWG0707428	
4-Nitrophenol	ND	U	50	1	07/05/07	07/12/07	KWG0707428	

Comments:

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0707428-5	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4-Dinitrotoluene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Chlorophenyl Phenyl Ether	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Diethyl Phthalate	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Nitroaniline	ND	U	10	1	07/05/07	07/12/07	KWG0707428	
2-Methyl-4,6-dinitrophenol	ND	U	50	1	07/05/07	07/12/07	KWG0707428	
N-Nitrosodiphenylamine	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
4-Bromophenyl Phenyl Ether	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Hexachlorobenzene	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
Pentachlorophenol	ND	U	50	1	07/05/07	07/12/07	KWG0707428	
Di-n-butyl Phthalate	**13**		10	1	07/05/07	07/12/07	KWG0707428	
Butyl Benzyl Phthalate	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	
3,3'-Dichlorobenzidine	ND	U	50	1	07/05/07	07/12/07	KWG0707428	
Bis(2-ethylhexyl) Phthalate	ND	U	50	1	07/05/07	07/12/07	KWG0707428	
Di-n-octyl Phthalate	ND	U	5.0	1	07/05/07	07/12/07	KWG0707428	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	8	10-86	07/12/07	Outside Control Limits
Phenol-d6	19	17-101	07/12/07	Acceptable
Nitrobenzene-d5	3	10-108	07/12/07	Outside Control Limits
2-Fluorobiphenyl	8	10-108	07/12/07	Outside Control Limits
2,4,6-Tribromophenol	49	21-110	07/12/07	Acceptable
Terphenyl-d14	73	26-122	07/12/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

00014

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	FO 070815	**Units:**	ug/Kg
Lab Code:	K0705445-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**87**		2.9	1	07/05/07	07/18/07	KWG0707426	
2-Methylnaphthalene	**80**		2.9	1	07/05/07	07/18/07	KWG0707426	
Acenaphthylene	**5.8**		2.9	1	07/05/07	07/18/07	KWG0707426	
Acenaphthene	**12**		2.9	1	07/05/07	07/18/07	KWG0707426	
Fluorene	**12**		2.9	1	07/05/07	07/18/07	KWG0707426	
Dibenzofuran	**8.1**		2.9	1	07/05/07	07/18/07	KWG0707426	
Phenanthrene	**160**		2.9	1	07/05/07	07/18/07	KWG0707426	
Anthracene	**29**		2.9	1	07/05/07	07/18/07	KWG0707426	
Fluoranthene	**290**		2.9	1	07/05/07	07/18/07	KWG0707426	
Pyrene	**280**		2.9	1	07/05/07	07/18/07	KWG0707426	
Benzo(b)fluoranthene	**130**		2.9	1	07/05/07	07/18/07	KWG0707426	
Benzo(k)fluoranthene	**39**		2.9	1	07/05/07	07/18/07	KWG0707426	
Benz(a)anthracene	**100**		2.9	1	07/05/07	07/18/07	KWG0707426	
Chrysene	**130**		2.9	1	07/05/07	07/18/07	KWG0707426	
Benzo(a)pyrene	**95**		2.9	1	07/05/07	07/18/07	KWG0707426	
Indeno(1,2,3-cd)pyrene	**98**		2.9	1	07/05/07	07/18/07	KWG0707426	
Dibenz(a,h)anthracene	**22**		2.9	1	07/05/07	07/18/07	KWG0707426	
Benzo(g,h,i)perylene	**110**		2.9	1	07/05/07	07/18/07	KWG0707426	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	24	10-123	07/18/07	Acceptable
Fluoranthene-d10	71	10-136	07/18/07	Acceptable
Terphenyl-d14	66	32-123	07/18/07	Acceptable

Comments:

00015

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	FO 070816	**Units:**	ug/Kg
Lab Code:	K0705445-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**24**		2.5	1	07/05/07	07/16/07	KWG0707426	
2-Methylnaphthalene	**12**		2.5	1	07/05/07	07/16/07	KWG0707426	
Acenaphthylene	**10**		2.5	1	07/05/07	07/16/07	KWG0707426	
Acenaphthene	**15**		2.5	1	07/05/07	07/16/07	KWG0707426	
Fluorene	**17**		2.5	1	07/05/07	07/16/07	KWG0707426	
Dibenzofuran	**13**		2.5	1	07/05/07	07/16/07	KWG0707426	
Phenanthrene	**240**		2.5	1	07/05/07	07/16/07	KWG0707426	
Anthracene	**46**		2.5	1	07/05/07	07/16/07	KWG0707426	
Fluoranthene	**500**		2.5	1	07/05/07	07/16/07	KWG0707426	
Pyrene	**390**	D	5.0	2	07/05/07	07/18/07	KWG0707426	
Benzo(b)fluoranthene	**250**		2.5	1	07/05/07	07/16/07	KWG0707426	
Benzo(k)fluoranthene	**93**		2.5	1	07/05/07	07/16/07	KWG0707426	
Benz(a)anthracene	**180**		2.5	1	07/05/07	07/16/07	KWG0707426	
Chrysene	**280**		2.5	1	07/05/07	07/16/07	KWG0707426	
Benzo(a)pyrene	**180**		2.5	1	07/05/07	07/16/07	KWG0707426	
Indeno(1,2,3-cd)pyrene	**200**	D	5.0	2	07/05/07	07/18/07	KWG0707426	
Dibenz(a,h)anthracene	**36**	D	5.0	2	07/05/07	07/18/07	KWG0707426	
Benzo(g,h,i)perylene	**190**	D	5.0	2	07/05/07	07/18/07	KWG0707426	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	61	10-123	07/16/07	Acceptable
Fluoranthene-d10	76	10-136	07/16/07	Acceptable
Terphenyl-d14	66	32-123	07/16/07	Acceptable

Comments:

00016

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	06/22/2007
Sample Matrix:	Sediment	**Date Received:**	06/25/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	FO 070817	**Units:**	ug/Kg
Lab Code:	K0705445-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**17**		3.1	1	07/05/07	07/18/07	KWG0707426	
2-Methylnaphthalene	**9.9**		3.1	1	07/05/07	07/18/07	KWG0707426	
Acenaphthylene	**4.4**		3.1	1	07/05/07	07/18/07	KWG0707426	
Acenaphthene	**9.1**		3.1	1	07/05/07	07/18/07	KWG0707426	
Fluorene	**12**		3.1	1	07/05/07	07/18/07	KWG0707426	
Dibenzofuran	**8.2**		3.1	1	07/05/07	07/18/07	KWG0707426	
Phenanthrene	**160**		3.1	1	07/05/07	07/18/07	KWG0707426	
Anthracene	**30**		3.1	1	07/05/07	07/18/07	KWG0707426	
Fluoranthene	**320**		3.1	1	07/05/07	07/18/07	KWG0707426	
Pyrene	**230**		3.1	1	07/05/07	07/18/07	KWG0707426	
Benzo(b)fluoranthene	**130**		3.1	1	07/05/07	07/18/07	KWG0707426	
Benzo(k)fluoranthene	**37**		3.1	1	07/05/07	07/18/07	KWG0707426	
Benz(a)anthracene	**91**		3.1	1	07/05/07	07/18/07	KWG0707426	
Chrysene	**130**		3.1	1	07/05/07	07/18/07	KWG0707426	
Benzo(a)pyrene	**92**		3.1	1	07/05/07	07/18/07	KWG0707426	
Indeno(1,2,3-cd)pyrene	**100**		3.1	1	07/05/07	07/18/07	KWG0707426	
Dibenz(a,h)anthracene	**24**		3.1	1	07/05/07	07/18/07	KWG0707426	
Benzo(g,h,i)perylene	**110**		3.1	1	07/05/07	07/18/07	KWG0707426	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	28	10-123	07/18/07	Acceptable
Fluoranthene-d10	77	10-136	07/18/07	Acceptable
Terphenyl-d14	70	32-123	07/18/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Portland, City of	**Service Request:**	K0705445
Project:	Portland Harbor Inline Samp	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0707426-5	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
2-Methylnaphthalene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Acenaphthylene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Acenaphthene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Fluorene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Dibenzofuran	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Phenanthrene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Anthracene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Fluoranthene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Pyrene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Benzo(b)fluoranthene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Benzo(k)fluoranthene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Benz(a)anthracene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Chrysene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Benzo(a)pyrene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Indeno(1,2,3-cd)pyrene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Dibenz(a,h)anthracene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	
Benzo(g,h,i)perylene	ND	U	1.3	1	07/05/07	07/18/07	KWG0707426	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	43	10-123	07/18/07	Acceptable
Fluoranthene-d10	75	10-136	07/18/07	Acceptable
Terphenyl-d14	86	32-123	07/18/07	Acceptable

Comments:

00018

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	City of Portland	**Service Request No.:**	K0705445
Project:	Porland Harbor Inline Sampling	**Date Received:**	06/25/2007
Sample Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier I data deliverables. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three sediment samples were received for analysis at Columbia Analytical Services on 06/25/2007. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Semivolatile Organic Compounds by EPA Method 8270C

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded Di-n-octyl Phthalate in ICAL ID CAL6370. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 7.9%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Method Blank Exceptions:
The Method Blank KWG0707428-5 contained low levels of Di-n-butyl Phthalate above the Method Reporting Limit (MRL). In accordance with CAS QA/QC policy, all sample results less than twenty times the level found in the Method Blank are flagged as estimated.

Surrogate Exceptions:
The lower control criterion was exceeded for 2-Fluorophenol, Nitrobenzene-d5, and 2-Fluorobiphenyl in method blank KWG0707428-5. Since the problem indicates a potential negative bias in the Method Blank, all associated field samples containing target analytes were re-extracted past the recommended hold time and reanalyzed. The Method Blank met control criteria for the reanalysis. Note the results for the field samples were comparable for both determinations, which indicates the problem with the initial analysis was restricted to the Method Blank. Therefore, the results from the original analysis are reported. The data is flagged to indicate the problem.

The control criteria were exceeded for Phenol-d6, Nitrobenzsene-d5 in FO 070815. Since the problem may indicate a potential bias in the analytical batch, all associated field samples were re-extracted past the recommended hold time and reanalyzed. The surrogates met control criteria for the reanalysis. Note the results for the field samples were comparable for both determinations, which indicates the problem with the initial analysis was restricted to the surrogate recovery. Therefore, the results from the original analysis are reported. The data is flagged to indicate the problem.

Approved by LJ Date 9-13-07

The control criteria were exceeded for 2-Fluorophenol, Phenol-d6, and Nitrobenzsene-d5 in FO 070817. Since the problem may indicate a potential bias in the analytical batch, all associated field samples were re-extracted past the recommended hold time and reanalyzed. The surrogates met control criteria for the reanalysis. Note the results for the field samples were comparable for both determinations, which indicates the problem with the initial analysis was restricted to the surrogate recovery. Therefore, the results from the original analysis are reported. The data is flagged to indicate the problem.

Elevated Method Reporting Limits:
The reporting limit is elevated for all samples. The sample extracts were diluted prior to instrumental analysis due to relatively high levels of non-target background components. Clean-up of the extract was performed within the scope of the method, but did not eliminate enough of the background components to prevent dilution.

No other anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

No anomalies associated with the analysis of these samples were observed.

Approved by _____ **Date** 8-13-07

Columbia Analytical Services, Inc.
An Employee-Owned Company

CHAIN OF CUSTODY
Sediment and Tissue Chemistry

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • FAX (360) 636-1068

SR#: 12070545

PAGE 1 OF 1 COC # 0021

PROJECT NAME: PORTLAND HARBOR INLINE SAMP
PROJECT NUMBER:
PROJECT MANAGER: JENNIFER SHACKELFORD
COMPANY/ADDRESS: WPCL - CITY OF PORTLAND
6543 N BURLINGTON AVE PORTLAND, OR 97203
PHONE #: FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Metals (list below) ☐ Total Volatile Solids ☐ Total Solids ☐ Lipids	TOC (ASTM D4129M)	Grain size - PSEP / ASTM D422	Sulfide ☐ Total (9030M) ☐ Water Soluble	AVS / SEM	Ammonia ☐ Total (350.1m) ☐ Pore water	Pesticides (8081)	PCBs (8082) ☐ Aroclors ☐ Congeners	Semivolatiles (GC/MS SIM) ☒ PAHs ☐ Phthalates ☐ Phenols ☐ PSEP	Organotin - Sediment ☐ Mono ☐ Di ☐ Tri ☐ Tetra	Organotin - Pore water ☐ Mono ☐ Di ☐ Tri ☐ Tetra	Volatiles (8260)	TRPH 8015 / 418.1	SVOCs EPA 8270 C	PAH + Phthalates EPA 8270C-SIM			REMARKS
FD 070815	6/22/07	0936		SED	3									X					X				
FD 070816	6/22/07	1006		SED	3									X					X				
FD 070817	6/22/07	1058		SED	1									X					X				

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

____ 24 hr. ____ 48 hr.
____ 5 Day
____ Standard (10-15 working days)
____ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn
CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 6/25/07 0955	Date/Time: 625/07 9:58	Date/Time: 6/25/07 12:00	Date/Time: 6/25/07 1400
Printed Name: KEVIN OLSON	Printed Name:	Printed Name:	Printed Name: Tracy Black
Firm: CITY OF PORTLAND	Firm: CAS	Firm: CAS	Firm: CAS

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC LOAN

Client / Project: City of PDX Service Request K07 5445

Received: 6/25/14 Opened: 6/25/14 By: T Hal

1. Samples were received via? *US Mail* *Fed Ex* *UPS* *DHL* *GH* *GS* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: _____ NA Y N

5. **Temperature of cooler(s) upon receipt (°C):**	n/a			
Temperature Blank (°C):				
6. If applicable, list Chain of Custody Numbers:				

7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Packing material used. *Inserts* *Bubble Wrap* *Gel Packs* *Wet Ice* *Sleeves* *Other* n/a
9. **Did all bottles arrive in good condition (unbroken)?** *Indicate in the table below.* NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? Y N
11. Did all sample labels and tags agree with custody papers? *Indicate in the table below* Y N
12. **Were the correct types of bottles used for the tests indicated?** NA Y N
13. Were all of the preserved bottles received at the lab with the appropriate pH? *Indicate in the table below.* NA Y N
14. Were VOA vials and 1631 Mercury bottles checked for absence of air bubbles? *Indicate in the table below.* NA Y N
15. **Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection?** NA Y N
16. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broken	pH	Reagent	Volume added	Reagent Lot Number	Initials

Additional Notes, Discrepancies, & Resolutions: _____

00022

APPENDIX C

Basin 19 Upland Source Updates

Appendix C: Basin 19 Upland Source Updates

The Oregon Department of Environmental Quality (DEQ) maintains an Environmental Cleanup Site Information (ECSI) database. Information in the ECSI database for DEQ Cleanup Sites located in or near Basin 19 was reviewed during development of the Basin 19 conceptual site model, as described in the *Phase 1 Report for City of Portland Priority 1 Basins* (Phase 1 Report; GSI, 2006),[1] to identify potential sources and migration pathways. This appendix provides updated site summaries for DEQ Cleanup Sites in Basin 19, based on information from the ECSI database and from selected site-specific reports on file at DEQ and the City. [2]

Upland Sites Located within Basin 19

Anderson Brothers (ECSI #970). Activities conducted at this site subsequent to the Phase 1 Report include site investigation and remediation activities in 2005 (including removal of petroleum-contaminated soil), catch basin sampling (March 2006), stormwater system mapping, cleanout and sampling (August 2006), and collection of stormwater samples (2006 - 2007). Site ownership changed in late 2007 and among the site improvements made by the new owner were installation of new asphalt surfacing, an additional catch basin, and a shallow "soakage trench" to capture roof drainage prior to discharge to the stormwater system. These activities are summarized in the site's Stormwater Source Control Evaluation Report (Wohlers, 2008).

Solids collected from the stormwater conveyance system in 2006 included composite solids samples from one sump and three catch basins, inline solids samples, and an onsite stream sediment sample; these samples were collected before the August 2006 cleanout of the onsite stormwater line. PCBs were detected in most of these solids samples (total PCB concentrations up to 66 µg/Kg). The samples also contained BEHP (up to 29,000 µg/Kg), diesel- and oil-range hydrocarbons, other semivolatile organic compounds (SVOCs), and metals (Wohlers, 2008).

Four rounds of stormwater sampling were conducted at the site between December 2006 and December 2007. The stormwater samples were tested for TPH, VOCs, SVOCs, PAHs, PCB Aroclors, metals, and pesticides. Several metals, pesticides, PAHs, and one VOC exceeded JSCS SLVs (Wohlers, 2008).

Additional stormwater sampling has not been conducted to evaluate the effectiveness of the site improvements implemented in 2007 as source control measures. Stormwater best management practices (BMPs) also have been implemented that reportedly will continue to be maintained under the new ownership.

DEQ issued a partial No Further Action (NFA) determination for soil and groundwater at the site on February 5, 2007. The partial NFA determination did not provide a final finding on potential impacts associated with stormwater discharging from the site (DEQ, 2007b).

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[1] References cited in this appendix are listed in Section 6 of the *Source Investigation Update Report for City of Portland Basin 19*.

[2] Review of the ECSI database for the purposes of the Basin 19 source investigation update was performed February 4, 2010.

Based on a review of the 2006 – 2007 stormwater and sediment sampling results (and dependent upon continued implementation of the stormwater BMPs), DEQ concluded that the site does not appear to be a significant ongoing source of contaminants to the Willamette River and issued a draft Source Control Decision to complete the NFA issued in 2007 (DEQ, 2009d). EPA indicated it disagrees with DEQ's conclusions in the draft Source Control Decision; among EPA's specific points of disagreement was the significance of JSCS SLV exceedances, the potential effectiveness of the site's stormwater BMPs, and the lack of an enforcement mechanism to ensure that the stormwater BMPs continue to be implemented in the long term (EPA, 2009). DEQ responded to EPA's comments (DEQ, 2009e) and issued a final NFA determination and Source Control Decision in December 2009 (DEQ, 2009f).

Brazil & Co. (ECSI #1026). Research of DEQ files for the Brazil & Co. site indicates that no additional information has been received by DEQ subsequent to the Phase 1 Report.

Results of the City's 2006 stormwater system investigation activities adjacent to the PGE – Forest Park property (BES, 2007) indicate that the Brazil & Co. site may be a possible source of PCBs and pesticides to the Basin 19 conveyance system. PCB Aroclor 1260 was detected at concentrations greater than the JSCS Toxicity SLV in two solids samples collected in the immediate vicinity of the Brazil & Co. site (the line from which these samples were collected was subsequently abandoned). PCBs also were detected in a sample collected from a catch basin immediately adjacent to the Brazil & Co. site that receives stormwater from a site lateral connection and discharges to the active stormwater line in NW St. Helens Road (BES, 2007). Total DDx concentrations exceeded the JSCS Bioaccumulation SLV in samples collected from the historic storm lines adjacent and downstream of the site. While these lines have since been abandoned, the potential for the site to be a current source of pesticides to Basin 19 is unknown.

Calbag Metals - Front Ave. (ECSI #2454). Information post-dating research for the Phase 1 Report includes a report summarizing the results of stormwater system evaluations conducted following implementation of source control measures (SCMs) at the site (Creekside, 2006). Before site remediation, PCBs, metals, and phthalates were detected at concentrations significantly greater than JSCS toxicity SLVs in solids samples collected from onsite catch basins and stormwater lines; total PCBs concentrations in the solids samples ranged up to 22,020 µg/Kg. In 2005, accumulated sediments within the storm drain lines at the site and in adjacent portions of the Basin 19 conveyance system were removed and the site was repaved with the goal of reducing or eliminating the source of contaminants to the Basin 19 conveyance system. In its final Source Control Decision and NFA determination, DEQ indicated that the "site was a potential historic source of copper, lead, chromium, mercury, PCBs and phthalates to the Willamette River" (DEQ, 2005). In the NFA, DEQ required the site to collect confirmatory stormwater samples through the spring of 2006. However, the stormwater samples were analyzed only for total suspended solids and total and dissolved copper, lead and zinc; Calbag Metals was not required to analyze the stormwater samples for additional site contaminants of interest identified by DEQ, including PCBs, phthalates, and other metals. The results of the post-source control stormwater sampling indicate that one or more total metals concentrations exceeded NPDES stormwater permit benchmarks and JSCS SLVs (Creekside, 2006).

Since implementation of SCMs at the Calbag Metals site in 2005, the site has not collected solids samples to evaluate the effectiveness of the SCM. Additionally, post-SCM stormwater samples collected at the site have not been analyzed for all contaminants. However, the City collected solids samples from the storm lateral from the Calbag Metals site in 2007 and 2008, and results

for both samples indicated significantly elevated total PCBs concentrations (630-2,360 µg/Kg) in the stormwater solids discharged from the site (BES, 2008; 2009a).

Chapel Steel (ECSI #4920). This site was not discussed in the Phase 1 Report as it was not identified as an ECSI site at the time the report was prepared. Chapel Steel handles and distributes raw steel, performs truck loading, trailer fabrication, fork lift maintenance, and tractor maintenance. Stormwater from this site drains to a multiparty, private line that connects to the stormwater main line in NW Kittridge Avenue. As part of a Portland Harbor Site Discovery pilot project, DEQ visited the site in June 2007 and sampled solids accumulated in a catch basin located on the north side of the property. The sample was tested for PCB Aroclors, PAHs, pesticides, phthalates, and metals. Total PCBs (33.7 µg/Kg) and BEHP (7990 µ/Kg) concentrations exceeded the JSCS SLVs, and a few metals (lead, nickel, and zinc) slightly exceeded the SLVs. In the site discovery summary report (DEQ, 2007c), DEQ reported that catch basins at this facility do not have filters installed and are not routinely cleaned out. Based on the site discovery findings, DEQ recommended that the site work with the City's Industrial Stormwater Program and undertake a cleanout of the entire stormwater conveyance system (DEQ, 2008a). The City is not aware of any source control actions taken by the site since the 2007 site discovery sampling.

Dura Industries (ECSI #111). Limited information for this site was on file at DEQ when the Phase 1 Report was prepared, and no additional information is currently on file.

Greenway Recycling (ECSI #4655). This site (also referred to as Armstrong Disposal Company in the ECSI database) was not discussed in the Phase 1 Report as it was not identified as an ECSI site at the time the report was prepared. In 2004 and 2005, the site began grading for redevelopment without appropriate permits; numerous complaints of mud washing onto the street and into the City's storm system were received during this period. The City required the site to apply for the appropriate permits and required stormwater collection and treatment to be installed, pursuant to the City Stormwater Manual. Site stormwater requirements by the City were coordinated with DEQ during the site development permitting process. Subsequently, the site entered DEQ's Cleanup Program to evaluate whether the redevelopment was adequate to meet JSCS requirements. A stormwater collection and treatment system was installed at the site in accordance with the City's Stormwater Manual in 2007.

An independent cleanup and risk assessment report summarizing soil and groundwater sampling efforts and remedial activities conducted at the site between 2003 and 2006 was submitted to DEQ in 2007 (Evren Northwest, 2007). Analytical data presented in the report includes PCB data for a soil sample collected near an onsite stormwater catch basin that exceeded JSCS SLVs (Aroclor 1016 concentration of 560 µg/Kg) (Evren Northwest, 2007). The soil represented by this sample was subsequently excavated and disposed offsite. Data were not collected at the site under the DEQ Cleanup Program to evaluate the effectiveness of stormwater source control measures.

The City collected solids samples from three catch basins in the vicinity of the Greenway facility in 2007 before the site had installed onsite stormwater treatment. Total PCBs were detected at a concentration of 32 µg/Kg in one of the catch basins immediately adjacent to the site (see Appendix B). DEQ issued a proposed NFA recommendation (DEQ, 2008c) concluding, based on review of the independent cleanup report, that remaining petroleum hydrocarbon constituents, metals, and chlorinated VOCs are present at low levels in the soil and groundwater and the site

was not likely to be contributing contaminants to the Willamette River at levels warranting DEQ oversight. DEQ issued a Conditional NFA Determination for the site in 2009 (DEQ, 2009a), which included an Easement and Equitable Servitude for additional site restrictions.

Mt. Hood Chemical Corp. (ECSI #81). At the time of the Phase 1 Report, potential migration pathways to the Outfall 19 area had not been evaluated at the site. In early 2008, the site entered into an agreement with DEQ to conduct a stormwater assessment and source control evaluation. The current focus has been on groundwater and soil vapor investigation. Work on the stormwater pathway has been limited but a work plan is expected later this year.

Mt. Hood Chemical Property (ECSI #1328). No additional information subsequent to the Phase 1 Report is on file at DEQ. As indicated in the Phase 1 Report, the site has been investigated and received closure from DEQ, although the stormwater pathway was not evaluated as part of the closure.

Penske Truck Leasing (ECSI #5055). This site was not discussed in the Phase 1 Report as it was not identified as an ECSI site at the time the report was prepared. Subsurface contaminated soil was remediated in conjunction with site redevelopment activities in 2007. Review of the site characterization and excavation report (EFI Global, 2008) indicates former oil-water separators and aboveground storage tanks were removed from the site and associated petroleum-contaminated soils were excavated during the remedial activities. Confirmation soil and groundwater samples collected after the soil removals did not detect petroleum-related contaminants at levels above Oregon's risk-based concentrations. DEQ issued an NFA determination for the site in December 2008 (DEQ, 2008d) based on its finding that residual concentrations of metals, petroleum hydrocarbons, and associated constituents in subsurface soils and groundwater are unlikely to present a threat to human health or the Willamette River and the fact that the site has been redeveloped in accordance with the City's Stormwater Manual (DEQ, 2008b). Redevelopment included construction of three flow-through planters, a detention vault, and sediment manhole to treat stormwater on site. Data were not collected at the site under the DEQ Cleanup Program to evaluate the effectiveness of stormwater source control measures.

PGE-Forest Park (ECSI #2406). A 1999 site investigation at this site showed that PCBs were present in surface and subsurface soils over a large percentage of the site, up to 1,400 ppm. Based on a cleanup level of 1.2 ppm, this site was remediated in 2000, including removal of 2,100 tons of site soils. During remedial excavation, a concrete French drain and inlet pipe were removed from the property. Metal piping leading from the drain to the City's stormwater system was cleaned and the open end of the lateral under the sidewalk was sealed by plugging it with quick-set concrete. An NFA determination was made by DEQ in May 2001, although the stormwater pathway had not been evaluated**.**

In April 2005, the City entered into a Prospective Purchaser Agreement (PPA) for the site with DEQ. In accordance with the PPA, the City evaluated the potential for current or historical offsite migration of site contaminants via the stormwater pathway. The City collected catch basin and inline solids samples in the storm system adjacent to the site and abandoned several unused lines in the vicinity of the site in 2006. The analytical results for the solids samples indicated the presence of PCB Aroclors 1248 and/or 1260 in 11 of the 15 samples. The highest total PCB concentrations were detected in two inline solids samples collected upstream of the site, adjacent to the Brazil & Co. site, in the subsequently abandoned lines (BES, 2007).

This site was obtained for a public trailhead to Forest Park but has not been developed pending funding through the City Parks & Recreation Bureau. Additional interim source control measures, such as placing gravel on the fire lane to stabilize soils and placement of jersey barriers to restrict vehicular access and reduce erosion from the site, were implemented in 2007. When funding is available, the site will be developed with DEQ approval to assure that activities do not exacerbate site contamination or offsite migration of contaminants.

Schnitzer-Kittridge Distribution Center (ECSI # 2442). This site was redeveloped in 1996. Prior to redevelopment activities, acetone, arsenic, cadmium, lead, mercury, zinc, 4-Methyl-2-pentanone, PCBs, and total petroleum hydrocarbons were identified as site soil and/or groundwater contaminants (DEQ, 2007a). Additionally, stormwater samples collected between 1991 and 1995 (as required by the site's general stormwater discharge permit) indicated detections of several metals (cadmium, chromium, copper, lead, mercury, nickel, and zinc); however, the information was deemed insufficient to determine the potential for metals or other hazardous substances to have been deposited or accumulated in the stormwater drainage system or in Willamette River sediments as a result of the site's stormwater discharges (DEQ, 2004).

DEQ issued a Source Control Decision for the site in 2004 (DEQ, 2004), as noted in the Phase 1 Report. The Source Control Decision recommended additional information be developed to address specific data gaps with regard to possible site contamination from VOCs, SVOCs, PAHs, phenols, metals and PCBs in soil and groundwater that could pose a threat to site workers, utility workers and groundwater. In response, the site submitted a site characterization summary report (Bridgewater, 2006a), a land and beneficial water use report (Bridgewater, 2006b), a human health risk assessment (Bridgewater, 2006c), a Level 1 ecological risk assessment (Bridgewater, 2006d) and a feasibility study (Bridgewater, 2006e). Based on information in these documents, DEQ selected a combination of worker training, maintenance of the existing pavement, building and landscape cap, and placement of institutional controls on the site as the final remedies for the site. The Record of Decision, including a conditional NFA determination, was issued in January 2007 (DEQ, 2007a).

Upland Sites Located Partially Within Basin 19

Chevron USA Asphalt Refinery (ECSI #1281). Stormwater from a portion of the site (the Guilds Lake Tank Yard) discharges to the Basin 19 conveyance system. Chevron has completed a stormwater source control evaluation at the site since submittal of the Phase 1 Report. In October 2006, Chevron submitted a work plan to DEQ for conducting a stormwater evaluation (BBL, 2006a). Based on comments received from DEQ (that incorporated comments sent by the City via email to DEQ), a revised stormwater evaluation work plan was submitted in November 2006 (BBL, 2006b), followed by submittal of a storm water sampling plan in August 2007 (ARCADIS BBL, 2007).

Chevron conducted catch basin cleanout and solids sampling (September 2006 and August 2007); stormwater line cleanout, solids sampling and a video survey of various onsite and offsite stormwater drain lines (February, June and October 2007); and stormwater sampling in accordance with the JSCS (October 2007 – March 2008). Analytical results for the solids samples collected during the 2006 and 2007 catch basin and stormwater line cleanout activities indicate concentrations of total PCBs, metals, DDD, DDE, DDT, PAHs, and/or BEHP at concentrations greater than JSCS SLVs. In stormwater samples collected following the catch basin and line

cleanout activities from the portion of the site discharging to Basin 19, analytes detected at concentrations greater than the corresponding JSCS SLVs were metals (copper, lead, mercury, and zinc), PAHs, and pesticides (total DDT, dieldrin, and heptachlor). The Source Control Evaluation Report was submitted to DEQ in 2009 (ARCADIS, 2009a). The City commented on the Source Control Evaluation Report in August 2009 (BES, 2009b). A proposed Source Control Decision was drafted by DEQ and reviewed by EPA and is expected to be finalized by summer 2010.

Front Avenue LP (ECSI #1239) – Tube Forgings. As discussed in the Phase 1 Report, the Front Avenue LP Properties site consists of four tax lots. Only one-half of one tax lot, occupied by Tube Forgings of America, is located within Basin 19. A stormwater evaluation work plan was submitted to DEQ in March 2007 (MFA, 2007). The City commented on the work plan in a letter to DEQ dated April 20, 2007. An updated work plan (MFA, 2008a) was submitted to DEQ, and DEQ approved the work plan in a letter dated May 21, 2008. Catch basin samples were collected in May 2008 in accordance with the approved work plan. Based on the summary of the catch basin sampling results (MFA, 2008b), metals, phthalates, PAHs and phenol were detected at concentrations greater than JSCS SLVs. PCBs were not detected in the catch basin solids (although detection limits were about 20 ppb per Aroclor). The stormwater sampling component of the evaluation was initiated in November 2008. Based on the memorandum summarizing the results of one sampling event in November 2008 (MFA, 2009), BEHP, metals, and PAHs are present at concentrations exceeding JSCS SLVs in stormwater discharging from the site to Basin 19. In addition, PCB Aroclor 1254 also exceeded the JSCS SLV in one sample. The remaining rounds of stormwater sampling were expected to be completed in fall 2009, with reporting to follow.

Unocal - Willbridge Terminal (#1549/#177). This site was not discussed in the Phase 1 Report; however, a portion of this site (Tank Farm #3) discharges to Outfall 19. A stormwater evaluation work plan for the site was submitted to DEQ in October 2006 (Delta, 2006), and investigation activities in accordance with the work plan were initiated in fall 2007. Results of catch basin sampling (Delta, 2008) indicate BEHP, metals, and total PCBs are present at concentrations greater than JSCS SLVs in the Tank Farm #3 stormwater drainage system. Stormwater sampling was scheduled to be completed in fall 2009 (DEQ, 2009b). Difficulties in locating a viable monitoring location for evaluating site stormwater discharges to Basin 19 resulted in a data gap. DEQ is currently working with the site to identify a location to sample and a stormwater evaluation report for the site is expected in 2010.

BNSF Willbridge Yard (ECSI #3395). This site has no identified direct connections to the Basin 19 stormwater conveyance system and was not discussed in the Phase 1 Report, though storm lines discharging to Outfall 19 cross through the site. A Preliminary Assessment (PA) and Expanded PA (XPA) work plan were submitted to DEQ in September 2006 (RETEC Group, Inc., 2006). The PA states that stormwater infiltrates into the subsurface and concludes that the stormwater pathway is therefore incomplete; however the limited information presented in the PA was insufficient to support this conclusion (i.e., it did not evaluate the presence of subsurface drainage systems, such as perforated pipes common under rail lines, or the potential for a groundwater preferential pathway into/along the stormwater system). DEQ issued comments requiring the proposed XPA work plan to include a stormwater pathway investigation (DEQ, 2009c), and in response BNSF proposed a work plan addendum to include

evaluation of surface water and the stormwater pathway (AECOM, 2009). The stormwater pathway investigation is currently underway.

Nonpoint Sources and Pathways Located Near Outfall 19

Lakeside Industries (ECSI #2372). This site was identified as a potential source of metals and SVOCs to the Willamette River based on detections in river sediments adjacent to the site. As noted in the Phase 1 Report, stormwater at the site formerly discharged to onsite dry wells. The two dry wells were closed in late 2003 / early 2004 (DEQ, 1999). The site directed its stormwater to the City's sanitary sewer without a permit and without knowledge of the City. The City has required the site to collect stormwater data to evaluate whether contaminants in the site's stormwater discharge are within allowable concentration ranges and is reviewing these discharges to determine whether the City will require stormwater flows to be redirected to the stormwater system. DEQ will decide whether or not a stormwater pathway evaluation is needed at this site pending the outcome of the City's review.

Shaver Transportation (ECSI #2377). This site was identified as a potential source of PAHs and diesel to river sediments based on site operations and contaminant concentrations detected in river sediments in the adjacent harbor. Based on its review of available information, DEQ determined this site poses no significant threat to human health or the environment and issued an NFA determination in June 2003 (DEQ, 2003).